Shift2Rail
Innovation Programme 3
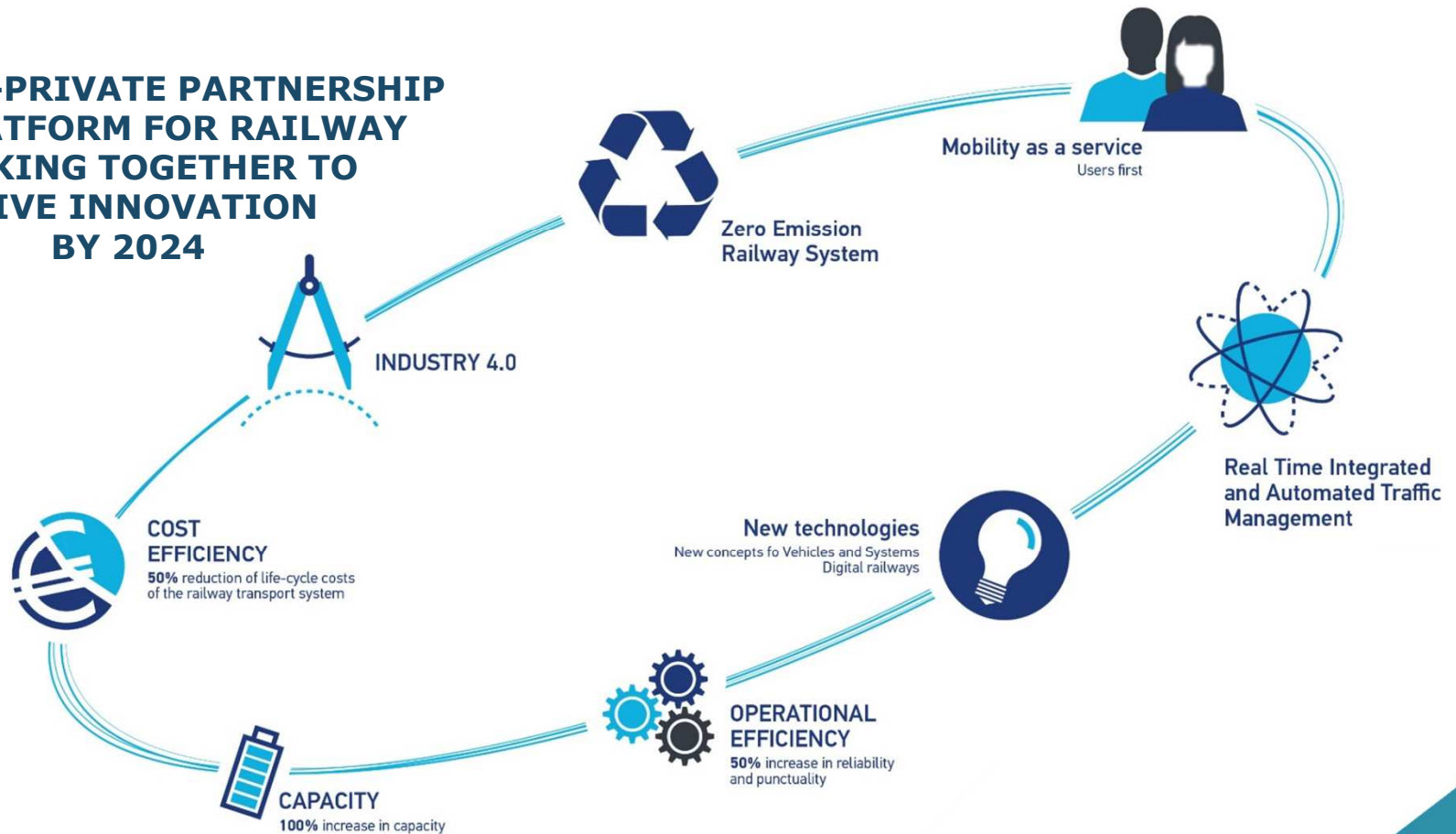# Cost Efficient and Reliable High Capacity Infrastructure

NetIRAIL-INFRA final conference

Ljubljana, 24 May 2018

@Shift2Rail_JU
#Horizon2020

**A PUBLIC-PRIVATE PARTNERSHIP R&I PLATFORM FOR RAILWAY WORKING TOGETHER TO DRIVE INNOVATION BY 2024**

Mobility as a service
Users first

Zero Emission
Railway System

INDUSTRY 4.0

Real Time Integrated
and Automated Traffic
Management

COST
EFFICIENCY
50% reduction of life-cycle costs
of the railway transport system

New technologies
New concepts fo Vehicles and Systems
Digital railways

CAPACITY
100% increase in capacity

OPERATIONAL
EFFICIENCY
50% increase in reliability
and punctuality

S2R VISION:

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

The S2R Programme Implementation

Master Plan

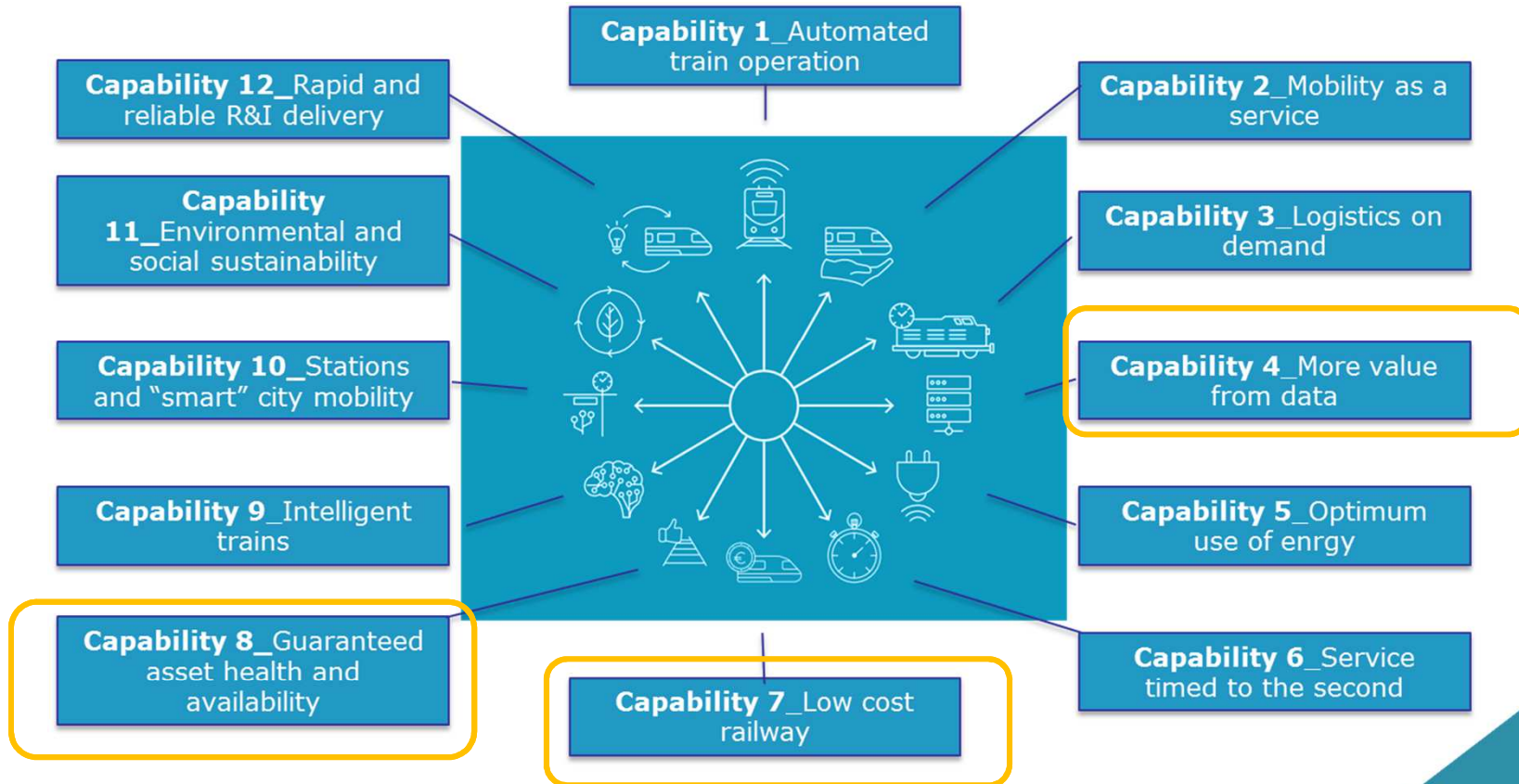MAAP
Part A   Part B

Annual Work Plans

R&I Projects
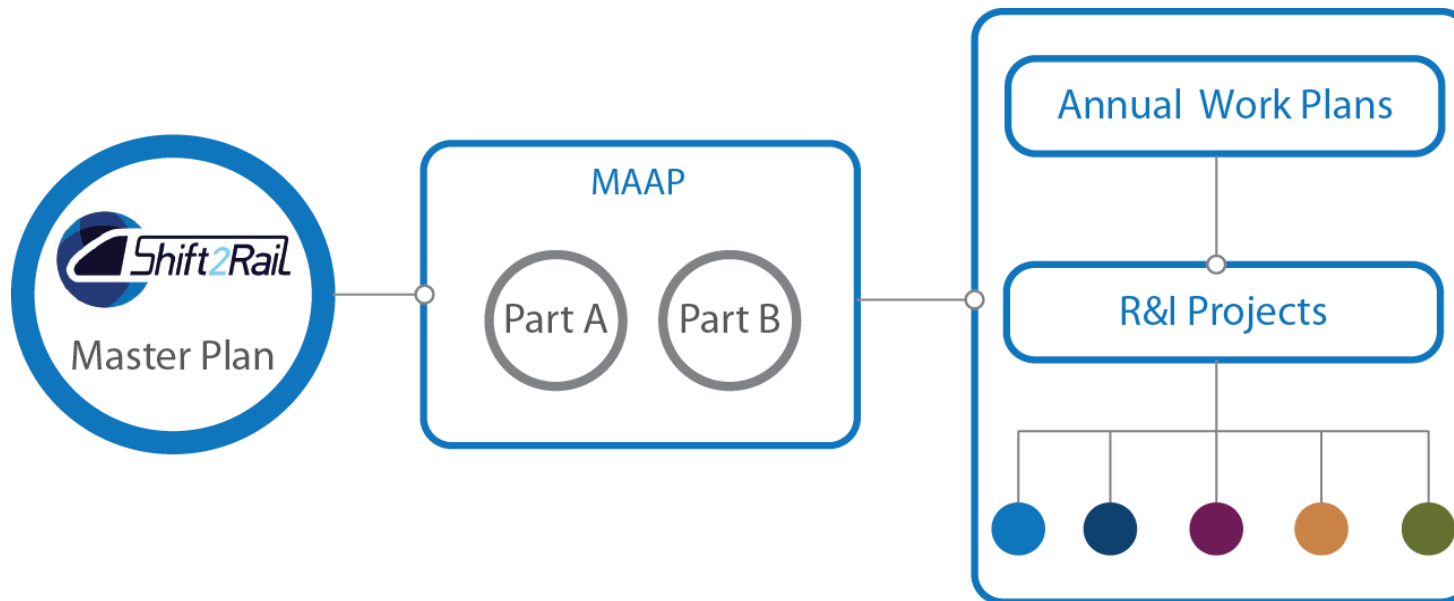
The S2R MAAP*

- is a collaborative long-term investment planning document, which contains an Executive View (**Part A**) providing the **S2R vision and Capabilities**

- translates strategic R&I priorities for the Railway sector – as per S2R Master Plan - into **concrete R&I activities, milestones and deliverables**

- contains the description of R&I activities worth an estimated **value of about EUR 777 million**

- **is a living document** (ongoing "maintenance" for **Part B**)

- enables the preparation of result-oriented **Annual Work Plans** and **Calls for Proposals or Tenders**

- **grants awarded** for the actions(Projects) should aim to implement part(s) of the MAAP
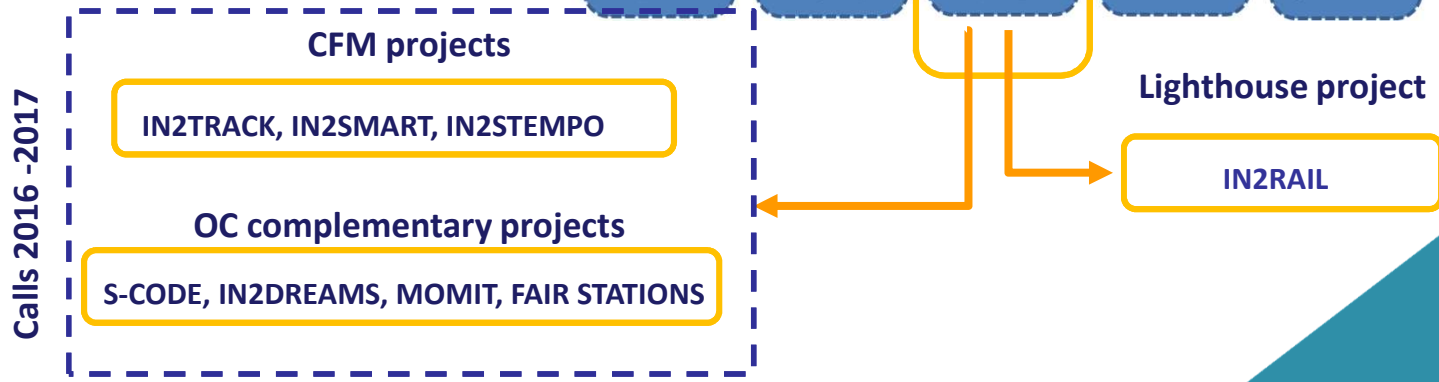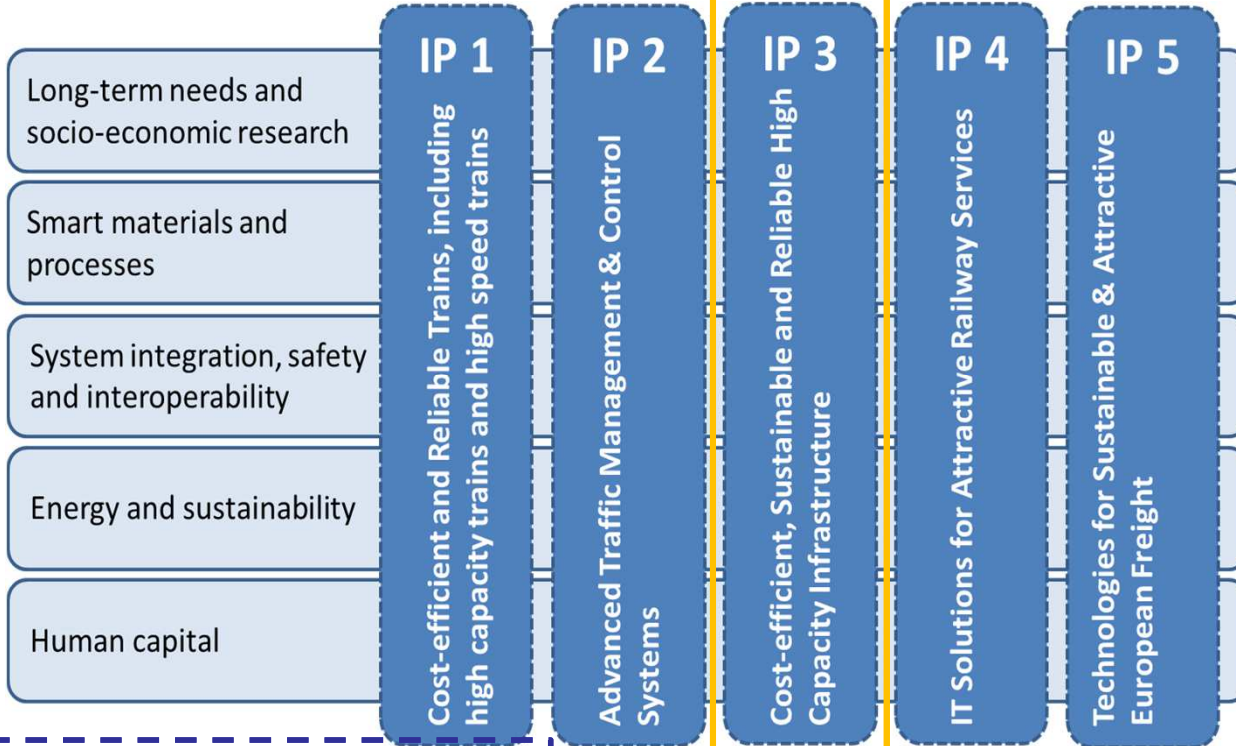
* multi-annual action plan

R&I for Innovation Capabilities

S2R PROGRAMME: INTEGRATED CONSISTENT DELIVERY ORIENTED

- Long-term needs and socio-economic research
- Smart materials and processes
- System integration, safety and interoperability
- Energy and sustainability
- Human capital

IP 1 — Cost-efficient and Reliable Trains, including high capacity trains and high speed trains

IP 2 — Advanced Traffic Management & Control Systems

IP 3 — Cost-efficient, Sustainable and Reliable High Capacity Infrastructure

IP 4 — IT Solutions for Attractive Railway Services

IP 5 — Technologies for Sustainable & Attractive European Freight

Calls 2016 -2017

CFM projects

IN2TRACK, IN2SMART, IN2STEMPO

OC complementary projects

S-CODE, IN2DREAMS, MOMIT, FAIR STATIONS

Lighthouse project

IN2RAIL

From TRL0 to TRL6/7

Technology Demonstrator (TDs)
Projects specifying, developing and demonstrating a specific technology resulting in a lab tested and/or simulated prototype

Integrated Technology Demonstrators (ITDs)
Projects integrating/combining TD prototypes at system level (lab and on-site) and testing performance

System Platform Demonstrators (SPDs)
Assessment of the whole systems performance based on the results of TDs and ITDs. SPDs bring S2R innovative solutions to a technology maturity level for a new generation of railway system

RAILWAY SYSTEM OF THE FUTURE
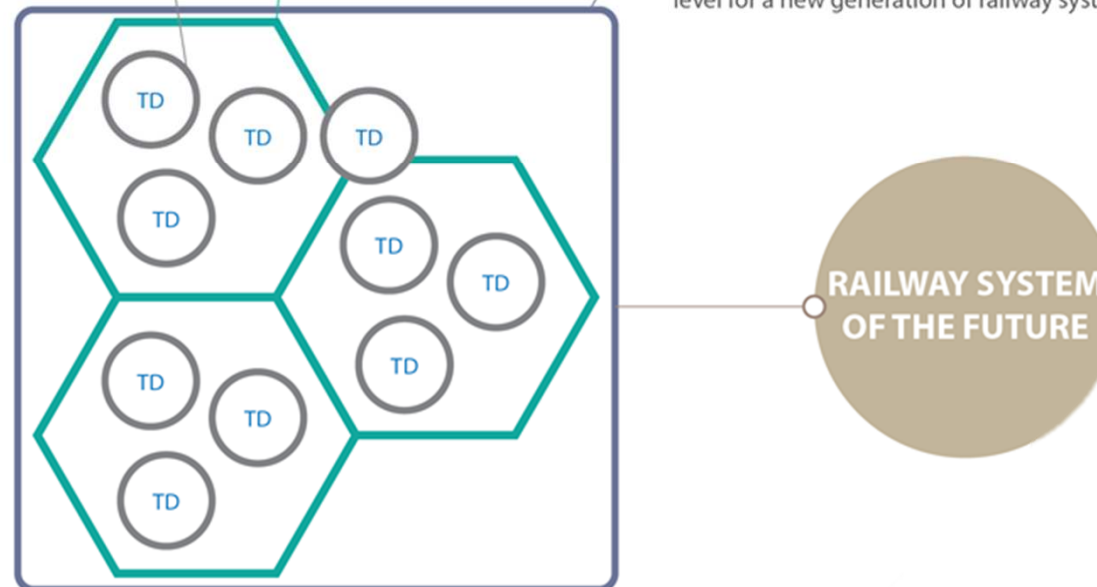
Innovation Programme 3:
Cost Efficient and Reliable High Capacity Infrastructure
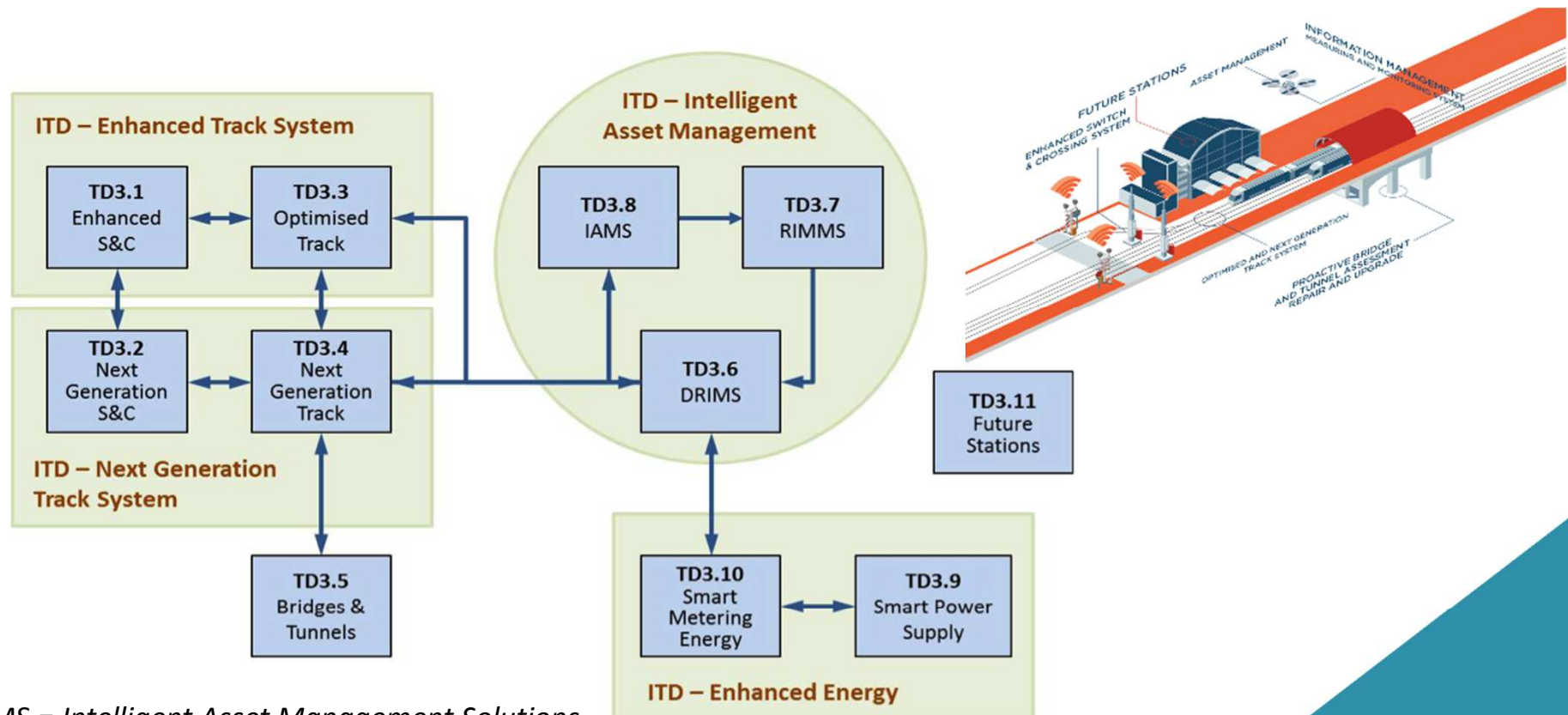
IAMS = *Intelligent Asset Management Solutions*
RIMMS = *Railway Integrated Measuring and Monitoring System*
DRIMS = *Dynamic Railway Information Management System*

IP3: Key innovations

✓ **Intelligent asset management:** shift from current used 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 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

Programme approach, future/ current projects

- EACH PROJECT contributes to the **achievement of the Master Plan and the MAAP objectives**

- EACH PROJECT is part of a programme and **cooperation with other projects** must be ensured
  → Through the **collaboration and input to the JU Members,** EACH PROJECT will support the realization of **long-term S2R technological demonstrations or innovative break-through**

- Particular attention is given to ensure that there is **no duplication of work** between EACH PROJECT and current/future R&I activities

- EACH PROJECT results are taken into consideration for the next annual work plans to ensure sufficient **complementarity** and **coherence**

IN2SMART

Intelligent Innovative Smart Maintenance of Assets by integRated Technologies

S2R-CFM-IP3-02-2016 (01/09/2016 - 31/08/2019)
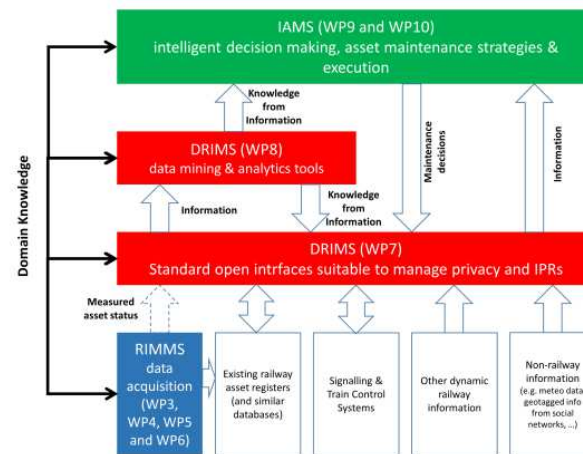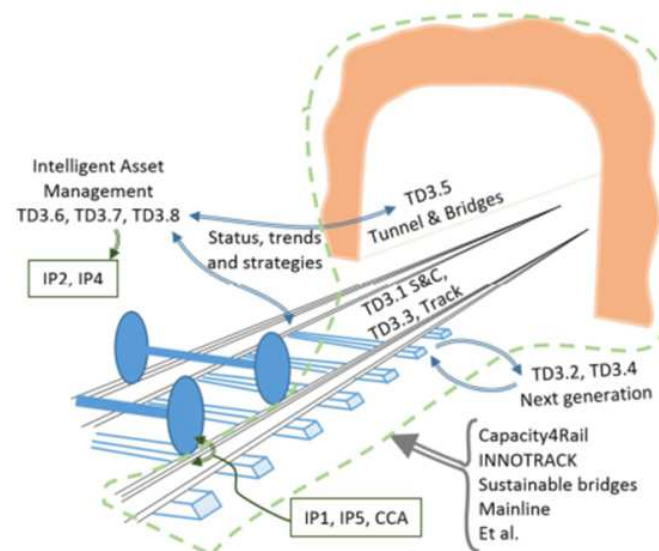

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Relation to S2R MAAP:

- ✓ **TD3.7** Railway Information Measuring and Monitoring System (RIMMS)

- ✓ **TD3.6** Dynamic Railway Information Management System (DRIMS)

- ✓ **TD3.8** Intelligent Asset Management Strategies (IAMS)

IN2TRACK

Research into enhanced tracks, switches and structures

S2R-CFM-IP3-01-2016 (01/09/2016 – 28/02/2019)

Intelligent Asset Management
TD3.6, TD3.7, TD3.8

TD3.5 Tunnel & Bridges

Status, trends and strategies

IP2, IP4

TD3.1 S&C, TD3.3, Track

TD3.2, TD3.4 Next generation

Capacity4Rail INNOTRACK Sustainable bridges Mainline Et al.

IP1, IP5, CCA

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Relation to S2R MAAP:

✓ **TD3.1** Enhanced Switches & Crossings (S&C) System

✓ **TD3.3** Optimized Track System

✓ **TD3.5** Proactive Bridge and Tunnel Assessment, Repair and Upgrade

IN2STEMPO

Innovative Solutions in Future Stations, Energy Metering and Power Supply

S2R-CFM-IP3-01-2017 (01/09/2017 – 28/02/2022)
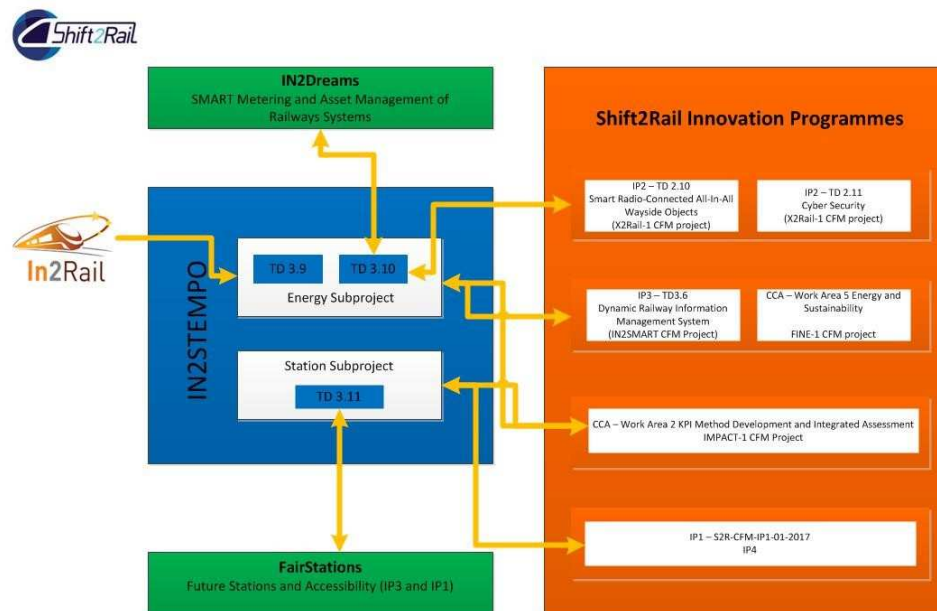
Relation to S2R MAAP:

- ✓ **TD3.9** Smart Power Supply

- ✓ **TD3.10** Smart Metering for Railway Distributed Energy Resource Management System

- ✓ **TD3.11** Future Stations

OC running projects

MOMIT

Multi-scale observation and monitoring of railway infrastructure threats

H2020-S2RJU-OC-2017 (01/09/2017 – 31/08/2019)

Complementary project to: IN2SMART

S-CODE

Switch and Crossing Optimal Design and Evaluation

S2R-OC-IP3-01-2016 (01/11/2016 – 31/10/2019)

Complementary project to: IN2TRACK

IN2DREAMS

INtelligent solutions 2ward the Development of Railway Energy and Asset Management Systems in Europe

H2020-S2RJU-OC-2017 (01/09/2017 – 31/08/2019)

Complementary project to: IN2SMART & IN2STEMPO
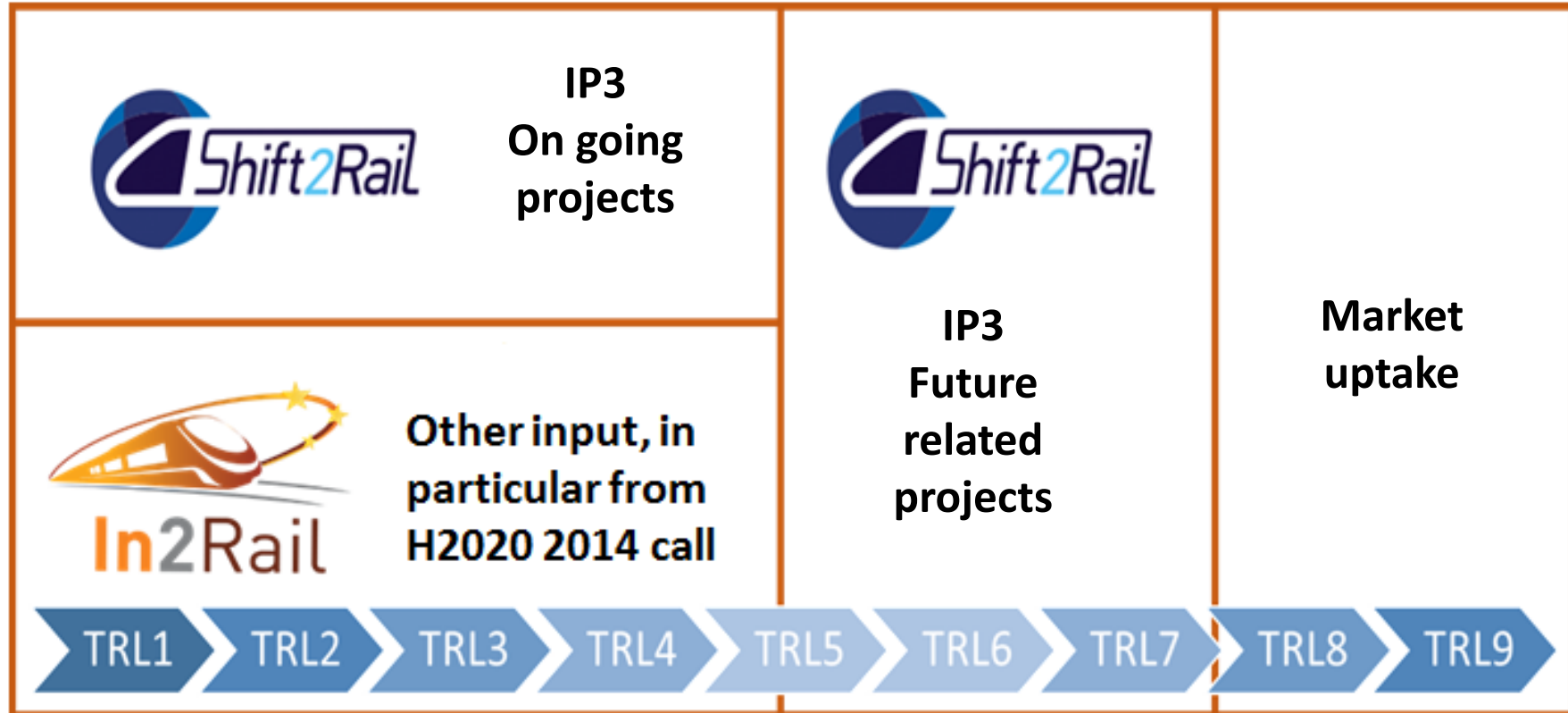
FAIR STATIONS

Fair Stations

H2020-S2RJU-OC-2017 (01/09/2017 – 31/08/2019)

Complementary project to: IN2STEMPO

IP3 Next Steps

IP3: Planning of activities per TD

TD3.1 Enhanced Switch & Crossing System

2015	2016	2017	2018	2019	2020	2021	2022	...
	Ongoing: In2Rail, In2Track							
				AWP 2018: CFM				
						Planned Activities		

TD3.2 Next Generation Switch & Crossing System

2015	2016	2017	2018	2019	2020	2021	2022	...
	Ongoing: In2Rail, S-CODE							
				AWP 2018: CFM				
						Planned Activities		

TD3.3 Optimised Track System

2015	2016	2017	2018	2019	2020	2021	2022	...
	Ongoing: In2Rail, In2Track							
				AWP 2018: CFM				
						Planned Activities		

TD3.4 Next Generation Track System

2015	2016	2017	2018	2019	2020	2021	2022	...
	Ongoing: In2Rail							
				AWP 2018: CFM				
						Planned Activities		

IP3: Planning of activities per TD

TD3.5 Proactive Bridge and Tunnel Assessment, Repair and Upgrade

2015	2016	2017	2018	2019	2020	2021	2022	...

Ongoing: In2Rail, In2Track

AWP 2018: CFM, OC

Planned Activities

TD3.6 Dynamic Railway Information Management System (DRIMS)

2015	2016	2017	2018	2019	2020	2021	2022	...

Ongoing: In2Smart, IN2DREAMS

Planned Activities

TD3.7 Railway Integrated Measuring and Monitoring System (RIMMS)

2015	2016	2017	2018	2019	2020	2021	2022	...

Ongoing: In2Rail, In2Smart, MOMIT

AWP 2018: OC

Planned Activities

TD3.8 Intelligent Asset Management Strategies (IAMS)

2015	2016	2017	2018	2019	2020	2021	2022	...

Ongoing: In2Rail, In2Smart

Planned Activities

IP3: Planning of activities per TD

TD3.9 Smart Power Supply								
2015	2016	2017	2018	2019	2020	2021	2022	...
	Ongoing: In2Rail, In2Stempo							
					Planned Activities			

TD3.10 Smart Metering for Railway Distributed Energy Resource Management System								
2015	2016	2017	2018	2019	2020	2021	2022	...
	Ongoing: In2Rail, In2Stempo, In2Dreams							

TD3.11 Future Stations								
2015	2016	2017	2018	2019	2020	2021	2022	...
			Ongoing: In2Stempo, FAIR Stations					

Thank you for your attention

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