

Foster Rail – Training and Education Roadmap

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Introduction: why the area is important and present situation

- ❑ **Rail is becoming a knowledge-intensive, fast-incorporating new technologies** and an internationally increasingly competitive sector, striving to create an optimal ecosystem for innovation.
- ❑ **It pulls together excellent research and higher education institutions and a world leading manufacturing industry**, with a strong and increasing research, development and innovation (R&D&I) investment.
- ❑ The transport industry in general and **the rail sector in particular demand a mix of competencies from present and future transport researchers.**
- ❑ **This demand is changing**, reflecting the current and future needs (environmental protection, new materials, new technology, new energy sources, etc.).
- ❑ Presently, the educational programs being offered at transport courses **do not in general meet in a systematic manner these requirements.**

Key issues and objectives referring to the SRRIA

The rail sector in particular demand **a mix of competencies** from present and future transport staff.

This demand is changing, **reflecting the current and future needs (environmental protection, new materials, IC Technology, new energy sources, etc.)**.

Several sources of **competences gaps** are identified:

- ☐ What the employees need and the actual competences of the students.
- ☐ The knowledge the companies need in a rapidly changing sector and the actual competences of the employees.
- ☐ The knowledge the universities generate and the actual competences of the students (is the knowledge generated in the research transferred in the courses?).
- ☐ The know-how the companies need and the knowledge the universities have
- ☐ Closer cooperation between academic institutions and end-users is needed in order to inform and train appropriate personnel for transport research and offer them competitive work conditions.

Objectives referring to the SRRIA

Key objectives in training and education activities are:

- ☐ **Forecasts of the skills** that the railway sector will need and **analysis of gaps in skills;**
- ☐ **Enhance and expand access to railway educational programs and courses;**
- ☐ Enhance educational quality in the railway area (academic, stakeholders);
- ☐ **improve cooperation between the railway sector and educational institutions to put forward courses not offered by existing institutions;**
- ☐ **Develop e-learning based courses and promote the production of course materials;**
- ☐ **Promote Joint PhDs using bilateral and multilateral programs;**
- ☐ **Promote joint international MSc programs in different rail related areas;**
- ☐ **Develop and deliver short training courses (STC);**
- ☐ **Facilitate sustainable partnerships involving the sector, SMEs, academia and R&D institutions envisaging knowledge transfer and fostering innovation processes.**

The Roadmap – per each priority area: challenge, - needs and recommendations

❑ **Characterisation of skills and competence needs**

- ❑ State-of-art and current trends in the development of technically and operationally inter-dependent systems, production methods and industry structure, value added and changes in volume trends, employment trends;
- ❑ Technical competences associated with: professional intervention across different railway assets; new emerging technology products and services such as IT, environmental efficiency; systems engineering, man-machine interfaces and human factors, signaling systems, innovative and modular RS, modern infrastructure maintenance, sensor technologies and asset management methods

❑ **Higher education offer**

- ❑ Appraise current educational offers and define major guidelines at BSc and MSc levels bridging the gaps between knowledge production in Higher Education institutions and required know-how in the different industrial environments.

❑ **Establishment of training and education for top management in the sector.**

- ❑ Running efficient and safe rail system while respecting the rules of competition; Focus on strategic directions, critical technologies, needs and aspirations of customers; Forward strategies ensuring rail as the backbone of a sustainable European transport system; Legal and institutional contexts; Features of the future rail passenger and freight services, standardisation and interfaces.

The Roadmap – per each priority area: challenge, - needs and recommendations

❑ **Advanced Training courses**

- ❑ To create professional profiles able to operate in the technological changes provided recently by the signalling, communication, IT systems introduced in the railway sector;
- ❑ To create professional profiles in the international legislation and market liberalization under implementation in the railway sector;
- ❑ Explore advanced training courses in different settings according to the industry needs and taking into consideration the target audiences
- ❑ Lifelong learning actions aimed to address emerging technologies and recover current staff to new organisational and emerging skill needs;
- ❑ Learning programmes fully exploiting current virtual learning environments, and e-learning technologies to explore networking of specialists and expose novices and specialists to real operational situations

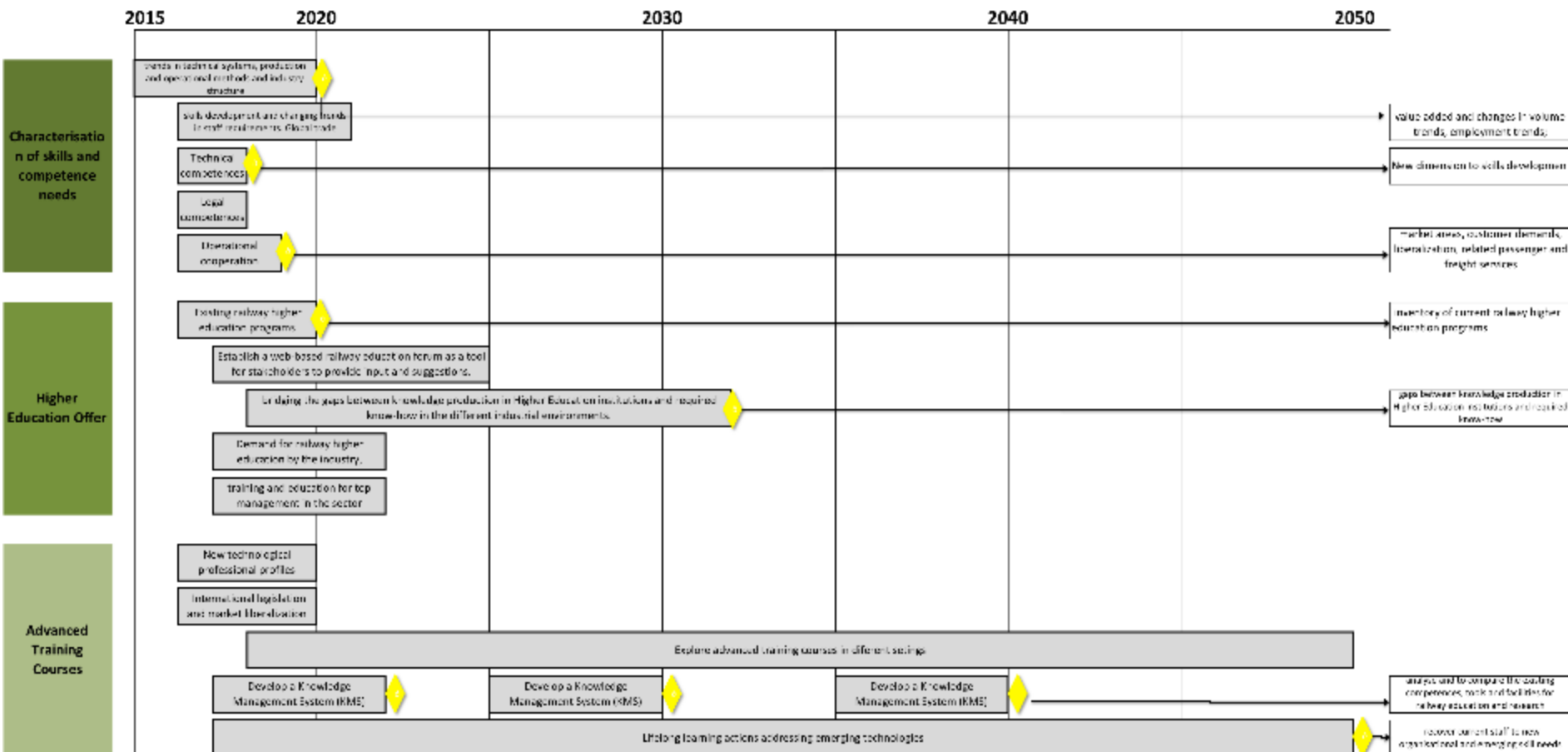
❑ **Meeting expectations of end users**

- ❑ “trusting partnerships” between academia and practitioners to develop regular problem solving workshops and research projects and Strategic alliances for on job coaching of practitioners (e.g. “seed planting” approach).
- ❑ Promote full and unhindered mobility of students, professors / teaching staff, and industry professionals

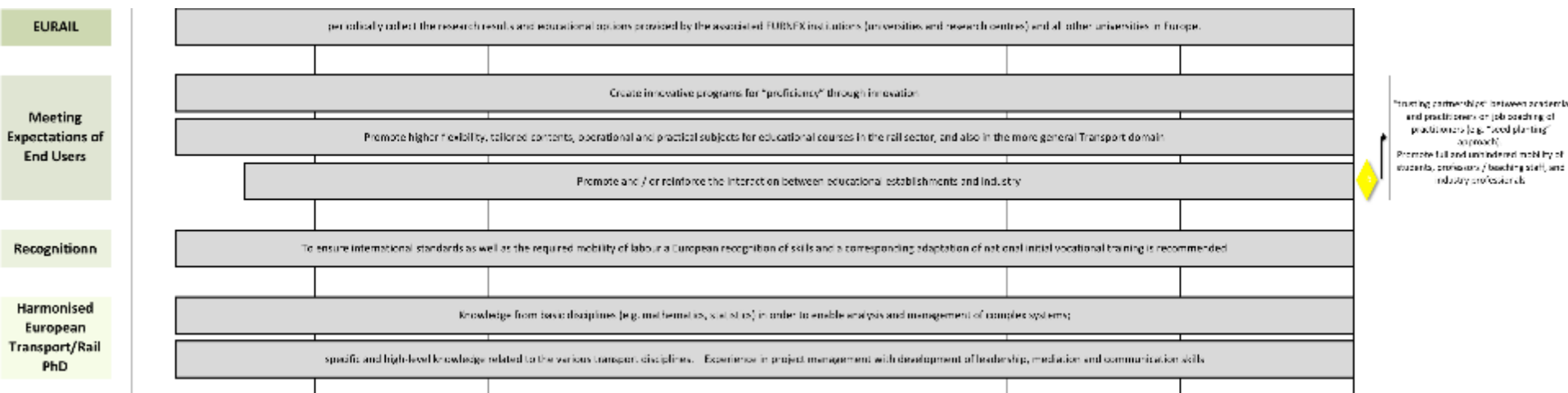
❑ **Harmonised European Transport/Rail PhD**

- ❑ Enable analysis and management of complex systems;
- ❑ Specific and high-level knowledge related to the various transport themes
- ❑ project management :leadership, mediation and communication skills.

Visual Roadmap, milestones and deliverables overview



Visual Roadmap, milestones and deliverables overview



EURAIL	periodically collect the research results and educational options provided by the associated EURRAC institutions (universities and research centres) and all other universities in Europe.			
Meeting Expectations of End Users	Create innovative programs for "proficiency" through innovation			
	Promote higher flexibility, tailored contents, operational and practical subjects for educational courses in the rail sector, and also in the more general Transport domain			
	Promote and / or reinforce the interaction between educational establishments and industry			
Recognition	To ensure international standards as well as the required mobility of labour a European recognition of skills and a corresponding adaptation of national initial vocational training is recommended			
Harmonised European Transport/Rail PhD	knowledge from other disciplines (e.g. mechanical, electrical, civil etc.) in order to enable analysis and management of complex systems;			
	specific and high-level knowledge related to the various transport disciplines. Experience in project management with development of leadership, mediation and communication skills			

“training partnerships” between students and practitioners or job coaching of practitioners (e.g. “weed planting” approach).
Promote full and unrestricted mobility of students, professors / teaching staff, and industry professionals.

Thank you for your attention!

See for the full Roadmap

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