

# Foster Rail – Strategy and Economics Roadmap

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- The Roadmaps – translating the SRRIA main target areas into implementation actions
- 10 Roadmaps in total, each with its own leader:
  - 8 targeted Roadmaps: Rolling Stock, Training, Energy and Environment, Infrastructure;
  - 2 cross-cutting Roadmaps: Customer Experience and Strategy and Economics.
- UITP:
  - Roadmaps leader of the 2 cross-cutting roadmaps
  - Contributor to all other roadmaps
- Acknowledgements for contribution to all roadmaps:
  - UITP staff/colleagues
  - Urban rail operators: RATP, TMB, etc.
  - FOSTER RAIL Coordinator & partners: UIC, UNIFE, NetworkRail, DB, TRV, Alstom, etc.;
  - Other non-FOSTER RAIL partners but ERRAC members – special thanks to EPF

# Deliver Value for Money to All Rail Stakeholders

This roadmap provides a high-level approach to common factors affecting the rail sectors' technology and innovation agenda.

Roadmap characteristics:

- Numerous common points with all of the other roadmaps, due to the nature of the information contained herein;
- Covering transversal topics;
- The “helicopter view”;
- Also comprises topics that are not directly attributable to the other roadmaps:
  - Land use;
  - Stakeholder cooperation;
  - Regulatory aspects;
  - Socio-economic direct and indirect impact of rail use and rail infrastructure developments, both positive (network extensions) and negative (network closures).

This Roadmap is twinned with the “Customer Experience” Roadmap. It is a ‘transversal’ roadmap – all main points from the other roadmaps are covered.

# The Vision

The SRRIA objectives in a nutshell – seamless multimodal journeys (first and last mile) with:

1. **Lower costs** – for customers and the rail actors that serve them;
2. **Reliability** of services;
3. **Comfort** and better vehicle utilization – e.g. space availability, PRM needs, etc.;
4. **Adaptability** to the different challenges – mostly in physical terms (rolling stock & infrastructure).

Respond to the various challenges, especially:

1. **Decarbonization**
2. **Digitalization**

# On-going Research and Innovation Within and Outside Rail

Numerous research activities at the EU level:

1. Past and on-going FP7 projects (see other roadmap presentation for a list of relevant projects)
2. The H2020 framework
  - The Shift2Rail JU, dealing with rolling stock, traffic management and control, infrastructure, IT solutions, freight-related technologies, and cross-cutting activities
  - Cooperation between European Technological Platforms (ETPs)
  - Punctual projects that include rail-related research

National research programmes: Germany, France, Spain, UK, etc.

Input coming from research outside the rail sectors both R&I and current technologies/practices:

- Automotive;
- Robotics;
- The IT/internet industries;
- The power sector: smart grids, electrification, etc.;
- Aerospace and satellite technologies, incl. drone technologies;
- Telecommunications.

Initiatives and developments in various standardization bodies:

- European: CEN/CENELEC, ETSI;
- International: ISO, IEC, IEEE.

# The Roadmap

Main topics:

1. **Customer experience:** Increase the use of the European railway as the core element of multimodal, end-to-end journeys
2. **Customer-oriented business:** Promote and sustain the interests of railway customers
3. **Customer accessibility,** e.g. PRM
4. **Value for money** for all involved stakeholders: customers, operators, authorities, industry
5. **Faster market uptake** for R&I results
6. **Integrated information:** Combine rail information systems, to enable smarter, timely and high quality data and information for customers, operators and authorities
7. **Environmental issues:** improve the sector's 'green credentials'
8. **Safety and security**
9. **Freight competitiveness:** technology and innovation that makes rail more attractive and usable to freight operators
10. **Specific freight and passenger priorities**

Each divided into different subtopics, and with an (indicative) timeline for implementation in the R&I activities

# Implementation Plan

## Public funding:

- FP7 projects (and roll-out of their results);
- The works in Shift2Rail and other H2020 programmes:
  - Recommendations from ERRAC on research topics proposed
- Other instruments:
  - EU funding – e.g. Cohesion Funds, ERDF, Connecting Europe Facility, etc.
  - National (research) funds, loans, grants, etc.

## Public-private partnerships (PPPs) and various private funding sources\*

R&I investments must be corroborated with investments on the existing operations and infrastructure for optimum outcomes.

Rail network extensions needed, especially in the urban and suburban areas

\*rail generally does not offer high returns of investment in a short period of time, therefore it is important that the sector – with efforts from the states, the EU and the other stakeholders – will try to become more attractive for private investors

# Visual Roadmap – A Snapshot

	T-0 Today	T-1 2020	T-2 2030	T-3 2040	T-4 2050	T-5 +2050
<b>Interchanges for passenger travel and transport</b>	Design and operation of new generation resilient urban transport interchanges for greater integration of urban mobility networks					
	Financing and business models					
	Integrating interchanges with urban policies (Land use planning, economic development, smart cities).					
<b>New city logistics concepts and interfaces for a more efficient freight delivery</b>	Framework for stakeholders' involvement in greater exchange of information on urban freight delivery					
	New city logistics concepts, taking into account the impact of societal changes on commercial behaviour and goods delivery in urban areas					
<b>Integrating urban mobility management</b>	Network management strategies, integrated with sustainable urban mobility plans					
	Governance for the coordination of the network management tools					
	Short term forecasting models					
	Strategies and models to face serious network disruption, network management for climate resilience					
	Evaluation of models efficiency and network management tools and policies					
	Integration of an all modes and mobility options, and of a greater variety of network management tools, in network management systems					
<b>Integrated Urban Mobility Systems and Governance</b>	Actions influencing modal choice and travel behaviour: mobility demand management					
	New mobility services (transport supply), including tailored services for different modes, social groups, territories and periods of					
	More sustainable land development: new activities settlement and transport services					
	Mobility management and social networks					
<b>Improving knowledge with data collection and analysis</b>	consistent data collection and exchange on urban mobility and development and use of harmonised models supporting data analysis, land use and transport forecasts, cost-benefit and multi-criteria economic analysis and decision-making					
	analyse and understand user behaviour throughout the different stages of mobility in order to better reply to his needs while at the same time improving the business models. (date missing)					
	A study on each transport mode to understand where and which service have to be provided by each of them. The idea is to promote and finance each transport mode in its core business environmentally sustainable. (date missing)					
	studies to promote the introduction and charging of the different transport modes according to the environmental impact costs (date missing)					
<b>Cooperation between stakeholders</b>	Training needs and programmes					
	Promote cooperation for sustainable urban mobility (understanding, awareness, incentives, etc.)					
	Developing the robustness and resilience of transport systems (facing and recovering from incidents and disasters)					
	Interregional and/or European approach of urban mobility					
	improving market up-take of EU research					
<b>Energy and Environment</b>	Use of environmental friendly materials					
	develop and use of energy efficient technologies					
	Adaptation of the existing railway system to the new climate conditions					
<b>Infrastructure</b>	tools and measures for better economic management of railways					
	Capacity improvements for lines and nodes to allow shorter train intervals, less crowded trains and increased punctuality					
	technical and operational methods for decreasing the cost of infrastructure development while at the same time improving the infrastructure quality					
<b>Benchmarking</b>	Benchmarking inside Rail sector and between transport sectors international cooperation for more efficient transport systems and technical harmonization					
<b>Safety</b>	Extreme Climate events & resilience					
	European level crossings risks ranking					
<b>Security</b>	Procedures, Regulations and standards - PPP					
	Procedures, Regulations and standards - International Security Organisations					
<b>Economics</b>	Delivering whole life asset performance					
<b>Regulatory framework</b>	research into the organisational and regulatory environment necessary to encourage the adoption of innovations and the step change in cost and quality of service necessary to achieve the sector' and the Commission's ambitions: - How to incentivise infrastructure managers to innovate to simultaneously improve services and reduce costs? What are the roles of train operators, regulators and governments in achieving this? - How can passenger franchising be designed to encourage innovation? Who should procure assets, how to specify requirements and how to overcome the inevitable short time horizons and risk aversion of franchisees? - How to ensure that the different players in the rail system work together to ensure system optimisation rather than the pursuit of sub-optimisation of their own particular part of the system, but without leading to discrimination against new entrants					



**Thank you for your attention!**

**See for more details**

**<http://www.errac.org/foster-rail/deliverables/>**