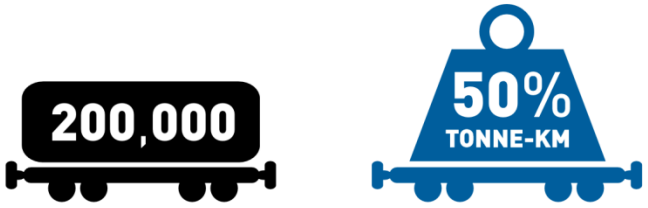
UIP – International Union of Wagon Keepers

250

We represent **250** Wagon Keepers and Entities in Charge of Maintenance

14

National Associations



Our members have approximately **200.000** freight wagons that produce **50%** of tonne-km around Europe.

TURNING DIGITALISATION INTO PERFORMANCE

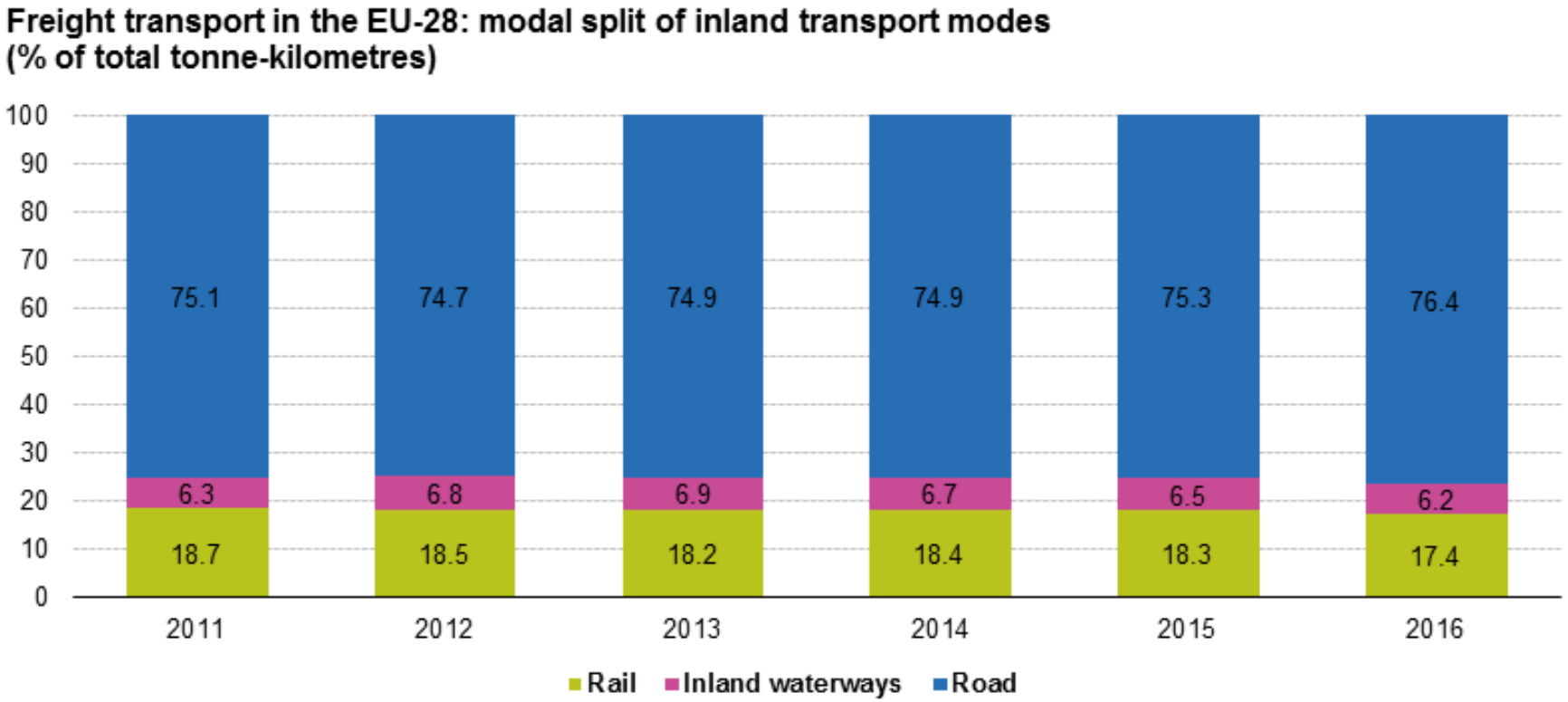
WIFI-ACCESS: FREEWAVE

2018: this what happens in an internet minute

TURNING DIGITALISATION INTO PERFORMANCE

Dr. Heiko FISCHER
President of UIP and chairman of the Executive Board at VTG

Freight transport in the EU-28 modal split of inland transport modes (% of total tonne-kilometres)



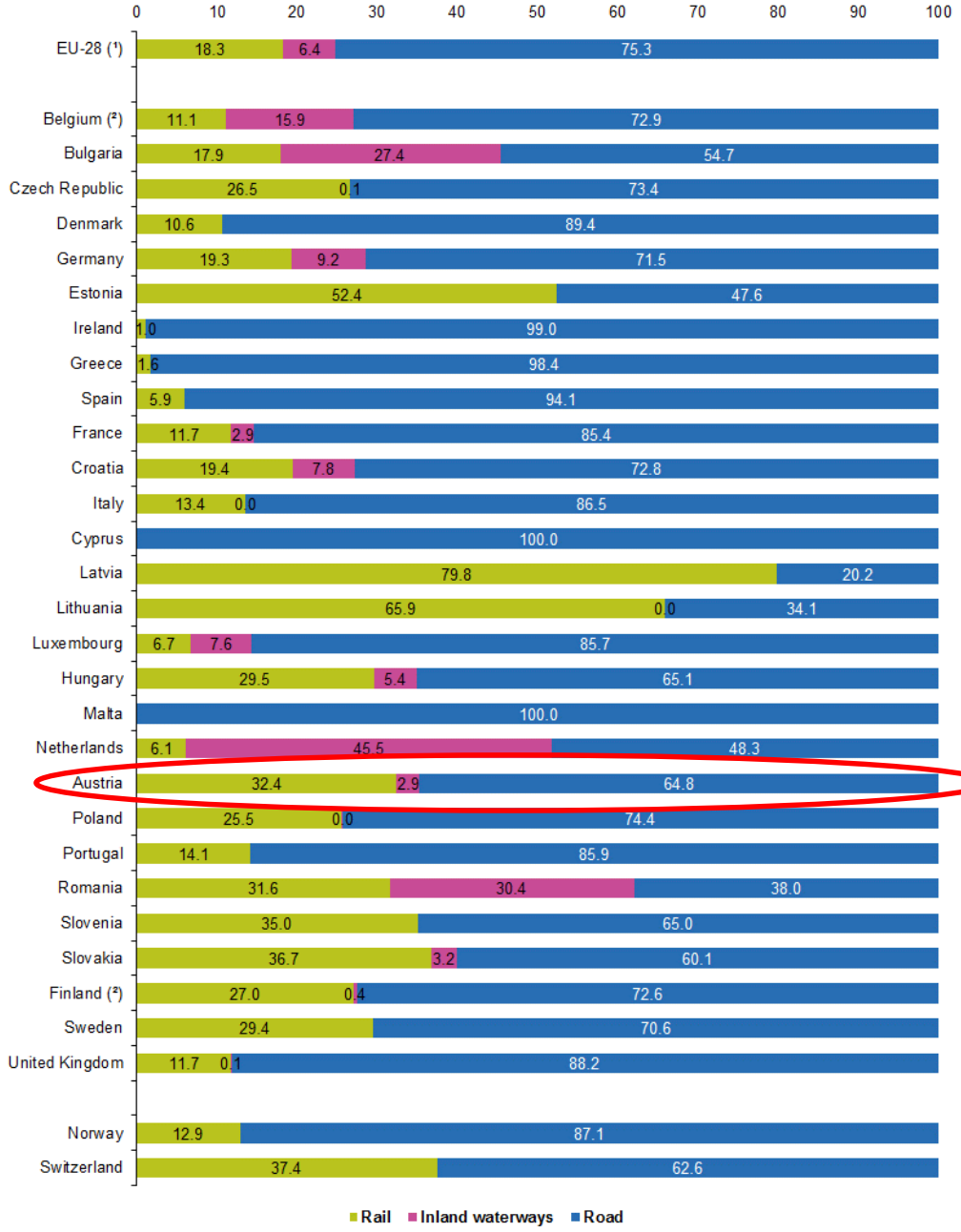
Note: EU-28 includes rail transport estimates for Belgium and Croatia and does not include road freight transport for Malta (negligible). Figures may not add up to 100% due to rounding.

Source: Eurostat (online data code: tran_hv_frmod)

eurostat

Source: Eurostat, May 2018 (actual)

Freight transport in the EU-28 modal split of inland transport modes (% of total tonne-kilometres)



(¹) EU-28 includes rail transport estimates for Belgium, inland waterways transport estimates for Finland and does not include road freight transport for Malta (negligible). Figures may not add up to 100% due to rounding.

(²) Estimated values.

The national views....

- Strategy and financial situation of the incumbants
- Industrial & environmental policy
- Heterogeneity of national system (technical/oparational)
- Economic dependency product/market
- Traffic and network density
- Competition between passenger – freight
- National laws on working hours, administrative workload, taxes,..
- .....

Source: Eurostat, May 2017 (actual)

Why talk about digitalisation ?
Address the challenges of freight transportation

REGULATION
stringent

TRAFFIC
heavy

PRICES
falling

increase
QUALITY

transparency
INFORMATION

TIME
fast

→ STANDARDISATION

→ AUTOMATION

→ DIGITALISATION

Source: VTG presentation

TURNING DIGITALISATION INTO PERFORMANCE

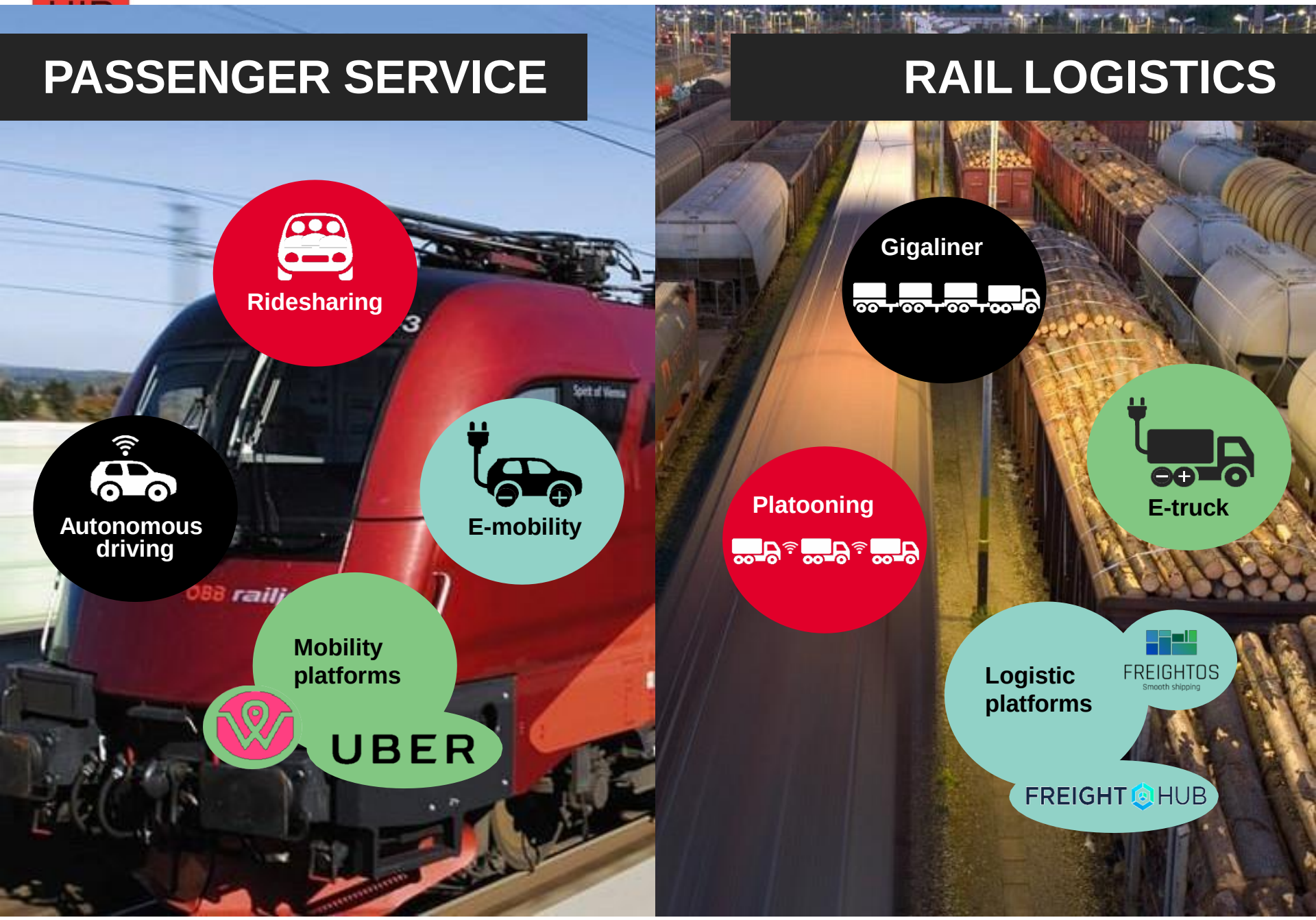
Dr. Clemens FÖRST
Chairman UIC High Level freight, CEO at Rail Cargo Group

Turning Digitalization into Performance

Dr. Clemens Först

24. Mai 2018


PASSENGER SERVICE
460Mio.
passengers
1,9
customer satisfaction
1.426km
train-KM / inhabitant
RAIL LOGISTICS
Top 2
rail logistics company
in Europe
>50 Mio. EUR
EBIT 2012-2017
2,9Mio. t
prevented greenhouse
gas emissions


PASSENGER SERVICE
Ridesharing
Autonomous driving
E-mobility
Mobility platforms
UBER
RAIL LOGISTICS
Gigaliner
Platooning
E-truck
Logistic platforms
FREIGHTOS
Smooth shipping
FREIGHT HUB

Open Innovation Initiative

Innovation Programme

12
Teams

24h
Competition

1
Challenge

wegfinder


10:00 AM
100%
Suche
Taxi 40100
wegfinder
wie wohin
wegfinder.at

Digital freight forwarder

Customer interface

Onboard entertainment @ railjet

Optimized wagon deployment

Automated brake test

Tracking of safety relevant components

Thank you for your interest

Dr. Clemens Först

24. Mai 2018

TURNING DIGITALISATION INTO PERFORMANCE

Dr. Gerhard H. GÜRTLICH
Head of Unit “Transport” at BMVIT

Focal points

1. Aspects of transport policy

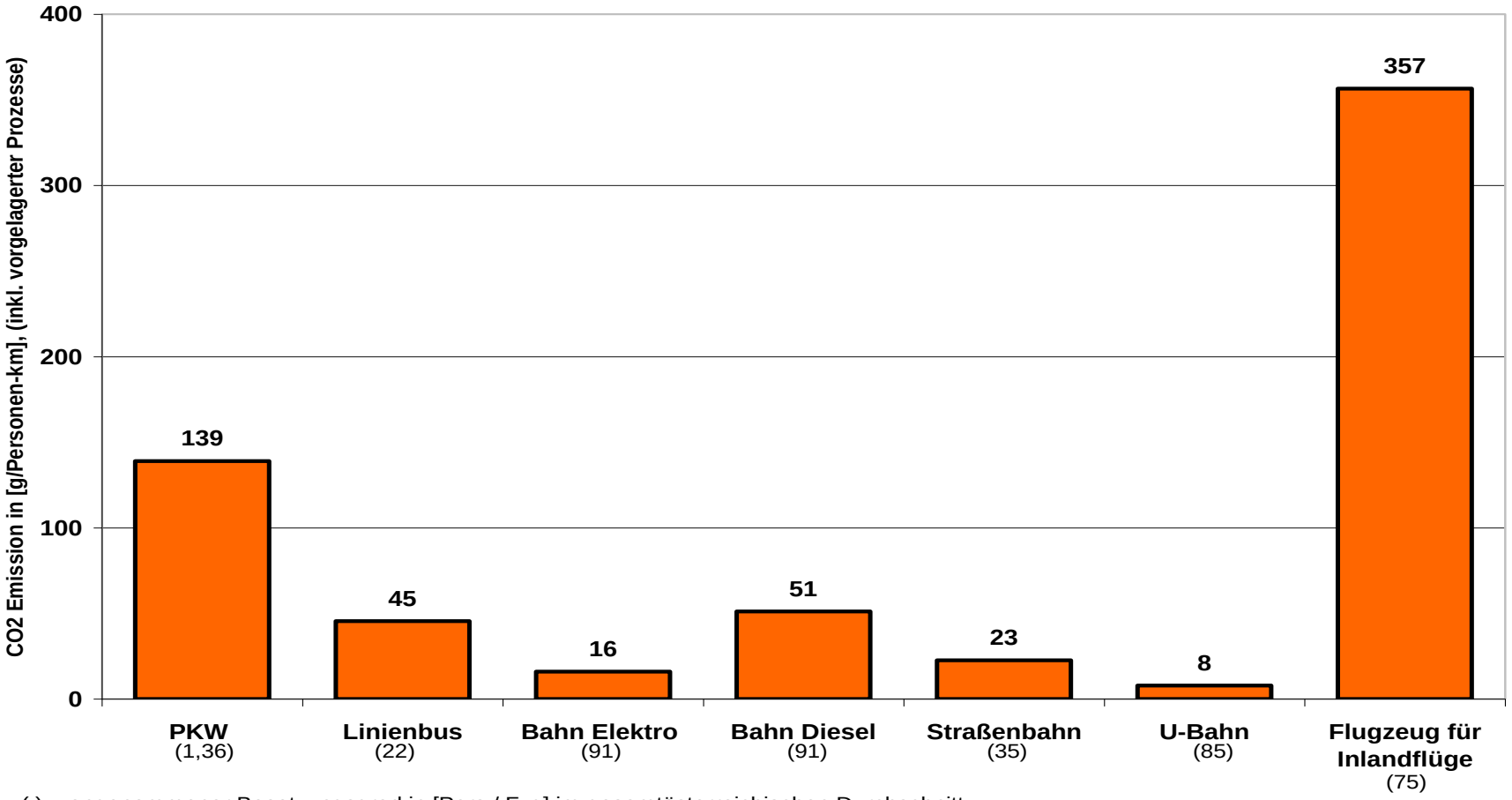
2. Austrian EU-Presidency – overview

1. Digitalisation – basic aspects

Aspects of transport policy

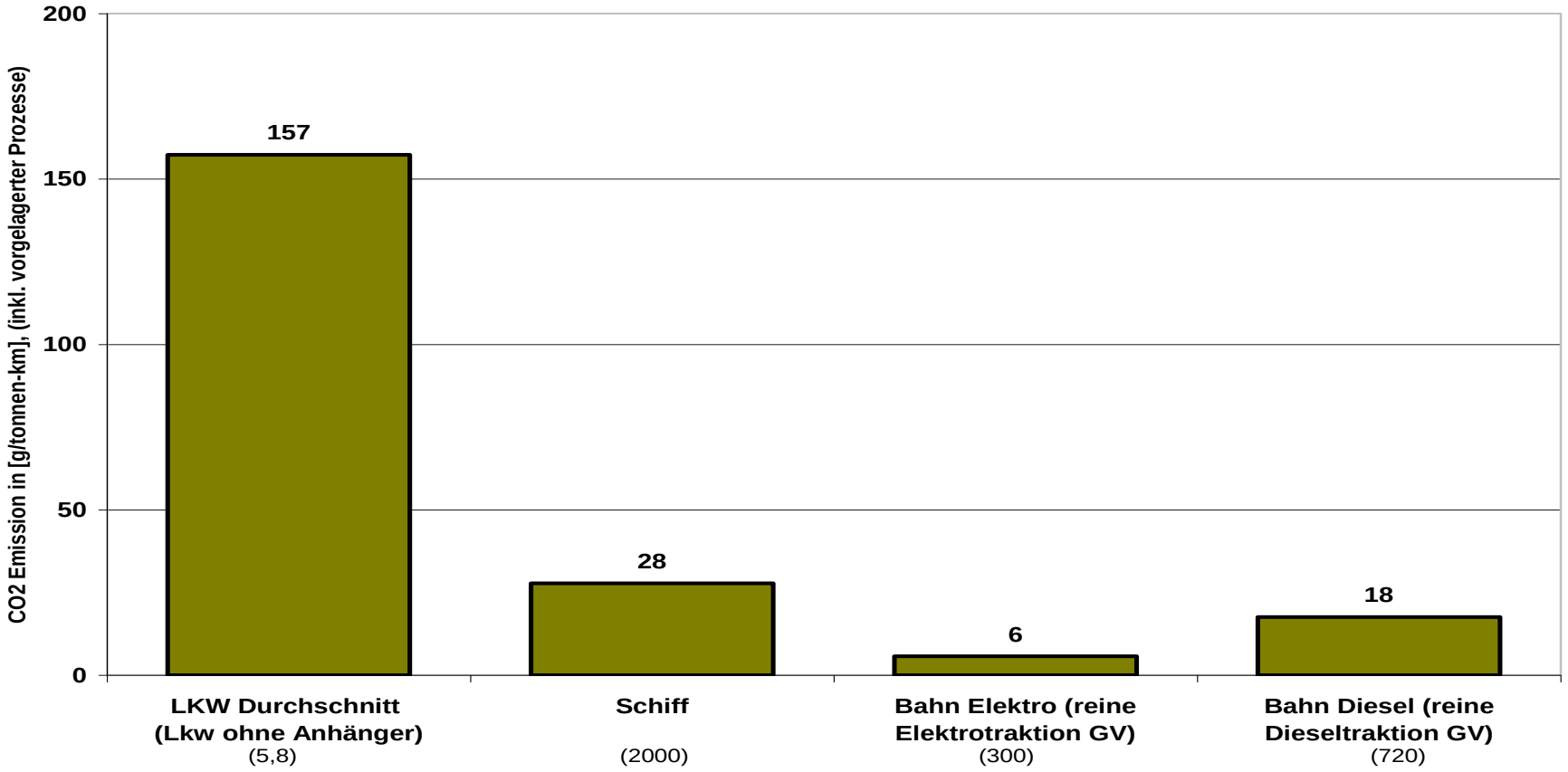
CO2 emissions → indicator for a transport mode‘s environmental friendliness

CO2 emissions per person and kilometre



( ) = angenommener Besetzungsgrad in [Pers / Fzg] im gesamtösterreichischen Durchschnitt

CO2 emissions per ton and kilometre



( ) = angenommener Beladungssgrad in [t / Fzg] im gesamtösterreichischen Durchschnitt

Transport policy goal:

Shifting traffic to transport modes with lower CO2 emissions („environmentally friendly modes of transport“)

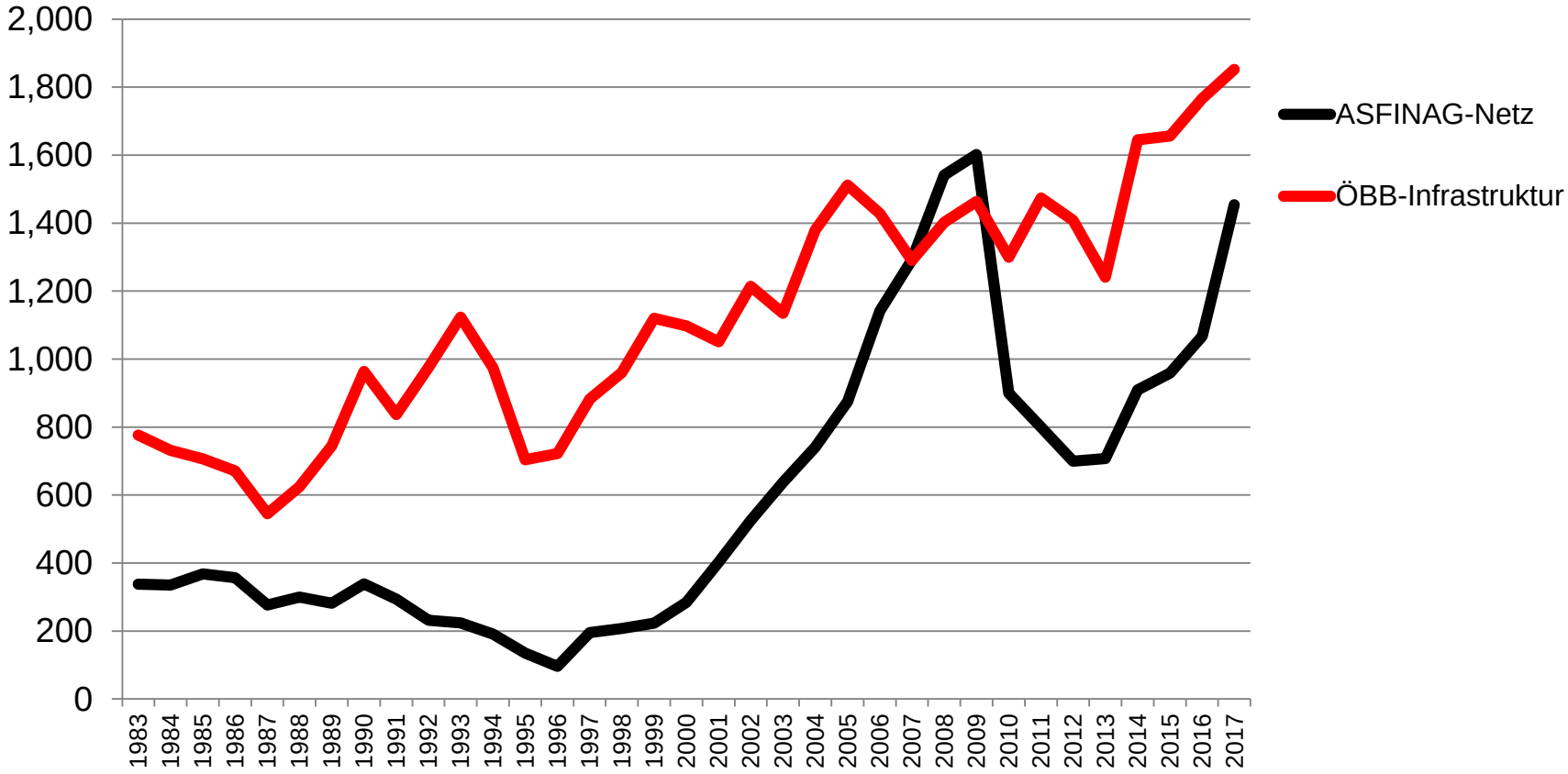
Problem:

Railways alone cannot handle all the traffic

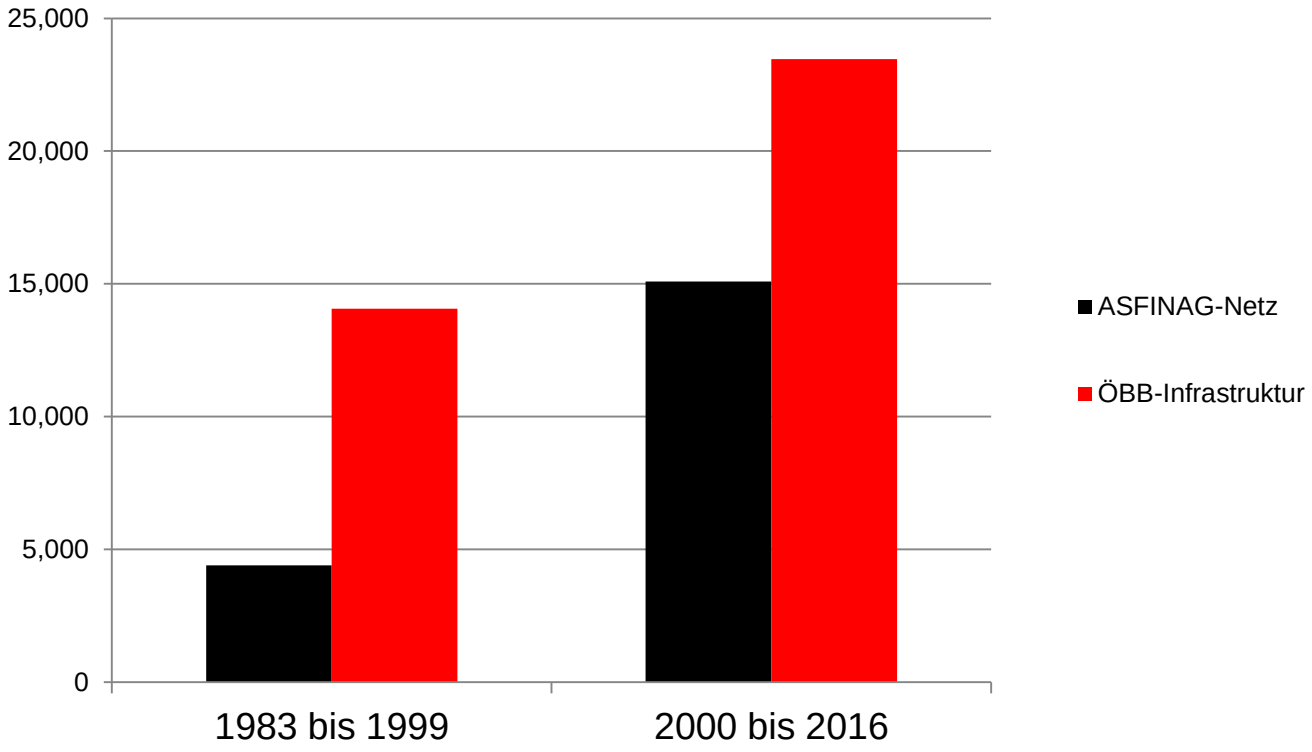
Solution:

Investing in both transport modes → with a higher priority given to rail over road

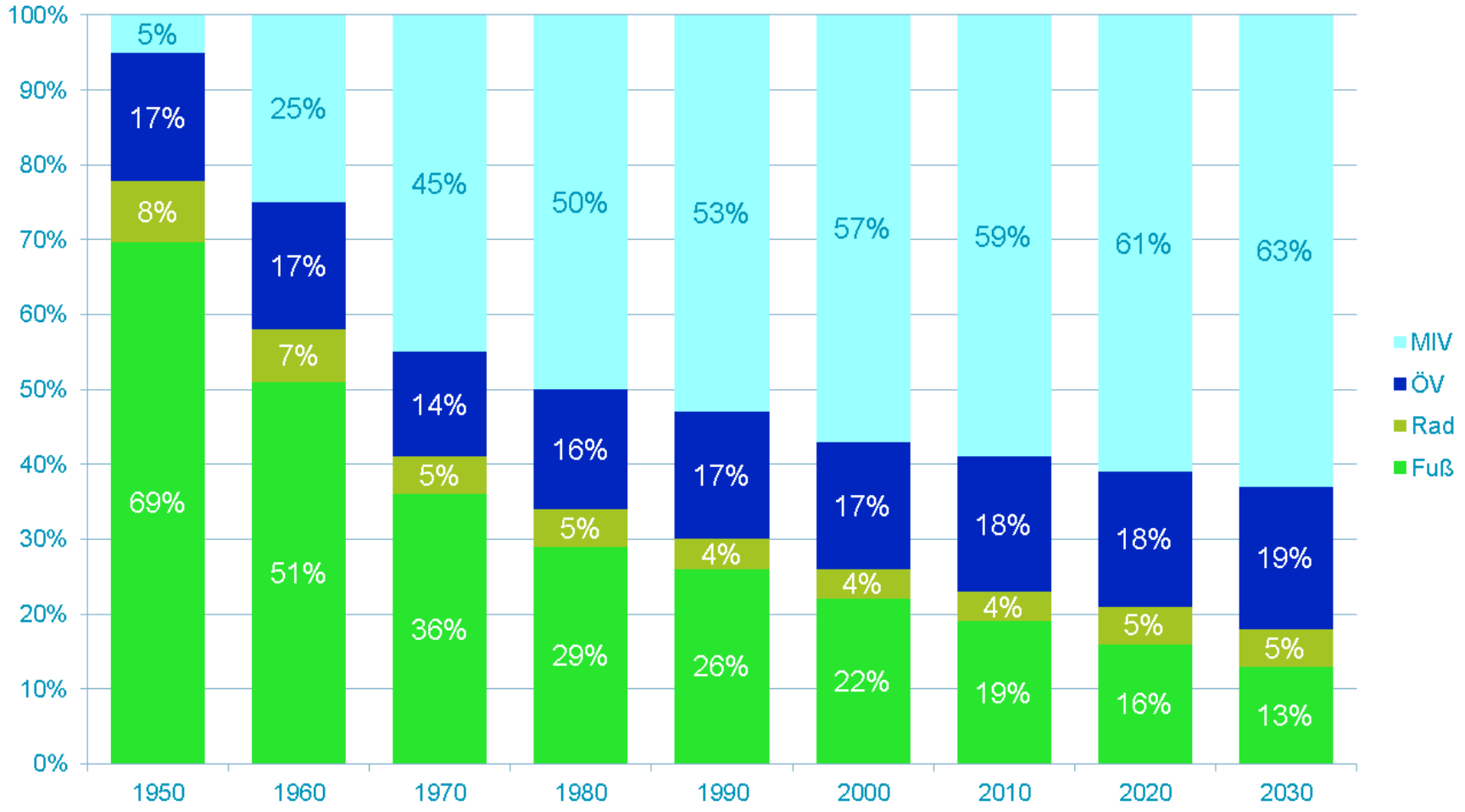
Investments into high-level transport infrastructure
(in million EUR)



Investments into high-level transport infrastructure
(in million EUR)

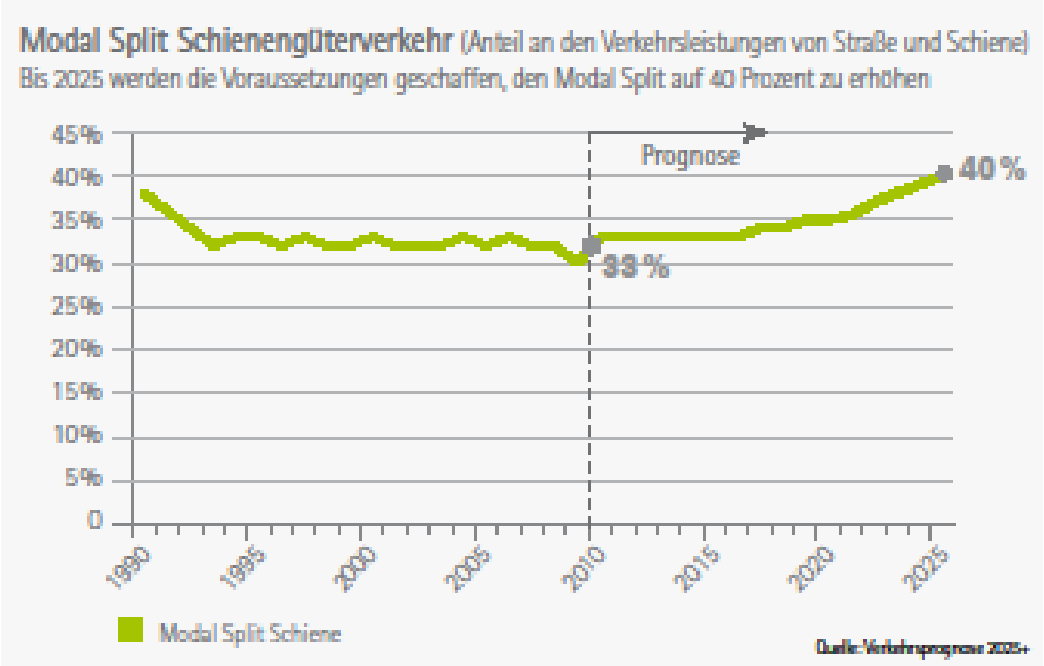


Modal split – passenger transport in Austria



Modal split public passenger transport

- In Austria constantly 16 - 18 %
- Increase in passenger car traffic from 25 % to 62 % at the detriment of pedestrian traffic
- Target of Austrian transport policy: 18 - 20 % by 2025


Modal Split Schienengüterverkehr (Anteil an den Verkehrsleistungen von Straße und Schiene)
Bis 2025 werden die Voraussetzungen geschaffen, den Modal Split auf 40 Prozent zu erhöhen
45%
40%
35%
30%
25%
20%
15%
10%
5%
0
1990
1995
2000
2005
2010
2015
2020
2025
Prognose
40 %
33 %
Modal Split Schiene

Modal split rail cargo traffic

- In Austria constantly at 30 - 33 %
- EU 28 average 17 %
- Target of Austria‘s transport policy: 40 % by 2025 (highly ambitious!)

Austria‘s EU-Presidency - overview

Objectives of the Presidency:

- Developing transport systems with a balanced competition of all transport modes
- Fair level of working and social conditions in the transport sector
- Increasing transport safety
- Making mobility sustainable and climate compatible

Proposals regarding

- Access to market and professions
- Driving times and rest periods
- Tachographs
- Monitoring social legislation
- Posting of workers in the transport sector

in cooperation with the European Parliament

Discussions on

- The cross-border electronic toll service EETS (European Electronic Toll Service)
- Promoting clean vehicles
- Combined transport

Joint Informal Council of the Ministers for the Environment and Transport (29./30. October 2018, Graz)

Topics

- Mobility transition / decarbonisation / emission reduction
- Transport safety
- Innovative transport systems

Future-proof data protection legislation

- Respect for private life
- Protection of person-related data in electronic communication
- Promoting development potentials of innovative services
- Promoting Copernicus (earth observation)
- Promoting Galileo/EGNOS (satellite navigation)
- Securing safe + effective satellite communication for safety-critical infrastructures

Other topical focuses:

- Identifying threats from space (space debris, space weather, observation of Near Earth Objects)
- Deepening cooperation between the Member States for safe and effective satellite communication

Digitalisation – basic aspects

Digitalisation will massively transform mobility in the coming years („revolutionise“)!

- Increasing transport safety
- New mobility offers and services
- Decisive step towards a sustainable management of scarce resources
- Digital infrastructure networking with digital vehicles
- Mutual networking of digital vehicles
- Automation, networking, emission reduction, multi-modal transport, traffic safety, logistics and cargo transport in the future

Inportant:

- Integration of users at an early stage
- Only if you disclose your needs and consumer behaviour, you can expect the digital services you need
- Absolutely necessary → “alleviating fears“!

Important for digitalisation → start-ups

- Flexible, customer-oriented, innovative, creative, few/no overheads ...

Important for creating start-ups:

- Splitting hardware and software
- Data storage declining prices at increasing performance
- Computers are constantly gaining speed and getting cheaper

No questions!

TURNING DIGITALISATION INTO PERFORMANCE

Mr. Keir FITCH
Head of Unit Rail Safety & Interoperability at EC – DG Move

European Commission

UIP Symposium
TURNING DIGITALISATION INTO PERFORMANCE

Keir Fitch – Head of Unit, Rail Safety and Interoperability, DG MOVE

24/05/2018

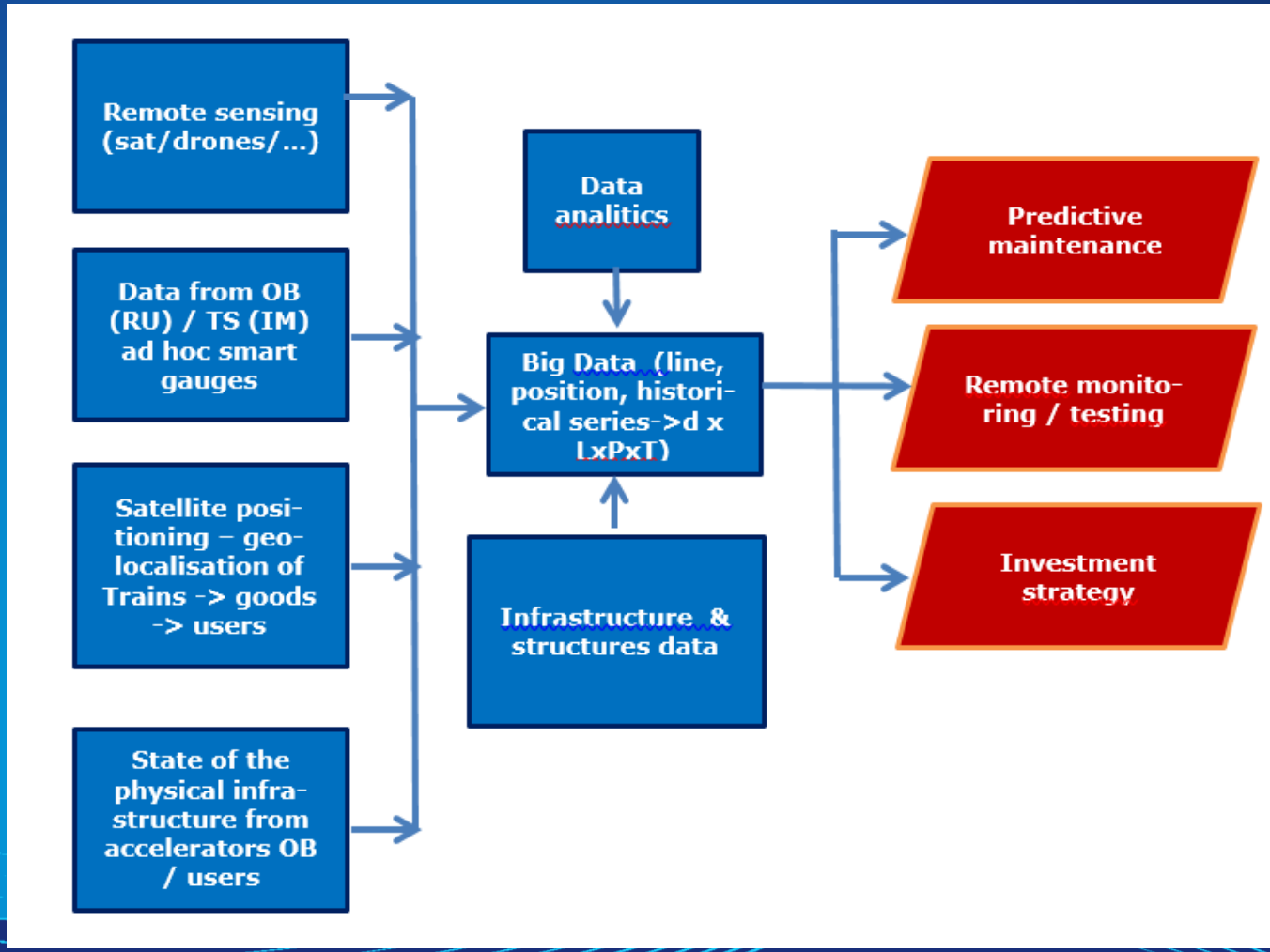
@Transport_EU

Mobility and Transport

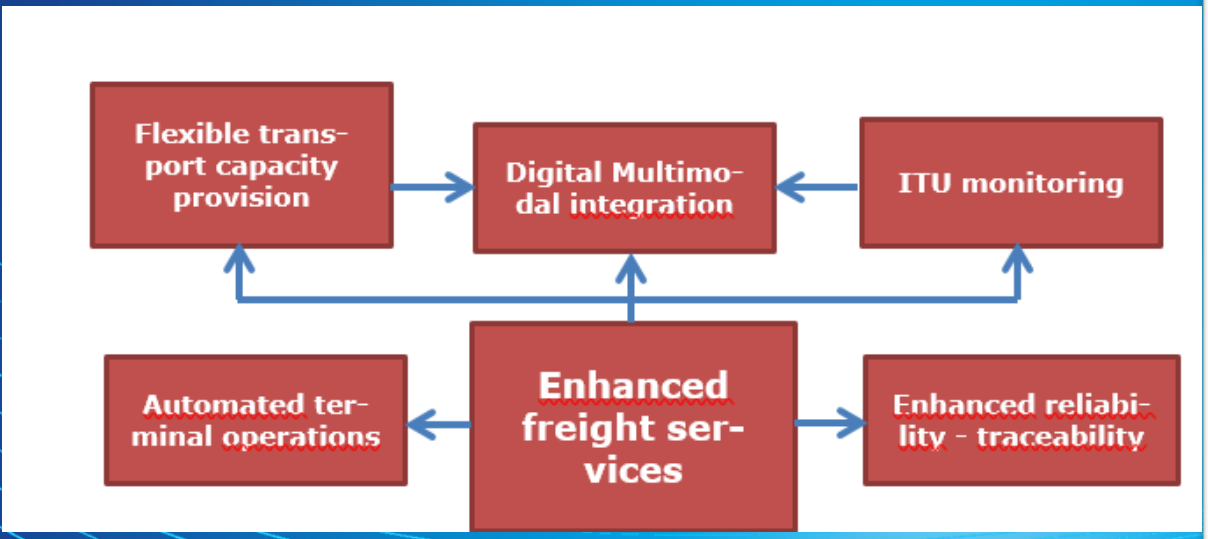
CONNECTING EUROPE

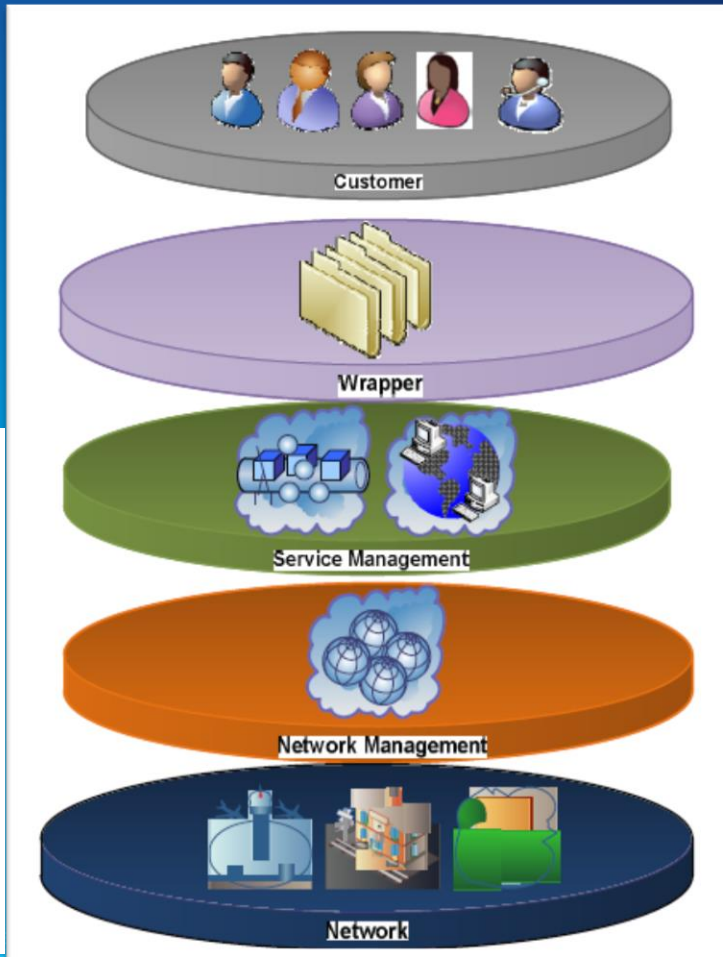
European Commission

Boundary conditions: Digitally enhanced railways (internal enablers)



Seamless information flows, service / goods monitoring -> digitally enhanced railways (freight)





Key features for serving a corridor – ST priorities

1) Knowing which train is running – (single?) **Train ID**
2) Knowing when a train is expected to reach a network / terminal: **reliable ETA** (beyond tracing « TIS-like »)
3) 1+2 = Responsive capacity allocation (/invoicing/tracing) via Telematics

Further evolutions of a digital rail corridor

1) Responsive capacity allocation (/invoicing/tracing) via Telematics (train-based)

----------toward goods----------

1) Associating goods to train (**IMU<– Train**)
2) -> Tracing goods along the corridor
3) IT tools for Security and integrity of goods
4) Railways as component of a digital multimodal environment - e-custom, e-consignment note...

Further evolutions of a digital rail corridor

5) Railways as component of a digital multimodal environment - e-custom, e-consignment note…
6) A crucial element for the logistic efficiency will be interfacing public registers and peer-to-peer relations
7) Smart tracing – ownership – contracts (which tool? Blockchain? Simplified versions? Else?)

A full integrated rail corridor exploitation would look like…

Capacity allocation

Good ownership

Data ownership

On-line (aut.) Terminal 1

T3

T2

Data openness -> efficiency of railways & better rail integration. Ultimate goals:

1) Full open data to be sought for operational static and dynamic information on rail services (ETA, trains ID & position)
2) Commercially sensitive /contractual data -> cryptography + Identification – Authentication (-Authorisation – smart contracts,…) – but e-data/e-docs shared on-line!

Availability of ICT to allow data flows hybrid systems, no one-fits-all

These systems **as well** have to be **interoperable** across networks (trains move …) – e.g.: GSM-R in CCS TSI

Need for a common, cooperative approach to Cybersecurity

Rail is a complex ecosystem involving suppliers, telecom companies, IMs, RUs – the most integrated transport mode

Resources: CEF Call 2018

Priorities	Indicative available funding
•Rail interoperability •European Rail Traffic Management Systems (ERTMS)	€100 million
•Safe and secure infrastructure •Innovation and new technologies	€200 million

NB: Deadline for submission: 24 October 2018 (17PM Brussels time)

https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/apply-funding/2018-cef-transport-call-proposals

TAP-TAF Priorities: Cross-Border/corridor/modal integration

- Ensuring quality management of data for TAP TSI (timetable data, tariff data);
- Provision of cross-border services (information and/or ticketing) through TAP standards;
- Support small and medium size Railway Undertakings in TAP implementation (timetable data exchange, tariff data exchange, reservations, home print tickets, PRM assistance);
- Support rail stakeholders to develop a common Telematics Reference Files merging the existing TAF and TAP Reference Files

European Commission

- Support IMs and RUs to implement and ensure the compliance with the TAP and TAF TSI: unique Train ID to replace Operation Train Number;
- Support rail actors to implement TAP and TAF TSI compliant databases and/or tools;
- Support IMs and RUs to implement compliant subsystem …or pre-arranged train paths and reserve capacity, traffic Management by Rail Freight Corridors;
- …implement e-Consignment Note …including intermodal information, ..to remove barriers between different modes of transport.

Future available resources: CEF 2, ESIF, EIB

PROPOSED CEF BUDGET ALLOCATION 2021-2027

Figures in current prices (M €)

CEF Transport 30.615, of which:

- **General envelope: 12.830**
- **Contribution from Cohesion Fund: 11.285**
- **Support for Military Mobility: 6.500**

Large focus (40% proposed) for smart, sustainable and innovative mobility

European Commission

Thanks for your attention!

@Transport_EU

Mobility and Transport

CONNECTING EUROPE

TURNING DIGITALISATION INTO PERFORMANCE

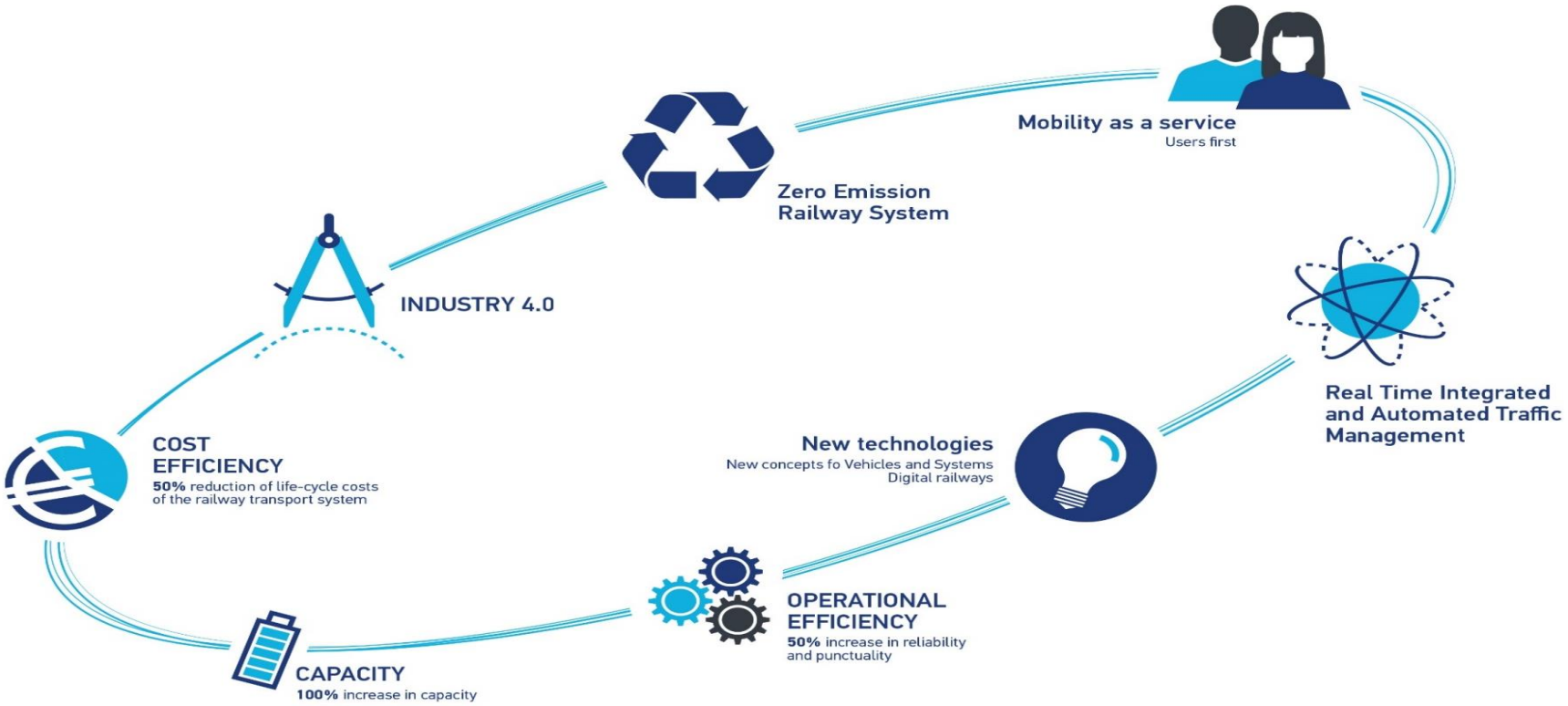
Mr. Carlo BORGHINI
Executive Director of the Shift2Rail Joint Undertaking

Delivering innovation, capitalizing on the rail value chain

Vienna, 24 May 2018

@Shift2Rail_JU
#Horizon2020

S2R VISION



To **deliver** through railway **research and innovation** the **capabilities** to bring about the most **sustainable**, **cost-efficient**, **high-performing**, **time driven**, **digital** and **competitive, customer-driven** transport **mode** for Europe

R&I for Innovation Capabilities

Capability 1_Automated train operation

Capability 12_Rapid and reliable R&I delivery

Capability 11_Environmental and social sustainability

Capability 10_Stations and "smart" city mobility

Capability 9_Intelligent trains

Capability 8_Guaranteed asset health and availability

Capability 7_Low cost railway

Capability 6_Service timed to the second

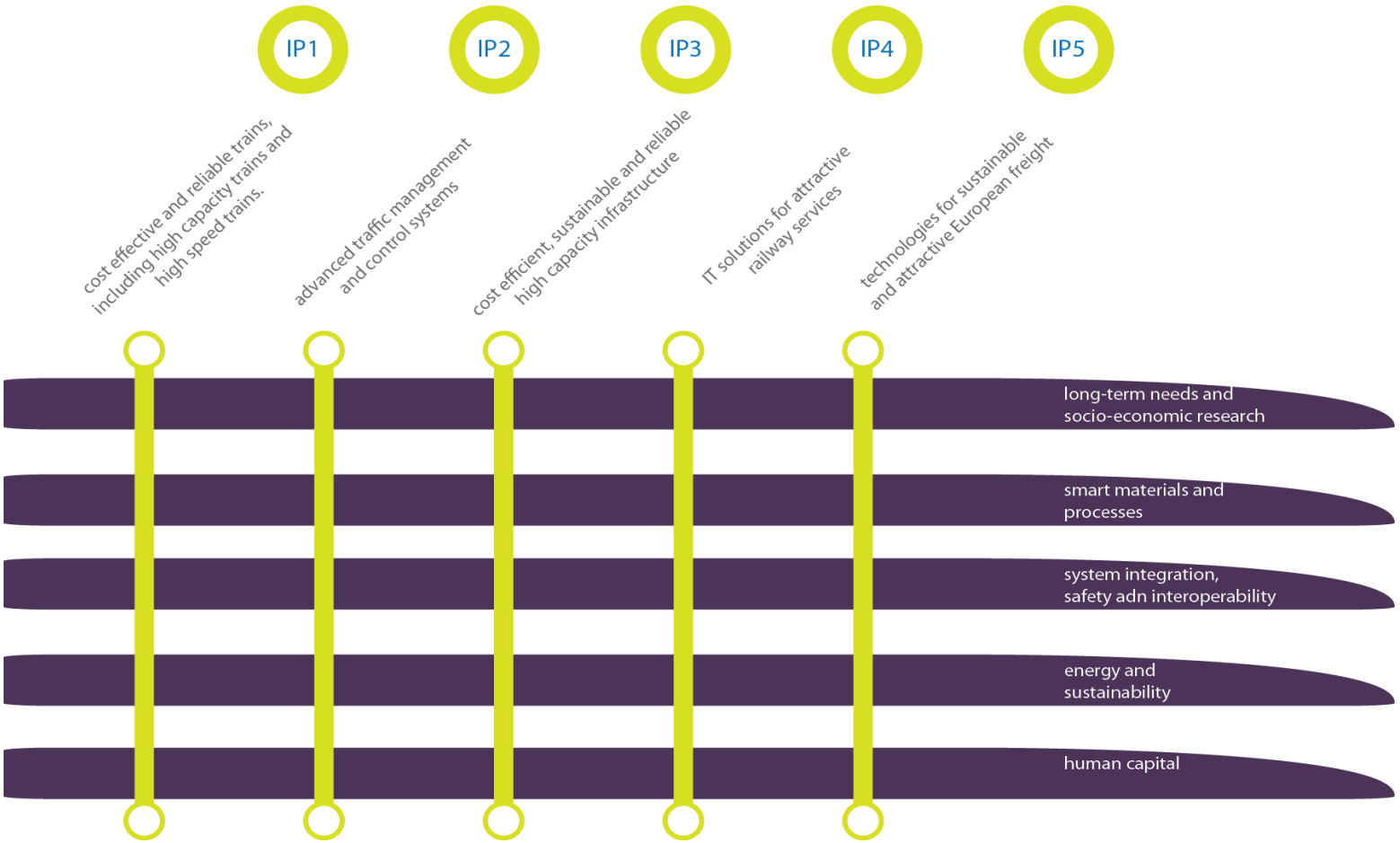
Capability 2_Mobility as a service

Capability 3_Logistics on demand

Capability 4_More value from data

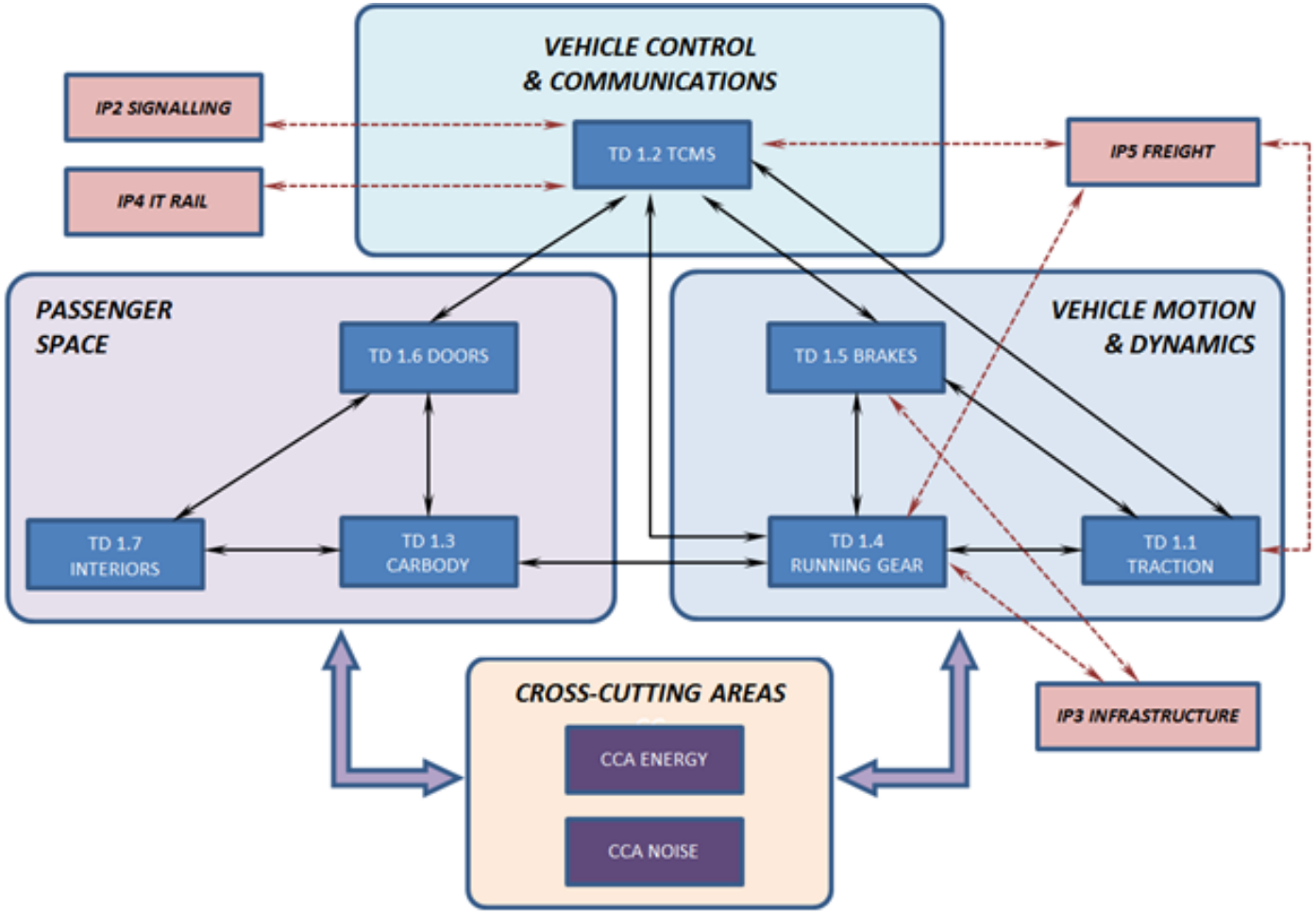
Capability 5_Optimum use of energy

R&I delivery structure



S2R PROGRAMME:
INTEGRATED
CONSISTENT
DELIVERY ORIENTED

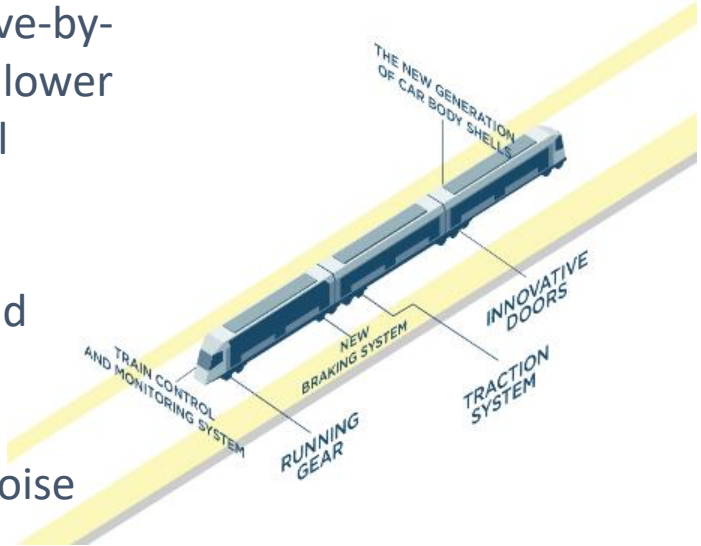
IP1 Cost-efficient and Reliable Trains, including high-capacity and high speed
EUR 225 Mio



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

✓**Traction system:** use of silicon carbide for higher energy efficiency, passive Cooling Equipment and Noise Reduction

✓**TCMS:** standardised interfacing for coupling different trains, use of wireless communication within vehicle/consist, drive-by-data technology and function distribution architectures – lower weight, increased services and control possibilities, virtual coupling



✓ **Running Gear:** Low-noise, lightweight, track friendly and sensors embedded

✓ **Brakes:** fully electric brakes, reduction of failures and noise levels; new gen eddy current brakes

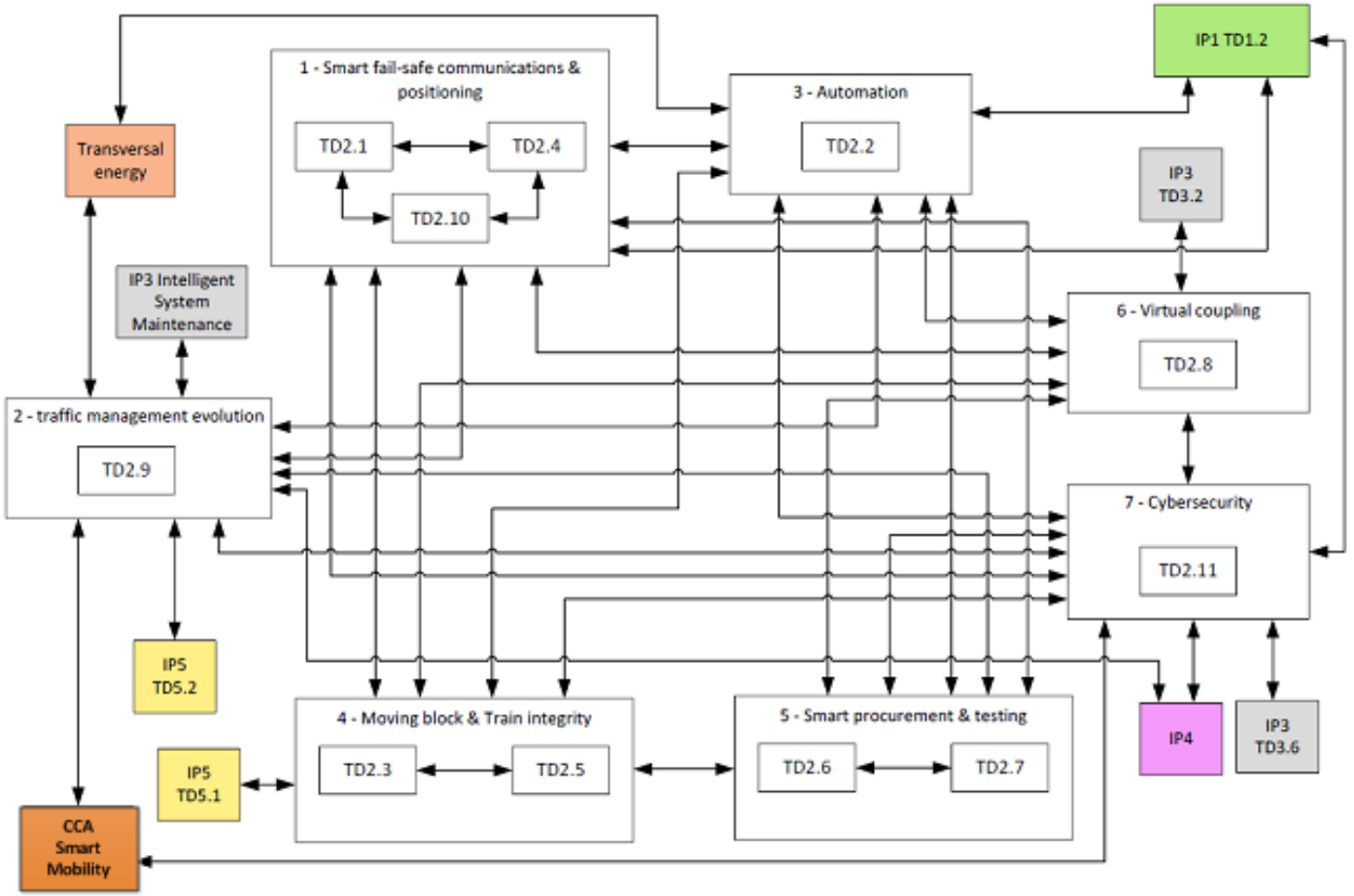
✓**Carbody shell:** hybrid use of composite materials, new designs and reduced maintenance

✓**Doors**: next gen doors, PRM access, noise attenuation and increased accessibility

✓**Interiors**: new modularity concepts, easier upgrades

Shift2Rail

IP2 Advanced Traffic Management and Control System
EUR 195 Mio



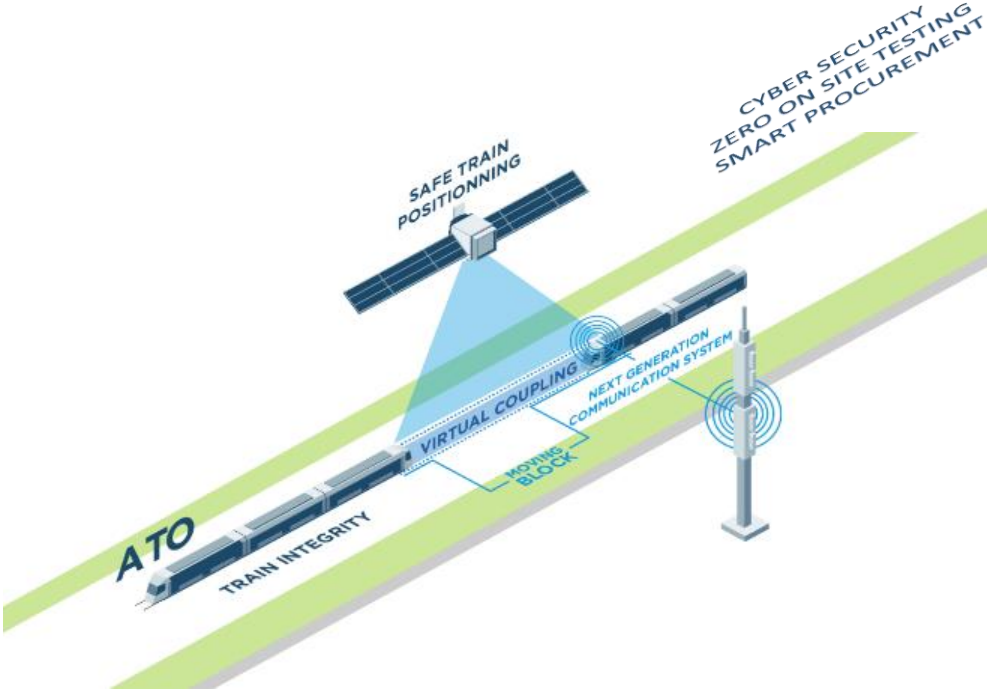
IP2 Advanced Traffic Management and Control System

✓**Moving Block** based on ERTMS/ETCS specifications and opportunity to remove trackside fixed signalling systems

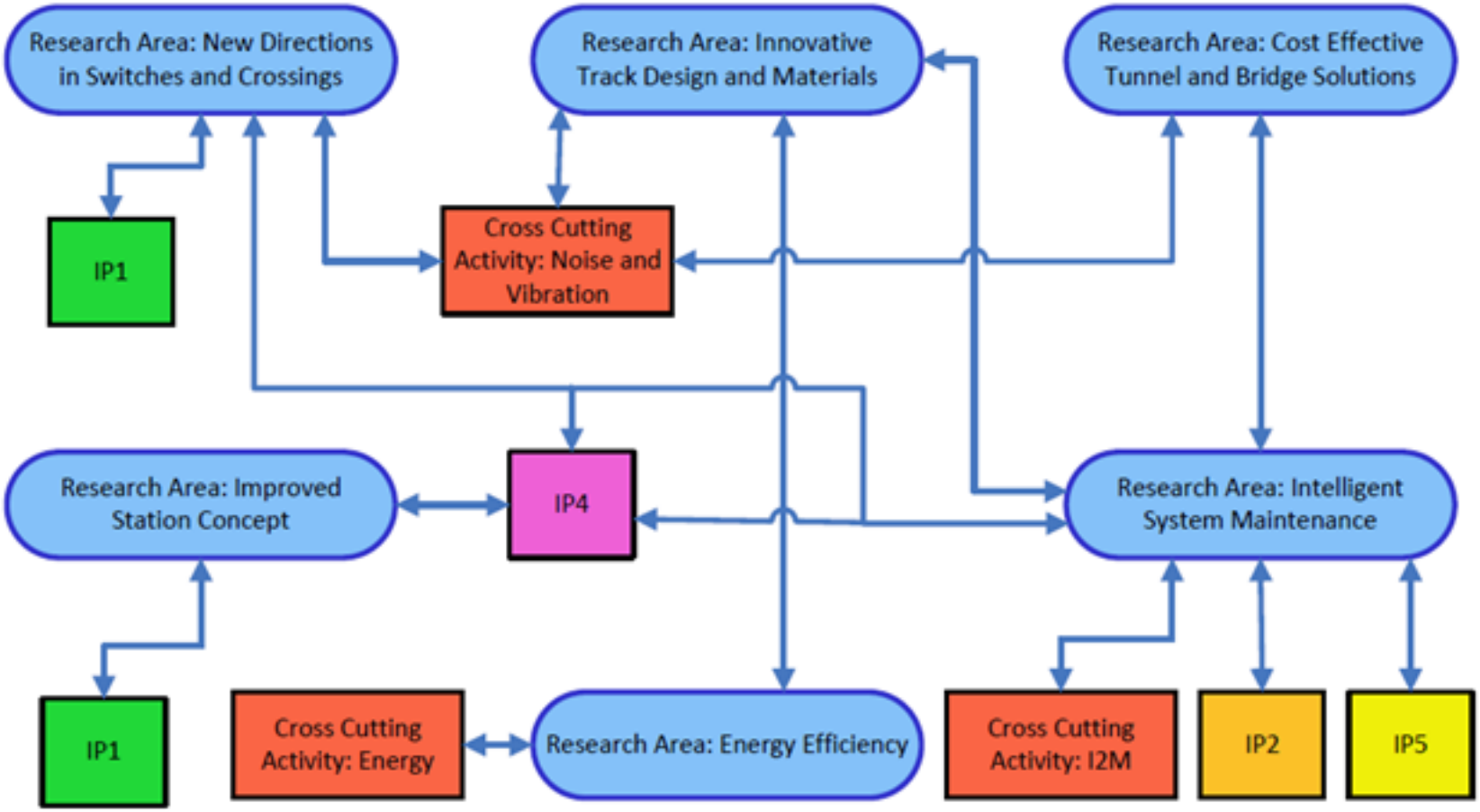
✓**GNSS/positioning systems** applied to rail to remove physical balises and facilitating the application of moving block

✓**Advanced ATO for railway lines**; GoA4 will reduce human error and increase service availability

✓**New and dynamic control of train management** – based on Virtual Coupling and On-board intelligence



IP3 Cost Efficient and Reliable High Capacity Infrastructure
EUR 153 Mio



IP3 Cost Efficient and Reliable High Capacity Infrastructure

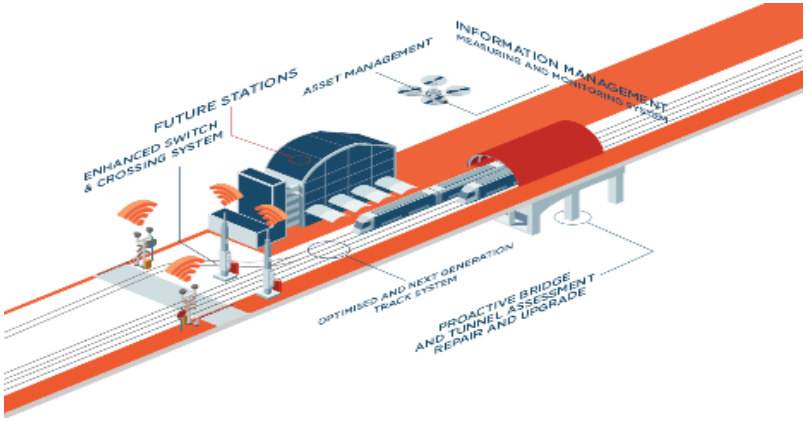
✓ **Intelligent asset management:** from reactive and/or preventive maintenance to condition based and/or predictive maintenance, based on intelligent monitoring/analysis of the assets. IT decision supporting tools and new processes/procedures. Lower costs and down-time

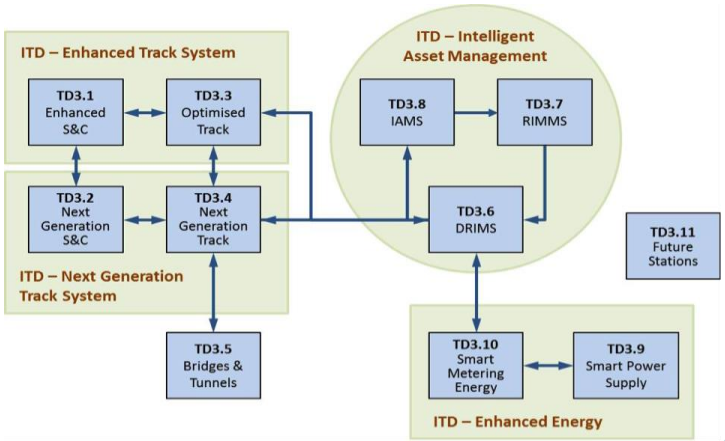
✓ **Enhanced energy management:** smart metering of the energy consumption for optimised use and power supply equipment able to optimise energy use and link to smart-grid

✓ **Enhanced track system:** new solutions to improve the life-cycle of tracks and S&C. Continuous monitoring techniques for better design solutions and automated maintenance. Noise & vibration reduction

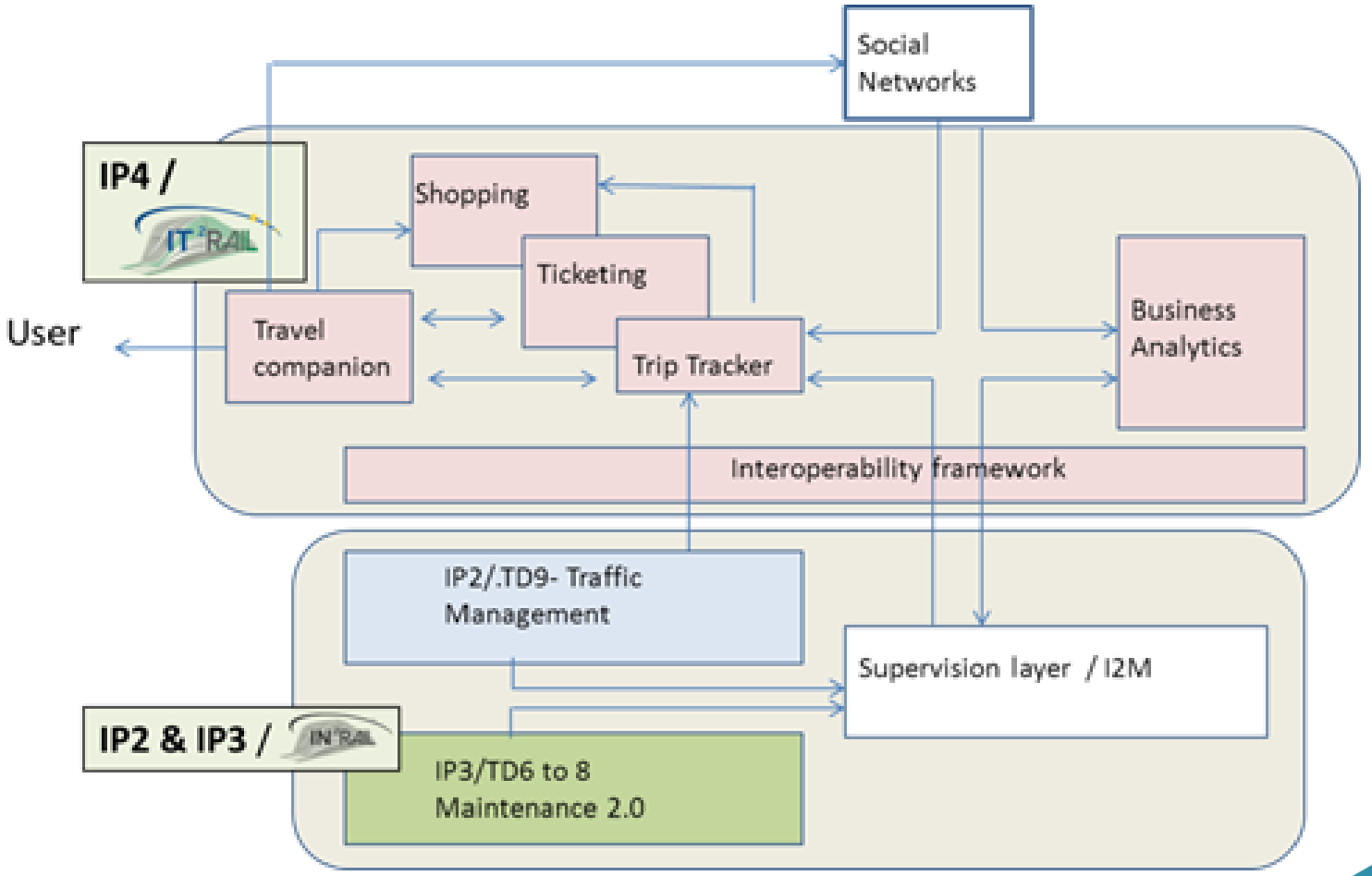
✓ **Next gen track system:** disruptive technology applicable to both track and S&C. possible tonnage increase, maintenance increased automation. Noise & vibration reduction

✓**Station:** design taking into account new IT techniques, crows flow and new management strategies





IP4 IT Solutions for Attractive Railways Services
EUR 86 Mio



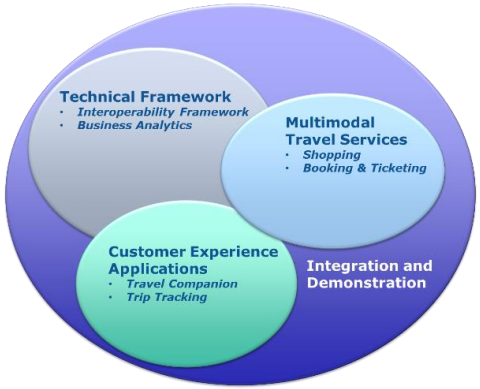
IP4 IT Solutions for Attractive Railways Services

✓ **Interoperable framework:** semantic based IT solution capable of making interoperable different databases using different standards, without the need of changing the legacy systems → creating a multimodal framework

✓ **Business analytics:** providing to the operating companies the means to understand and adapt their offer to a real time multi-modal demand

✓ **Multimodal travel services:** providing to the passenger the easy interface, masking the complexity of technical and financial interaction among the several services provider, for shopping, booking and retrieving their right to travel

✓ **Customer experience applications:** providing to the user the engine to search its travel accordingly to his/her specific needs/preferences + providing an useful companions guiding the user across the right platform or across a service disruption through an automatic re-routing, etc.

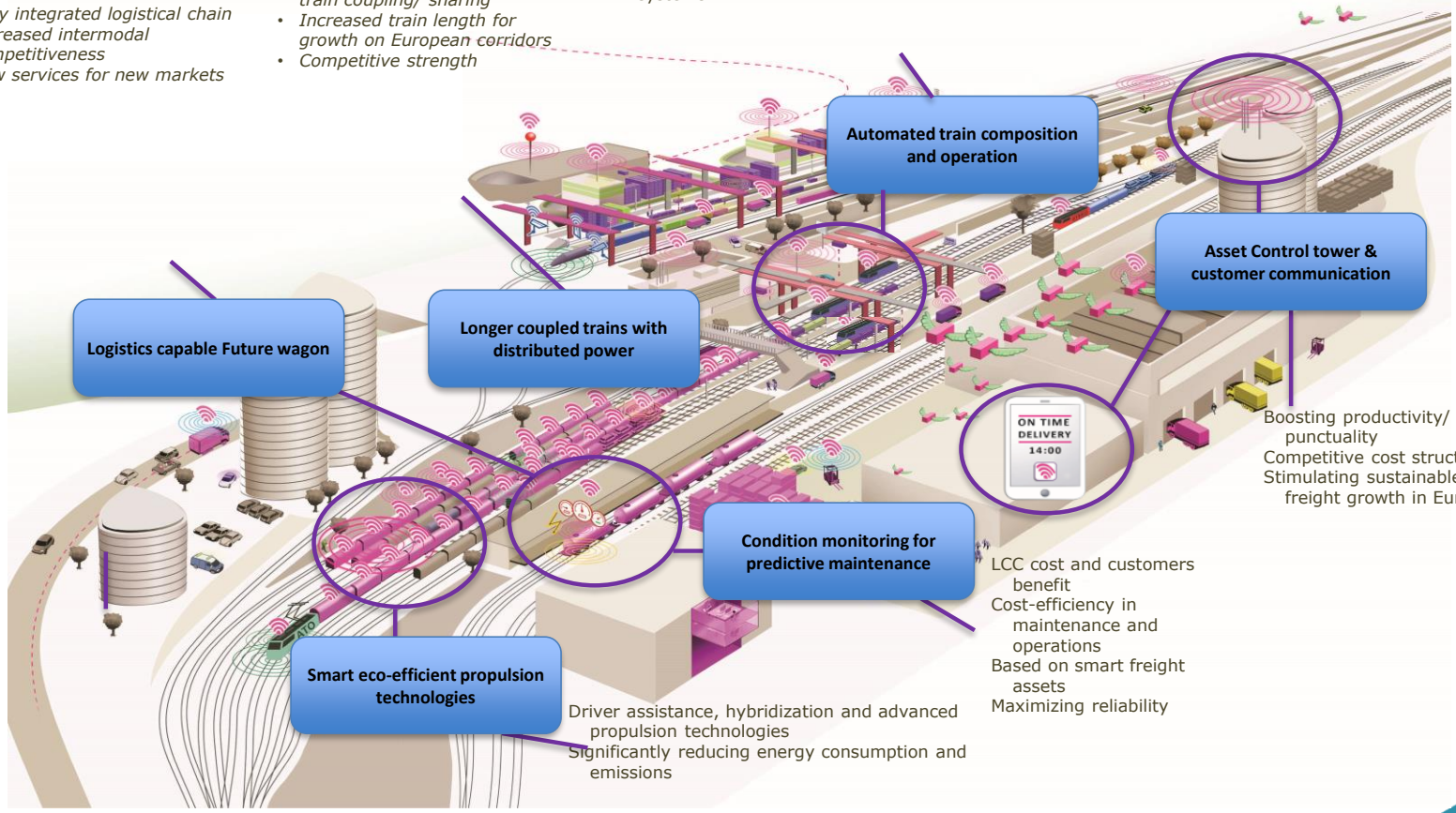


IP5 Technologies for Sustainable & Attractive European Rail Freight
EUR 83 Mio

- *High load efficiency*
- *Low energy consumption*
- *Low noise emissions*
- *Fully integrated logistical chain*
- *Increased intermodal competitiveness*
- *New services for new markets*

- *Increased flexibility through train coupling/ sharing*
- *Increased train length for growth on European corridors*
- *Competitive strength*

Maximizing service quality, productivity, resource utilization and network capacity
Pan-European rail freight as key enabler for automated driving systems

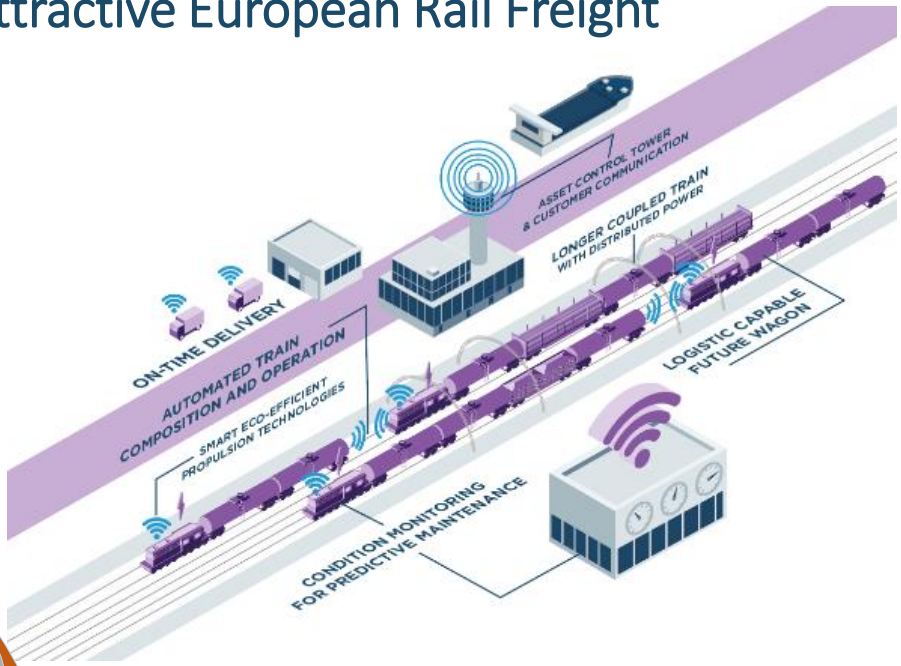


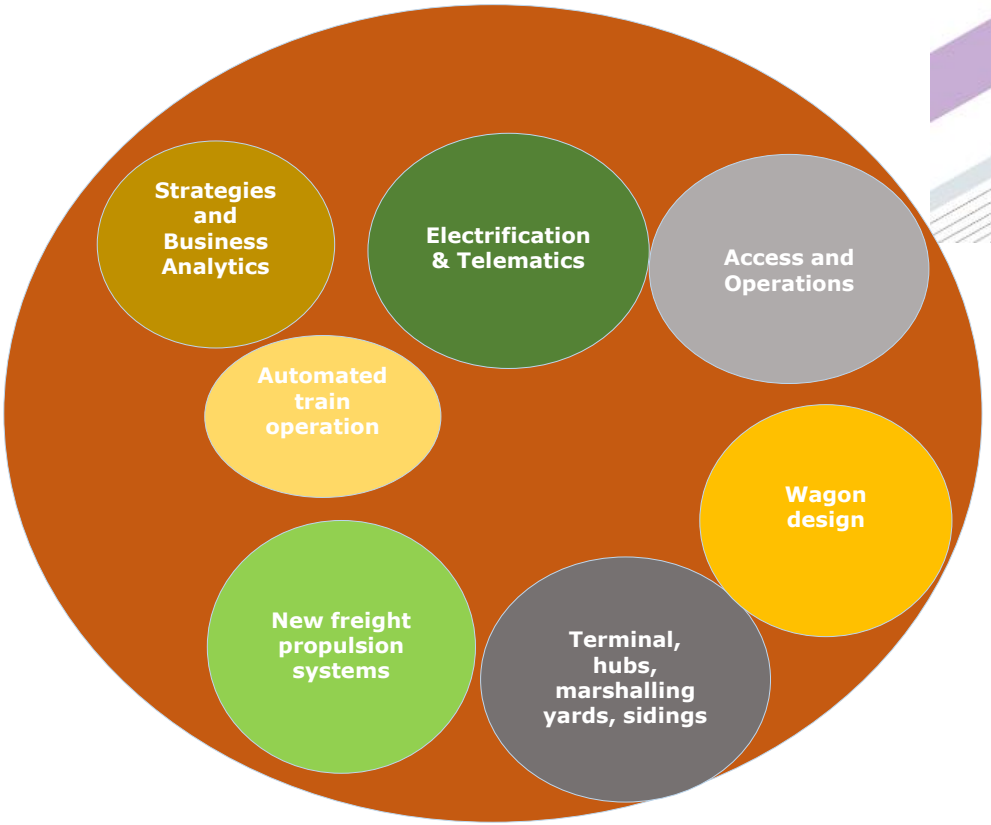
Boosting productivity/ punctuality
Competitive cost structures
Stimulating sustainable rail freight growth in Europe

LCC cost and customers benefit
Cost-efficiency in maintenance and operations
Based on smart freight assets
Maximizing reliability

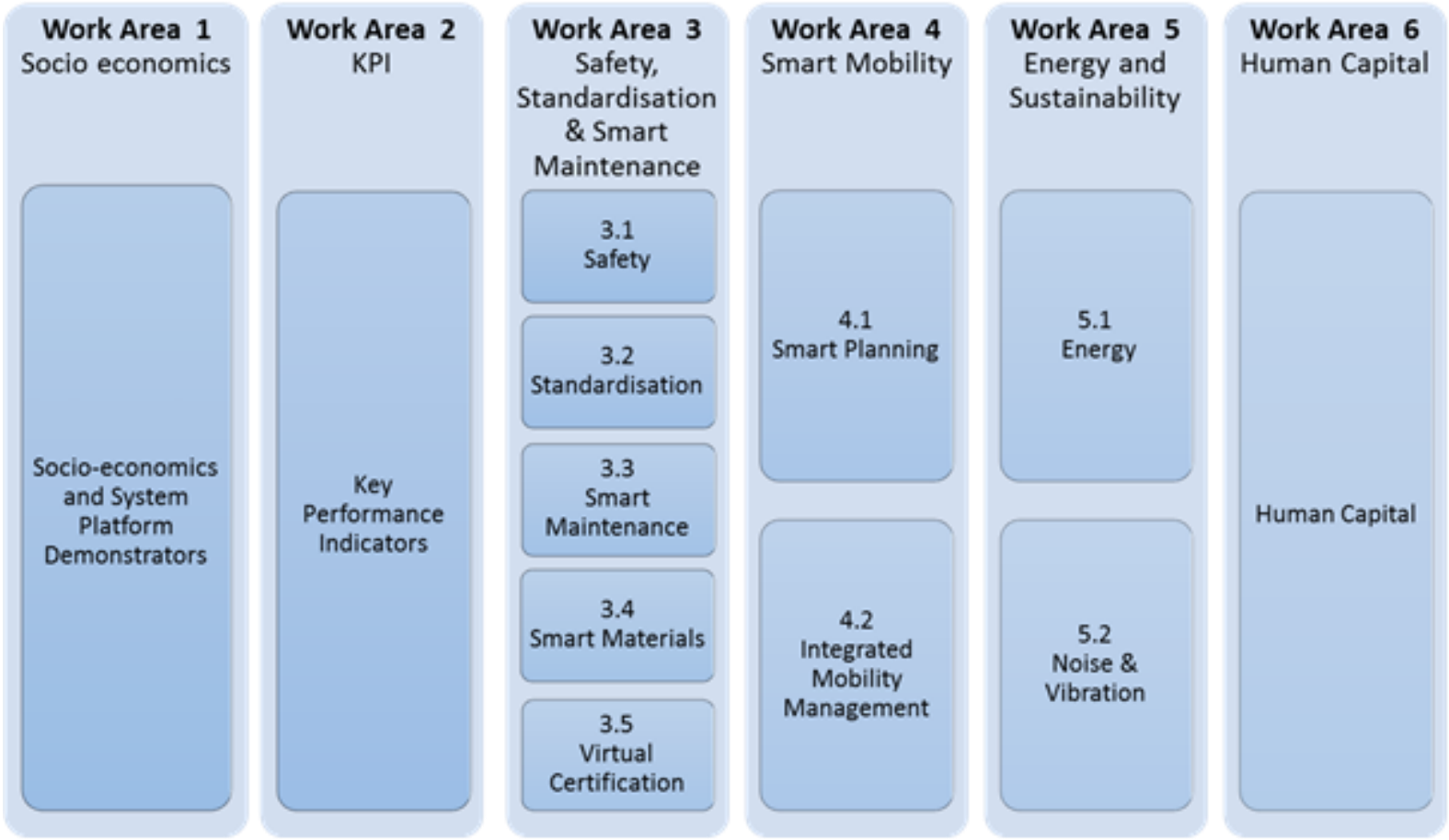
Driver assistance, hybridization and advanced propulsion technologies
Significantly reducing energy consumption and emissions

IP5 Technologies for Sustainable & Attractive European Rail Freight





CCA EUR 35 Mio



IP5 Implementation Strategies and Business Analytics - Technologies in line with the market needs

- Migration plans
- Identifying market segments
- Developing specifications and KPIs

Status:

All activities covered by ongoing projects

Projects:

SMART-RAIL (2015-2018)
FR8RAIL (2016-2019)
INNOWAG (2016 – 2019)
FR8HUB (2017 – 2020)

IP5 Fleet Digitalisation and Automation - Improved services and reliable automated freight trains

- Automatic coupling
- Condition-based and predictive maintenance
- Driver Advisory Systems

Status:

Covered by ongoing projects & further work in future calls

Projects:

FR8RAIL (2016-2019)
INNOWAG (2016 – 2019)
ARCC (2016-2019)
SMART (2016-2019)
…

IP5 Digital Transport Management - to optimize service planning, operation and capacity

- Real-time data gathering, steering, operation
- Coordination of intermodal transport through the asset control tower

Status:

Covered by ongoing projects & further work in future calls

Projects:

ARCC (2016-2019)
FR8HUB (2017 – 2020)
SMART (2016-2019)
OPTIYARD (2017-2019)
…

IP5 Smart Freight Wagon Concepts – Flexible and reliable high-capacity assets

- Telematics and Electrification

Status:
Covered by ongoing projects & further work in future calls

Projects:

FR8RAIL (2016-2019)
INNOWAG (2016 – 2019)
FR8HUB (2017 – 2020)
…

IP5 New freight propulsion concepts – Smart and eco-efficient propulsion technologies for

- Last mile
- Longer coupled trains with distributed power
- Improving the overall locomotives' performance
- Hybridisation the legacy shunting fleet

Status:

Covered by ongoing projects & further work in future calls

Projects:

FFL4E (2016-2019)
DYNAFREIGHT (2016-2018)
FR8HUB (2017 – 2020)
…

IP5 Running projects involving RFC

FR8HUB

Tech.: increase average speeds/train dynamics

Corridor: Sweden and in Germany

Timeline: 2019

DYNAFREIGHT

Tech.: long trains operation

Corridor: RFC 5 and 6

Timeline: 2018

OPTIYARD

Tech.: Software module for RTYM

Corridor: RFC 5

Timeline: 2019

X2Rail1-2

Tech.: pilot phase with ATO and TMS

Corridor: Rhine-Alpine"

Timeline: 2019

SMART RAIL

Tech.: wagonload, control tower and design measures

Corridor: AT, CS, SK, HR, UK, PL, UK, FR, ES, IT, NL

Timeline: 2018

IP5 Next steps on Freight Transport & RFC – AWP2018

S2R-CFM-CCA-01-2018
Virtual certification & smart planning

Case studies for a large national network and parts of the TEN-T corridors for **strategic investment and daily capacity planning**

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

Methods for improved interaction between network management and yard management

Development of a data exchange platform for inter-modal hubs

Simulation of operational scenarios on freight corridors to increase the average speed

S2R-OC-IP5-01-2018
Radio communication and simulation of train dynamics for Distributed Power within long trains

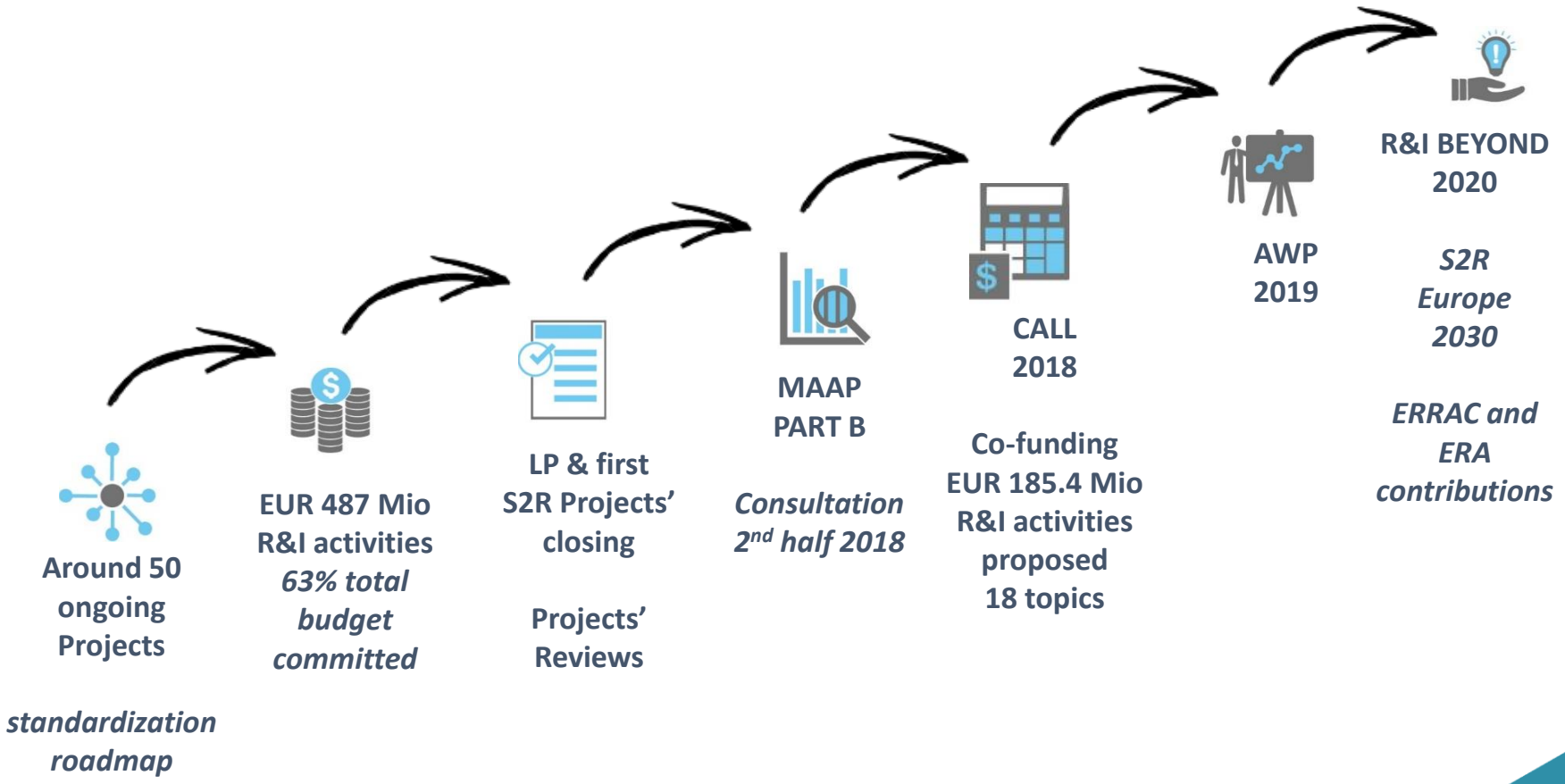
Develop and implement a GSM-R-based radio communication system for Distributed Power systems in freight trains

Demonstrate it in trial runs up to 1,500 m train-length

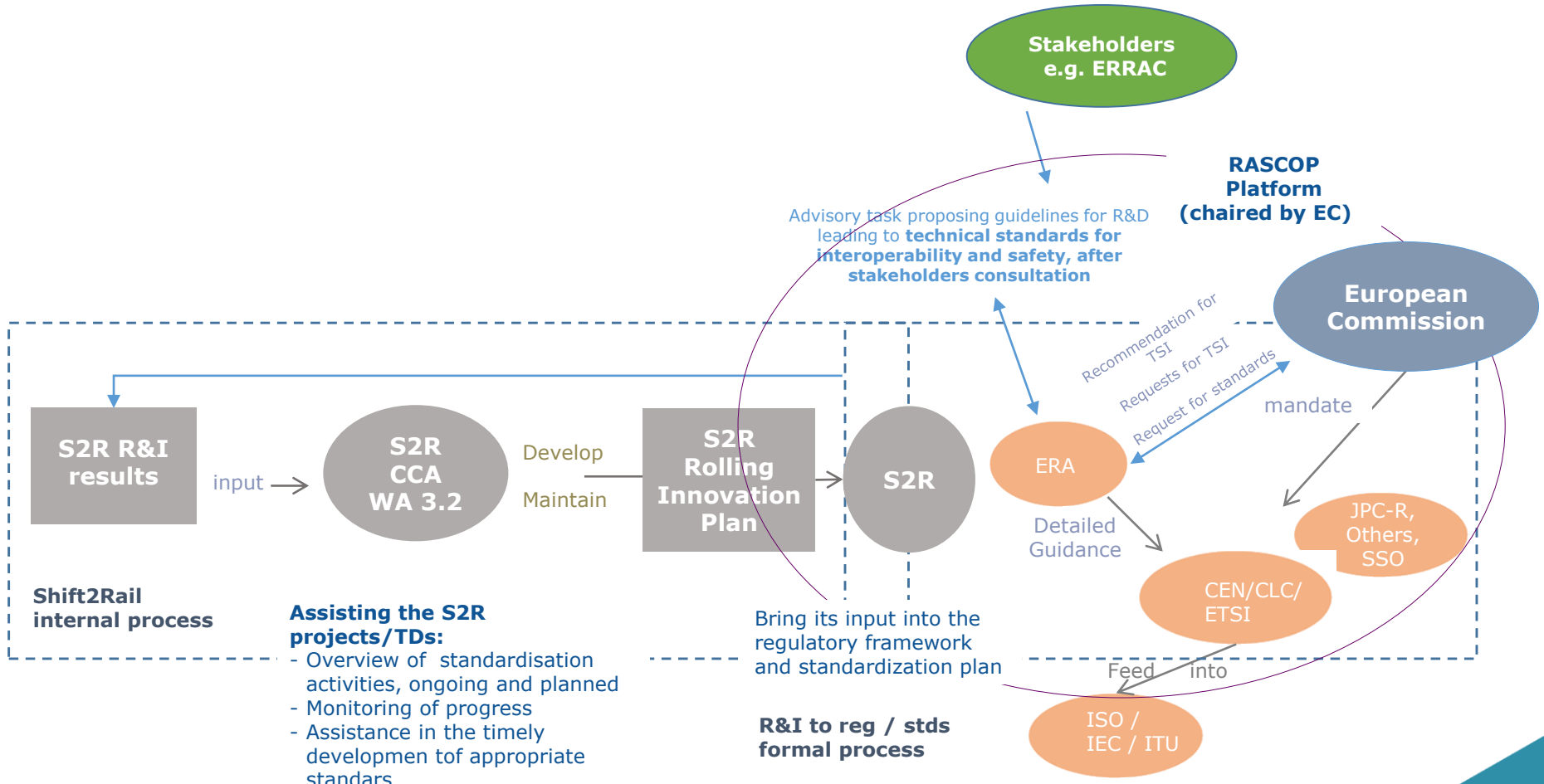
Identify upcoming and tolerable in-train-forces in different operational scenarios

Integrate this into a **safety assessment of the operation of long trains**

What's ongoing



S2R R&I results and process leading to standards and regulation



S2R 2 Research and Innovation beyond 2020

S2R 2 requires revised

Governance
membership vs participation

Content
ERRAC Vision 2050, Master Plan

Regulation & Administrative Simplification
No matrix approach, flexibility, clarity, … while maintaining legality/regularity and sound financial management

19 JUNE 2018

DIALOGUE CONFERENCE ON

S2R: THE FUTURE OF RAIL RESEARCH AND INNOVATION

ad-hoc governance open to all

PPP membership wi parties

Funding type: FP9 rules

Flat rate on entity accounting rules

Funding type: CEF/EIB/etc.

@Shift2Rail_JU
#Horizon2020

carlo.borghini@s2r.europa.eu

Shift2Rail

UIP Symposium – 24.05.2018

TURNING DIGITALISATION INTO PERFORMANCE

Panel discussions with

- Dr. Thorsten BIEKER, Vice President Rail & Site Services, BASF SE
- Johann FEINDERT, COO at GATX Rail Europe and President VPI Austria
- Peter REINSHAGEN, COO at Ermewa Group
- Vanessa LANGHAMMER, Head of Digital Transformation at Rail Cargo Group
- Carlo BORGHINI, Executive Director Shift2Rail Joint Undertaking

Digitalisation & Innovation: engage in creative destruction

Digital transformation is not only about "better, faster, cheaper"…

it is about **innovation**

"Innovation is the process of finding economic applications for inventions."

Joseph A. Schumpeter, 1911

- "not just the conception of a new idea, nor the invention of a new device, nor the development of a new market. The process is all these things acting in an integrated fashion" (Myers & Marquis, 1969)

- "the process of turning opportunity into new ideas and of putting these into widely used practice" (Tidd & Bessant, 2009)

- "the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new (or improved) product[/service]" (Trott, 2008)

Targets, levers and expected outcome

Source: GCU discussions on communication platform and Technical Innovation Circle for Rail Freight Transport (TIS)

Increase in efficiency and reliability of assets as basis for costs reduction

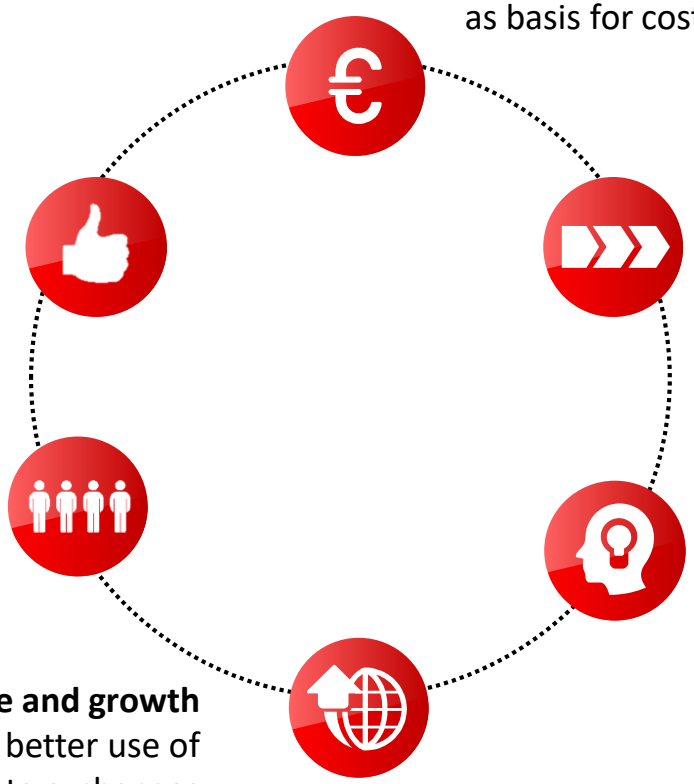
Increase in process stability and quality based on harmonized database

(Semi-) **Automation of processes** along the overall value chain

Reduction of manual handling dand thus increase in productivity and competitiveness

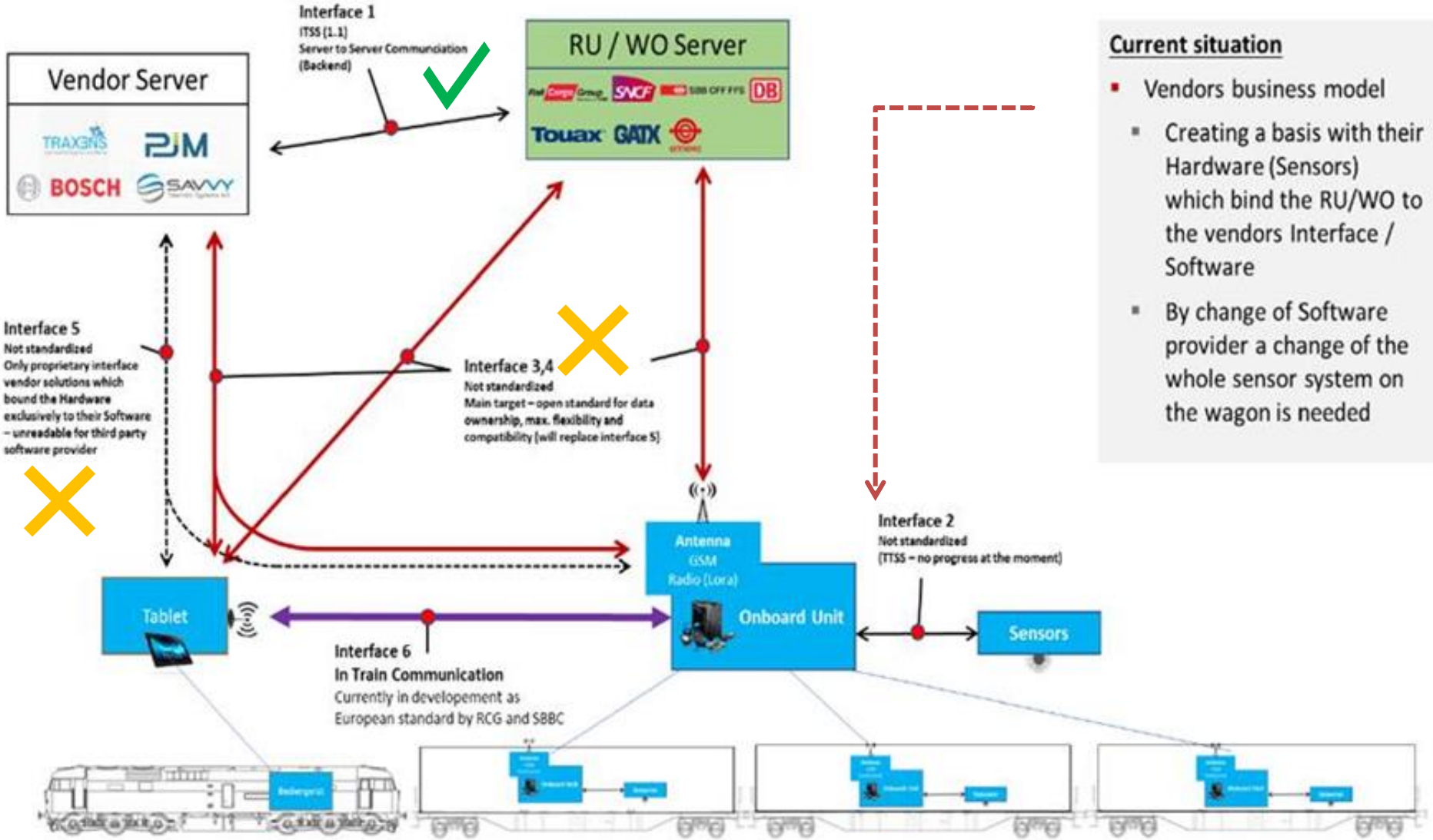
Setting knowledge through intelligent usage of existing and new data

Creation of customer added value and growth through digital service offers and better use of common interfaces for data exchanges



Targets **Levers**

Standardisation of interfaces for data exchanges and communication between IT systems

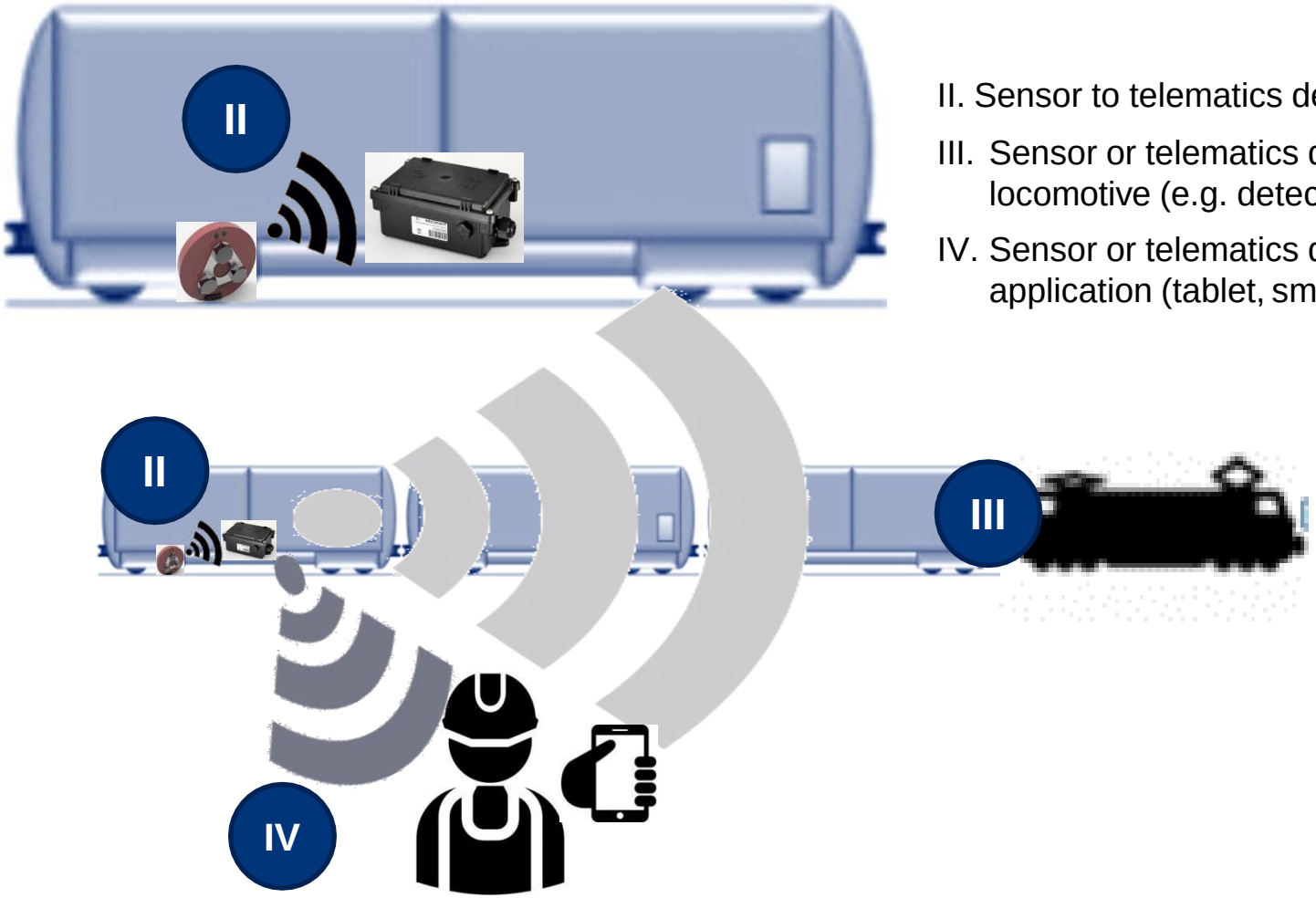


Current situation

- Vendors business model
  - Creating a basis with their Hardware (Sensors) which bind the RU/WO to the vendors Interface / Software
  - By change of Software provider a change of the whole sensor system on the wagon is needed

Standardisation of interfaces for data exchanges and communication between IT systems

Besides interface #2 further interfaces have to be standardized for intra-train- as well as for wagon-handheld-communication



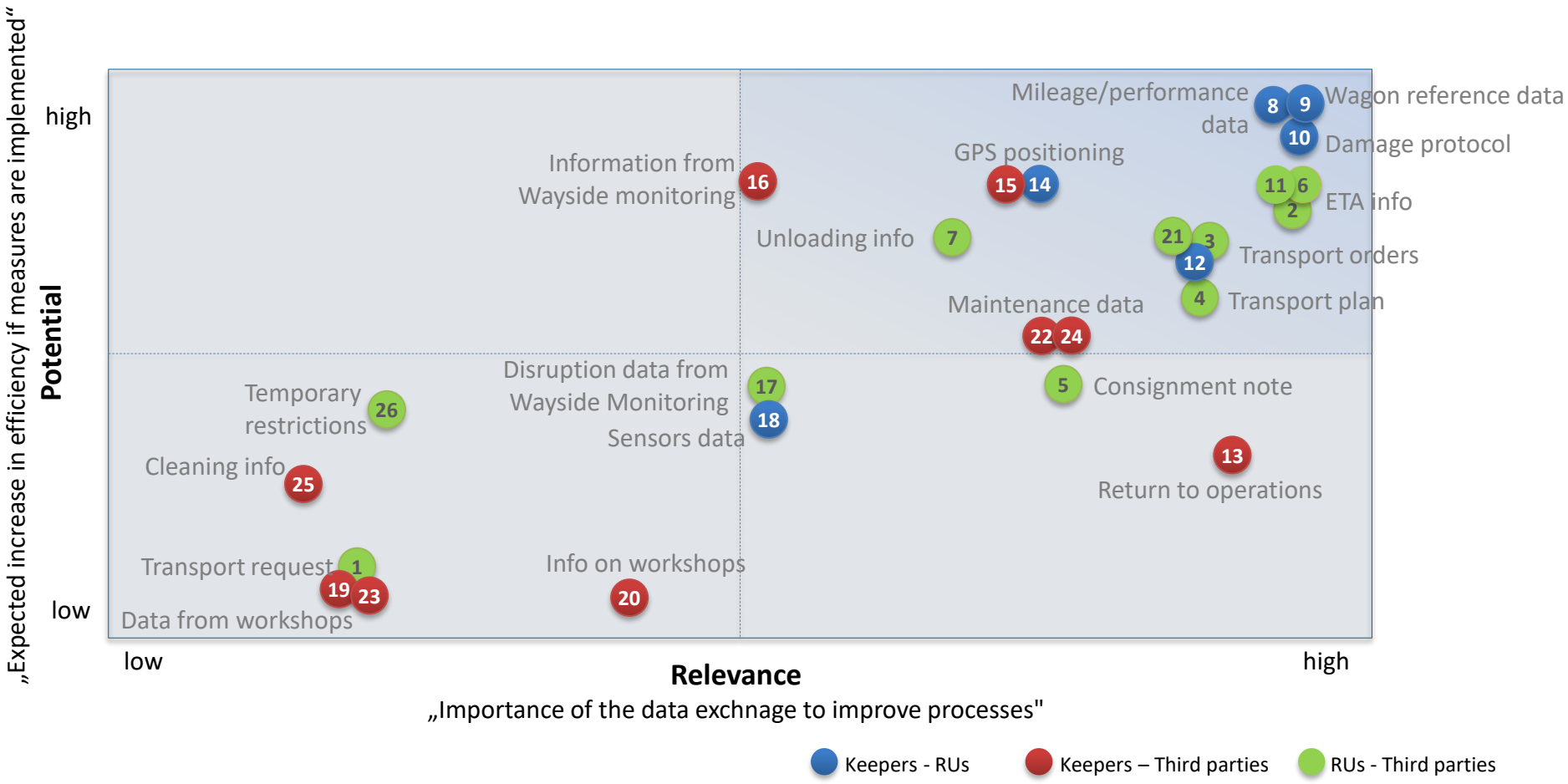
II. Sensor to telematics device on board

III. Sensor or telematics device on board to locomotive (e.g. detection of derailment)

IV. Sensor or telematics device to mobile application (tablet, smartphone)

Standardisation and digitalisation of data exchanges along the transport chain

Draft proposal for the classification of identified data exchanges



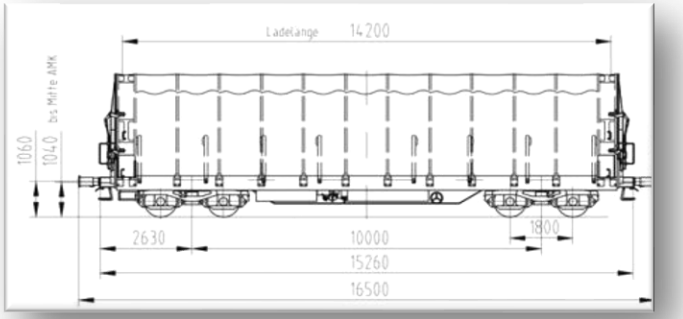
Exchange of data in 21st century: a first step

RSRD² Wagon Data: data catalogue includes all necessary information required for train preparation and operation by RUs

Registration/Authorisation

- Registration country, multilateral authorisations
- Authorisation data
- Keeper (VKM), ECM and ECM certificate
- Etc…

Design



- Compatibility with infrastructure (load limits, maximum speed, loading gauge etc.)
- Brake information (incl. LL block)
- Loading dimensions
- Maintenance dates

The data catalogue comprises about 100 mandatory and optional TAF TSI elements

Get away from markings, fax, email…

Towards asset intelligence and automation

Improve productivity

- Real time fleet management
- Real time shock detection
- Reduce turnover time
- Reduce manual work
- Better forecast of fleet utilization

Optimize maintenance

- Develop preventive maintenance scheme
- Higher reliability
  - Better understanding and early recognition of damages
  - Reduction of damages
- Improve processes at workshops
- Reduce maintenance costs

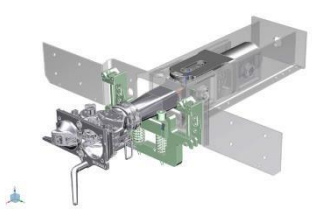
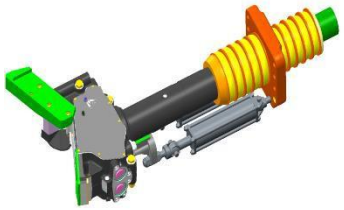
Increase customer benefits

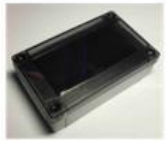
- Develop new services based on
  - Real time tracking and tracing
  - Event messages tailored for the customer's needs
- Monitor goods in real time
  - Specific thresholds
  - Triggered actions

Aspects under consideration

Innovative Bogies and Brake Systems | **Wagon Intelligence** | **Automated Operational Processes*** | **Wagon Design** | **LCC-Models Components and Wagons**

*Automated operational processes, e.g. automated break tests, automated support in technical wagon inspection, support in train integrity, train composition,…

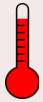





A second step ?

Agree on use cases and define compensation models

First use case: identification of freight wagons via RFID or other technologies (NFC, …)

Tracking & Tracing 	Last known position* ■ [GNSS position]	Positions in time interval* ■ [GNSS position list]	Mileage* ■ [meters]	Estimated time of arrival ■ [UTC time stamp]	Ident. of delays ■ [UTC format]
Automatic brake test 	Capturing of train formation ■ [list of wagon numbers]	Train integrity check ■ [Integrity check passed / integrity check failed]	Monitoring applied brake valve ■ [pressure]	Automatic brake test ■ [Brake test passed / brake test failed] ■ [GNSS position]	Monitoring hand brake ■ [hand brake on / hand brake off]
Shock detection 	Detection of shunting shocks* ■ [shunting shock detection] ■ [UTC time stamp of shock] ■ [GNSS position]	Automatic derailment detection ■ More, repetitive vertical shocks within short time period ■ Time stamp first shock ■ GNSS position			
Weighting / (Over) Load detection 	Loading state* ■ [Loaded / unloaded / unknown] ■ [UTC time stamp]	Uneven load detection ■ [uneven load detected] ■ [percentage] ■ [GNSS position]	Overload condition detection* / Axle load detection ■ [Overload detected] ■ [UTC time stamp of detection] ■ [GNSS position]	Loading shock detection* ■ [loading shock detected] ■ [UTC time stamp of shock] ■ [GNSS position]	Weighting ■ [kg] ■ [UTC time stamp of detection] ■ [GNSS position]
Condition based maintenance 	Monitoring of wear down ■ Brake blocks ■ Replace by demand	Monitoring of technical condition ■ Distributor valves ■ Slack Adjuster	Identification of components ■ Traceability / LLC control	Flat spot detection ■ Axle ID ■ Time stamp first detection ■ GNSS pos. first detection	
Active Control 	Temperature inside/outside the wagon (eg. humidity) ■ Active control ■ Time stamp ■ GNSS position				

Source: UIC project eWag in collaboration with UIP

Apply the industrial revolutions to railways

1. INDUSTRIAL REVOLUTION	Mechanical production with water and steam power
2. INDUSTRIAL REVOLUTION	Mass production through assembly lines and electricity
3. INDUSTRIAL REVOLUTION	Digital revolution (the use of electronic and IT systems)
4. INDUSTRIAL REVOLUTION	Industry 4.0 (industrial production combined with modern information and communication technology)

CHANGE MANAGEMENT

Change management encompasses all measures used to change the strategies, structures, processes and behavior

Open points and conclusions

Aspects of Digital Transformation: phases

COLLABORATION	In a fragmented industry, internal and external collaboration shall be adapted to digital transformation.
DIGITAL INFRASTRUCTURE & DIGITAL ASSETS	Define digital infrastructure and digital assets. Ensure compatibility of solutions to create conditions for new collaborations and business offers.
BUSINESS PROCESSES	Develop new but common processes, existing processes are digitized and automated.
INTELLIGENT SYSTEMS	Connection with the Internet makes objects intelligent (Internet of Things). Sharing data, information and knowledge to deliver benefits (Big Data and Data Mining).

Thanks for your attention!

Austria | Belgium | Czech Republic | France | Germany | UK | Hungary

Italy | Netherlands | Poland | Slovak Republic | Spain | Sweden | Switzerland

GILLES PETERHANS

Secretary General

gilles.peterhans@uiprail.org

Conclusions

THE SECRET TO CHANGE IS TO FOCUS ALL YOUR ENERGY NOT ON FIGHTING THE OLD, BUT ON BUILDING THE NEW.

SOCRATES

POLICY-MAKERS HAVE TO CHOOSE BETWEEN PROTECTING THE PAST FROM THE FUTURE, OR PROTECTING THE FUTURE FROM THE PAST.

TIM O'REILLY

Open points and conclusions
The dimensions of success

Technology does not cause change, it only enables, facilitates and accelerates change that already wants to take place!

- Look for new ideas but feasible - viable – valuable
- Ensure interoperability of ICT systems – common interfaces
- Create trust and define rules/terms and conditions for data sharing and use
- Foster stronger cooperation for the development of common standards and procedures
- Raise awareness, knowledge, education

A real revitalisation in today's rail freight market and a better modal split for railways **need new realities!!**

From Analog to Digital: a second step
Concentrate on solutions not on the barriers!

Usual barriers in rail business and possible responses

- The European market for new rail freight wagons is small and volatile
  ⇨small volume/long term investments
  Differenciate between asset investments and investments in telematics
- Innovations must not restrict interoperability (technical and operational)
  Pressure on telematic suppliers: develop standardised interfaces*
- Basic innovation requirements are not sufficiently defined.
  Implementation is too slow.
  Learn from best practices – Adapt existing solutions/mature technologies
- Innovations must generate economic gains. Economic benefits and costs are not necessarily reaped by the same entities.
  Concentrate on the simple use cases with high customer benefits

*** Industry platform telematics and sensors in the rail freight sector**

BOSCH Bosch Engineering · COGNID TELEMATIK · dresden elektronik · eureka CONNECTING COMPETENCE · ibes · SAVVY · Siemens AG