The Shift2Rail IP2 vision

Control Command and Railway Communication Conference 2017
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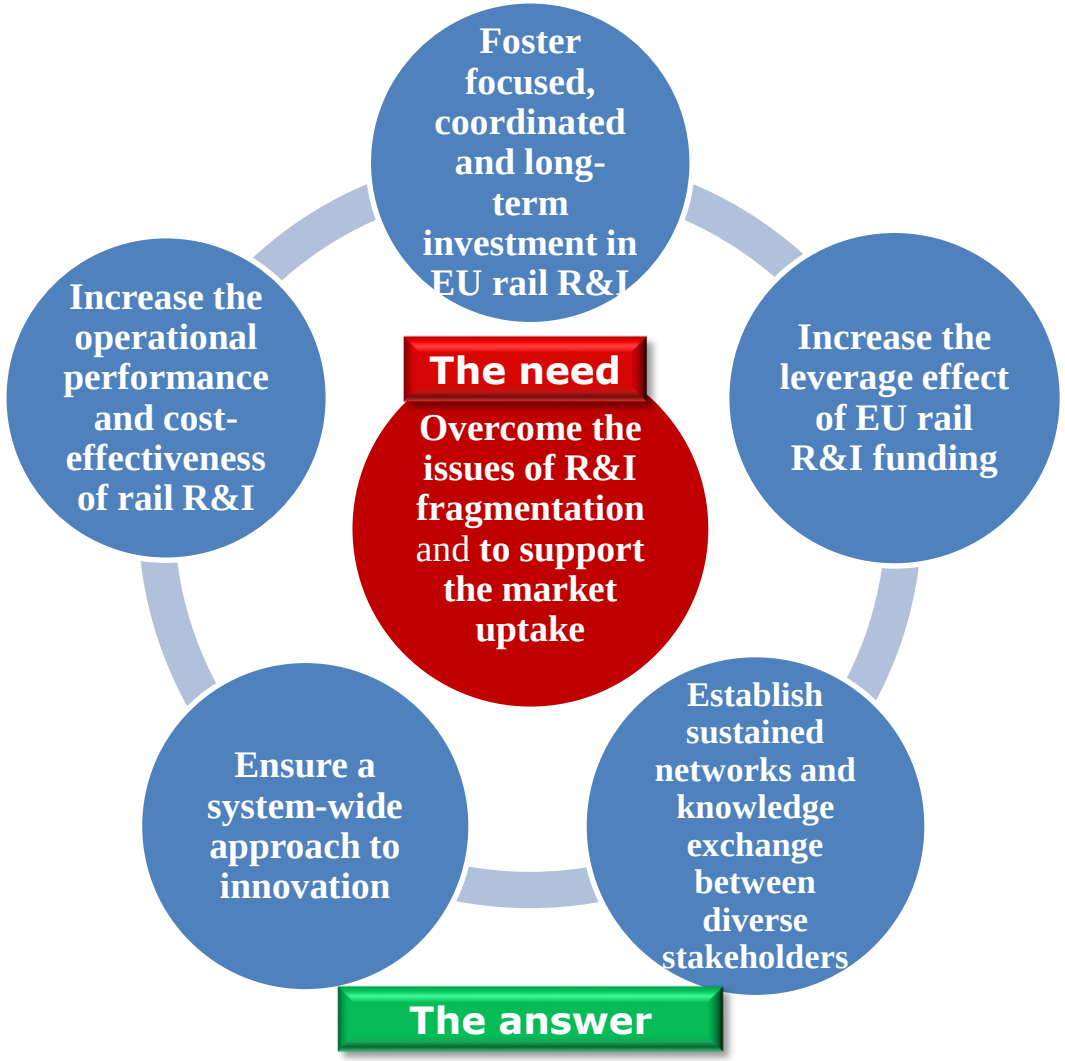
Shift2Rail, a great opportunity of growth for European Railways and Industries

The Shift2Rail Joint Undertaking (S2R JU) is a new Public-Private Partnership in the rail sector, established under Horizon 2020, to provide a platform for coordinating research activities with a view to driving innovation in the rail sector in the years to come. (*)

(*) EU funding: EUR 450 million
Total budget: ~ EUR 920 million



Shift2Rail - Macro and Long Term targets

50 % reduction of the life-cycle cost of the railway transport system, through a reduction of the costs of developing, maintaining, operating and renewing infrastructure and rolling stock, as well as through increased energy efficiency

100 % increase in the capacity of the railway transport system, to meet increased demand for passenger and freight railway services

50 % increase in the reliability and punctuality of rail services (measured as a 50 % decrease in unreliability and late arrivals)

Impacting all segments of the rail market!

Shift2Rail - Macro and Long Term targets

Enhance Interoperability

Respect and adapt the existing target system specifications (TSIs). Identification of the need to remove current open points to apply future technological solutions

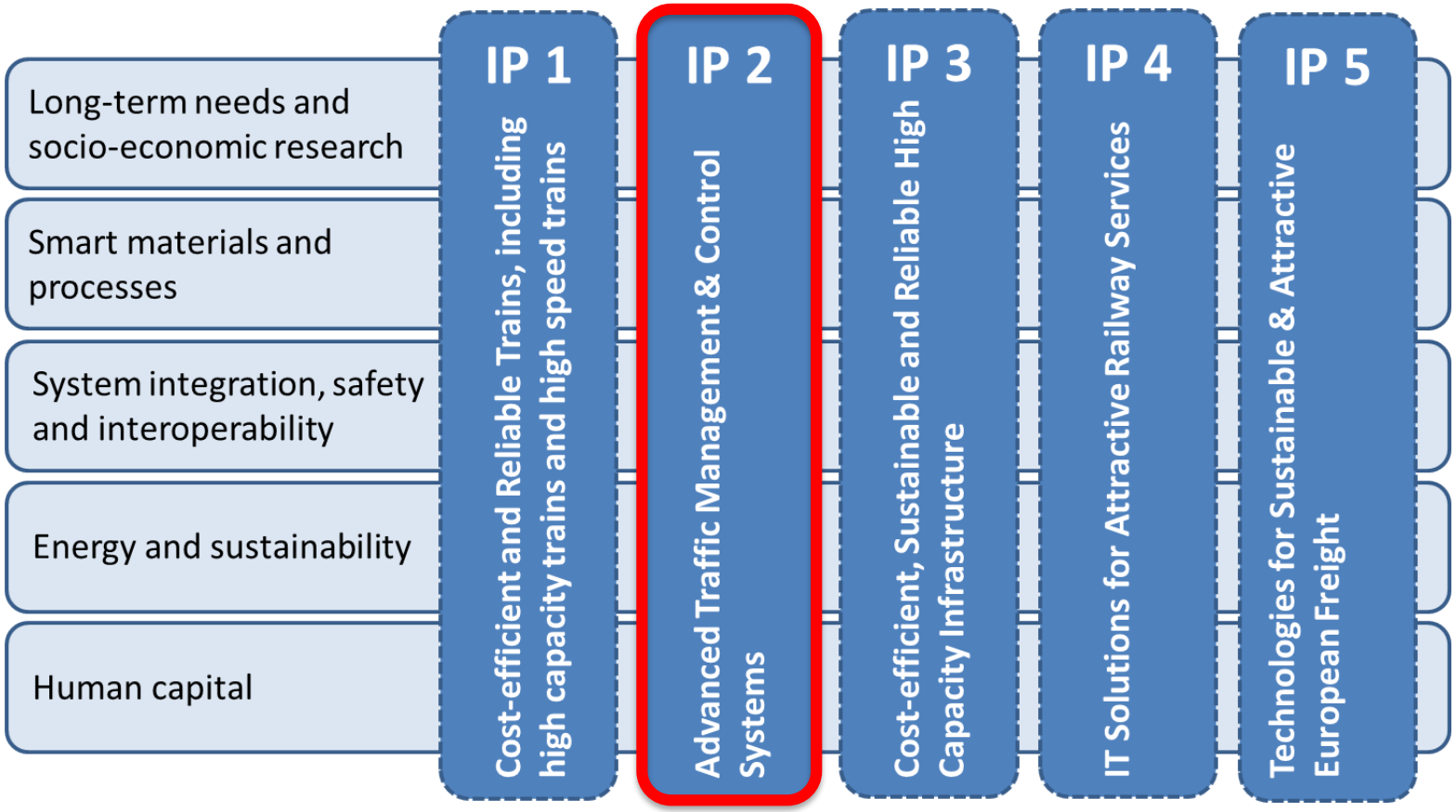
Simplify Processes

The aim is to reduce the development and productions costs of innovative technologies

Impacting all segments of the rail market!

Shift2Rail – Five Innovation Programmes

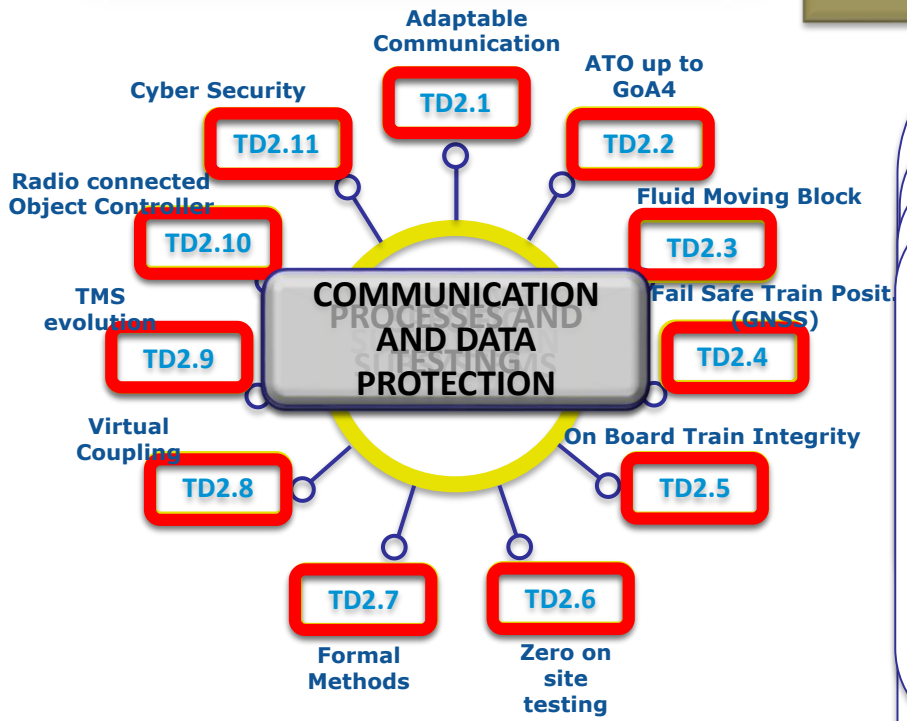
(*)



(*) Total budget: ~ EUR 191 million

Focusing on IP2
The Steps - today and the future

CONTRIBUTION FROM ALL THE STAKEHOLDERS



Moving block

ATO up GoA4

Adaptable communication for all Railway
The objective is to overcome the current limitation of GSM-R by means of the application of the up to date technologies. The new system will be bearer independent, resilient to radio technology evolution, high performance, backward compatible to ERTMS.

Cyber security
To define a cyber-security system dedicated to Railways through the application of the cyber-security methodology ensuring high availability, authentication and integrity, improving compatibility and interoperability by standardizing the security system at European level.

Traffic Management System evolution
To enhance the standardization of Traffic Management processes in order to rationalise automation processes, simplify Train Dispatcher operations and performances.

Focusing on IP2
The Steps - today and the future

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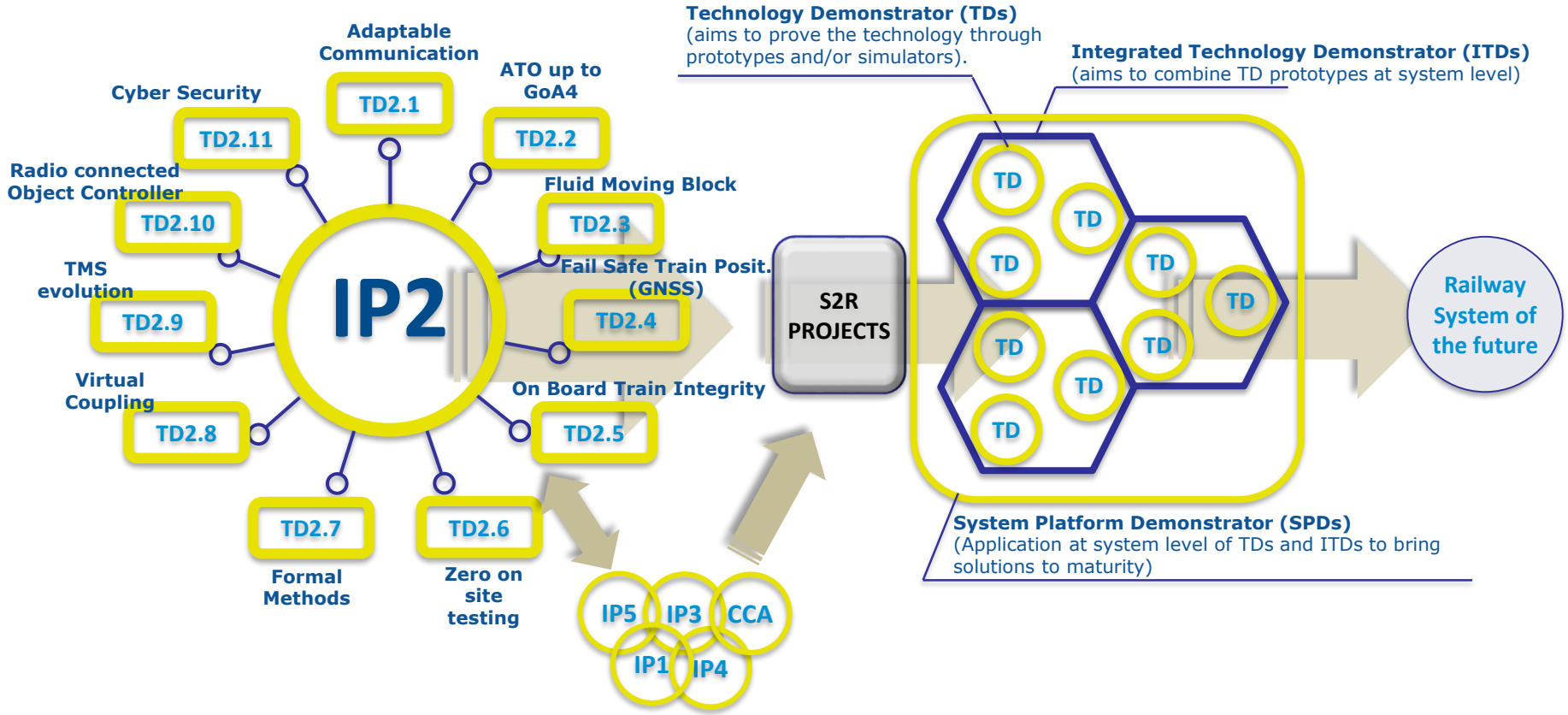
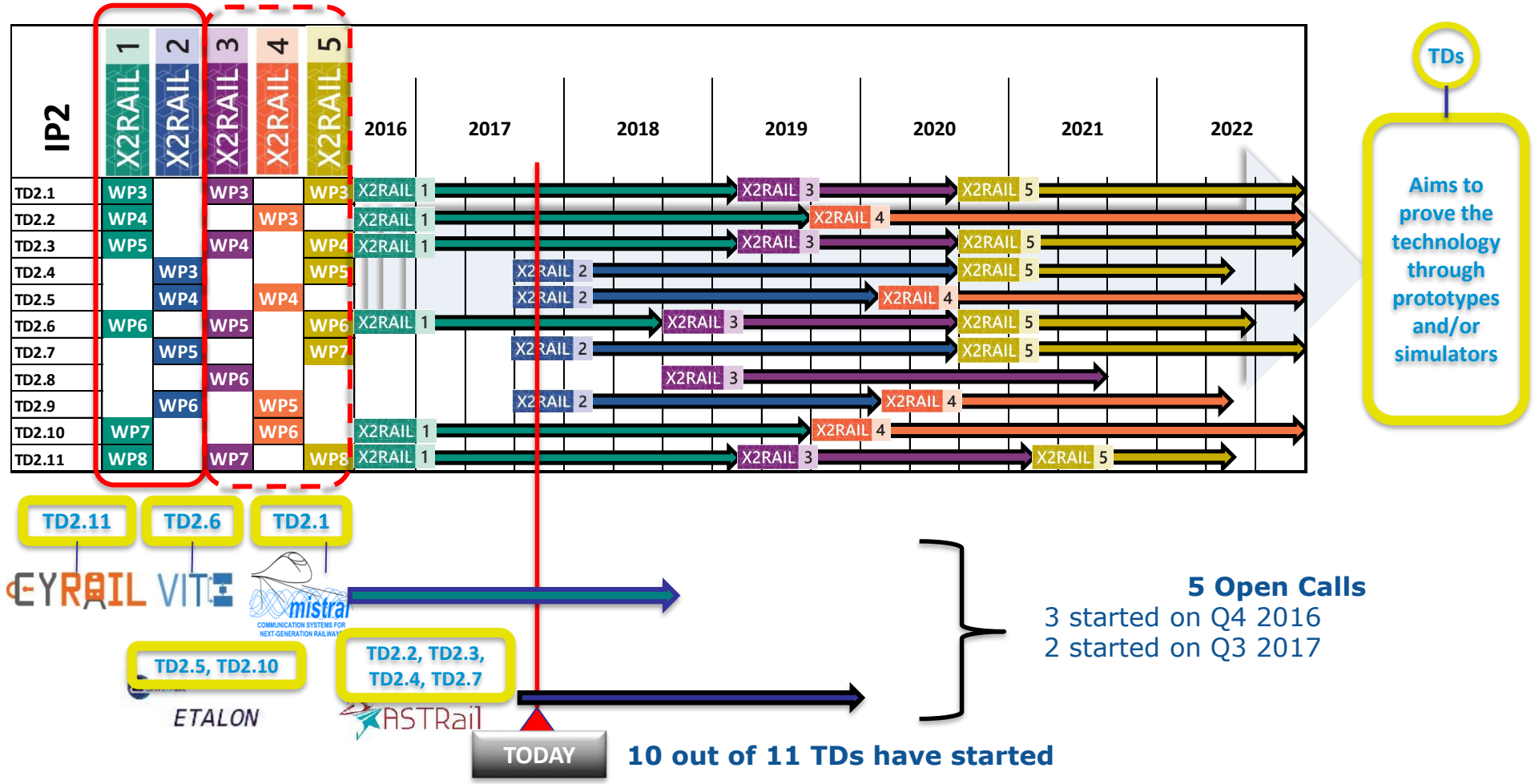
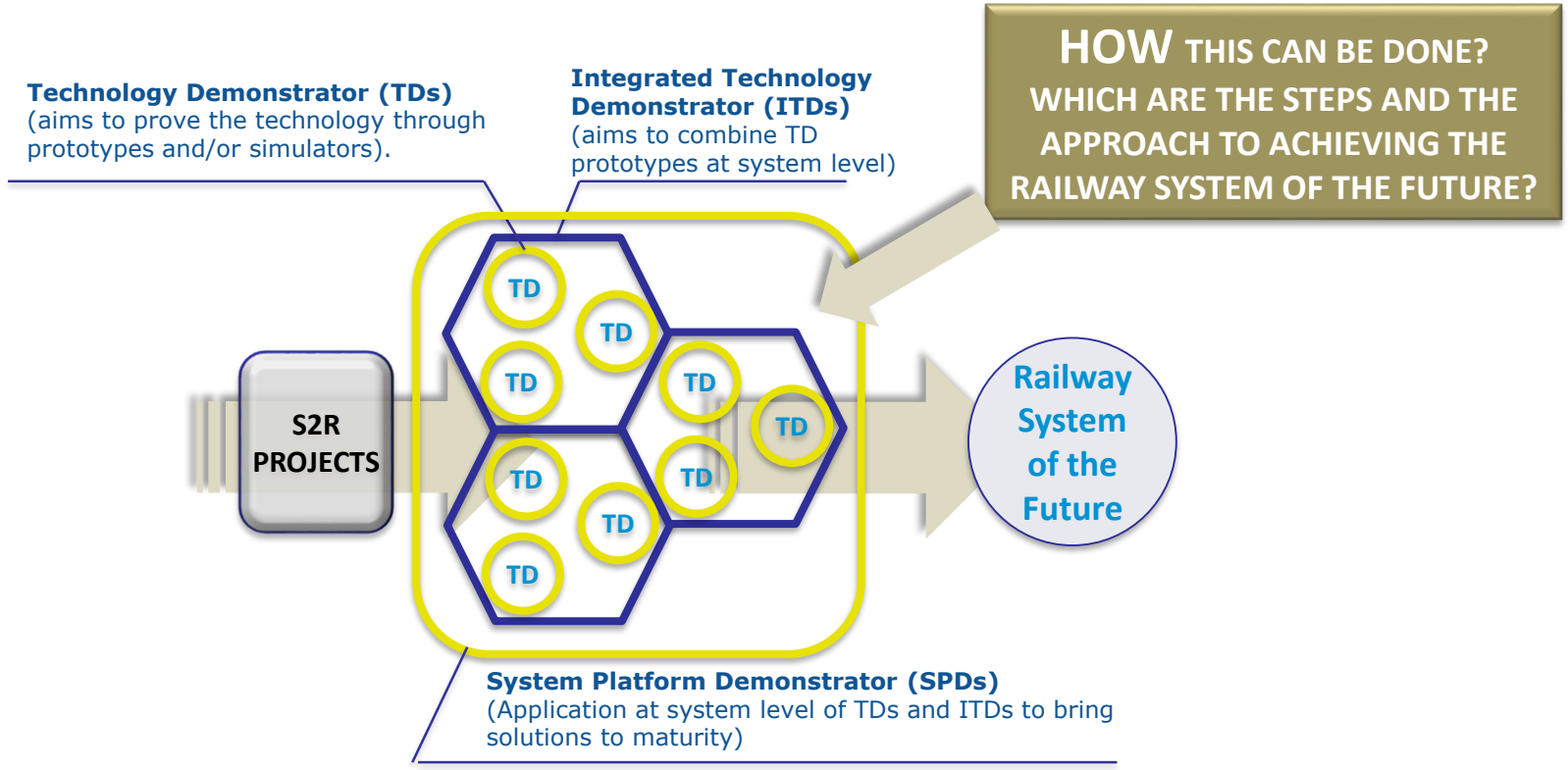


IP2 - the projects and the programme



- 6 TDs started on Sept. 2016 in **X2Rail-1** (TD2.1, TD2.2, TD2.3, TD2.6, TD2.10, TD2.11)
- 4 TDs started on Sept. 2017 in **X2Rail-2** (TD2.4, TD2.5, TD2.7, TD2.9)
- Only one TD has still to start (TD2.8 Virtual Coupling – planned in **X2Rail-3** on Sept. 2018)
- The succeeding Grants (from **X2Rail-3** to **X2Rail-5**) are planned to bring to conclusion all the TDs by the end of 2022.

The vision
HOW to perform the evolution

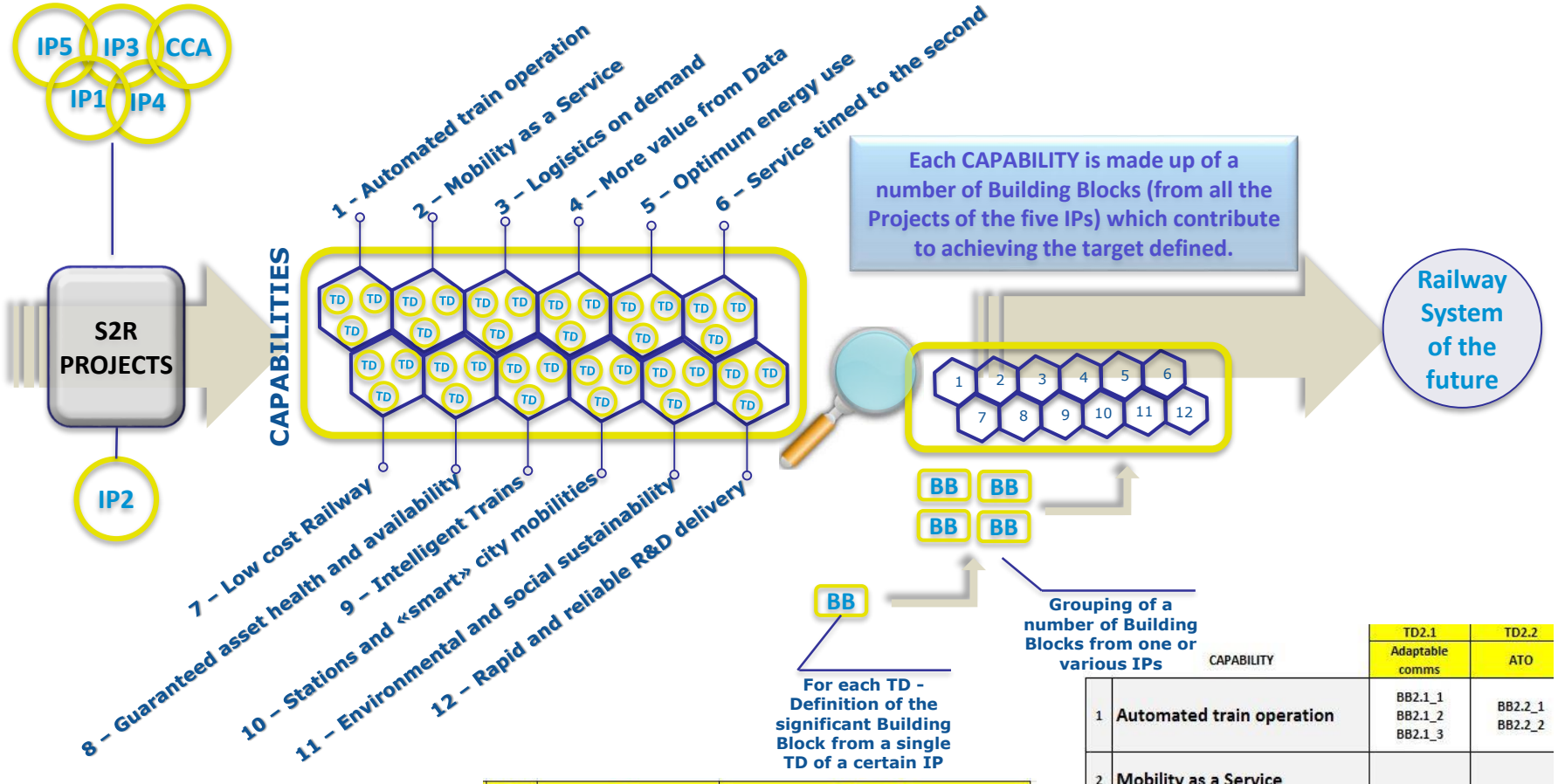


The rationale is to have a vision well balanced between:

- **Being well anchored to the recognised knowledge and tradition of signalling**
- **Being creative improving and producing applicable innovation and added value by means of new and enhanced functionalities and systems**

The vision
HOW to perform the evolution

The idea is to identify consistent, coherent and significant CAPABILITIES (which are the selected most innovative characteristics/scenarios of the Railway System of the future)



TD	BB	Deliverable
TD2.1	BB2.1_1 Definition of a Multi Bearer Technology including SatCom BB2.1_2 System open to exploit the use PLMNs BB2.1_3 System resilient to the evolution and needs of the	D2.1_1 New communication system adaptable to the needs of the different Railway market segments

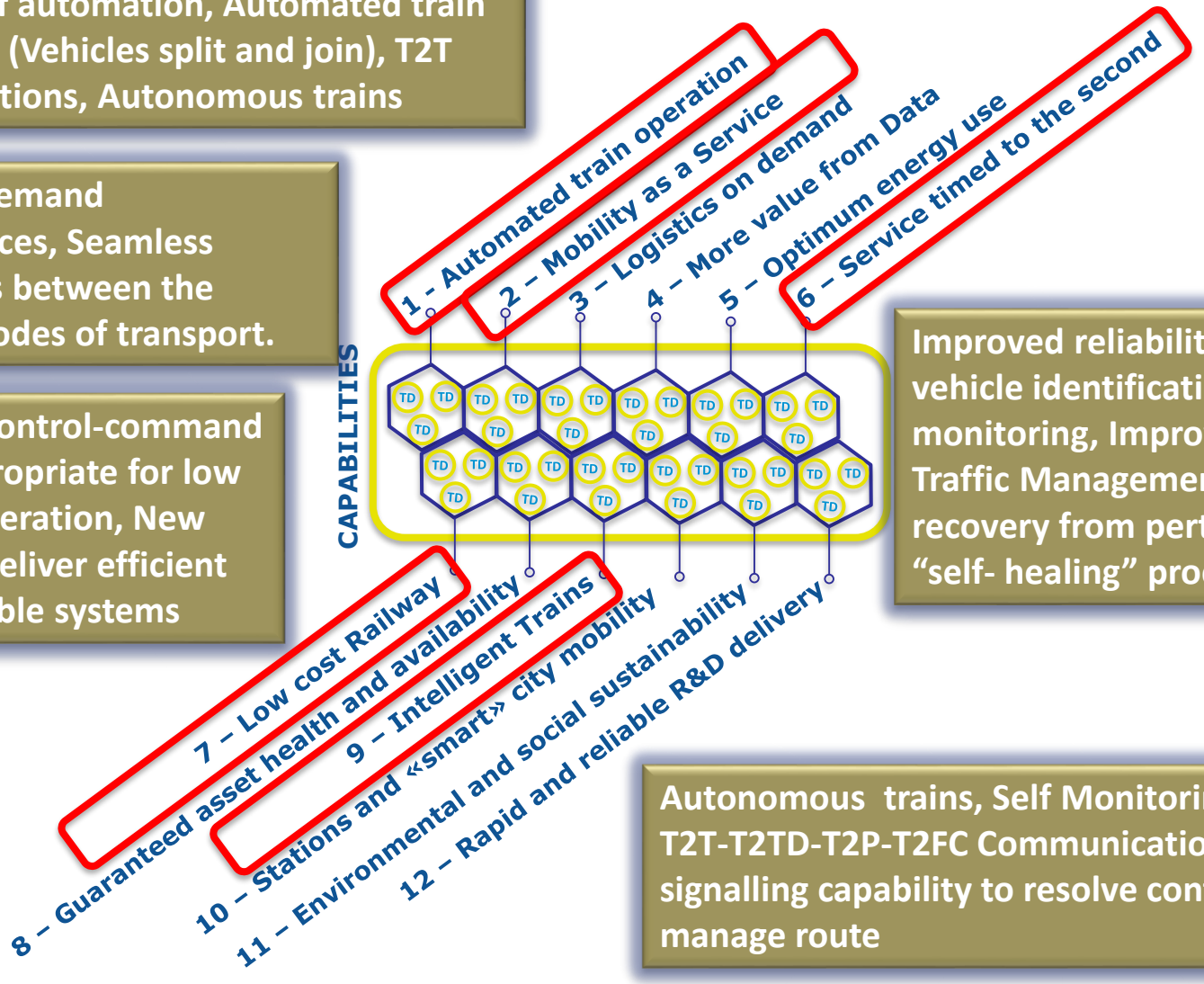
	CAPABILITY	TD2.1 Adaptable comms	TD2.2 ATO
1	Automated train operation	BB2.1_1 BB2.1_2 BB2.1_3	BB2.2_1 BB2.2_2
2	Mobility as a Service		

Some examples & Key words to identify the Capabilities

High level of automation, Automated train preparation (Vehicles split and join), T2T Communications, Autonomous trains

Customer demand driven services, Seamless connections between the different modes of transport.

Simplified control-command system appropriate for low intensity operation, New models to deliver efficient and affordable systems



Improved reliability, Automated vehicle identification and monitoring, Improved Smart Traffic Management, Automated recovery from perturbation (e.g. “self- healing” process)

Autonomous trains, Self Monitoring&Regulation, T2T-T2TD-T2P-T2FC Communication, In-Train signalling capability to resolve conflicts and to manage route

ERTMS Long Term Perspective
Shift2Rail contribution and Roadmap

LTP Report


Report

ERTMS Longer Term Perspective

incl. ERTMS Specifications Roadmap

	Elaborated by	Validated by	Approved by
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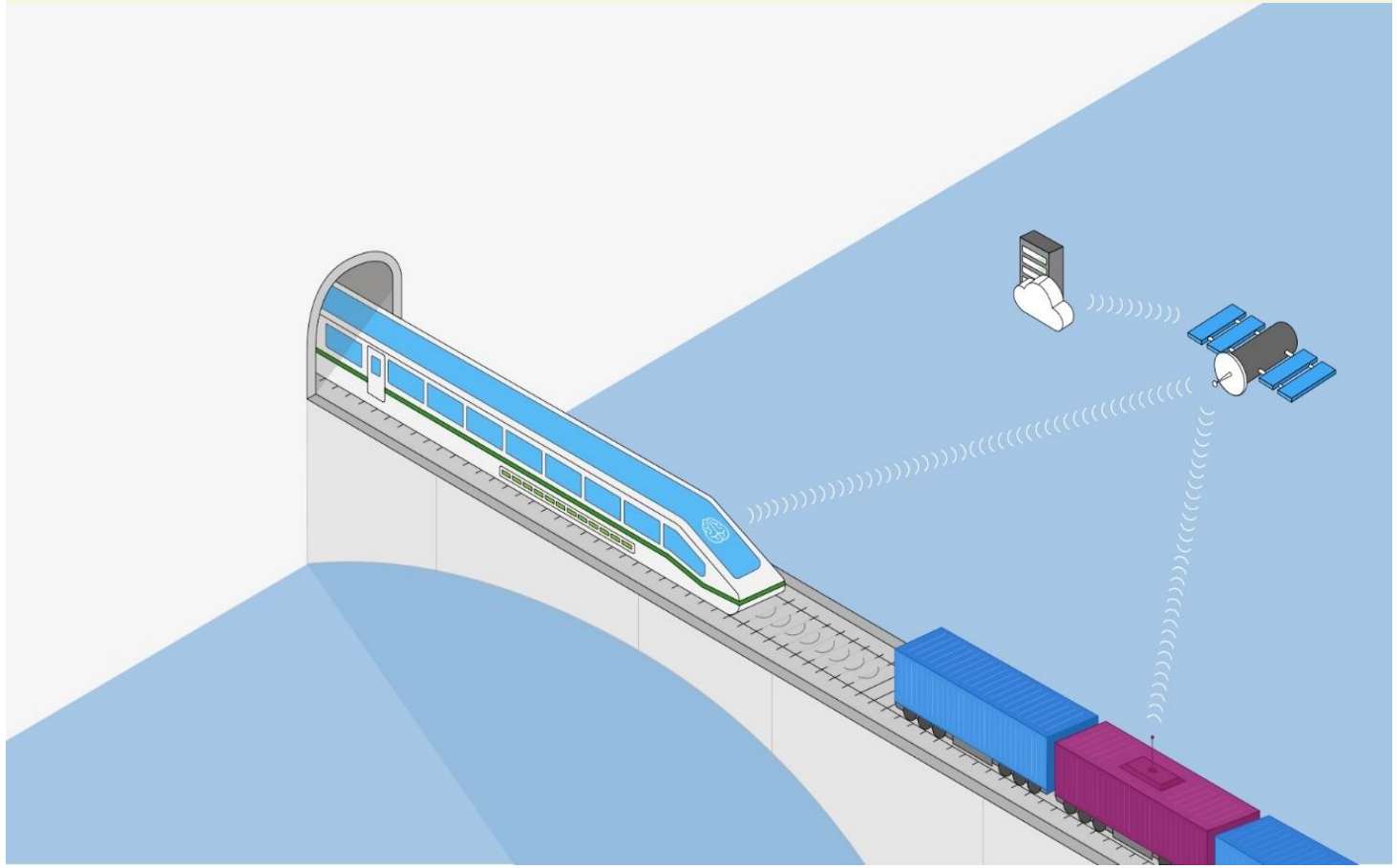
Position	Rapporteurs	Head of Unit	Executive Director
Date	15/12/2015	18/12/2015	18/12/2015
Signature			

Game Changers & other evolutions	The ANSWER of Shift2Rail IP2
ETCS L3	YES – IP2 TD2.3/TD2.5 (Fluid Moving Block/Train Integrity)
ATO	YES – IP2 TD2.2 (ATO up to GoA4)
Braking Curves Model	Not in the current phase – to check within the evolution of TD2.8 (Virtual Coupling)
Next Generation Communication System	YES – IP2 TD2.1 (Adaptable Communications)
Satellite Positioning	YES – IP2 TD2.4 (Fail Safe Train Positioning - GNSS)
Cyber Security	YES – IP2 TD2.11 (Cyber Security)

THE FUTURE: TO BE ACHIEVED THROUGH A DYNAMIC PROCESS TOWARDS EASY, RELIABLE, SAFE, SUSTAINABLE, HIGH PERFORMING, CUSTOMER DRIVEN & LOW COST RAILWAY SYSTEMS



Horizon 2020
European Union Funding
for Research & Innovation

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Thank you