The European Rail Research Network of Excellence

Excerpt of the

project proposals

for FP 7

provided by the

EURNEX Poles of Excellence

Theme: Surface Transport

[A1] Activity 1: The greening of surface transport

Complete lean design for environment

First contact: pole 7, Raul Carlson, Chalmers University of Technology, raulcarl@chalmers.se

Further development of the design for environment methodology RAVEL/REPID for industry applications to include environmental problem areas as energy, noise, electromagnetic emissions, risk assessment and to develop applications

Environmental Management Tools for Railway Systems
First contact: pole 7, Norbert Ostermann, Vienna University of Technology, norbert.ostermann@eiba.tuwien.ac.at

Adaption of durability and life expectancy of materials to achieve a fixed service interval. The use of recycled materials according to the boundary conditions then allows to reduce Life Cycle Costs as well as increases the environmental compatibility of the railway system.

Climate change and the railway environment (CLICHÉ)

First contact: pole 7, Chris Baker, University of Birmingham, C.J.Baker@bham.ac.uk

The railways, together with all other transport modes will be significantly affected by the climate change. Evaluate the results of the latest generation of global climate change models and to prepare a number of possible scenarios for the European railway system and develop long term strategies for dealing with such problems. Make recommendations for future infrastructure and vehicle development etc.

Eco2TRAIN: Ecologic and economic rolling stock

First contact: pole 3, Stefano Bruni, Politechnical di Milano, stefano.bruni@polimi.it

Development of a methodology and measurement tool to reduce the environmental and noise pollution. This includes embracing vehicles, vessels and component technologies, including overall system optimisation, all with special regard to energy savings by performance improvement, new materials and structures for mass reduction, noise and ground vibrations reduction and rules to quantify passengers' comfort.

[A2] Activity 2: Encouraging and increasing modal shift and decongesting transport corridors

EUROTRUST - Solutions and Support for "Cross Acceptance" and "Pan-European Conformity Assessment" - Development of Product Qualification Methods for New Technologies

First contact: pole 4, Petr Moos, ČVUT Prague, moos@fd.cvut.cz

Product qualification methods for information and telecommunication support for railway traffic and transportation processes.
Complex tests and methods of product qualification for railway transportation systems in Interaction with the environment – Transportation Infrastructure Development and Traffic Optimization on Transportation Networks Respecting Ecology.
Product qualification methods for transport telematics, safety and reliability in railway transportation – integration with safety assessments.
Systematic method of establishing track stiffness for use in vehicle acceptance.
Modern rail vehicles interdisciplinary solutions by the computer aided virtual model simulation and experimental methods support.
Testing complexity methods in the large system processes analysis and railway system security (Virtual centre for methodology assessment – Knowledge Centre for Methods Development).
Europe-wide Interoperability Testing Platform
Simulation Based Methodologies for the Development of Cross Acceptance, Interoperability and Interchangeability criteria
Virtual Test and Product Qualification Laboratory.

[A3] Activity 3: Ensuring sustainable urban mobility

Real-time and personalised information for the traveller

First contact: pole 5, Pekka Leviäkangas, VTT, pekka.leviakangas@vtt.fi

Development of real-time and personalised information systems for travellers making use of all kinds of media, incl. new information technologies.

New devices, services and applications for the traveller

First contact: pole 5, Pekka Leviäkangas, VTT, pekka.leviakangas@vtt.fi

Development of rail passenger information support via development of new on-board services, new integrated services/functions at major transport interchange points stations and hot-spots and development of new devices and applications.

Improving knowledge on passenger rail mobility behaviour and policy response

First contact: pole 1, Odile Heddebaut, INRETS, odile.heddebaut@inrets.fr

This project will intend to sort out the rail transport passenger behaviour and improve the knowledge on their needs.

Meeting customers expectation for rail travel/ Co-ordination in passenger inter-modality information, operation & accessibility

First contact: pole 2, Chris Baker, University of Birmingham, C.J.Baker@bham.ac.uk)

Requirements identification of passengers and public transport management systems, with special regard to rail transport and the interfaces between transport modes.
Development of a generic system model and sets of queries to be addressed to stakeholders including train operators, infrastructure owners, passenger lobby groups and policy makers.
Expected outcome is an objective understanding of the structure of the existing system and the stakeholder requirements and constraints.

Improvement of the operational interoperability by upgrading planning and controlling in international train traffic

First contact: pole 2, Andreas Lischke, Deutsches Zentrum fuer Luft- und Raumfahrt (DLR), Andreas.Lischke@dlr.de)

Definition and implementation of unified systems and procedures to exchange basic information for planning, monitoring and controlling of train operation on European level.
Development of a harmonised information framework to cover the whole transport process starting from the timetable through the monitoring of the train run towards on-line solution of operational conflicts, include a link to customize information, like tracking and tracing solutions for wagons and/or consignment of transport units.

Intermodal links for long distance passenger transport

First contact: pole 1, José Viegas, Instituto Superior Técnico, Lisboa, viegas@ist.utl.pt)

Evaluate the conditions for a long distance passenger intermodal link service: the provision of accurate and detailed information about the best path from the arrival station to final destination, including public transport timetables, location of stops, and sale of valid tickets for that local transport or identification of groups of passengers going to destinations close-by to one-another and organization of a taxi or mini-van dedicated transport for them.

[A4] Activity 4: Improving safety and security

Safety assessment of operating rules

First contact: pole 6, El Miloudi El Koursi, INRETS, el-miloudi.el-koursi@inrets.fr

In relation to the European standards an approach for the common understanding, specification and assessment of operational safety is be reached. The allocation of the safety in the different rail subsystems is to be analysed as well as the operation rules for the staff and the operators in the case of disturbances. Expected result is the definition of the common understanding of safety in the domain of railways. Furthermore a set of rules for the assessment is to be defined.

Ergonomic design, man and automation: control centres and drivers

First contact: pole 9, Manfred Rentzsch, IAS Foundation, M.Rentzsch@ias-stiftung.de

Guidelines as how to optimally automate systems. . Furthermore different measures how to realise the diagnostic functions in view of the hard- and software components are added.

Integrated protection of the rail system

First contact: pole 6, Thomas Meißner, FAV, tmeissner@fav.de

The integration of European Rail Transport Security demands knowledge of the different Technologies and Security strategies within the European Regions. A study should provide a survey about security strategies, operations and technologies applied in different European countries/regions, including the corresponding planning for the next years. Based on the survey, two to three scenarios should be derived fulfilling the fundamental requirements: enhance security in terms of counter measures towards potentials threats, while maintaining the important features of the rail system as open access.

Security of critical infrastructures related to mass transport

First contact: pole 6, Wolfgang H. Steinicke, FAV, wsteinicke@fav.de

Security of critical infrastructures related to integrated urban mass transport systems

Radiations influence of transport systems on environment. Subproject: Influence of electromagnetic radiations on environment

First contact: pole 7, Riga Technical University, Valentin Popov, popovs@latnet.lv

The substantiation and selection of yardsticks of influencing of transport systems on environment
Construction of mathematical models of influencing
Realization of measurements of radiations spectral levels.
Research of possible negative influencing of different types of radiations on human organism.
Refinement aged and padding Development of the proposals under the standards on tolerance levels of radiations for the professionals and population.
Training of the specialists in the indicated sphere of activity.
Development of effective methods of a decrease of the danger class of radiations of transport systems.

Radiations influence of transport systems on environment. Subproject: Influence of acoustics radiations on environment

First contact: pole 7, Riga Technical University,

Peteris Balckars, peteris@dzti.edu.lv

- *Research, measurements and monitoring of levels of acoustics radiations and noise of transport systems.*
- *Development of mathematical models of influencing on environment and people of acoustics radiations and noise of different intensities and guidelines on tolerance levels of acoustics radiations and noise of transport systems.*
- *Proposals on a decrease of levels acoustics radiations and noise and background radiation.*
- *Monitoring of radiations of transport systems*

Further development and alignment of rules for a safe operation of European railway traffic systems – Subproject: Verification of the drivers track knowledge

First contact: pole 2, Jürgen Siegmann, TU-Berlin,

JSiegmann@Railways.TU-Berlin.de)

Creation and Implementation of Instructions for drivers of cross-border services in order to compensate existing incompabilities by profound knowledge and expertise.
Additionally existing differences have to be minimised. The identification and analysis of best-practice-strategies of railway operations throughout Europe could provide a solid basis for recommendations concerning need for harmonisation and standardisation

[A5] Activity 5: Strengthening competitiveness

Railway traffic regularity monitoring unified methodologies
First contact: pole 2, Jürgen Siegmann, TU-Berlin, JSiegmann@Railways.TU-Berlin.de)

Definition of universally accepted methods to quantify the quality (actual and perceived by the customers) of the railway services as a premise to unified commercial transactions between RU and IM, in particular, but not exclusively, for international traffic. The main tasks in this area are the development of measurement methods for quality of passenger and freight services, the elaboration of rules for commercial transactions between RU and IM regarding quality and the comparison of international rules and guidelines to ensure good quality of operation and compilation of a catalogue with quality-ensuring methods.

Cross-cutting activities

Stimulating radical technological changes for the future of the railways
First contact: pole 1, Wolfgang H. Steinicke, FAV, wsteinicke@fav.de

Assessment/evaluation of the potentials of new existing and anticipated technologies from different disciplines (e.g. nano-technologies, micro-technologies, information/communication, mechatronics) while considering socio-economic scenarios

Evaluating alternative railway structures
First contact: pole 1, Chris Nash, UNIVLEEDS, cnash@its.leeds.ac.uk

Comparison of the different implementations of EU railway legislation in the EU countries and the impacts on the railway system, esp. on costs and performance.

Europe wide experience in rail demand forecasting (pole 1, Chris Nash, UNIVLEEDS, cnash@its.leeds.ac.uk)

Improvement of rail demand forecasting through identification and dissemination of rail demand forecasting best practices.

Competitive tendering of passenger rail services
First contact: pole 1, collab. pole 2, Bertil Hylén, VTI Linköping/Stockholm, bertil.hylen@vti.se

Research on boundaries for competitive tendering of Public Service Obligations (PSO traffic), regarding institutional/financial/legal frameworks, alternatives to competitive tendering, entry barriers, quality of service measurements in a broad sense, incentive schemes or bonus-malus schemes and integration with other modes of public transport.