

Improve freight competitiveness between Europe and Asia: European Union Rail R&I

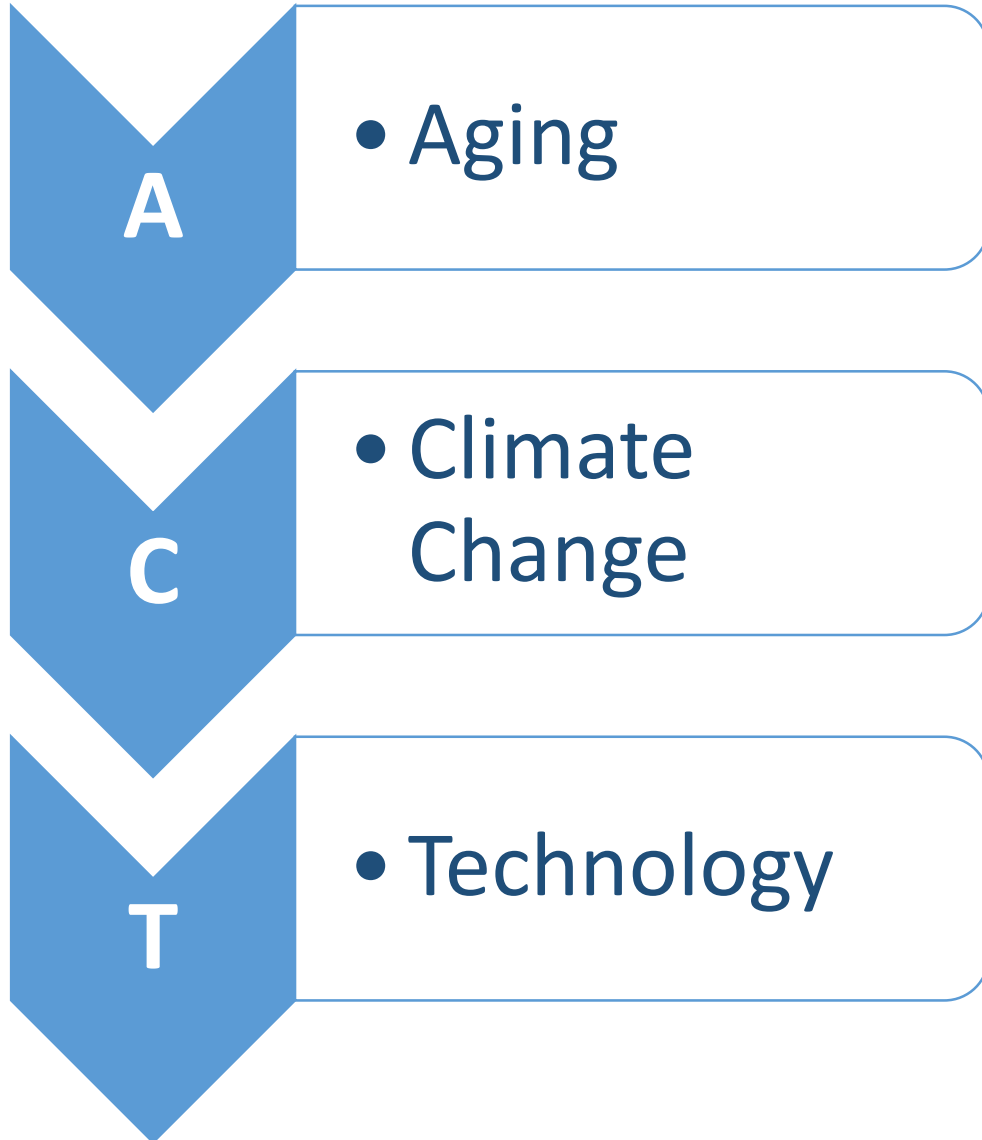
carlo m borghini
Shift2Rail Executive Director

Geneva, 25 November 2019

@Shift2Rail_JU
#Horizon2020



SUSTAINABLE DEVELOPMENT GOALS



RAILWAY

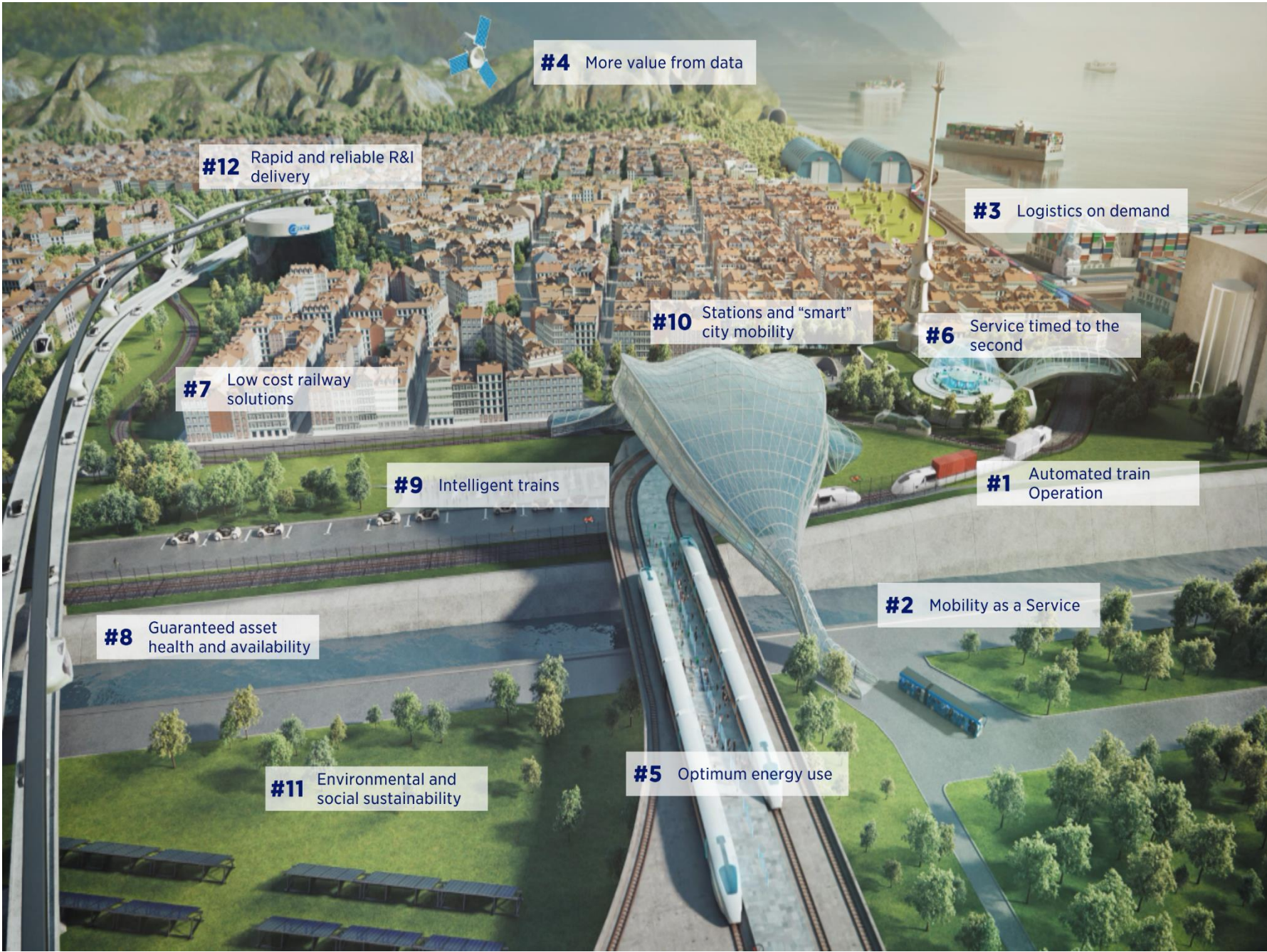
People, Infrastructure, Assets
Staff, ...

Game changer

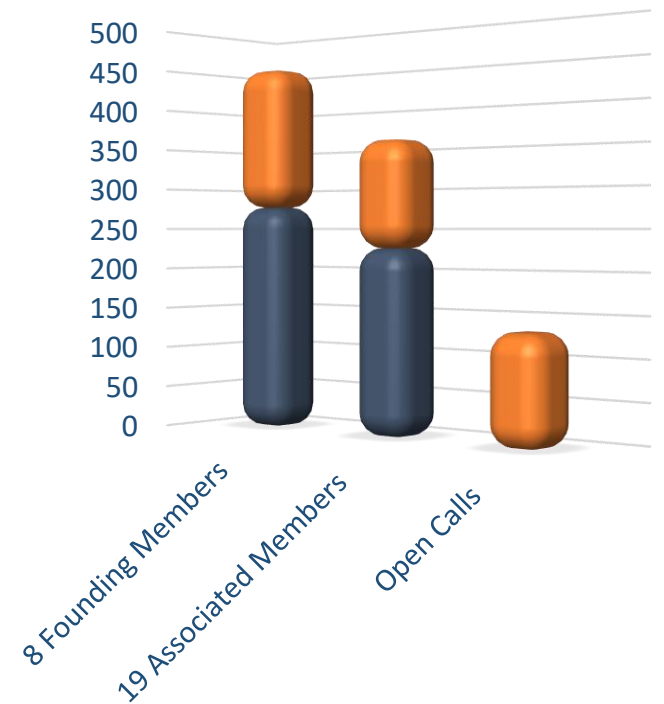
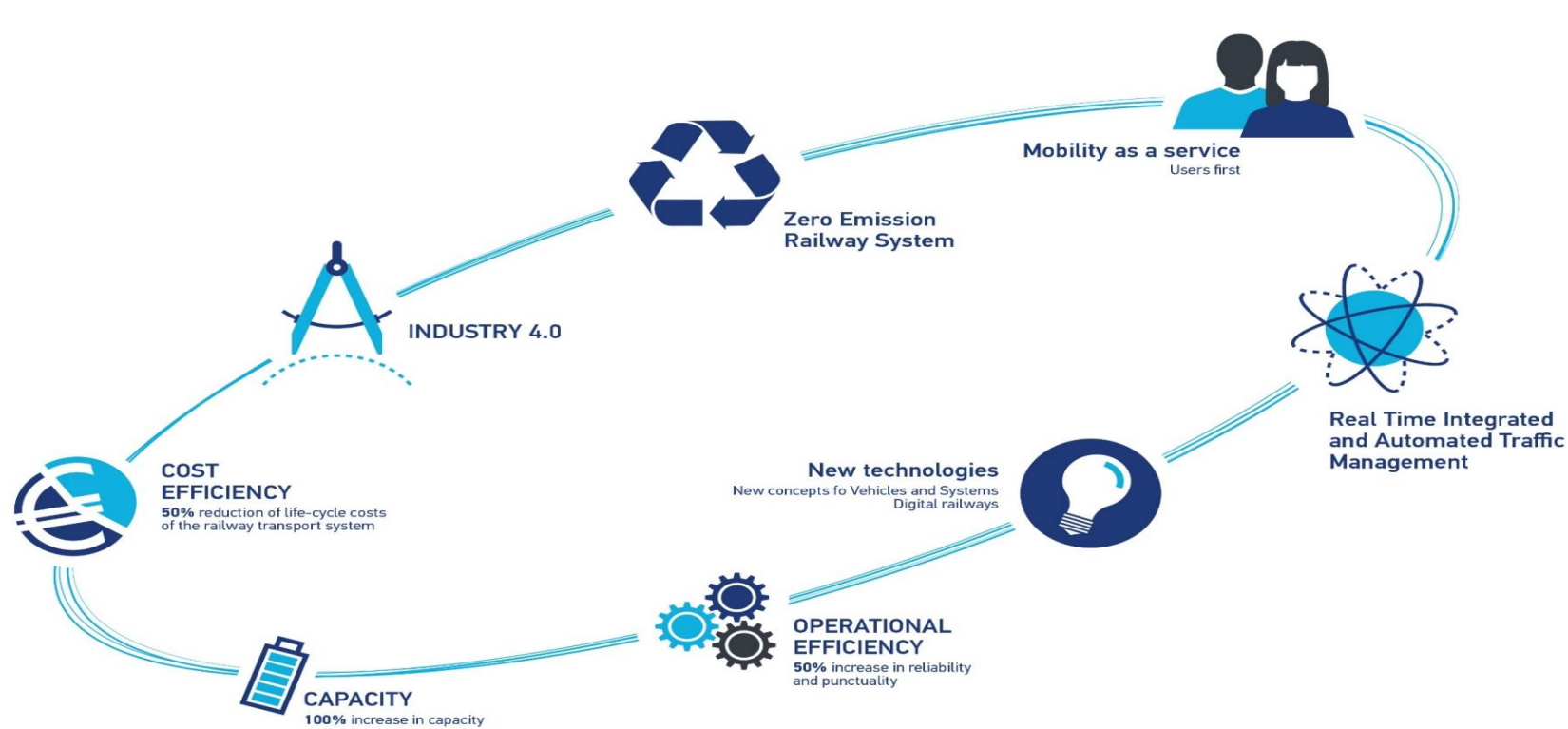
Opportunity & risk

INNOVATION CAPABILITIES

USER FIRST

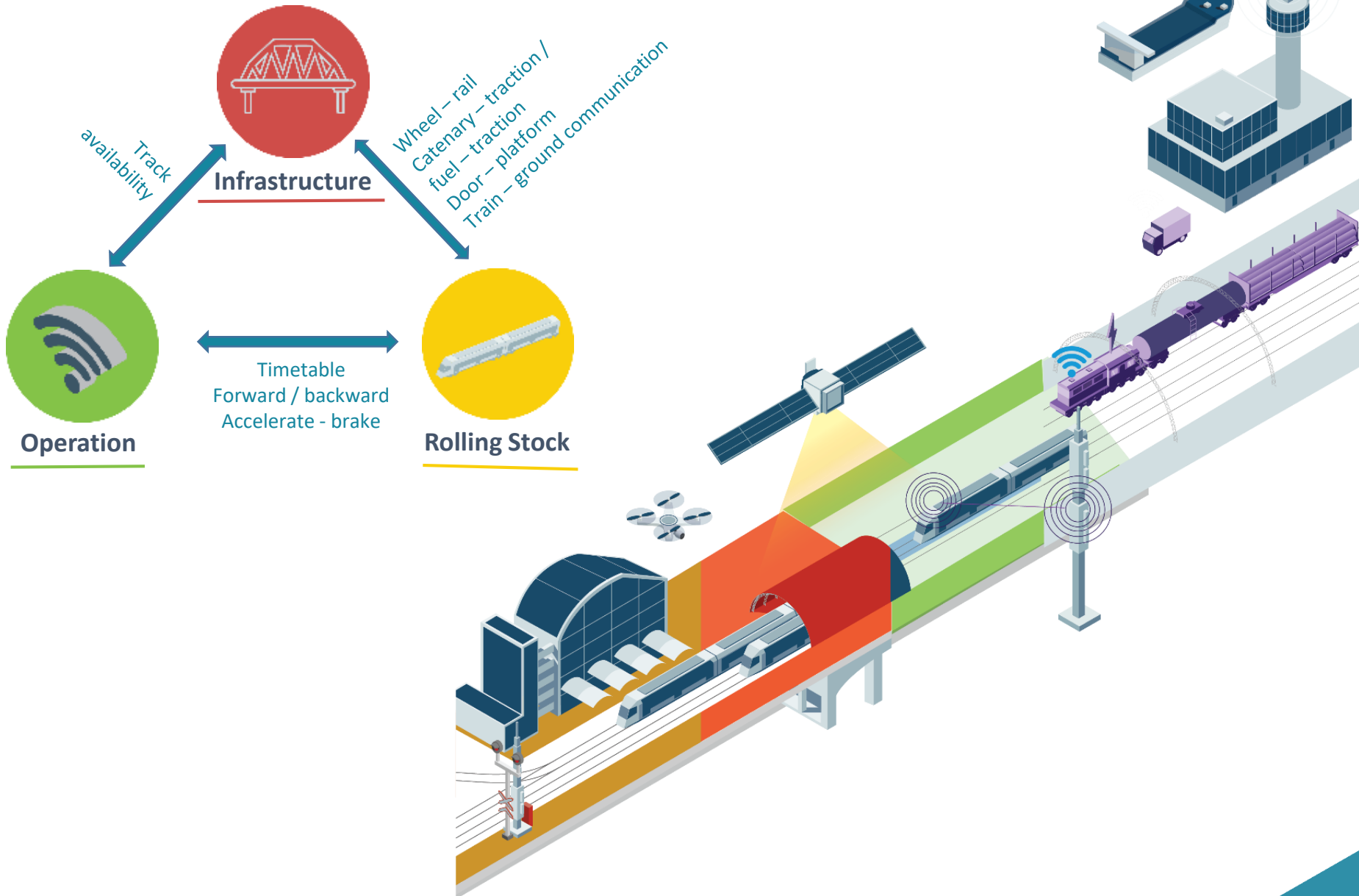


S2R VISION



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

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

Railway System Architecture: **Linux4Rail Project**

- ✓ **Innovation:** evolutionary, by steps or disruptive
- ✓ **Time to market:** moving from R&I to deployment => **system approach to decrease fragmentation**
- ✓ **“Do not reinvent the wheel”:** **Open System Interface (or interconnection) model**
- ✓ **Innovation Skills and Competences :** still the same needs in the Digital Railway?

THE FUTURE RAIL SYSTEM: TRAINS MAXIMIZING THE SYSTEM PERFORMANCE BY A COMBINATION OF DISTRIBUTED INTELLIGENCE AND SUPERVISION

- ✓ **Enablers:** digital technologies, automation, artificial intelligence, data, cloud and supercomputing, **connectivity**, satellite, but also **new regulatory concepts and framework**, traction, braking systems, etc....
- ✓ **Deployment:** from zero on site testing through integrated testing to revenue services testing, large real time demos, transition models



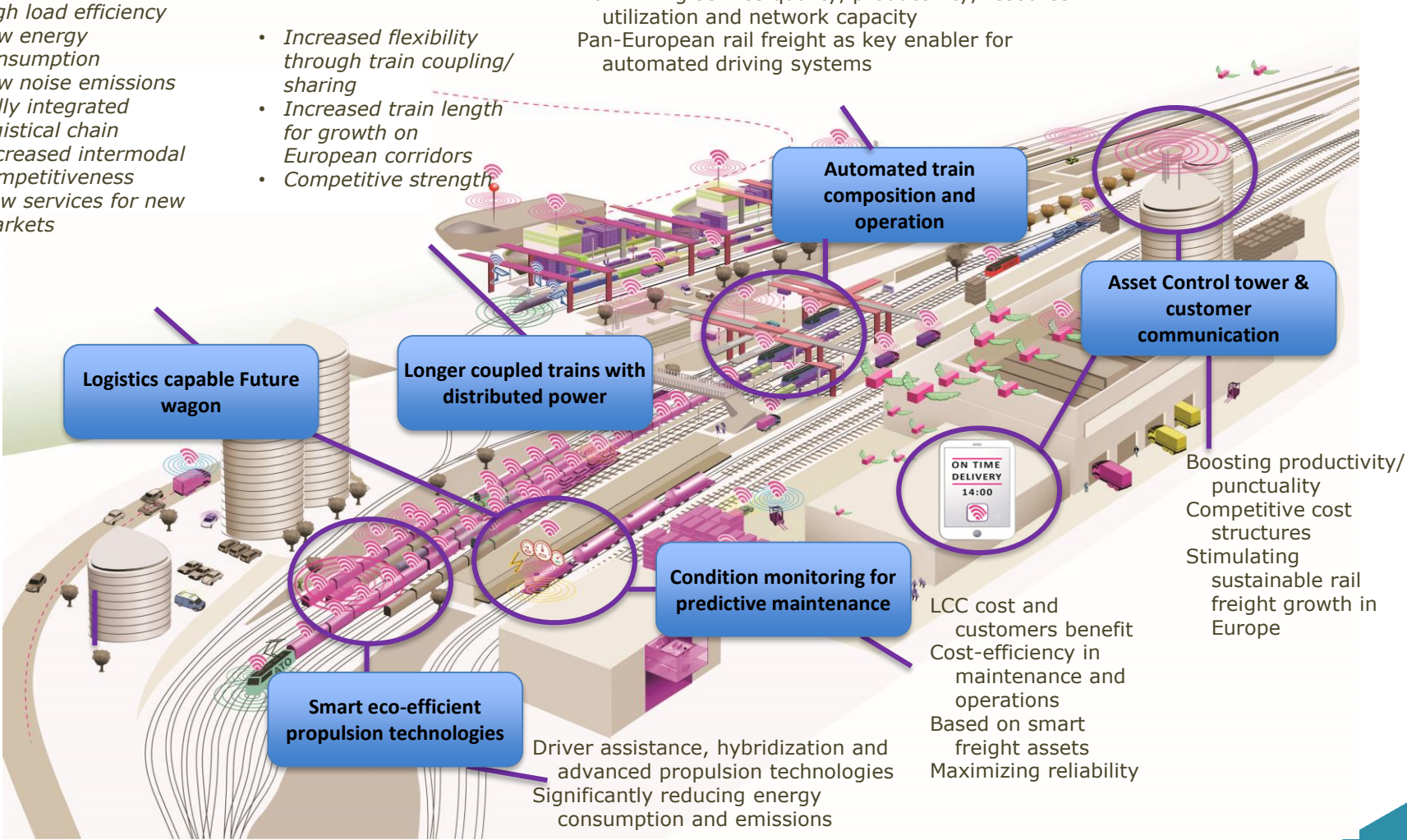
IP5 Technologies for Sustainable & Attractive European Rail Freight

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

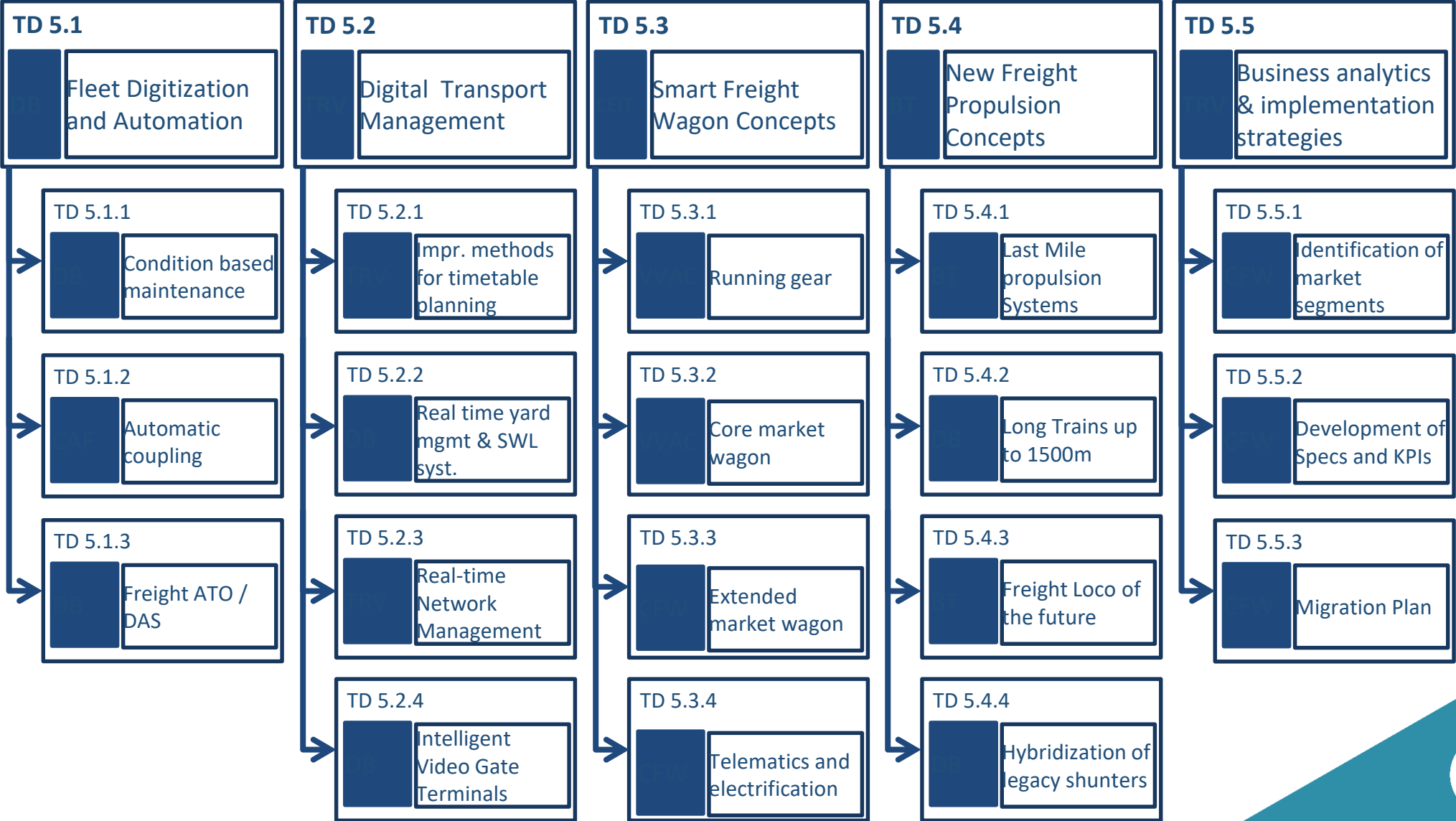


Boosting productivity/
 punctuality
 Competitive cost
 structures
 Stimulating
 sustainable rail
 freight growth in
 Europe

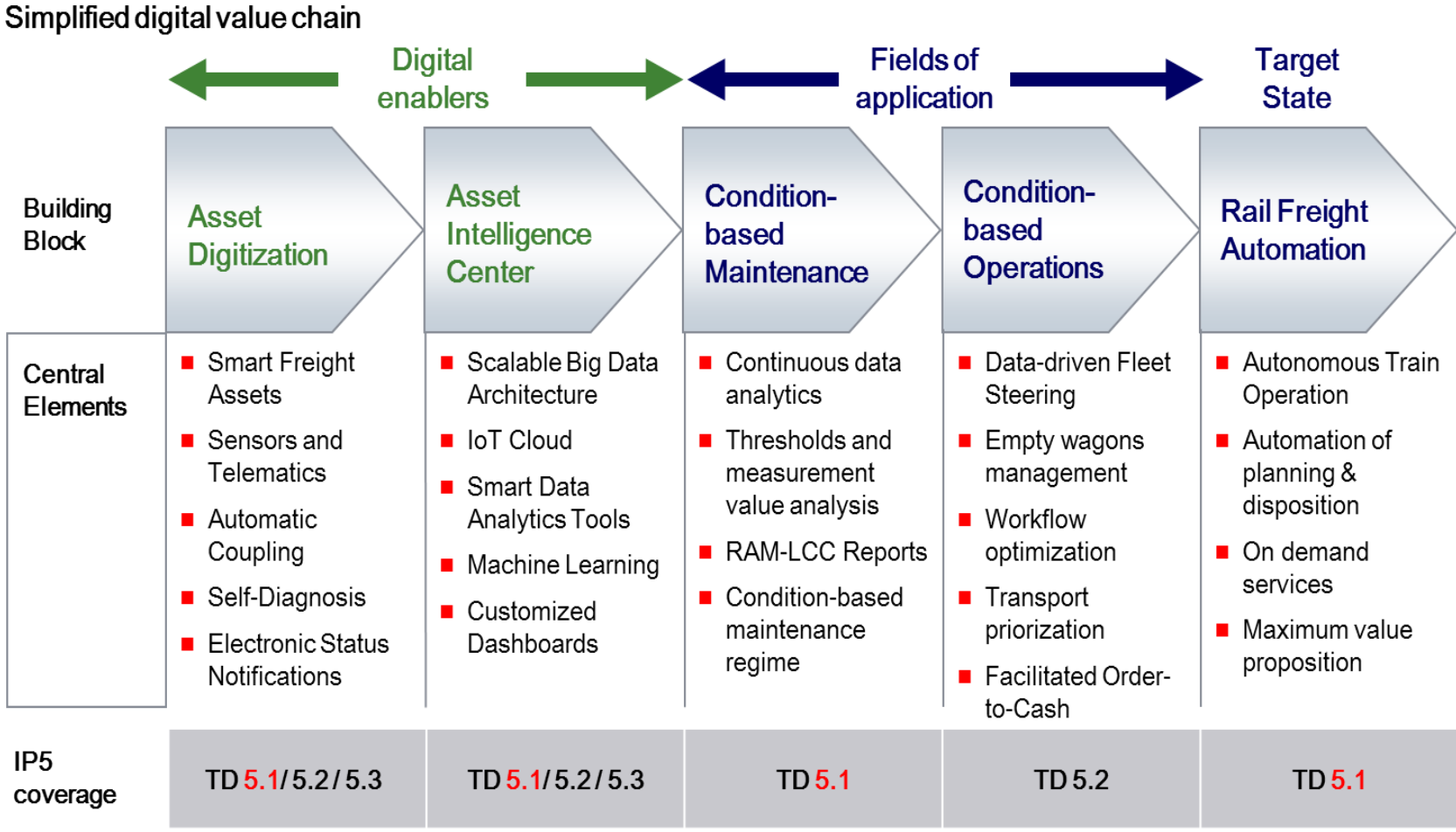
LCC cost and
 customers benefit
 Cost-efficiency in
 maintenance and
 operations
 Based on smart
 freight assets
 Maximizing reliability

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

IP5 better focused approach



IP5 interaction between TDs



IP5 planning

TDs	TASKS	TRL	2016				2017				2018				2019				2020				2021				2022			
TD 5.1	Fleet Digitalisation and Automation		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
5.1.1	High level specification definition, feasibility analysis and preliminary testing CBM and AC	n/a	■	■	■	■																								
5.1.2	Conceptual / architecture design CBM and AC	3				■	■	■																						
5.1.3	ATO over ETCS - GOA2 freight specification	3				■	■	■	■	■	■	■	■	■	■	■	■	■	◆											
5.1.4	Detailed design, implementation and unitary testing CBM and AC	4						■	■	■	■	■	■	■																
5.1.5	GOA2 Pilot Line freight demonstration	6									■	■	■	■	■	■	■	■	◆											
5.1.6	Integration of components CBM and AC	5												■	■	■	■	■	■	■	■	■								
5.1.7	C-DAS/ ATO interface assessment	3												■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	◆
5.1.8	ATO over ETCS - GOA4 freight simulation	3																	■	■	■	■	■	■	■	■	■	■	■	■
5.1.9	Demonstration activities CBM and AC	6																												■

- ◆ milestone
- quick win
- ongoing activities
- planned activities

IP5 projects' page and deliverable

https://projects.shift2rail.org/s2r_ip.aspx?ip=5



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EUROPEAN UNION

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IP5 Technical Demonstrators



IP5 Projects

Technologies for Sustainable & Attractive European Rail Freight

IP Coordinator: Norbert Kahl - DB

S2R-IP1

Lighthouse Projects

S2R-IP2

S2R-IP3

S2R-IP4



S2R-IP5

S2R-IPX

S2R-CCA

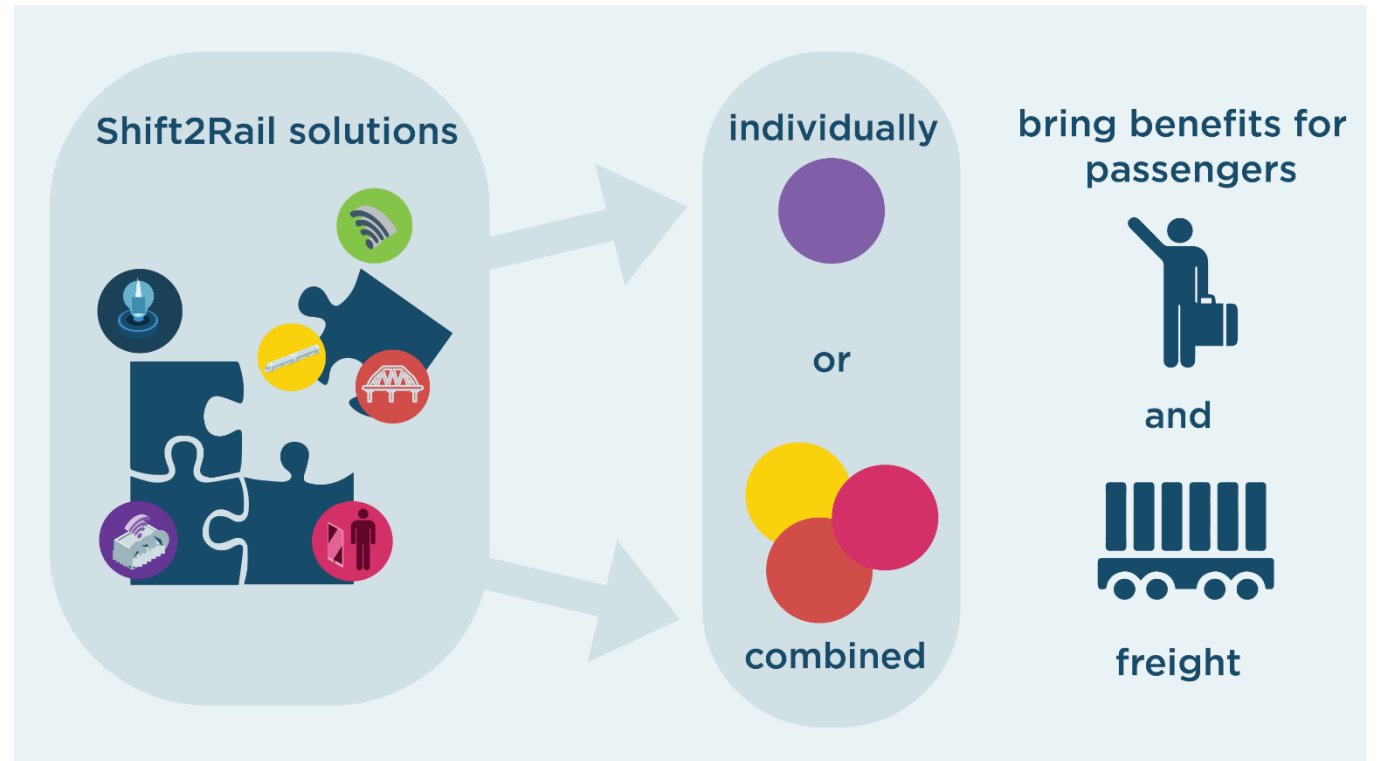
Projects 2015/2016

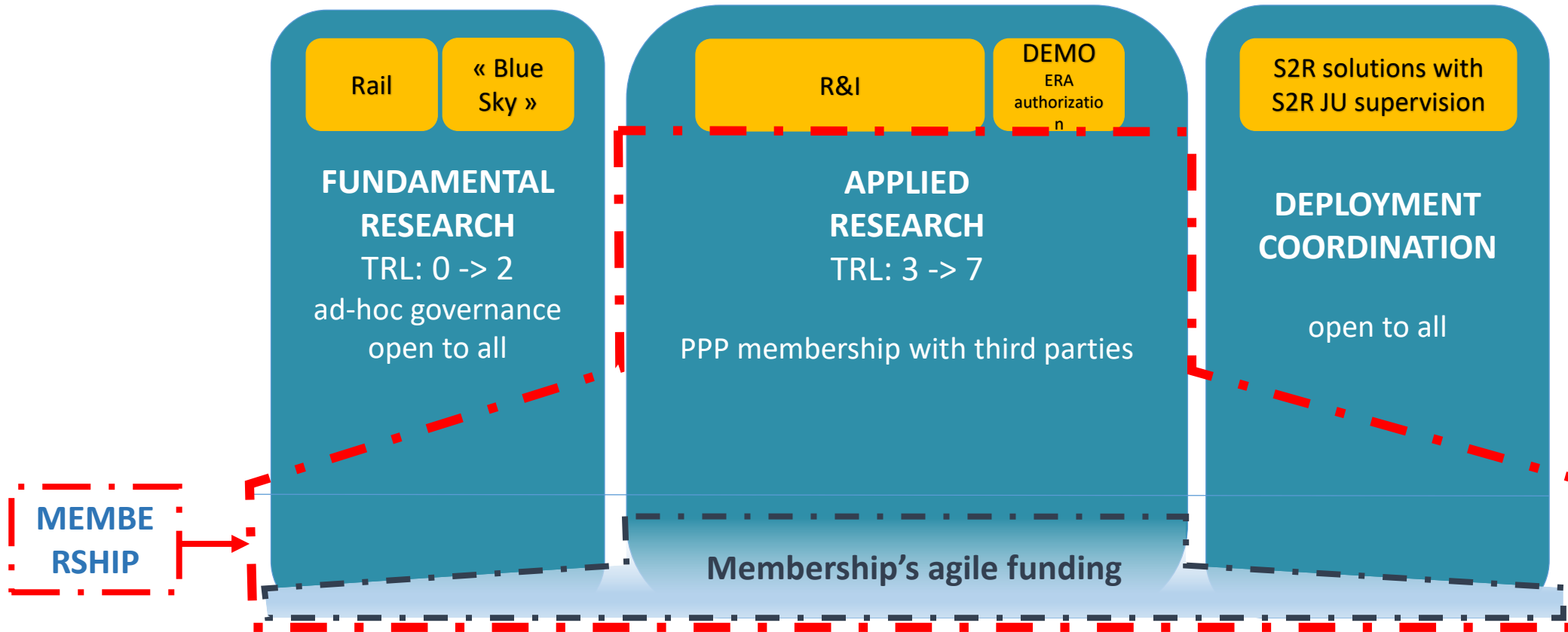
Contacts



S2R JU Catalogue of solutions

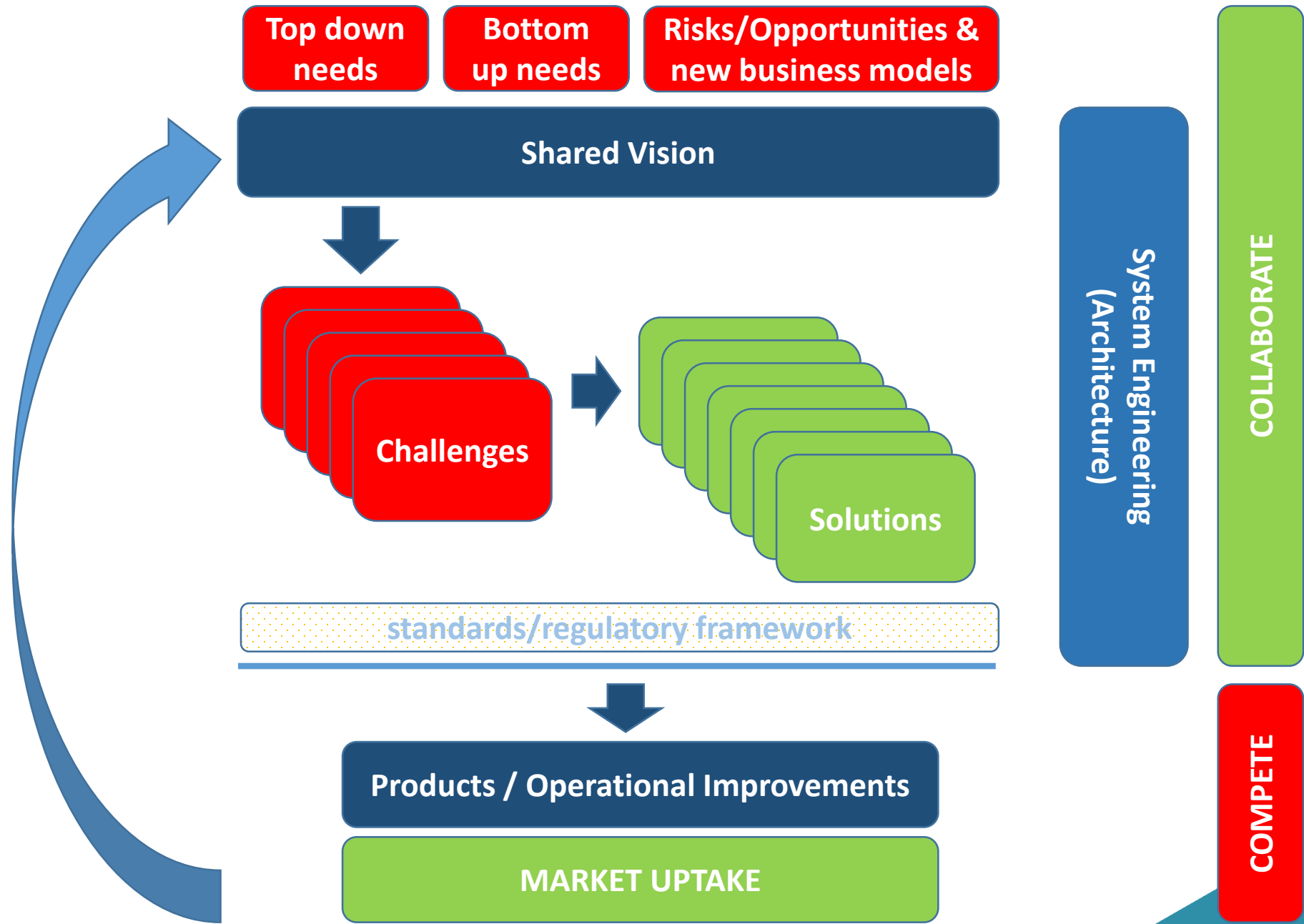
- What R&I investments generate as innovative solutions for market uptake
- To explain **successful results in term of possible products/solutions** with a clear timetable
- **To show Benefits for “customers”**: final users, operators, infrastructure managers and/or suppliers
- To highlight the **advantages** of integrating the demonstrators into **market solutions**
- **To deliver the Innovation Capabilities**
- **28 October publication**





No participation barriers between R&I&D areas

TRL 7 Demos included in Applied Research, Live Large Scale Demos in Deployment Coordination



FOUNDING MEMBERS



ALSTOM

BOMBARDIER

CAF

Hitachi Rail STS

NetworkRail

SIEMENS

THALES

TRAFIKVERKET

ASSOCIATED MEMBERS

amadeus



DIGINEXT
be visionary

Faiveley Transport
A Wabtec Company

HaCon

indra



KNORR-BREMSE

kontron
S&T Group

mermec
AN ANGEL COMPANY



Talgo

Virtual Vehicle Austria consortium+
(VVAC+)

European Rail Operating
community Consortium (EUROC)

Swi'Tracken consortium

Smart DeMain (SDM) consortium

virtual vehicle

WIENER LINIEN

ÖBB
Immer in Bewegung

bls

RAILENIUM

Universidade do Porto
Euskal Herriko Unibertsitatea

Strukton
Rail

cemosa

FCP

TATRAVAGÓNKA
POPRÁD

CP
COMBOIOS DE PORTUGAL

likenne
virosto

U.PORTO

University of Miskolc

Fraunhofer
IVI

acciona

getzner
engineering a quiet future

ACT

PKP
POLSKIE KOLEJE PAŃSTWOWE
Spółka Akcyjna

SBB CFF FFS

TATA STEEL

TRONICO
ALCEN

KIRCHDORFER
CONCRETE SOLUTIONS

MCL

ProRail

Infraestruturas
de Portugal

vossloh

egis

Plasser & Theurer

PJM

TCDD

Slovenske železnice

EURO
TUNNEL

voestalpine
ONE STEP AHEAD.

AVL

AERFITEC

Competitive Freight Wagon
Consortium (CFW)

Smart Rail Control
(SmartRaCon) consortium

AERnova

ConTraffic
Consulting Network for Traffic Systems

DLR

DLR

RAILENIUM

FIDAMC

DIE BAHNINDUSTRIE.
VDB VERBAND DER BAHNINDUSTRIE IN DEUTSCHLAND E.V.

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