



PROJECT FINAL REPORT

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Name of the scientific representative of the project's co-ordinator¹, Title and Organisation:

Dennis SCHUT

Research Manager

UNION INTERNATIONALE DES CHEMINS DE FER (UIC)

Tel: +32 2 213 0832

Fax: +32 2 213 0833

E-mail: schut@uic.org

Project website² address: www.errac.org

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¹ Usually the contact person of the coordinator as specified in Art. 8.1. of the Grant Agreement.

² The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos). The area of activity of the project should also be mentioned.

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1. ERRAC ROADMAP FP7 Project - Final summary report

ERRAC ROADMAP FP7 Project executive summary

ERRAC – the European Rail Research Advisory Council was set up in 2001 with the ambitious goal of creating a single European body with both the competence and capability to help revitalise the European rail sector and make it more competitive, by fostering increased innovation and guiding research efforts at European level. Within ERRAC, all major rail stakeholders are gathered. ERRAC comprises of 45 representatives from each of the major European rail research stakeholders: manufacturers, operators, infrastructure managers, the European Commission, EU Member States, academics and users' groups. ERRAC covers all forms of rail transport: from conventional, high speed and freight applications to urban and regional services.

Since its start, ERRAC has produced a number of important and influential documents, such as the Joint Strategy for European rail Research – Vision 2020, the SRRA – Strategic Rail Research Agenda and its 2007 updated version, Suburban and Regional Railways Landscape in Europe, Light Rail and Metro Systems in Europe, Rail Research in Europe, a comparison of the Member States public research programs with the ERRAC SRRA and others.

The most important target for the future of rail transport as it has been described in the SRRA is the doubling of the market share of rail transport and the tripling of rail transport in general. This can also be seen as the main driver behind the ERRAC Roadmap project.

The ERRAC Roadmap CSA project was designed to support the Advisory Council in its work and has focussed for a period of 3 years on the drafting and delivery of concrete and detailed roadmaps on common European R&D to implement the ERRAC Strategic Rail Research Agenda (SRRA). Officially the ERRAC-ROADMAPS project started on 1 June 2009 and ran for three years and two months. However, because of the importance of the work things started rolling soon after the submission of the project proposal to the European Commission and Work Package teams for the future project were formed and started work.

The ERRAC SRRA was built up on 7 pillars:

1. Intelligent mobility
2. Energy and Environment
3. Personal Security
4. Test, Homologation and Security
5. Competitiveness and enabling technologies
6. Strategy and Economics
7. Infrastructure

For several practical reasons the ERRAC member chose to “translate” these pillars into the 5 priorities of the FP7 Surface Transport Program:

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Fig. 1: ERRAC SRRA – FP7 Transport research area matrix

The above figure 1 shows how the 7 research clusters (priorities) identified by the revised SRRA are effectively covered by the 5 Activities in ERRAC- ROADMAP and as defined by the Commission for the FP7 “Transport” theme.

WP01 the **greening** of surface transport,

WP02 encouraging modal shift and **decongesting** transport corridors,

WP03 ensuring **sustainable urban transport**,

WP04 improving **safety and security**,

WP05 **strengthening competitiveness**

The work of these 5 Work package teams has produced 9 – inter-related - Rail Research Roadmaps in the following areas:

- 3 within WP01: Energy, Noise & Vibration and Sustainable Design & Procurement
- 2 with WP02: Passenger and Freight - medium & long distance - Transport
- 2 within WP03: Urban Mobility (developed together with ERTRAC) Urban, Sub-urban and Regional rail Transport
- 1 within WP04: Safety & Security
- 1 within WP05: Competitiveness (which includes rail infrastructure)

In addition to this and feeding into the Roadmaps, the ERRAC Roadmap project has developed a method and checklist for the evaluation of past European railway project. Using this it has evaluated in detail more than 75 EU funded rail research projects, especially looking at the implementation of their results. This has led to the definition of projects with strong, medium and low “market uptake” and the factors influencing this as well as to recommendations for building up a proposal and consortium. This method and checklist has been also used to advise consortia putting together new rail research projects.

ERRAC- ROADMAP covered research related to all types of freight and passenger rail services as well as their interaction with other modes within the transport system (High Speed and conventional rail over long, medium and short distances, as well as urban rail and co-modal services) and its infrastructure, implementing the ERRAC Strategic Rail Research Agenda SRRA. It has set the research priorities, describing the targets between now and 2020, identifying what is needed to get there, what steps to take, how to facilitate this, what barriers to overcome etc. in other words to manage the way forward towards realizing the Vision 2020 for a sustainable European Railway system.

The objective of this project has been to develop a framework of quality roadmaps structured around each of the key work packages identified by the ERRAC European Rail Technology Platform. These roadmaps identify research needed to such a level of detail that the information contained within them can be directly transposed into actual research projects to be developed. The roadmaps also identify synergies and interrelationships between the individual research activities and they will be used as a tool to stimulate private and public, national and European research coherently. As a result it is also designed to provide guidance and as such has been used to contribute to shape the calls of the European Commission’s Transport Work Programme.

The 3 year project has produced 9 detailed Rail Research Roadmaps covering each of the 5 “strategic areas” as described in Work Packages WP01 – WP05. All aspects of the rail system have been well covered in detail as well as their interactions.

Outside of work which has been described in the project description, work has been undertaken to integrate all of the 9 separate detailed Roadmaps into one document. This work will soon be finished and will be published on the ERRAC Website as well as disseminated in complementary ways to the members of ERRAC and other European rail stakeholders.

All the ERRAC Roadmap documents can be downloaded from the ERRAC website www.errac.org

2. A summary description of the project context and objectives

The ERRAC-ROADMAP project – with duration of 38 months – was set up in support of the work of ERRAC and especially to implement the SRRA. It has been – and still is - an essential coordination tool to ensure that the ERRAC 2020 Vision can be turned into a reality. The project has among other results delivered 9 part-roadmaps covering the entire railway system as well as the connection with the urban public transport system in order to guide the rail research and to provide a rail system that is reliable, environmentally friendly, efficient and economic to customers. The project fully integrated and built on the previous work done by ERRAC and Work Package teams have further developed this.



Fig. 2: “Third Status report: At the launch of FP7”, European Commission – March 2007

Fig. 2 shows the evolutions that many well functioning ETP’s go through. It is clear that the project’s activities fit the description of the third box by making more concrete as well as planning the steps needed to be taken through research & development activities in order to implement the SRRA and eventually turn the Rail Vision into reality.

The ERRAC- ROADMAP project has covered research related to the entire rail system, including all types of freight and passenger rail services as well as their interaction with other modes within the transport system: High Speed and conventional rail over long, medium and short distances, as well as urban rail and co-modal services. It describes the targets and how to manage the way forward towards realising the Vision 2020 in identifying the main issues which have to be solved in order to reach the target in a priority manner taking into account all legal, economical and political and standards or other issues there might be. It specifies the needed research in enough detail as to be useful for the European Commission for drafting of work programs and call texts. During the running time of the project, the ERRAC advice to the European commission for topic to be included in the FP7 Calls have been based on the results of the work carried out during the ERRAC Roadmap project.

2.1. The objective of this project was to develop a framework of quality roadmaps structured around each of the key work packages identified by the ERRAC European Technology Platform. The 9 roadmaps which have been developed identify the research needs and priorities to such a level of detail that the information contained within them can be directly transposed when the actual research proposals are developed. The roadmaps also in many cases identified synergies and interrelationships between the individual research activities and they are also used as a tool to stimulate and influence private and public, national and European research coherently.

The work of the ERRAC Roadmap Work Package teams have been based on the previous work and documents published by ERRAC as well as on a great number of finalised EU funded projects which have been evaluated by ERRAC. This evaluation of EU funded rail research projects also was a part of the project itself – carried out through WP06. Results of the ongoing work have been fed into the “strategic” Work Packages continuously during the project as can be seen in each of the Roadmap reports.

Among the ERRAC documents consulted for the project were the following:

2007 Updated SRRA, 2006 Rail21 Brochure - Sustainable rail systems for a connected Europe, 2006 Suburban and Regional Railways Landscape in Europe, 2005 A comparison of Member State public research programmes with the ERRAC SRRA 2020 - Part 2, 2004 Response to the EC consultation exercise on thematic domains for the 7th FPRD, 2004 Rail Research in the EU - Part 1, 2004 Light Rail and Metro Systems in Europe, 2002 Strategic

Rail Research Agenda, 2002 SRRA and Technical Annex of the SRRA as well as the 2001 Joint Strategy for European Rail Research. All these documents and more can be found and downloaded from the public website www.errac.org.

For urban transport the project-team – especially through WP03 – has been cooperating closely with The European Road Transport Advisory Council ERTRAC and their SRAs have also been used as a reference for research actions targeting better urban mobility jointly defined by ERRAC-ROADMAP and ERTRAC (See the WP03 Roadmap on Urban Mobility).

2.2. The scope of the roadmap project and work carried out is broad and is reflecting the following elements of the transport system:

- *Railway Stakeholders:*
 - *Consumers:* passengers and freight forwarders
 - *Other technology platforms:* especially ERTRAC, but also Waterborne, ACARE, ECTP etc.
 - *Industry:* manufacturers, infrastructure managers, railway undertakings/operators and the associated supply, distribution and service chains, covering the full range of services and the full life cycle of vehicles from design to end-of-life, including both large and small companies.
 - *Research providers:* universities, research and technology organisations, government laboratories and other non-corporate research providers.
 - *European and National Governments:* various local, regional and national government departments and agencies that are concerned directly or indirectly with rail transport.
- *Other transport systems:* road, air and waterborne transport modes, the interfaces between them, and their interoperability (for example, alignment of schedules, through-ticketing, co-modal services and logistics).
- *Environment:* external trends and drivers that influence the utilisation and development of the rail transport system, including social, economic, environmental, technological, political and infrastructural. The social, economic and environmental trends and drivers are considered to be the primary motivations for change, as these are the three cornerstones of sustainable development.

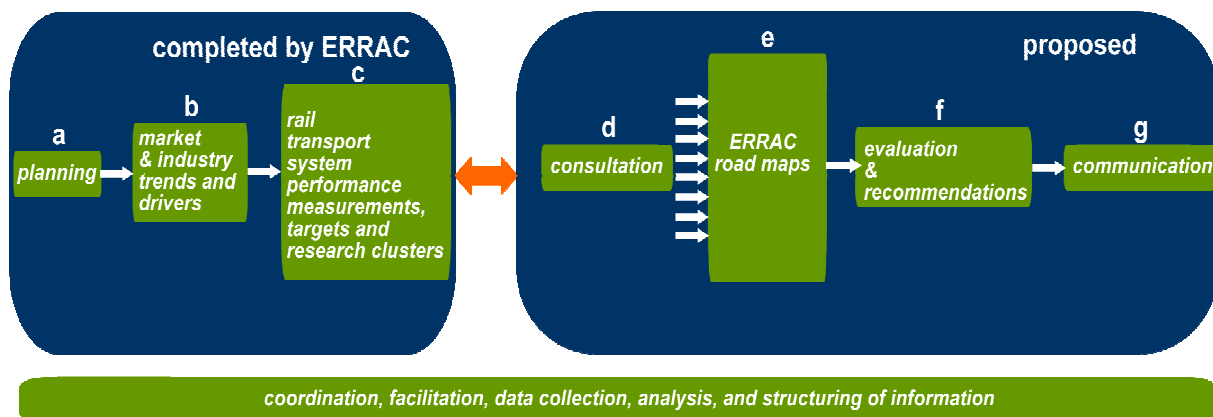


Fig. 3: ERRAC-ROADMAP process

- a) Planning, to review scope and aims, and to support process design.
- b) Exploration of industry and market trends and drivers.
- c) Consideration of performance measures and targets for the rail transport system.

The first 3 stages in the roadmapping process had already been achieved by ERRAC before the start of the project (through its Railway Business Scenario, SRRA and its update). Within ERRAC ROADMAP these

targets and assumptions have been validated as they developed by a feedback mechanism as shown above. This project has further developed the next stages:

- d) Consultation to solicit views from industry, academia and other organisations.
- e) ERRAC Roadmaps.
- f) Evaluation and recommendations
- g) Communication to and within the rail sector and beyond to coordinate research and stimulate the sector

The roadmap architecture is based on the 2020 SRRA and beyond and it has taken into account the following thematic layers:

- *Industry and market trends and drivers*, which define the strategic context in terms of overall goals and requirements, together with enablers and constraints, in terms of the following sub-themes: economy, environment, technology, policy and infrastructure.
- *Rail transport system performance measures and targets*, in response to the trends and drivers: society, economy, environment, technology, EU transport policy and system.
- *Technology solutions and options* that can enable the performance targets to be achieved.

The detailed roadmaps which have been produced by the Work Package – each led by a WP leader and co-leader representing a variety of stakeholders – represent reports that result largely from creative interactive processes, and reflect the expert opinion of a wide range of participants involved with the rail transport sector. The information used does not represent official company or Government policy, but rather perspectives from individual experts.

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Fig 4: ERRAC-ROADMAP Architecture

2.3. Cooperation with ETPs and NTPs. Through the ERRAC-ROADMAP project, ERRAC has established closer cooperation with the Technology Platforms dealing with the other modes of transport – especially ERTRAC and ACARE - as well as with Member States and National Technology Platforms. This has been achieved by involving experts representing national authorities in the Work Package teams and workshops as well as representatives of National Rail technology Platforms from the Member States where such NTP's exist and some EU-bordering countries (the cooperation has intensified with for instance Spain, the Czech Republic, the Netherlands, Sweden, Poland as well as Turkey and Russia). Furthermore there has been a very close cooperation in the field of urban mobility with ERTRAC. A common Roadmap in this area has been prepared together and the cooperation will be continued and no doubt deepened and strengthened. During the project also cooperation has been set up with ACARE and ERRAC has been represented in the work of developing the updated SRA, dealing with the connection of airport to the rail network. Near the end of the project work has begun in cooperation with all Transport ETP's and the ECTP on a Roadmap on co-modal infrastructure.

There has been a very close cooperation between ERRAC Roadmap – especially WP06 and the TRKC which has published all the results of the evaluation of EU-funded rail research projects. This information is also available from the ERRAC website as well as from the recently established UIC Rail Research Portal www.railway-research.org

ERRAC-ROADMAP through its complete involvement of all stakeholders in the railway sector (infrastructure managers, operators, suppliers, users, academia, representatives of the Member States and also the ERA) has coordinated the research priorities and activities. This has resulted in a better alignment between Railway policy making, development of directives and TSI as well as development of EN standards and research. This will result in a better utilisation of resources and funds than today and in a better rate of implementation of

research results (market up-take of research results). During the project we have already seen a positive development in this direction.

Another important issue has also been the establishment and maintenance of the contacts with the EU's National Contact Point representatives for the Seven Framework Programme in the Member States. There have been frequent contact with the ETNA network and presentations about the ERRAC Roadmaps have been made during dissemination events organised in cooperation with ETNA.

2.4. The Work Package set-up. Besides the so-called "Strategic Work Packages" two other WP's have played an important role within the ROADMAP project and strongly contributing toward the quality of its work and deliverables: WP06 dealing with the project evaluation of completed rail research, giving direct input to the "Strategic Work packages and setting up and maintaining a data-base, while WP07 has organised and dealt with all dissemination and communication activities.

The various themes and activities addressed in the Work Packages were often of a different nature, involved different partners and require a slightly different approach. For that reason although more or less the same format is used, the appearance of the Work Package description varies. Also the approach of the WP teams has been different. While some WP's developed their Roadmap over the period of three year, covering the total scope of topics within their area, other WP's have annually concentrated on a certain part of the field they were supposed to cover and have produced 3 separate Roadmaps (for instance WP01).

As far as possible, the each rail research topic has been only dealt with, within one Work Package. For instance the subject of "energy" was treated within WP01, safety issues are being addressed solely in WP04. Overlap is therefore avoided while at the same time communication and interaction between the WPs has been guaranteed.

3. A description of the main results of the ERRAC Roadmap FP7 project

Introduction

All the deliverables of the ERRAC Roadmaps are described in the Description of Work of the project. Besides the usual management-, financial- and technical deliverables and annual or annually updated Roadmaps, the project produced 9 final Roadmaps spread over 5 different areas which are all non-confidential and available to the interested public. The 9 Roadmaps cover the following areas:

1. The greening of surface transport:
 - a. Roadmap on Energy
 - b. Roadmap on Noise & Vibration
 - c. Roadmap on Sustainable Design & procurement
2. Encouraging modal shift (long distance) and decongesting transport corridors
 - a. Freight Roadmap
 - b. Passenger roadmap
3. Ensuring sustainable (sub)urban transport (including modal shift, suburban and regional rail, light rail and metro, and sustainable urban mobility)
 - a. Urban, Suburban and Regional Rail Research Roadmap
 - b. Urban Mobility Research Roadmap
4. Improving Safety & Security
 - a. Improving Safety & Security Roadmap
5. Strengthening Competitiveness

a. Strengthening Competitiveness Roadmap

Each of these Roadmaps also contains an overview of the status of ongoing projects as well as information on the implementation of finalised research projects in the for this part-Roadmap relevant area. This information played an important role in the definition of the final research needs as described in the Roadmaps. This information has been provided to the 5 “Strategic” Roadmaps by WP06.

All 9 Roadmaps have been written along the lines of a common outline. This outline consisted of the following elements:

1. Present Situation
2. State-of-art, recent projects, ongoing research
3. Vision
4. Roadmap Development
5. Pictorial View – priorities on a timeline

3.1 WP01 - The greening of surface transport

This Work Package dealt with the following issues, each of which has been elaborated into a separate final Roadmap:

- a. Roadmap on Energy
- b. Roadmap on Noise & Vibration
- c. Roadmap on Sustainable Design & Procurement

3.1.1 - The Energy Roadmap

1. The most important challenges for energy policy and constraints are:

- Rail has the capability to play a key role in any sustainable transport system by offering efficient transport with low environmental impact, and these strengths need to be articulated in the political decision-making process.
- railways must increase their energy efficiency in order to stay economically competitive and act socially responsible towards the environment,
- It is necessary to act now because of:
 - Rising energy costs
 - Energy security and independency
 - Climate protection

2. Targets for future research

- The European railways must strive towards a carbon-free train operation by 2050 and provide society with a climate neutral transport alternative. Therefore the environmental performance of rolling stock and installed equipment needs significantly to be improved.
- The European railways will strive towards halving the specific final energy consumption from train operations by 2050 compared to the base year 1990; measured per passenger-km (passenger service) and gross ton-km (freight service). Therefore the energy efficiency of rolling stock and installed equipment needs significantly to be increased.

In the overview below, the highest priorities for research in the energy of energy efficiency and energy reductions are depicted on an intermediary time line towards 2035. The rationale for this as well as an in-depth detailed description you will find in the WP01 Energy Roadmap.

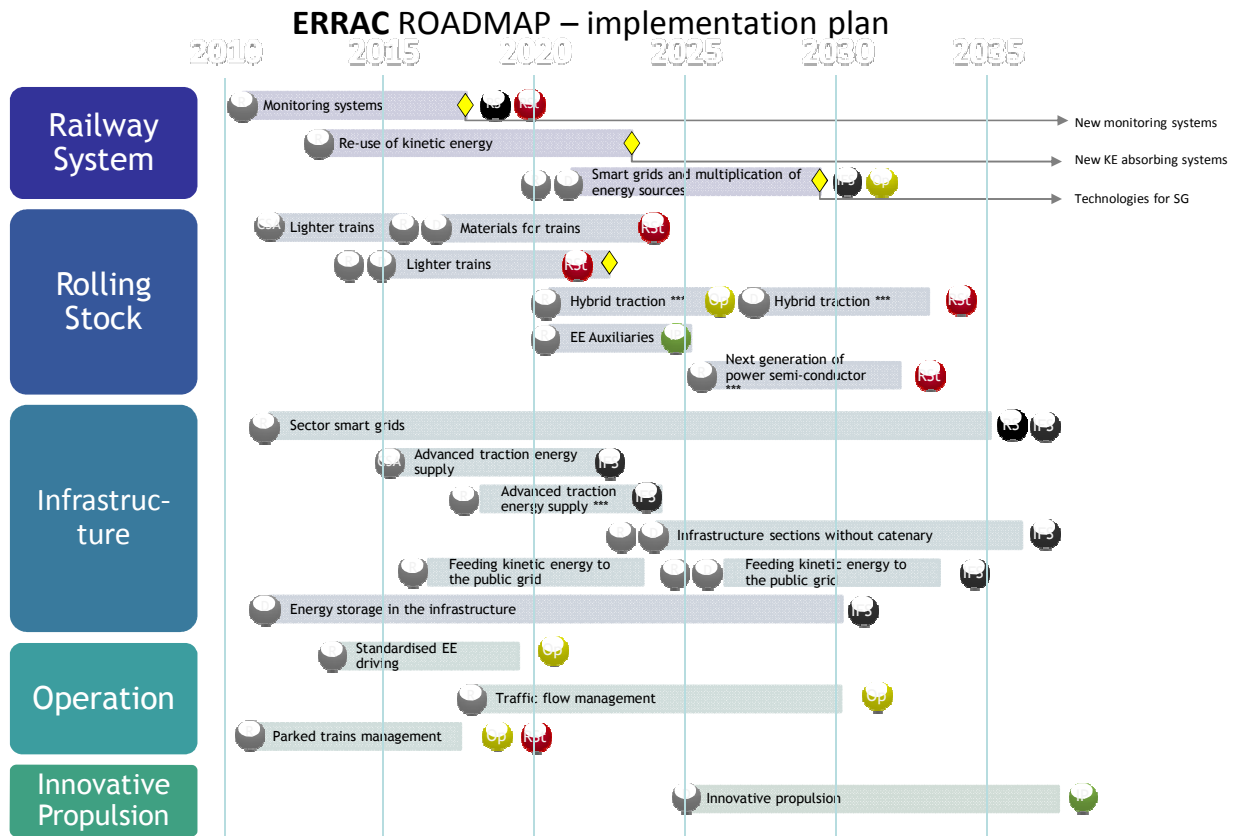


Fig. 5: WP01a – Energy Roadmap implementation plan

3.1.2 - The Noise and Vibration Roadmap

1. The most important challenges for Noise and Vibration are:

- Noise considered as Achilles' heel amongst environmental advantages of rail?
- Modal Shift to rail and increased market share can only be achieved with sustainable noise and vibration mitigation measures.
- European Union policy supports noise reduction.
Issue addressed in interoperability directives and corresponding technical specifications, by the Environmental Noise Directive (END).
- Noise and vibration became an even more critical factor for the railways in recent years in the construction of new infrastructure
- Introduction of noise emission ceilings in some countries raised the pressure to plan line capacity to comply with the available noise quota.
- But Railways have a long history of noise research and control since late 1980's!

2. Goals for future research

- By 2030 noise mitigation measures will be integrated naturally in all relevant processes of the railway, offering sustainable and practical solutions, implemented using a toolbox of various innovative and homologated techniques.
- The European railways will strive towards noise and vibrations no longer being considered a problem for the railways and its neighbours – meaning that noise levels are socially and economically acceptable and allow for 24-hour passenger and goods operations by 2050.

In the overview below, the highest priorities for research in the Roadmap on Noise and Vibration are depicted on an intermediary time line towards 2035. The rationale for this as well as an in-depth detailed description you will find in the WP01 Energy Roadmap.

ERRAC ROADMAP Noise and Vibration – implementation plan

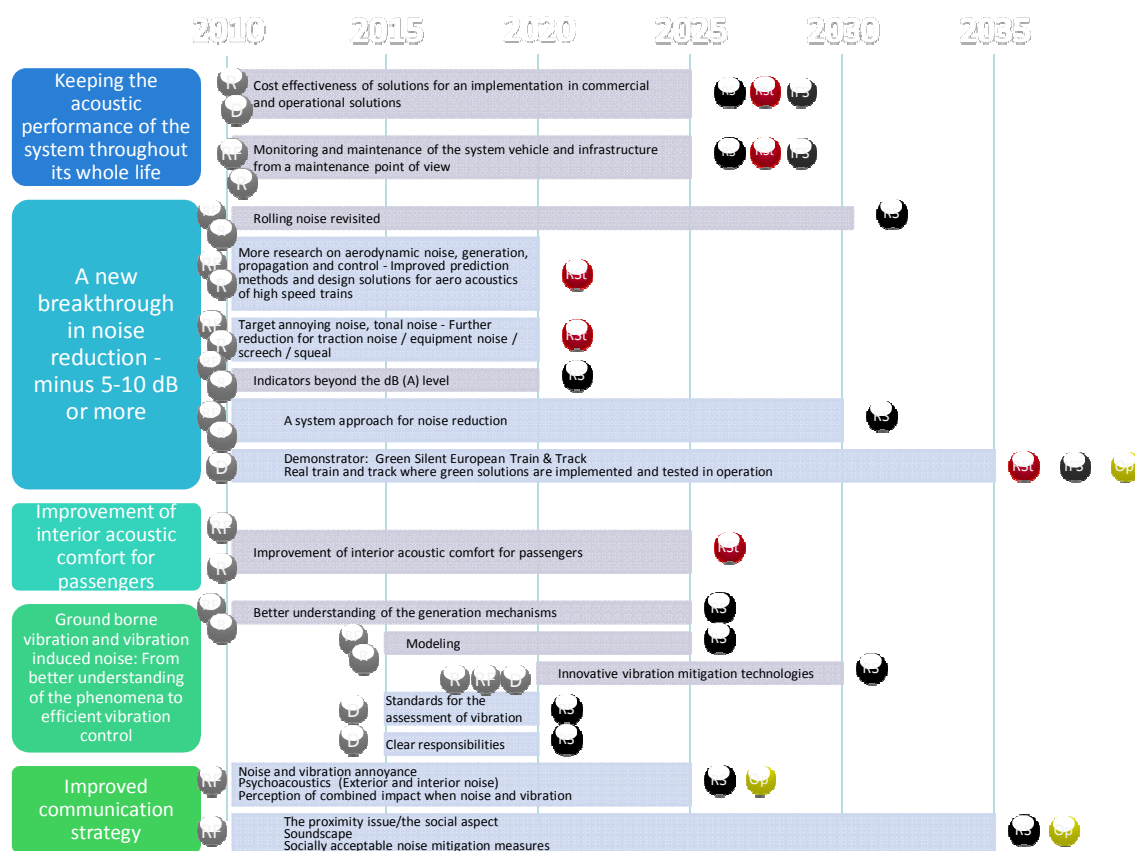


Fig. 6: WP01b – Noise and Vibration Roadmap implementation plan

3.1.3. - The Sustainable Design & Procurement Roadmap

Sustainable procurement means careful consideration of environmental and societal aspects as well as the economic aspects when carrying out the investment process. There is no single definition of sustainable procurement – not least because sustainability is a contested concept – and applications vary across organisational hierarchy and sector. However, there is a general acceptance that it involves a higher degree of collaboration and engagement between all parties in a supply chain. Many businesses have adopted a broad

interpretation of sustainable procurement and have developed tools and techniques to support this engagement and collaboration.

It is important to note that railways are also affected *by* the environment, in addition to having effects *on* the environment. Over time, the way that railways manage natural hazards and weather events will change due to the impact of climate change. This roadmap therefore includes a section on Climate Change Adaptation, which summarises the issues and proposes a research agenda for the railway.

Finally, the topics on energy efficiency, noise and vibration are also included in this Roadmap. However, we need to highlight that ERRAC WG1 Greening of surface transport has already tackled these topics via the previous roadmaps “Energy Roadmap for the European Railway sector” and “Noise and Vibrations Roadmap” These reports do not include, proposals for procurement and design, and therefore for completeness, energy, noise and vibration issues relevant to procurement are also included in this Roadmap.

In the work carried out within WP01 in drafting this Roadmap, among other things, relevant policy drivers and constrains have been considered, such as Eurovignette directive, the REACH regulation, the RoHS Regulation , the Ambient air quality directive, the Noise directive and many others

Furthermore, relevant megatrends have been taken into account as well as findings from many research projects dealing with related issues, such as REPID and RAVEL, Prosper II, InfraGuider, the Railway Industry Substance List, the UIC study on Sustainable Wooden Sleepers , EWENT and FUTURENET, WEATHER, ACOUTRAIN, RIVAS and CleanER-D.

Following this, a number of priority areas have been identified such as:

- General Procurement Guidance and especially Eco-design label for Rolling Stock
- Creosote or wooden sleeper alternatives - composite sleepers/ alternative substructure
- Availability of materials currently used in 20 years time – if not, ideas for alternatives
- Identification of components with special concerns in REACH, (the European regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
- Vegetation control
- Pesticides alternatives
- The end of life treatment of products and reduction of waste

The following research areas were identified:

- Industrial processes to eliminate dangerous waste cost-effectively
- Design of products with consideration of elimination constraints
- Recognising the value of already existing infrastructure
- Cradle to cradle approach
- Research on bio-degradable materials for railway (long term strategy)

In the overview below you will find the highest priorities for research in the field of Sustainable Design and Procurement. The rationale for this as well as an in-depth detailed description you will find in this specific WP01 Roadmap.

System	Climate change adaptation <i>Adaptation of the existing railway system to the new climate conditions</i>	CSA	2020	3
System	Optimise environmental and sustainable impacts of the Life Cycle of subcomponents	R&D	2020 - 2030	2

	<i>Design procurement installation maintenance operations and disposal</i>			
System	Identification of components with special concerns in REACH <i>investigate alternatives with same life duration</i>	R&D	2020 - 2030	3
Rolling Stock	Eco-design label for rolling stock <i>Based on key criteria covering significant environmental aspects: Energy-CO2, Materials, Noise</i>	R&D	2020	3
Infra-structure	Creosote or wooden sleeper alternatives <i>Composite sleepers or Alternative substructure</i>	R	2015	3

Fig. 7: WP01c – Sustainable design & procurement Roadmap implementation plan

3.2. - WP02 - Encouraging modal shift (long distance) and decongesting transport corridors

ERRAC WG 02 has during the course of the three years EU funded ERRAC roadmap project produced three roadmaps each for long distance passenger and freight rail transports. The roadmaps have been developed from a market requirement perspective.

The Project's Description of Work for this Work package originally contained the following four objectives:

- Public rail transport that makes life easier for the European traveller
- Reliable public transport
- Efficient freight transport for business
- Advancing the technological and economic frontier

Each objective were to be addressed (tasks 2.1-2.4) by a roadmap with defined targets or milestones along a timeline. WP 02 decided at an early stage to merge the roadmaps into a single one for passenger and one for freight. These two roadmaps cover the tasks as described in the Description of Work of the project.

The method chosen for developing the roadmap was to work with a scorecard and a chart were identified items were assessed with respect to their research, demonstration, regulatory framework or market introduction maturity. A core group was established consisting of experts in public transport and freight and logistics. The core group identified items of importance to advance rail as a preferred mode of transport. The items were discussed and validated in a series of workshops held during the period 2010-2012. Questionnaires were circulated in the first year to experts working with public transport and freight to establish and assess priorities.

The WP02 has produced three successively annually updated versions of roadmaps for passenger and freight respectively.

The roadmaps has contributed to a common view among key players on necessary actions to be taken to make long distance passenger and freight rail transport more capable of complying with customer requirements

which is necessary if rail is to capture higher market shares and contribute to the objectives of the transport white paper. Results from the roadmaps have been discussed within ERRAC and fed into EU FP 7 calls, which has resulted in the launch of projects like ON-TIME and MARATHON.

The main deviation from the initial set-up was the merging or rather integration of the foreseen four roadmaps into two. This was justified by the necessity to work efficiently with experts who are pressed on time i.e. we had to cover as much as possible during workshops and conf calls. The same experts now only had to deliver input on one document or two if they covered issues relevant for both passenger and freight. The content of the roadmaps nevertheless addresses the key items in the Description of Work.

This Work Package dealt with the following two issues, each of which has been elaborated into a separate final Roadmap:

- a. Roadmap on Freight Transport
- b. Roadmap on Passenger Transport

3.2.1 – The Rail Freight Roadmap

The most important challenges for rail freight transport are:

- Reliability in delivery times
- Attracting more than a limited market share
- Train performance
- Price competitiveness and stability
- Cost for shunting and loading

The targets and objectives for the future are:

- Freight will arrive at the destination on time, 95% of all trains are punctual
- Multimodal real time solutions and information system
- Freight forwarders prefer to ship their goods though rail
- Train is the strongest link in intermodal transport chains
- The capacity of a given railway will be doubled compared with today
- The costs and time for the production of new rolling stock and equipment are significantly reduced

The most important areas for future research are:

- IT solutions, wagon identification, fleet management and train movements
- More efficient multipurpose wagons, less maintenance on the infrastructure, enhancing network use efficiency
- More intelligence in logistics, optimizing train payload, improved interfaces between modes

3.2.2. – The Passenger Rail Roadmap

The most important challenges for medium and long-distance journeys are:

- Punctuality and reliability
- Value for fare and taxes
- Local connections to medium/long distance travels
- Service offerings; frequency, seating, capacity...

The most important targets and objectives for the future are:

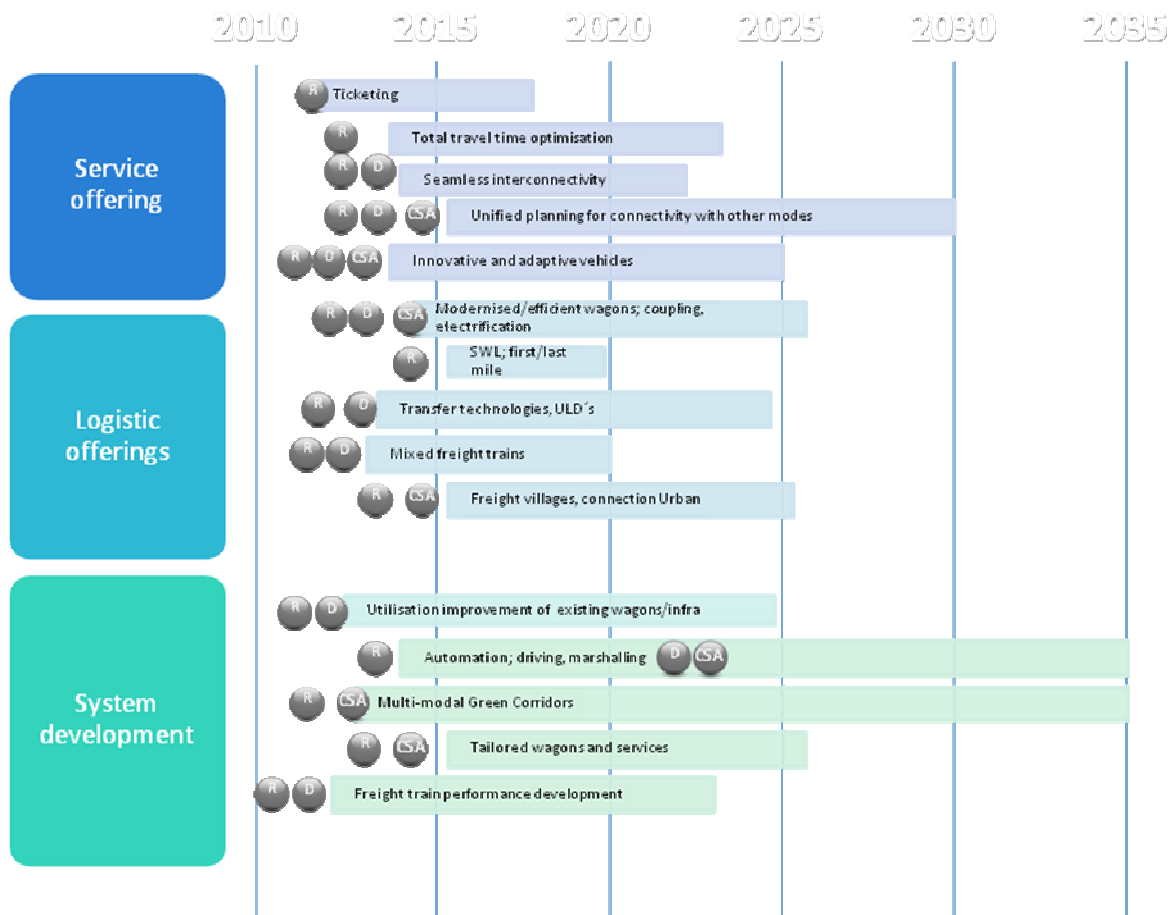
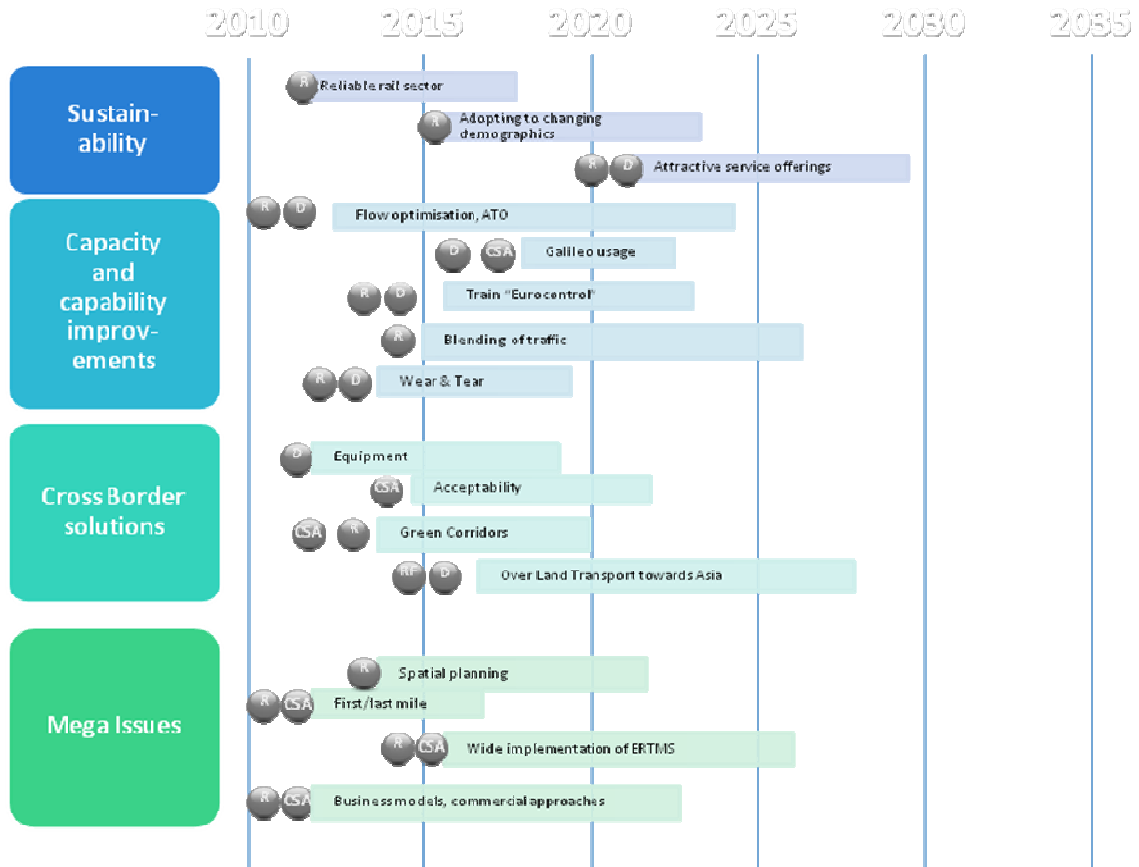
- A rail service able to attract a majority of the medium-distance passenger
- Multimodal real time traffic and journey information and payment systems
- Competitive rolling stock, operational systems and infrastructure
- A seamless European travel system with reliable connections
- Attractive and efficient (multimodal) interchanges
- Spatial planning to facilitate the increased demand

The most important areas for future research are:

- Seat-km costs
- Cross modal integrated Information systems
- Network usage and capacity enhancement
- Spatial planning; knowledge and investment analysis tools
- Travel time optimization across modes

In the overview below, the highest priorities for research in the field of “Encouraging modal shift (long distance) and decongesting transport corridors” are depicted on an intermediary time line towards 2035. The rationale for this as well as an in-depth detailed description you will find in the WP02 Freight and Passenger Roadmaps, which have been developed from a market requirement perspective.

ERRAC WG 02 has during the course of the three years EU funded ERRAC roadmap project produced three roadmaps each for long distance passenger and freight rail transports. The roadmaps have been developed from a market requirement perspective. The main RTD implications in the roadmaps are summarily described below. A more thorough and detailed description is found in the roadmaps.



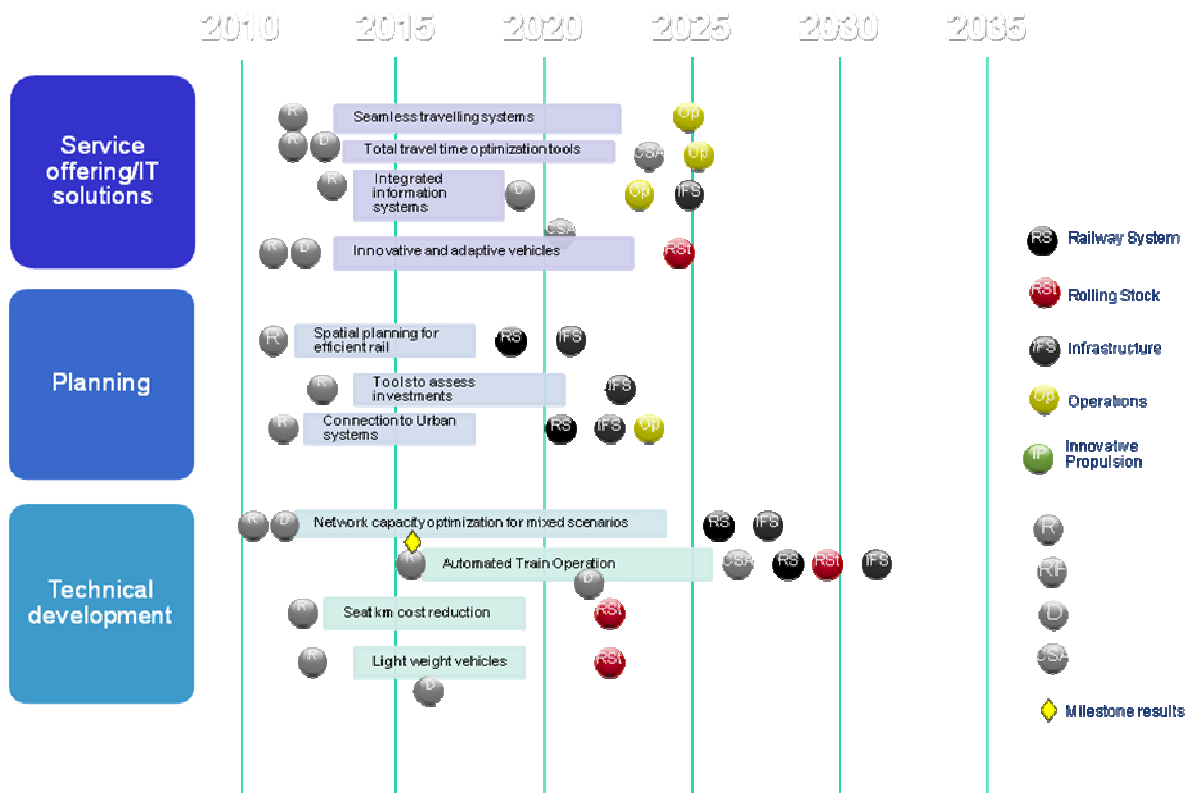
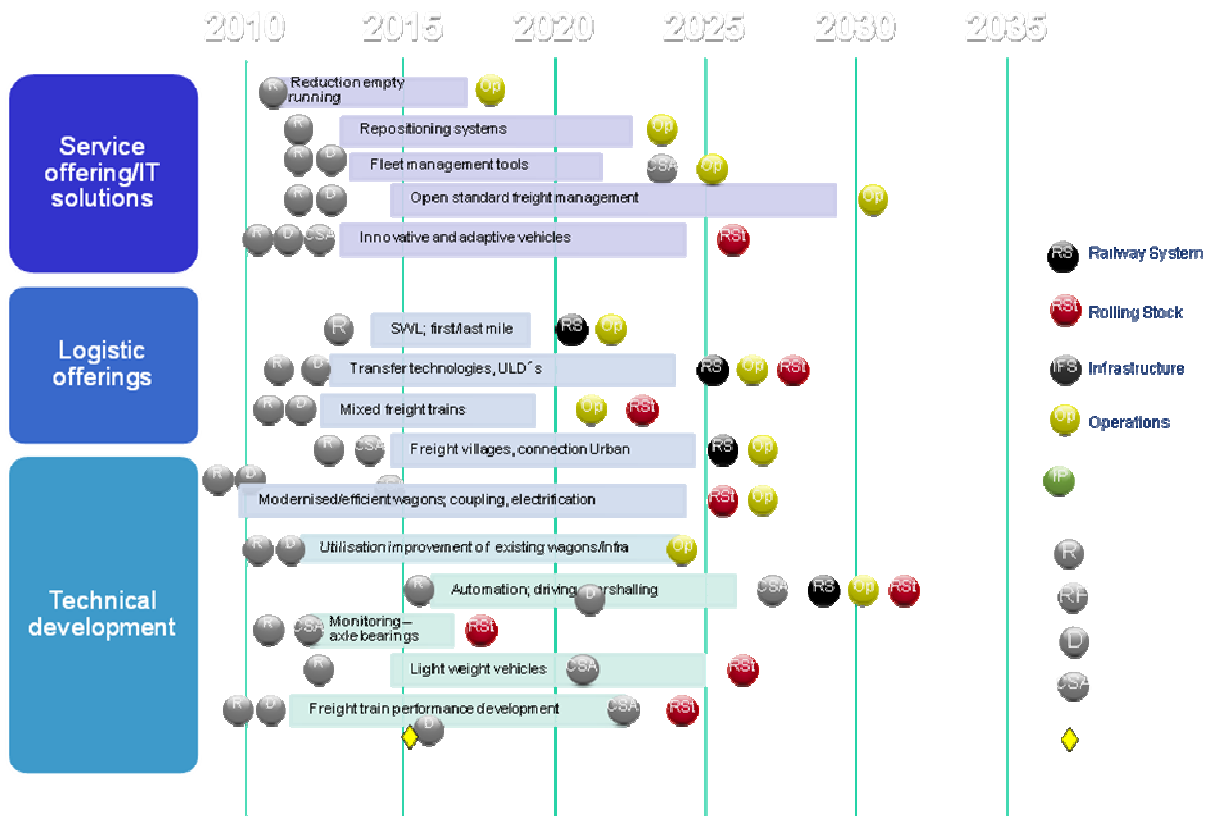


Fig. 8: ERRAC WG 02 Passenger and Freight Roadmaps – implementation plan

3.3. – WP03 - Ensuring sustainable (sub-)urban transport (including modal shift, suburban and regional rail, light rail and metro, and sustainable urban mobility)

WP03 as the other Work packages worked with a network of stakeholders enabling dissemination of the project results, exchange of experience and building the widest possible consensus between stakeholders (including urban rail operators, manufacturers and researchers).

The WP03 prepared **two Roadmaps** (the Rail Roadmap and the Urban Mobility Roadmap), which were updated yearly. In order to do so, basic reference documents were studied (for the Rail Roadmap: “ERRAC Strategic Research Agenda 2020” of 2007, “Strategic Research Agenda for urban, suburban and regional public transport and urban mobility in the European Union, UITP” and “Rail 21 Sustainable Rail Systems for a Connected Europe, ERRAC”; for the Urban Mobility Roadmap: “EURFORUM Strategic Research Agenda”) and a wide consultation of stakeholders was organised. In addition, the White Paper of Transport was taken into account as well as the FP7 calls published during that period.

For the Urban Mobility Roadmap, collaboration was put in place with ERTRAC. In particular, regular contacts were taken with Sylvain Haon from Polis, leader of the Urban Mobility topic within ERTRAC. Together, Polis and UITP published a **common ERRAC-ERTRAC Urban Mobility Roadmap**.

Furthermore, this WP published a **study “Light Rail and Metro systems in Europe”**, with the help of a subcontractor.

The scope of the WP03 was to focus on the mobility of people and goods by research on the “next generation vehicle” and its market uptake, bringing together all elements of a clean, energy efficient, safe and intelligent rail transport system. Research on new transport and mobility concepts, innovative organisational and mobility management schemes and high quality public transport will aim at ensuring access for all and high levels of intermodal integration. Innovative research strategies for clean urban transport will be developed. Particular attention will be paid to non-polluting modes of transport, demand management and information and communication strategies and infrastructures. Tools and models supporting policy development and implementation will cover transport and land use planning including the relationship with growth and employment.

Efficient urban, suburban and regional transport systems are critical elements of the sustainable development of urban areas, where already some 80% of Europe’s citizens live. Urban public transport and especially rail systems have numerous advantages, which shall never be shared by private car transport in terms of e.g. speed, capacity, safety, environmental friendliness, energy savings and urban space consumption. At the same time, car ownership and care use is increasing every day due to a great variety of attractive technical innovations which are easy to standardise and to implement on private vehicles and on roads or streets in comparison to rail systems. Rail systems and especially (sub-)urban rail systems are indeed far more complex technically than road systems and they involve for their management many more (public) stakeholders than private or commercial vehicles traffic management. In addition, local rail transport services are operated under public transport contracts following public service requirements, which represent a heavy financial burden on local authorities for rail services financing and rail systems funding as long as external costs of motorised road vehicle are not internalised. As a consequence (sub-)urban rail will not be able to compete with private cars without an important improvement of public transport attractiveness, and a reduction in investment and operating costs. This implies an important investment in rail research, a strong support from public authorities, and an agreement between local/regional/national public authorities, rail operators (railway undertakings and infrastructure managers), and railway manufacturers to coordinate across Europe for technical harmonisation of products and services where it allows to bring European added value. This was the major challenge of WP03. At the same time, the European rail manufacturing industry is a world leader for urban rail systems (metro, tram and light rail) and has achieved significant innovation for the benefit of the customer (e.g. low floor tram), but has to remain competitive for most promising markets in Europe and outside Europe, especially China and other Asian markets.

This Work Package dealt with the following issues, each of which has been elaborated into a separate final Roadmap:

- Urban, Suburban and Regional Rail Research Roadmap
- Urban Mobility Research Roadmap

3.3.1 – The Urban, Suburban and Regional Rail Roadmap

The work has been built among others on recently finished and ongoing EU funded Framework Programmes projects like: LIBERTIN, MODURBAN and URBAN TRACK (finished) and MODSafe and OSIRIS (still ongoing at the time of the ERRAC Roadmap project).

The most important trends in this area been identified and taken into account:

- Constantly increasing level of ridership
- Development of automated metro systems
- More energy efficient systems
- Limited public funding
- Changes in lifestyles and aging customers

The most important challenges for this area are:

- Improving the cost effectiveness of rail services to reduce the need for tax payers money
- Increasing the attractiveness of urban rail in order to achieve a modal shift from road to rail

Some of the key targets for urban, suburban and regional rail are:

- Efficient core network for multimodal intercity travel and transport
- Clean urban transport and commuting, meeting customers' expectations
- Competitive and resource efficient rail for achieving a 60 % GHG emission reduction target
- Improved performances (capacity, environment, service quality and reliability)

The most important research areas for this area are:

- Intelligent mobility
- Energy and Environment
- Personal Security
- Safety and homologation
- Competitiveness and enabling technologies

- Strategy and economics
- Infrastructure
- Benchmarking

In the overview below, the highest priorities for research in the field of Urban, Suburban and Regional Rail are depicted on an intermediary time line towards 2020 and beyond. The rationale for this as well as an in-depth detailed description you will find in the WP03 Urban, Suburban and Regional Rail Roadmap.

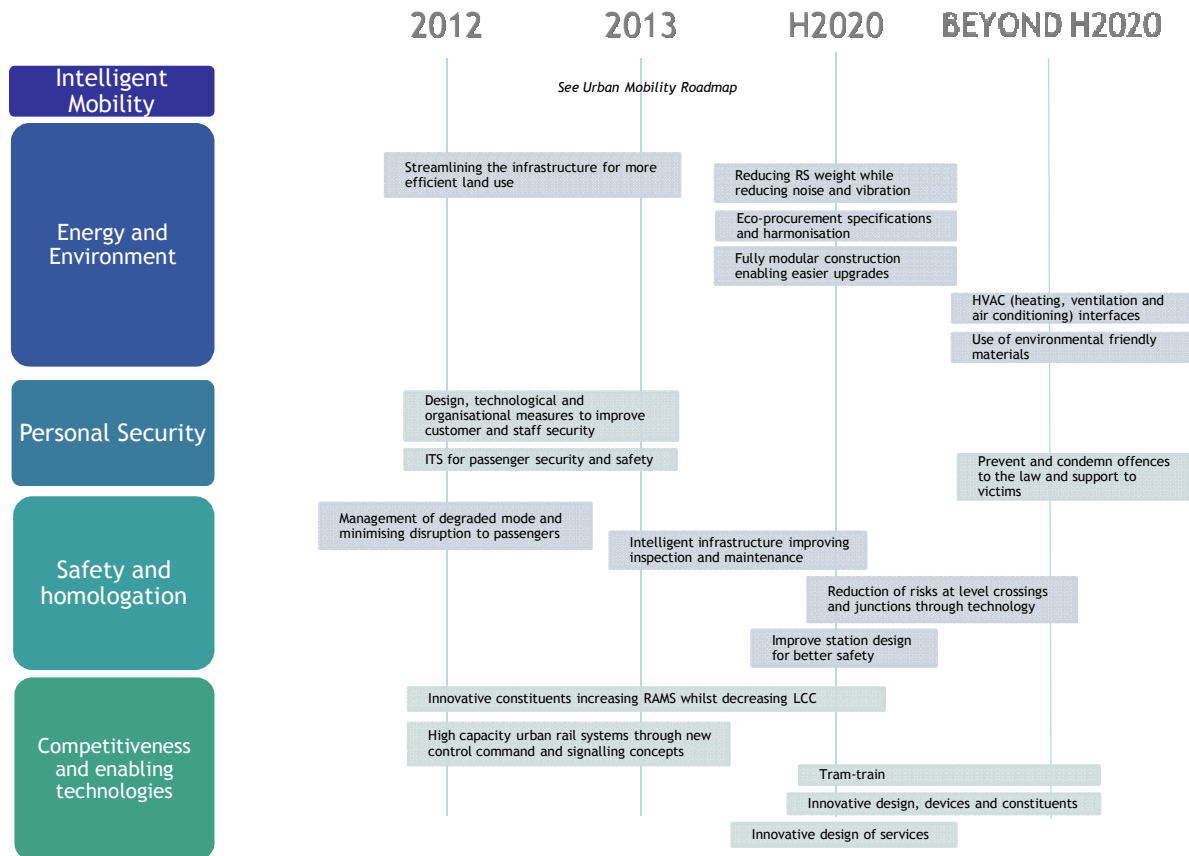


Fig. 9: ERRAC WG 03 Urban, Suburban and Regional Rail Roadmap – implementation plan

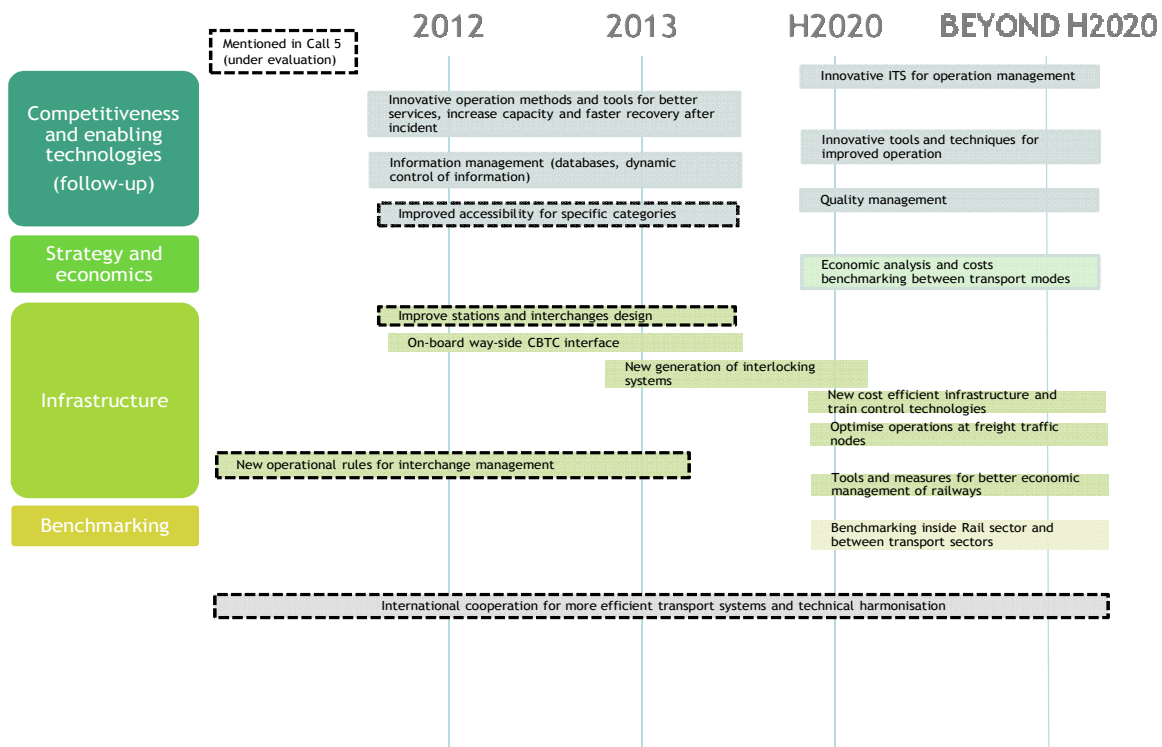


Fig. 9: ERRAC WG 03 Urban, Suburban and Regional Rail Roadmap – implementation plan, ctd.

3.3.2 - Urban Mobility Roadmap

The work has been built among others on recently finished and ongoing EU funded Framework Programmes projects like: EURFORUM, IFM, SPUTNIC, COUNTERACT, LINK and EMOTION (finished) and EBSF (still ongoing at the time of the ERRAC Roadmap project).

The most important trends in this area been identified and taken into account:

- Limited public funding
- More energy and environmentally friendly mobility
- Changes in lifestyles and aging customers
- Development of ITS
- Better intermodal and co modal coordination

The most important challenges for the area of urban mobility (in general) are:

- Reducing the overall cost of urban mobility
- Increasing the attractiveness of public transport and reduce the need for motorised modes in urban areas

The most important targets for future research are:

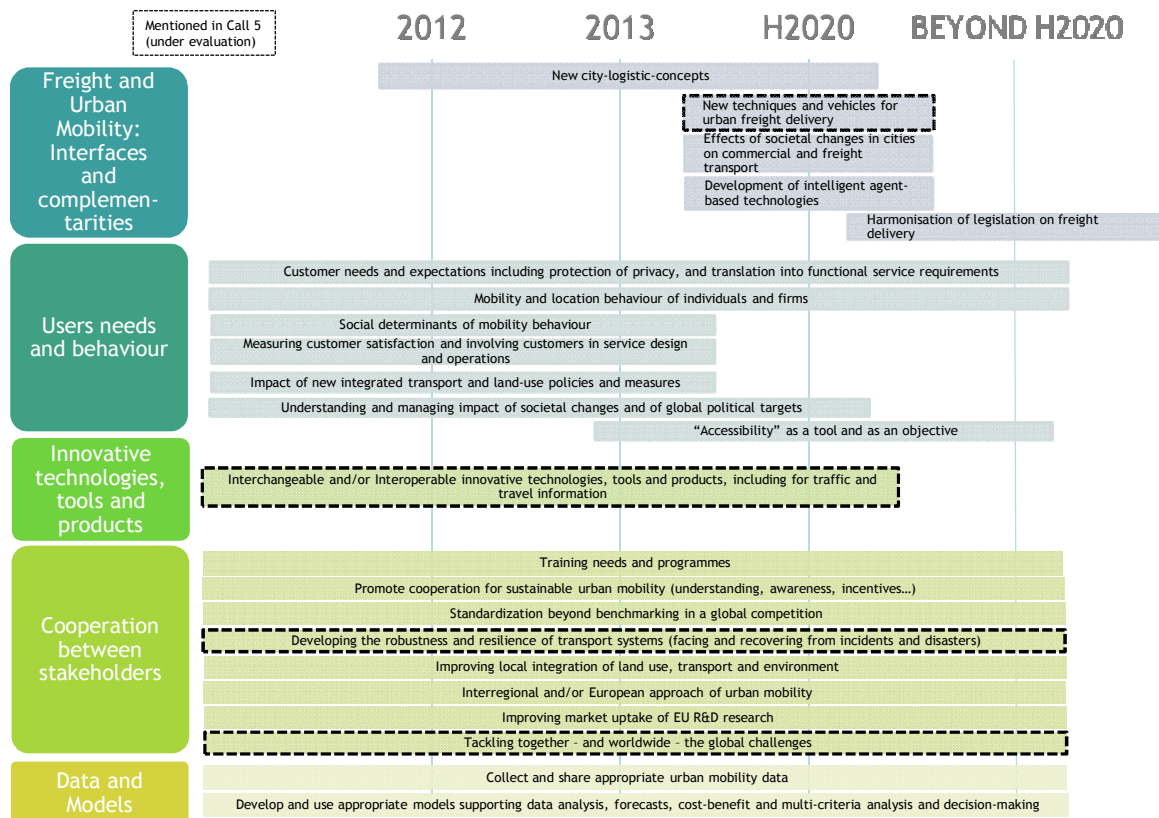
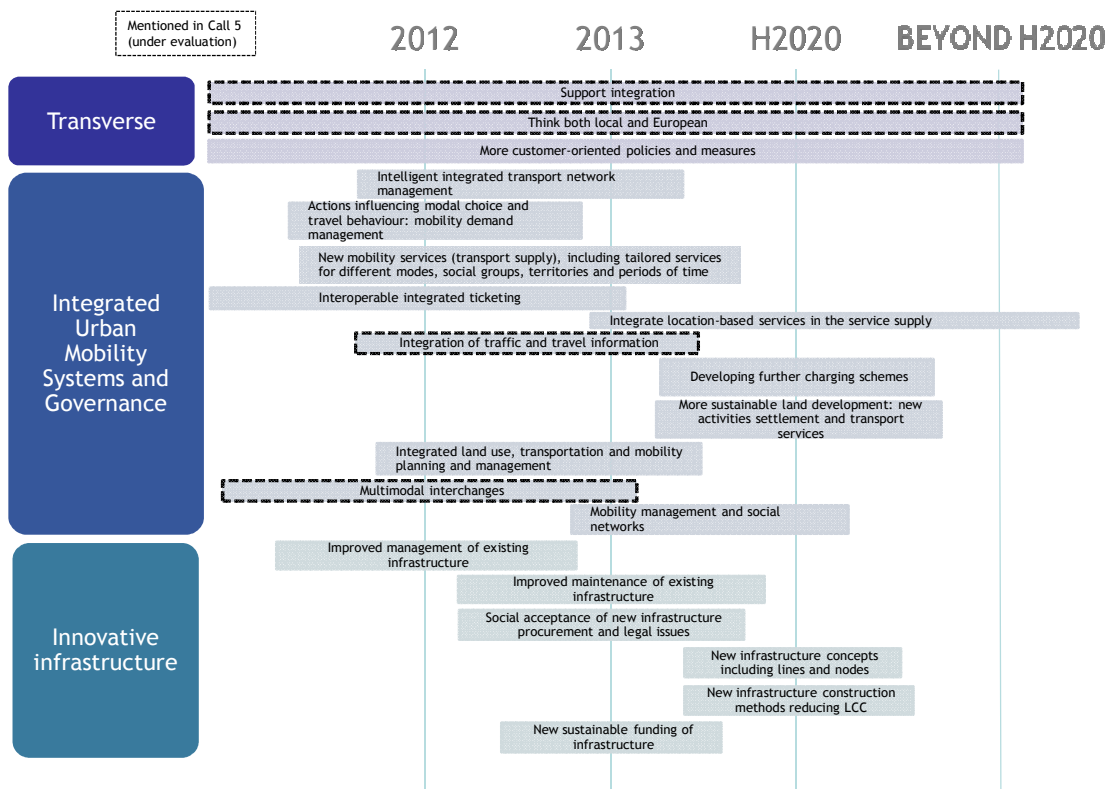
- To contribute to the achievement of the White Paper and Eurforum and UITP vision for long term mobility (Overarching target)
- Understanding better the user needs and behaviour
- Sustainable, effective and user oriented urban mobility system of integrated land use services and infrastructures
- Optimise relationship between land use, transport system and mobility (freight and passengers)
- Modern and innovative transport infrastructure and services
- Improved regulatory and financial framework, involving all relevant stakeholders

The most important key areas for research are:

- Integrated Urban Mobility Systems and Governance
- Innovative infrastructure
- Freight and Urban Mobility: Interfaces and complementarities
- Users needs and behaviour
- Innovative technologies, tools and products
- Cooperation between stakeholders
- Data and Models

In the overview below, the highest priorities for research in the field of Urban Mobility are depicted on an intermediary time line towards 2020 and beyond. The rationale for this as well as an in-depth detailed description you will find in the WP03 Urban Mobility Roadmap.

Fig. 9: ERRAC WG 03 Urban Mobility Roadmap – implementation plan (see below)



3.4 – WP04 - Improving Safety & Security Roadmap

This Work Package dealt both with Safety as well as Security which both have been integrated in one final Roadmap on Improving Safety & Security.

According to project's Description of Work requirements, the WP02 on Safety & Security has delivered roadmaps on an annual basis. The first part-roadmap has been settled in the 1st year and has incrementally been updated on the relevant aspects having changed along the previous years. As a final result, the 3rd year integrated roadmap on Safety & Security represents the most updated document on both these critical issues for the railway sector.

This roadmap takes into account, the state of art of safety and security in railway system in Europe, the implications suggested by the completed and ongoing projects and a common vision shared among expertise coming from the main railway system stakeholders.

As such, the integrated final Roadmap fully covers the obligations as set in the DOW in terms of Targets to be achieved. In particular, we refer to the **Target 1** dealing with coverage of safety and security management aspects and **Target 2** dealing with Security Improvement. Target 1 can be regarded as fully achieved, considering the structure of both roadmaps that include clear identification of priority Area, Topics, Critical Requirements and Actions, respectively for safety and security. Related to target 2, it is convenient to refer to the Roadmap on Security more specifically. This latter takes into account all the subjects that sector considers most critical, including the very important aspect of Security Perception in railway assets (train and station) so as their surroundings (station surroundings, shunting and parking areas). For the first time an integrated Safety & Security Roadmap has been achieved, thanks to this EC funded CSA project ERRAC Roadmap.

The Roadmap is the result of a joint work carried out by all the relevant stakeholders and actors in the field: Infrastructure Managers, railway operators, Industries, Academia, Regulatory and Association sectors.

Having been supported by all the above mentioned stakeholders, actors, the Railway system has the availability of guidelines settling the research priorities to be covered in Safety & Security long term horizon. The 2050 perspective has been divided in four main targets areas:

- Short term target – 2015
- Short-medium target – 2020
- Medium-long target – 2030
- Long term target - 2050

Ongoing research and Trends (Finished and Ongoing)

Covered during the period from 2000 until 2010 there were about 30 projects, of which the majority in lowest occurrence- highest risk safety aspects (tunnel/fire)

At the moment of this writing there were more than 10 projects running of which the majority are oriented on infrastructure and maintenance.

At the moment of this writing there were 5 – 7 topics planned for the FP7 6th Call.

In the development of the Safety and Security Roadmap dealing with Safety, the WP04 team has described the distinction between 11 separate areas in the field of Safety. These areas are:

- Derailments
- Fires and tunnels
- Train collisions
- Human factors
- Infrastructure

- Rolling stock
- Command/control
- Rail system
- Level crossing
- Rolling stock in motion
- Environment and climate

The same method was used for the area of Security where the WP04 has developed “sub-roadmaps for the areas of:

- Key asset protection
- Security human factor
- Security detection systems
- Security procedures, regulations and standards
- Feeling of security

In the overview below, the highest priorities for research in the field of Rail Safety are depicted on an intermediary time line towards 2030. The rationale for this as well as an in-depth detailed description you will find in the integrated WP04 Safety and Security Roadmap.

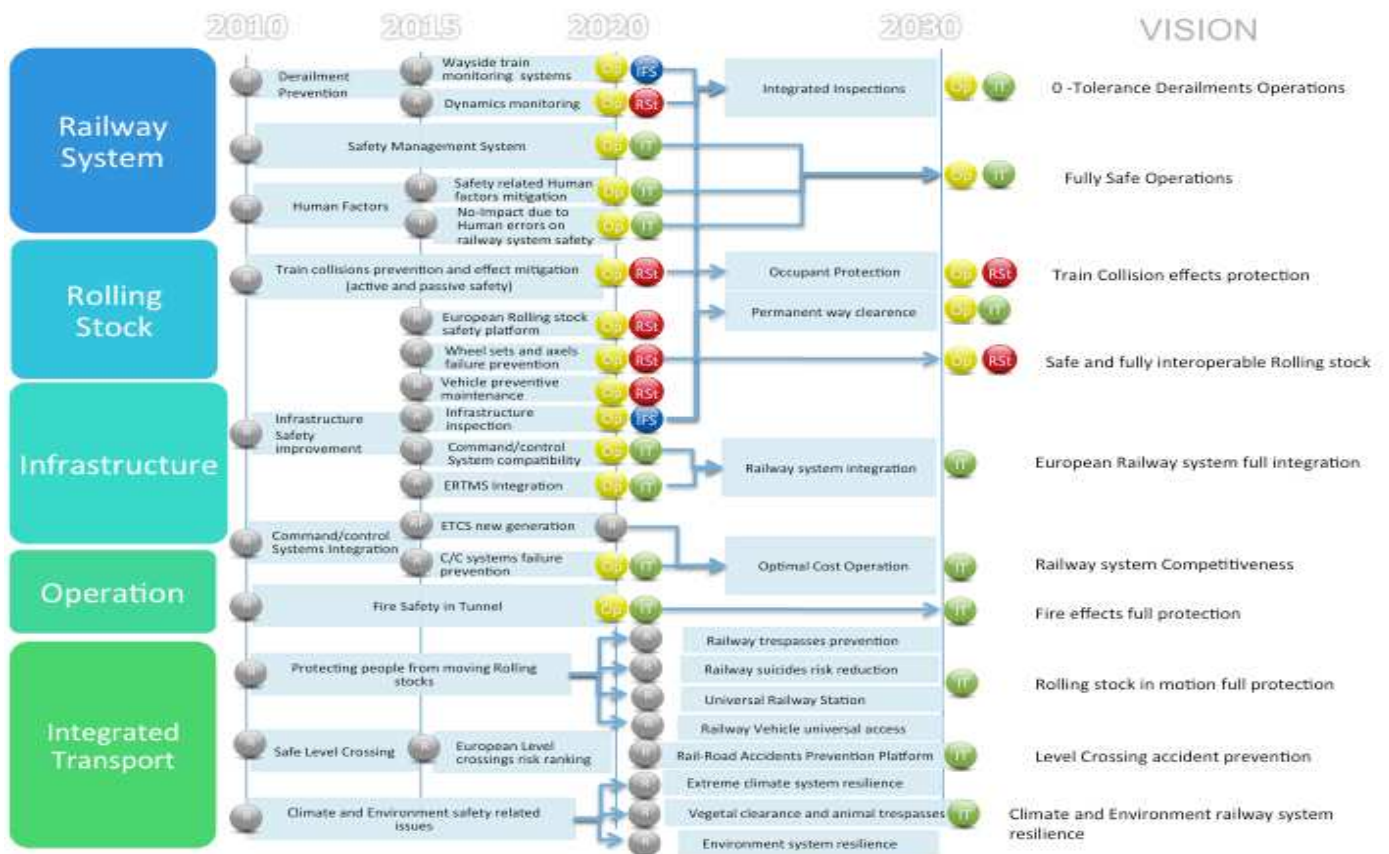
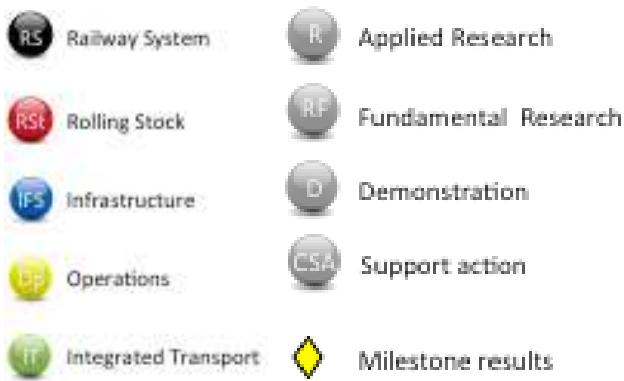


Fig. 10: ERRAC WG 04 Safety Roadmap – implementation plan

The selected sectors and topics are integrated in the above scheme that addresses 2030 targets for the area of Safety. The symbols in the pictorial view are described as follows:



In the overview below, the highest priorities for research in the field of Rail Security are depicted on an intermediary time line towards 2030. The rationale for this as well as an in-depth detailed description you will find in the integrated WP04 Safety and Security Roadmap.

ERRAC SECURITY ROADMAP

Feeling of Security

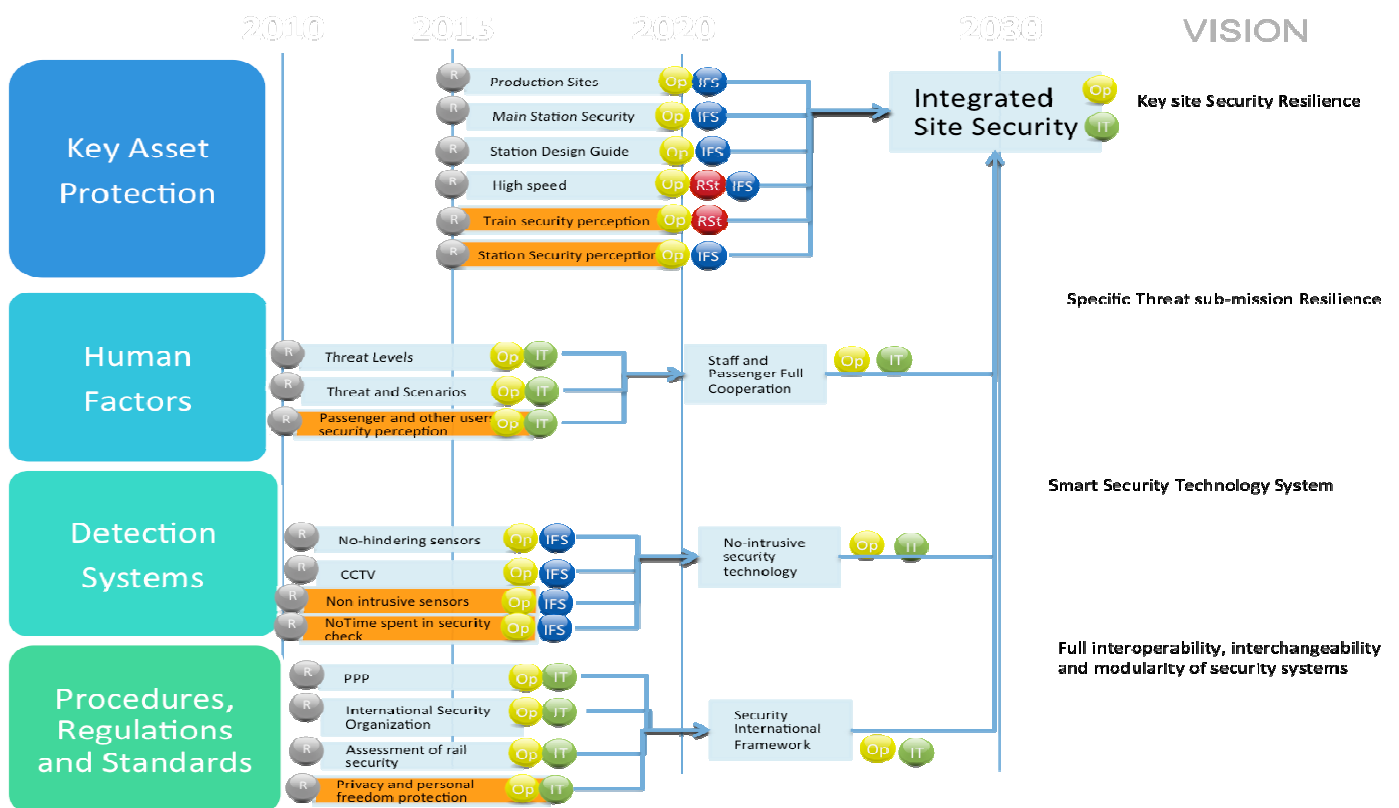
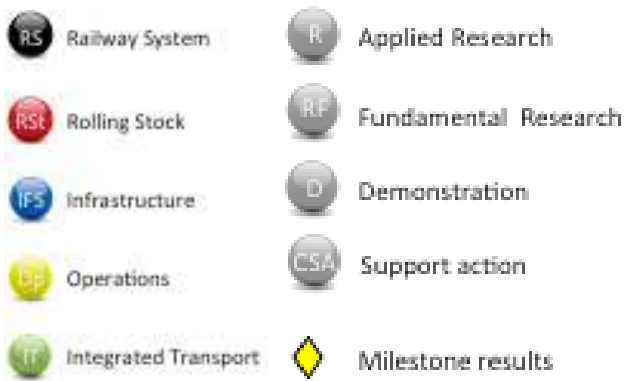


Fig. 11: ERRAC WG 04 Security Roadmap – implementation plan

The selected sectors and topics are integrated in the above scheme that addresses 2030 targets for the area of Safety. The symbols in the pictorial view are described as follows:



3.5 – WP05 - Strengthening Competitiveness Roadmap

The purpose of the work within this roadmap was to follow through on the ERRAC SRRA and supporting documents that describe the areas of research that need to be undertaken in order that the technologies identified as necessary for the vision for the future railway are delivered. Inevitably the vision for the future railway is not fixed, and as the impact of climate change, energy costs, road congestion and global competition for the railway supply industry are evaluated, the vision and technical strategy are modified. In addition, the impact of completed and ongoing projects within the EU Framework Programme and national programmes changes the definition of research needs.

As part of the Roadmap process, open workshops have been held on a biannual basis by all work streams to ensure that the widest range of opinions and knowledge sharing are available for inclusion in the developed maps. The work within this roadmap has been based on the following points of action:

- To define the vision for the future railway based on the ERRAC RSA and updated from the EU White Paper ‘towards a single European transport system’, ERRAC Open Workshops and other authorities
- To develop the technology requirements to deliver the vision
- To examine past and current research projects to identify gaps in the research strategy for delivering these technology requirements
- To propose projects to deliver the research agenda in a logical sequence and timescale

The long-term framework for the SRRA sets out seven research priority areas. The following relate directly to the work of WP05:

- Test, homologation and security

The spread of European homologation and acceptance procedures requires less restrictive product approvals, the wider application of cross acceptance while reducing risk through improved safety management.

- Competitiveness and enabling technologies

Increasing the competitiveness of the rail sector can be achieved by improving all aspects of product attractiveness for customers and reducing life cycle costs by the introduction of modern technology throughout the railway system including rolling stock, maintenance procedures, ticketing systems and infrastructure.

- Strategy and economics

New accounting and planning models will provide a better understanding of the costs of operating and maintaining rail infrastructure and how these costs vary according to changes in the frequency and types of train service. This understanding will lead to incentives to provide high performance and attractive rail services for customers.

The collection of costs must be done at a sufficiently fine granularity to reflect true costs as an aid to building a business case for innovative products.

- Infrastructure

Cost efficient condition based maintenance, and maintenance-free interoperable infrastructure systems will be developed that yield a reduction in the need for maintenance possessions, increases in traffic capacity, track loading and track stability.

- Demographics - labour force

In addition to the influence of demographics on travel patterns and customer services, the other significance of the demographic shift will be the availability of manual labour to undertake many of the difficult and demanding jobs that ensure the continued safe running of the railway. Research is needed into the use of technology to increase the productivity of staff and remove some of the physical difficulties in order to both attract qualified staff to the railway and ensure that they are used to their full potential. Considerable investment is needed in education and life time training, not only to replace the increasing number of retirees but also to train for the new technologies that will be required.

- The need for change

Railway assets traditionally have a long life cycle that may typically be forty years but for some structures may exceed a century. Therefore many investment decisions that we make today will have an impact on the railway system of 2050. Major investments in infrastructure must take into account the needs of the second half of the 21st century including:

- Changing socio-economic frameworks of societies, e.g. globalization, ageing and urbanisation
- Significant and growing ecological imbalances worldwide, e.g. climate change, scarcity of resources and degradation of biodiversity
- Increased regulation and use of new technologies in the transport sector, e.g. alternative traction concepts and information and communication technologies

This roadmap is based on a mid and long-term vision and has four target points in time:

- Year 2015
- Year 2020
- Year 2030
- Year 2050

The most important single challenge for Competitiveness is:

- Developing a pan European solution for a 21st century railway to be a platform that is an affordable railway system concept, resilient to extreme weather, is designed for automated maintenance and operations and is adaptable to different route characteristics and future innovation

The most important trends for Competitiveness are:

- Time for maintenance possessions reduced
- More need for maintenance
- Maximise usage of assets; rolling stock and infrastructure
- Higher capacity trains
- Shortage of experienced staff

The most important research areas are:

- Developing a train track / system that is close to non damaging interaction
- Innovative and adaptable vehicles
- Innovative infrastructure and maintenance technologies
- Automated and high speed maintenance
- Alternative solutions to conventional ballasted track
- Modeling as a tool to optimise system interfaces and support maintenance and renewal decisions

In the overview below, the highest priorities for research in the field of Competitiveness are depicted on an intermediary time line towards 2035. The rationale for this as well as an in-depth detailed description you will find in the WP05 Competitiveness Roadmap.

ERRAC ROADMAP – WP05

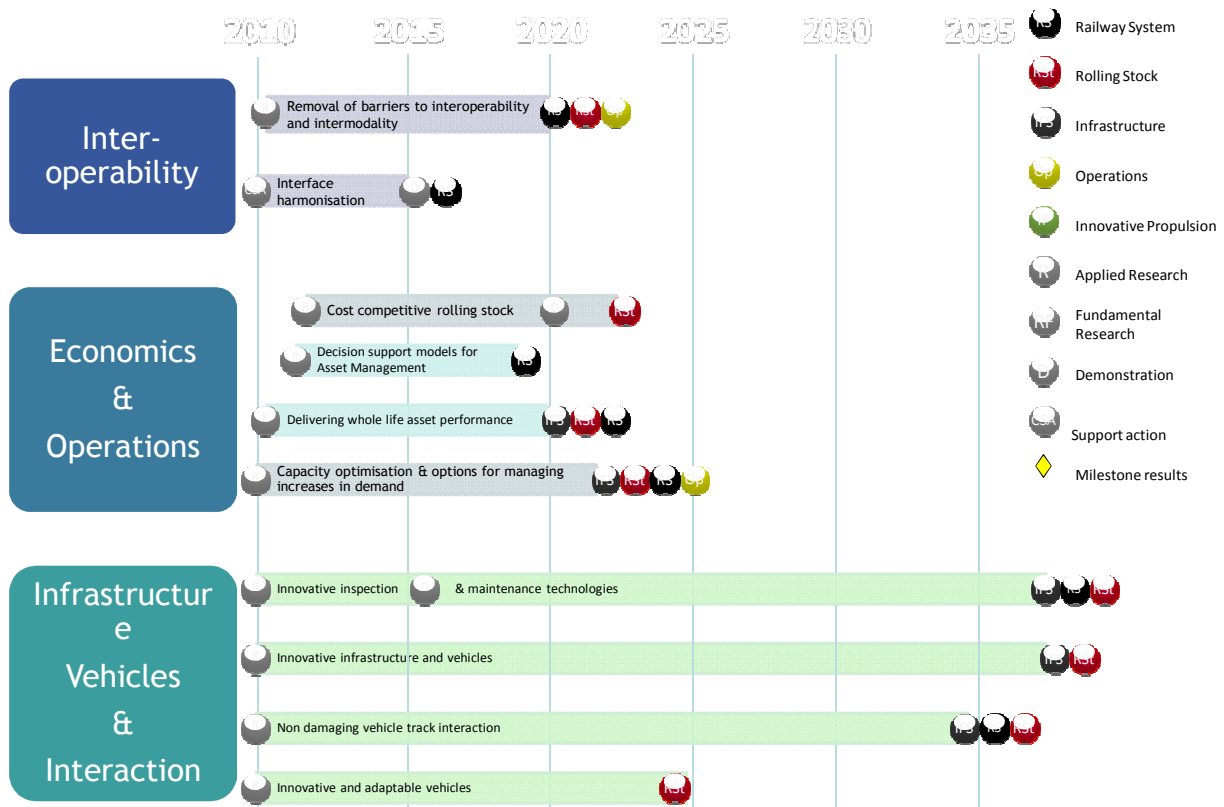


Fig. 12: ERRAC WG 05 Competitiveness Roadmap – implementation plan

3.6 – WP06 – Project evaluation and Rail Innovation Database

Work Package 06 has a very different character compared to the “Strategic” Work Packages 01 to 05 which have developed rail research Roadmaps based on the Vision 2020 (and beyond) and the Strategic Rail Research Agenda – SRRA. Results from this WP also have served as an important basis to the work of the “strategic” Work Packages.

3.6.1. Background and objectives of the work carried out in this Work package:

1. Summarising the philosophy of project evaluations
 - Project evaluation started in 2006, with the aim of determining how effective the investment in Framework Programme projects (by the sector and the European Commission) was on improving the rail sector.
 - Evaluation of past rail projects funded in Framework Programmes was one of the tasks of ERRAC Roadmaps. WP06: determines how projects’ results have been implemented; this is the concept of “market uptake”.
 - The goal is to improve the effectiveness of rail research funding and ensure a strategic approach to the prioritisation of future rail research.

- Learning from the past and trying do to better in the future
- ‘Lessons Learnt’ and ‘Reasons for Outcome’ – inform future proposals and projects.
- The EWG provides intelligence based on the project evaluations as input into future Calls.

3.6.2. The ‘Market uptake’ concept

- The rationale for railway research is rightly always expressed in terms of achieving results, problem solving, decongestion of transport corridors, reducing energy consumption etc.
- This focus on results, can be seen in all declarations from the Commission, National political groups and in the Transport White Paper.

Unless research results are actually implemented, they cannot contribute to these high level ambitions

Strong market-uptake:

A project is evaluated with a strong market uptake if there is clear evidence of use of products or services, processes, dissemination of knowledge, tools, etc. in several countries/products and the major objectives of the project have been implemented. These projects will sometimes lead to additional research to realise their full market uptake.

Medium market-uptake:

A project is evaluated with a medium uptake if there is some evidence of use of products, services or processes, or a limited dissemination of knowledge, tools, etc. in a few countries or products. If only a small proportion of a project has some market uptake, the project as a whole is considered to have a medium market uptake. A follow up of the project may be necessary in some cases.

Weak market-uptake:

A project is evaluated with a weak market uptake if no known use of products, services, processes, knowledge, tools, etc. has been identified anywhere. No follow up project is needed unless the reason for the market uptake failure is clearly understood and removed.

3.6.3. Main outcomes

Projects database

- All identified FP projects were captured in an Excel database, for practical use in the evaluation activity. The database was regularly updated both with new projects and with details of each evaluation carried out. ERRAC database includes now 165 rail related projects, of which 59 have been evaluated.
- WP06 initiated cooperation with the Transport Research Knowledge Centre (TRKC) to make public the presentations of the evaluated projects. Project evaluations have been uploaded to the TRKC website, allowing a better visibility of the results of WP06 work.

- The database of WP06 has been also been incorporated in the Railway Research website of UIC and the full project evaluation presentations are also available online. A permanent link, including the general documentation about the working group, has been established on the ERRAC website.

Evaluation status

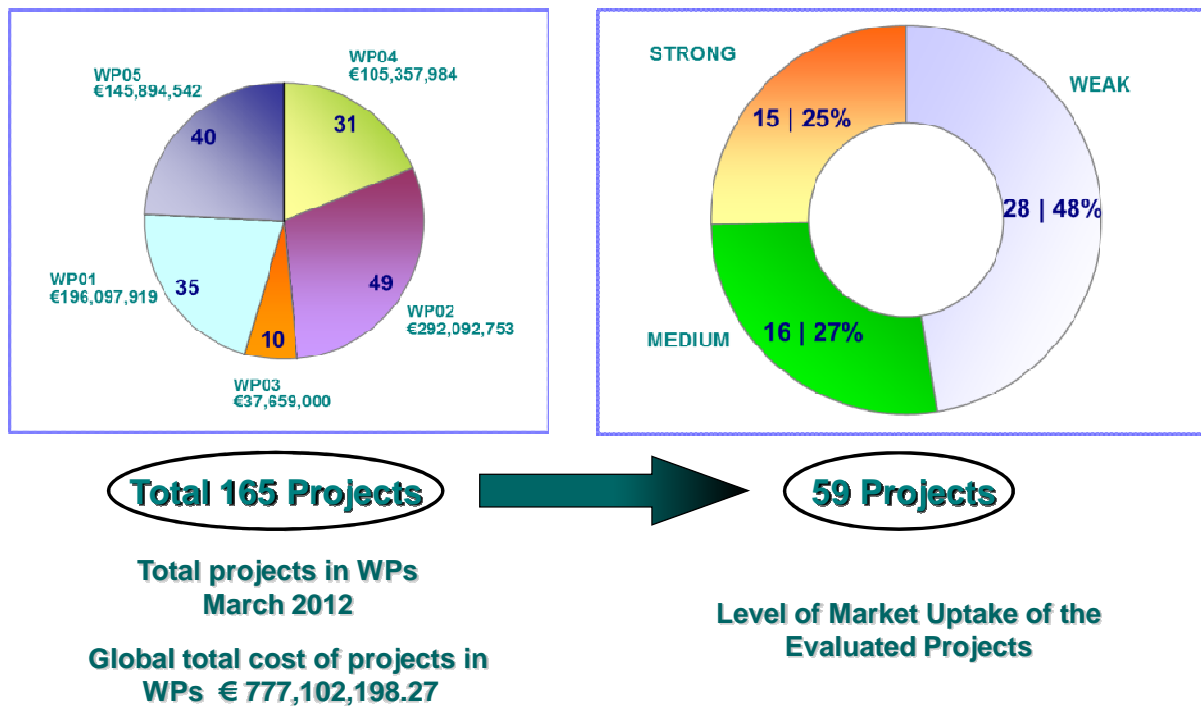


Fig. 13: ERRAC WG 06 Evaluation status overview

3.6.4. Lessons learnt:

- The evaluations have established a level of knowledge which enables us to predict a potential success in market uptake (already) at the proposal conceptual phase.
- Applying this knowledge helps to:
 - design future projects so that chances of successful market uptake are dramatically increased, or
 - determine that an idea will have a very narrow chance of achieving any market uptake and therefore should not be proposed.

Examples of lessons learnt from projects with Strong Market uptake:

- Projects aimed at solving issues of general acknowledged interest (e.g. technical, safety, harmonisation, business cases, etc.)

- Projects had strong interaction between partners and relevant stakeholders
- Projects clearly defined scope and objectives at the beginning
- Project results applied and implemented for products, or for regulatory application and made available for future revisions of TSIs and/or standards
- Project used results of previous projects
- Project pilot cases or business cases developed to provide viable solutions.

3.6.5. Recommendations:

- Make it clear that projects should search for viable solutions in terms of applicability and cost implications, and develop real business cases;
- Think of future market uptake and what happens after project ends: the project as an enabler and not an end to itself;
- Clearly define scope, inputs and deliverables of project at inception. Develop implementation strategy/ plan (a mandatory critical factor), identifying targeted users for dissemination of results;
- Clarify ownership of project results and deliverables at inception
- Select committed partners really interested in finding and applying viable solutions
- Anticipate and identify possible problems/ barriers to implementation to avoid split of interest and weak market uptake, taking account of implications for strategic interests of key players to avoid strategic, commercial, technological and operational constraints (e.g. not to devise technical solutions that incur extra costs to another party, without involving them).
- Set-up a Steering Group of experts/stakeholders familiar with exploitation of results once the project has ended.
- Plan for knowledge retention and dissemination at inception
- Establish clear communication channels and define frequency of exchange
- Conduct a regular review on post-project progress (possibly electing a project responsible/promoter).

3.6.6. Dissemination and the way forward:

- Following the successful workshop of 2010 and others, WP06 has organised a final event on 15 May 2012 in Brussels in order to disseminate the final project results. During this meeting the lessons learnt gained from project evaluations to all rail stakeholders were disseminated.
- A “Checklist for successful projects” was developed in 2011
- WP06 has also taken up contacts with National Ministries in order to investigate whether initiatives have also been launched for funding programmes. Contacts have been taken up with other relevant ETP’s (ERTRAC and WATERBORNE).

- The results achieved by WP06 have been presented and had a significant impact on different occasions
- The usual activities of the Evaluation Working Group will be continued also after the end of the ERRAC Roadmap project (as they were before) and results achieved so far will be preserved and developed further.
- The projects database and evaluations will be maintained also after the end of the project and should be made more visible to improve the impact of WP06 work on European Commission's, research organisations' and stakeholders' activities.
- Although the impact of ERRAC evaluations was significant for organisations preparing new projects, and the influence thereof already visible in the newly submitted proposals (the market uptake really became a high priority), future efforts should focus to improve the involvement of stakeholders to provide feedback and support the implementation of valuable projects' outcomes.

3.6.7. Research innovation database

Initially it was the intention to set up and use a research database within the UIC – the International Union of Railways – one of the project partners – to “store all the results from the WP06 activities. However, it proved that the organisation was not yet ready for that at that moment. Therefore the project set up its own project database as well as shared the results of the project evaluations with the TRKC, the Transport research Knowledge Centre of the European Commission, which recently became TRIP.

The rail research institute of the University of Newcastle – NewRail - the responsible partner within the project for setting up the ERRAC Roadmap database therefore shifted its focus somewhat toward evaluating larger numbers of Rail projects. In the meantime also the development at the UIC concerning the rail research data base took off – outside and independently of the ERRAC Roadmap project and budgets - and is this now fully operational and all the evaluated projects are part of that database. The ERRAC Evaluation Working Group has used the evaluation method developed to finally evaluate around 70 projects from a total of listed 160 projects. Considering the impact of the previous evaluations carried out, the project partner UNEW is constantly developing further its methodology and activities, in order to support the strengthening of the effectiveness of research and innovation capacities. They are also involved as partner and coordinator of the HERMES EC funded projects transport research database, building on one of their earlier EC projects TRANSLO and TRANSNEW.

4.A. Use and dissemination of foreground

Section A (public)

This section includes only the second of the two overviews of dissemination activities related to the project.

- A1: List of all scientific (peer reviewed) publications relating to the foreground of the project.

NB: There have not been any scientific (peer reviewed) publications as ERRAC Roadmap is not a scientific research project which has not led to new foreground, IPR or such. For other publications – see the dissemination overview under Template A2.

- A2: List of all dissemination activities (publications, conferences, workshops, web sites/applications, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters).

4.1. WP01 - Section A2 (public)

LIST OF DISSEMINATION ACTIVITIES WP01								
NO.	Type of activities	Main leader	Title	Date/Period	Place	Type of audience	Size of audience	Countries addressed
1	<i>Presentation of WP01 key elements</i>	<i>WP01 WP leader</i>	<i>FP7 SKILLRAIL dissemination meeting</i>	<i>27/04/11</i>	<i>Brussels</i>	<i>SKILLRAIL project partners and interested parties</i>	<i>45</i>	<i>All EU countries</i>
2	<i>Presentation</i>	<i>WP01 WP leader</i>	<i>7th UIC Railway Noise reduction workshop</i>	<i>09/09/11</i>	<i>Paris</i>	<i>Operators, infrastructure managers and other interested</i>	<i>60</i>	<i>All EU countries</i>

						parties		
3	<i>Poster presentation and full paper on energy, noise and vibration</i>	<i>WP01 WP leader</i>	<i>TRA Poster presentation</i>	<i>23/05/12</i>	<i>Athens</i>	<i>Many different interested parties</i>	<i>Several 100's</i>	<i>All EU countries</i>
4	<i>Presentation of WP01 results</i>	<i>WP01 WP leader</i>	<i>TRA special ERRAC session</i>	<i>23/05/12</i>	<i>Athens</i>	<i>Many interested parties</i>	<i>80</i>	<i>France, Spain</i>
5	<i>Presentation, updates and discussion</i>	<i>WP01</i>	<i>UIC Research Coordination Group meetings</i>	<i>2 – 3 meetings a year</i>	<i>Paris & Brussels</i>	<i>Operators and infra-managers</i>	<i>20 - 25</i>	<i>All EU countries</i>
6	<i>Publication</i>	<i>WP01</i>	<i>UIC Noise Letter</i>	<i>April 2012</i>	<i>Paris</i>	<i>Global UIC membership</i>	<i>5000</i>	<i>global</i>
7	<i>See also WP07 overview</i>							

4.2. WP02 - Section A2 (public)

LIST OF DISSEMINATION ACTIVITIES WP02								
NO.	Type of activities	Main leader	Title	Date/Period	Place	Type of audience	Size of audience	Countries addressed
3	Presentation & discussions	WP02	Freight 1 st open workshop	25/02/10	CER offices Brussels	WP02 Freight and interested parties	25	All EU countries
2	<i>Presentation & discussions</i>	WP02	Passenger open workshop	06/04/11	CER offices Brussels	WP02 Passenger and interested parties	25	All EU countries
3	<i>Presentation, updates & discussion</i>	WP02	UIC Research Coordination Group & freight Forum, Passenger Forum	Diverse meetings, 3 – 4 annual	UIC offices Paris & Brussels	Operators & infra-managers & special freight and passenger experts,	25	All EU countries, some non EU
4	<i>See also WP07 overview</i>							

4.3. WP03 - Section A2 (public)

LIST OF DISSEMINATION ACTIVITIES WP03								
NO.	Type of activities	Main leader	Title	Date/Period	Place	Type of audience	Size of audience	Countries addressed
1	<i>Presentation / Update</i>	<i>UITP</i>	<i>Metro Committee</i>	<i>2 meetings per year</i>	<i>Different location for each meeting</i>	<i>Metro Com members</i>	<i>15</i>	<i>All EU countries</i>
2	<i>Presentation / Update</i>	<i>UITP</i>	<i>Regional and Suburban Rail Committee</i>	<i>2 meetings per year</i>	<i>Different location for each meeting</i>	<i>RSR Com members</i>	<i>19</i>	<i>All EU countries</i>
3	<i>Presentation / Update</i>	<i>UITP</i>	<i>Light Rail Committee</i>	<i>2 meetings per year</i>	<i>Different location for each meeting</i>	<i>LR Com members</i>	<i>38</i>	<i>All EU countries</i>
4	<i>WP3 meeting (open to external stakeholders)</i>	<i>UITP</i>	<i>WP3 meetings</i>	<i>10 meetings</i>	<i>Brussels</i>	<i>Urban rail operators, manufacturers and research institutes</i>	<i>+/- 5</i>	<i>France, Spain</i>
5	<i>Presentation</i>	<i>UITP</i>	<i>WCTR</i>	<i>13 July 2010</i>	<i>Lisbon, Portugal</i>	<i>WCTR participants</i>	<i>+/- 50</i>	<i>All EU countries</i>
6	<i>Presentation</i>	<i>UITP</i>	<i>ERRAC presentation at Unife stand at InnoTrans</i>	<i>21-24/09/2010</i>	<i>Berlin</i>	<i>InnoTrans participants</i>	<i>+/- 80.000</i>	<i>All EU countries</i>
7	<i>Presentation</i>	<i>UITP</i>	<i>Urban Rail Platform</i>	<i>3 meetings per year</i>	<i>Brussels</i>	<i>UITP, UNIFE and DG MOVE members of URP</i>	<i>20</i>	<i>All EU countries</i>

4.4. WP04 - Section A2 (public)

LIST OF DISSEMINATION ACTIVITIES WP04								
NO.	Type of activities	Main leader	Title	Date/Period	Place	Type of audience	Size of audience	Countries addressed
1	<i>Presentation & discussion</i>	<i>WP04</i>	<i>1st open workshop WP04 Safety</i>	<i>04/2010</i>	<i>UIC Brussel</i>	<i>WP04 team members and interested parties</i>	<i>25</i>	<i>All EU countries</i>
2	<i>Presentation & discussion</i>	<i>WP04</i>	<i>2nd open workshop WP04 Security</i>	<i>12/07/2012</i>	<i>UIC Paris</i>	<i>WP04 team and interested parties</i>	<i>35</i>	<i>All EU countries</i>
3	<i>See also WP07 dissemination overview</i>							<i>All EU countries</i>

4.5. WP05 - Section A2 (public)

LIST OF DISSEMINATION ACTIVITIES WP05								
NO.	Type of activities	Main leader	Title	Date	Place	Type of audience	Size of audience	Countries addressed
1	Presentations & discussion	Project coordinator & WP05 leader	1 st FP7 & Roadmap project dissemination event	14/07/09	Department for Transport London	Rail stakeholders, policy makers	100	EU countries but mainly UK
2	Brainstorm discussion on The Roadmap process, the railway system cost model, incentives and barriers to innovation	WP05	1 st open workshop	27/10/09	Corus offices (partner) London UK	WP05 partners + interested stakeholders	15	All EU countries
3	Presentation and feedback on Railway competitiveness, costs and priorities for innovation	WP05	2 nd open workshop	22/04/10	CER, Brussels	WP05 partners + interested stakeholders	23	All EU countries
5	Presentation	WP05 leader	Innotrans	23/09/10	Innotrans,	Rail	150	All EU countries

			Conference		Berlin	stakeholders		
6	Presentations & feedback	WP05 leader	3rd open workshop	29/09/10	UNIFE, Brussels	Rail Stakeholders	30	All EU countries
7	Presentation of ERRAC ROADMAP to ECTP Plenary	reFINE	refine plenary	18/01/11	IFSTTAR Paris	Construction and Infrastructure researchers	28	All EU countries
8	Presentations and discussion on training needs for the future railway	EURNEX	SkillRail Workshop	27/4/11	CER Brussels	EURNEX, ERRAC and SkillRail partners	36	All EU countries
10	Presentations & discussion	Project coordinator & WP05 leader	3 rd FP7 & Roadmap project dissemination event	01/07/11	Network Rail, London	Rail stakeholders, policy makers and researchers	80	EU countries but mainly UK
11	Presentation & discussion	Railway Industries Association	ERRAC & European research topics-present and future	30/11/11	RIA London	Railway supply industry infrastructure technical interest group	44	Mostly UK
12	Presentation and feedback on Railway competitiveness, costs and priorities for innovation plus	WP02 and WP05 Joint open workshop	4 th open workshop	15/3/2012	UIC Paris	WP02 and 05 partners + interested stakeholders	27	All EU countries

	WP02 activities							
13	Presentations & discussion	ERRAC and ECTP	TRA Athens	26/04/12	Athens	Members of rail and construction ETPs, stakeholders and media	96	All EU countries
14	Presentations & discussion	Project coordinator & WP05 leader	4 th FP7 & Roadmap project dissemination event	28/05/12	Department for Transport, London	Rail stakeholders, policy makers and researchers	120	EU countries but mainly UK
15	Presentations & discussions	University of Huddersfield	COMADEM2012 keynote address on the future railway by WP5 Leader	20/06/12	University of Huddersfield	Participants at the international conference on condition monitoring	250	Global
16	Presentations & discussion including relevance of ERRAC ROADMAP and reFINE	ECTP	reFINE plenary	30/01/13	Brussels	Construction industry stakeholders and infrastructure ETPs	80	All EU countries

4.6. WP06 - Section A2 (public)

LIST OF DISSEMINATION ACTIVITIES WP06								
NO.	Type of activities	Main leader	Title	Date/Period	Place	Type of audience	Size of audience	Countries addressed
1	<i>Presentation & discussion</i>	WP06	<i>1st open workshop</i>	18/03/10	<i>Brussels Royal Academy</i>	<i>ERRAC members and interested parties</i>	40	All EU countries
2	<i>Presentation & discussion & full paper</i>	<i>ERRAC vice- chair Dan Otterborn</i>	Implementing the European Strategic Rail Research Agenda – SRRA: The EU project ERRAC ROADMAP explained	25/05/11	9 th WCRR Lille	Global rail researchers	150	All EU countries + global
	<i>Presentation & full paper</i>	<i>WP06 co- leader Prof Mark Robinson</i>	Market Impact Evaluation – The way to judge the success of completed rail research.”	24/05/11	9 th WCRR Lille	Global rail researchers	150	All EU countries + global

3	<i>Poster Presentation & full paper</i>	<i>WP06 member C. Ulianov - UNEW</i>	"Market impact evaluation: the way to judge the success of completed rail research."	22-26/04/12	TRA Athens	Transport research & interested parties	100's	All EU countries
4	<i>Presentation & discussion</i>	<i>WP06</i>	2 nd open workshop	30/05/12	Brussels	ERRAC members & interested parties	45	All EU countries
5	<i>Presentation</i>	<i>WP06 co-leader Prof Mark Robinson</i>	"Market uptake and lessons learnt from past project results"	07/11/11	<i>TRANSNEW project final workshop Bratislava</i>			<i>All EU countries</i>
6	<i>Presentation</i>	<i>WP06 Co-leader</i>	"Evaluation and the Rail Innovation Data Bank".	21/03/12	<i>ERRAC Plenary – Infrabel offices/ Brussels</i>	<i>ERRAC members</i>	60	<i>All EU countries</i>
7	<i>Presentation & discussion</i>	<i>WP06</i>	<i>Results of the ERRAC Evaluation Working Group</i>	<i>Medio 2011</i>	<i>INNOVA Stockholm</i>	<i>INNOVA members (Ministry of Transport, academics & rail & road</i>	40	<i>Sweden</i>

	<i>Presentation & discussion</i>	<i>WP06</i>	<i>3 hour seminar - Results of the ERRAC Evaluation Working Group</i>	<i>Medio 2011</i>	<i>CNR - Rome (Italian National Research Council members)</i>	<i>experts) Research managers</i>	<i>12</i>	<i>Italy</i>
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4.7. WP07 - Section A2 (public)

LIST OF DISSEMINATION ACTIVITIES WP07								
NO.	Type of activities	Main leader	Title	Date/Period	Place	Type of audience ³	Size of audience	Countries addressed
1	<i>Newsletter</i>	<i>WP07</i>	<i>ERRAC newsletter</i>	<i>January 2010</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
2	<i>Newsletter</i>	<i>WP07</i>	<i>ERRAC newsletter</i>	<i>May 2011</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
3	<i>Newsletter</i>	<i>WP07</i>	<i>ERRAC newsletter</i>	<i>April 2012</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
4	<i>Website</i>	<i>WP07</i>	<i>ERRAC website</i>	<i>Ongoing</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
5	<i>Fact sheet</i>	<i>WP07/WP01</i>	<i>The Greening of Surface Transport</i>	<i>May 2011</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
6	<i>Fact sheet</i>	<i>WP07/WP02</i>	<i>Encouraging modal shift (long distance) and decongesting transport corridors</i>	<i>March 2011</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
7	<i>Fact sheet</i>	<i>WP07/WP03</i>	<i>Ensuring sustainable (sub)urban transport (including modal</i>	<i>May 2011</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>

			<i>shift, suburban and regional rail, light rail and metro, and sustainable urban mobility)</i>					
8	<i>Fact sheet</i>	<i>WP07/WP04</i>	<i>Improving Safety and Security</i>	<i>April 2011</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
9	<i>Fact sheet</i>	<i>WP07/WP05</i>	<i>Strengthening Competitiveness</i>	<i>April 2010</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
10	<i>Fact sheet</i>	<i>WP07/WP06</i>	<i>Evaluation and Rail innovation data bank</i>	<i>March 2011</i>	-	<i>Interested stakeholders</i>	-	<i>EU27</i>
11	<i>Publication</i>	<i>WP07</i>	<i>Annual Roadmap Report</i>	<i>September 2010</i>	-	<i>Rail community and EU stakeholders</i>	-	<i>EU27</i>
12	<i>Event</i>	<i>WP07</i>	<i>Press event – Annual Roadmap Report</i>	<i>23 September 2010</i>	<i>Berlin</i>	<i>Rail community and EU stakeholders</i>	<i>20-30</i>	<i>EU27</i>
13	<i>Event</i>	<i>Project coordinator</i>	<i>SEETRANS 2011 - Transport Research Opportunities for South East Europe in the EU</i>	<i>12 – 13 April 2011</i>	<i>Ljubljana</i>	<i>Transport researchers and stakeholders</i>	<i>150</i>	<i>New Member States & Balkan</i>
14	<i>Event</i>	<i>ERRAC project coordinator</i>	<i>ETNA/ERRAC rail brokerage event - ERRAC Roadmap presentation</i>	<i>26 June 2012</i>	<i>Warsaw</i>	<i>ETNA members and rail stakeholders</i>		<i>Poland + EU New member States</i>
15	<i>Publication</i>	<i>WP07</i>	<i>Rail route 2050: The Sustainable Backbone of the Single European Transport Area</i>	<i>June 2012</i>	-	<i>Rail community and EU stakeholders</i>	-	<i>EU27</i>
16	<i>Event/Exhibition</i>	<i>WP07</i>	<i>TRA 2012 – exhibition stand</i>	<i>23-26 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	-	<i>EU27</i>

17	<i>Event/Exhibition</i>	<i>WP06</i>	<i>TRA 2012: Evaluation and Rail Innovation data bank</i>	<i>24 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
18	<i>Event/Exhibition</i>	<i>WP02</i>	<i>TRA 2012: Encouraging modal shift and decongesting transport corridors</i>	<i>24 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
19	<i>Event/Exhibition</i>	<i>WP01</i>	<i>TRA 2012: The Greening of Rail Transport</i>	<i>25 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
20	<i>Event/Exhibition</i>	<i>WP04</i>	<i>TRA 2012: Improving Safety and Security</i>	<i>25 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
21	<i>Event/Exhibition</i>	<i>WP03</i>	<i>TRA 2012: Ensuring sustainable (sub)urban transport</i>	<i>26 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
22	<i>Event/Exhibition</i>	<i>WP05</i>	<i>TRA 2012: Strengthening Competitiveness</i>	<i>26 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
23	<i>Event/Exhibition</i>	<i>WP01</i>	<i>TRA 2012: Poster Session ERRAC Roadmap. Towards 2030: energy, noise and vibration European railway roadmaps</i>	<i>23 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
24	<i>Event/Exhibition</i>	<i>WP03</i>	<i>TRA 2012: Thematic Session Urban, Suburban and Regional Rail and Urban Mobility</i>	<i>24 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>
25	<i>Event/Exhibition</i>	<i>WP06</i>	<i>TRA 2012: Poster Session, Evaluation and Rail research database</i>	<i>25 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	<i>-</i>	<i>EU27</i>

26	<i>Event/Exhibition</i>	<i>WP01/07</i>	<i>Special event dedicated to ERRAC Roadmaps</i>	<i>25 April 2012</i>	<i>Athens</i>	<i>Rail research community and EU stakeholders</i>	-	<i>EU27</i>
27	<i>Article</i>	<i>WP07</i>	<i>Railways and Energy: Moving forward into a sustainable future</i>	<i>March 2012</i>	-	<i>EU stakeholders</i>	-	<i>EU27</i>
28	<i>Article</i>	<i>WP07</i>	<i>Public Service Review 26: Project railway</i>	<i>January 2011</i>	-	<i>Public sector</i>	-	<i>EU27</i>
29	<i>Article</i>	<i>WP07</i>	<i>Public Service Review 28: Off the beaten track</i>	<i>November 2011</i>	-	<i>Public sector</i>	-	<i>EU27</i>
30	<i>Article</i>	<i>WP07</i>	<i>Public Service Review 27: The Roadmaps for rail</i>	<i>June 2011</i>	-	<i>Public sector</i>	-	<i>EU27</i>
31	<i>Article</i>	<i>WP07</i>	<i>Railway Gazette: Setting rail's research priorities</i>	<i>6 October 2010</i>	-	<i>Rail community</i>	-	<i>EU27</i>
32	<i>Article</i>	<i>WP07</i>	<i>Transport Business Journal: Revitalising the European Rail sector</i>	<i>February 2010</i>	-	<i>Transport stakeholders</i>	-	<i>EU27</i>

4.B. The applications for patents, trademarks, registered designs, etc - confidential⁴ or public: Section B - Part B1

The work that has been carried out within this CSA project has not led to scientific or exploitable foreground, any patents, trademarks or registered designs. All deliverables are public and have been disseminated widely and is seen as an ongoing activity.

⁴ Note to be confused with the "EU CONFIDENTIAL" classification for some security research projects.

5. Report on societal implications

Replies to the following questions will assist the Commission to obtain statistics and indicators on societal and socio-economic issues addressed by projects. The questions are arranged in a number of key themes. As well as producing certain statistics, the replies will also help identify those projects that have shown a real engagement with wider societal issues, and thereby identify interesting approaches to these issues and best practices. The replies for individual projects will not be made public.

A General Information (completed automatically when *Grant Agreement number* is entered).

Grant Agreement Number:

234255

Title of Project:

CSA

Name and Title of Coordinator:

Dennis Schut, M.Sc, M.A.

B Ethics

1. Did your project undergo an Ethics Review (and/or Screening)?

NO

- If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports?

Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 'Work Progress and Achievements'

2. Please indicate whether your project involved any of the following issues (tick box) :

NO

RESEARCH ON HUMANS

- Did the project involve children?
- Did the project involve patients?
- Did the project involve persons not able to give consent?
- Did the project involve adult healthy volunteers?
- Did the project involve Human genetic material?
- Did the project involve Human biological samples?
- Did the project involve Human data collection?

RESEARCH ON HUMAN EMBRYO/FOETUS

- Did the project involve Human Embryos?
- Did the project involve Human Foetal Tissue / Cells?
- Did the project involve Human Embryonic Stem Cells (hESCs)?
- Did the project on human Embryonic Stem Cells involve cells in culture?
- Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?

PRIVACY

- Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)? **NO**
- Did the project involve tracking the location or observation of people? **NO**

RESEARCH ON ANIMALS

- Did the project involve research on animals? **NO**
- Were those animals transgenic small laboratory animals? **NO**
- Were those animals transgenic farm animals? **NO**

• Were those animals cloned farm animals?	NO
• Were those animals non-human primates?	NO
RESEARCH INVOLVING DEVELOPING COUNTRIES	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	NO
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	NO
DUAL USE	
• Research having direct military use	No
• Research having the potential for terrorist abuse	

C Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator		3
Work package leaders and co-leaders	3	12
Experienced researchers (i.e. PhD holders)		
PhD Students	0	0
Other		

4. How many additional researchers (in companies and universities) were recruited specifically for this project?

Of which, indicate the number of men:

D Gender Aspects

5. Did you carry out specific Gender Equality Actions under the project? Yes No

6. Which of the following actions did you carry out and how effective were they?

	Not at all effective	Very effective
<input type="checkbox"/> Design and implement an equal opportunity policy	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
<input type="checkbox"/> Set targets to achieve a gender balance in the workforce	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
<input type="checkbox"/> Organise conferences and workshops on gender	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
<input type="checkbox"/> Actions to improve work-life balance	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
<input type="radio"/> Other: <input type="text" value="Did not carry out any of these actions"/>		

7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?

- Yes- please specify
- No

E Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?

- Yes- please specify
- No

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?

- Yes- please specify
- No

F Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?

- Main discipline⁵: 2
- Associated discipline^{5.1} Associated discipline

G Engaging with Civil society and policy makers

11a Did your project engage with societal actors beyond the research community? (if 'No', go to Question 14) Yes No

11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?

- No
- Yes- in determining what research should be performed
- Yes - in implementing the research
- Yes, in communicating /disseminating / using the results of the project

⁵ Insert number from list below (Frascati Manual).

11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	<input type="radio"/> <input checked="" type="radio"/>	Yes No
12. Did you engage with government / public bodies or policy makers (including international organisations)		
<input type="radio"/> No <input checked="" type="radio"/> Yes- in framing the research agenda <input type="radio"/> Yes - in implementing the research agenda <input type="radio"/> Yes, in communicating /disseminating / using the results of the project		
13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?		
<input type="radio"/> Yes – as a primary objective (please indicate areas below- multiple answers possible) <input checked="" type="radio"/> Yes – as a secondary objective (please indicate areas below - multiple answer possible) <input type="radio"/> No		
13b If Yes, in which fields?		
Agriculture Audiovisual and Media Budget Competition Consumers Culture Customs Development Economic and Monetary Affairs Education, Training, Youth Employment and Social Affairs	<u>Energy</u> Enlargement <u>Enterprise</u> <u>Environment</u> External Relations External Trade Fisheries and Maritime Affairs Food Safety Foreign and Security Policy Fraud Humanitarian aid	Human rights Information Society Institutional affairs Internal Market Justice, freedom and security Public Health Regional Policy <u>Research and Innovation</u> Space Taxation <u>Transport</u>

13c If Yes, at which level? <input checked="" type="checkbox"/> Local / regional levels <input checked="" type="checkbox"/> National level <input checked="" type="checkbox"/> European level <input type="checkbox"/> International level		
H Use and dissemination		
14. How many Articles were published/accepted for publication in peer-reviewed journals?		
To how many of these is open access⁶ provided?		
How many of these are published in open access journals?		
How many of these are published in open repositories?		
To how many of these is open access not provided?		none
Please check all applicable reasons for not providing open access:		
<input type="checkbox"/> publisher's licensing agreement would not permit publishing in a repository <input type="checkbox"/> no suitable repository available <input type="checkbox"/> no suitable open access journal available <input type="checkbox"/> no funds available to publish in an open access journal <input type="checkbox"/> lack of time and resources <input type="checkbox"/> lack of information on open access <input type="checkbox"/> other ⁷ :		
15. How many new patent applications ('priority filings') have been made? <i>("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).</i>		none
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	none
	Registered design	none
	Other	none
17. How many spin-off companies were created / are planned as a direct result of the project?		none
<i>Indicate the approximate number of additional jobs in these companies:</i>		none
18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project: <input type="checkbox"/> Increase in employment, or <input type="checkbox"/> Safeguard employment, or <input type="checkbox"/> Decrease in employment, <input type="checkbox"/> Difficult to estimate / not possible to quantify		
<input type="checkbox"/> In small & medium-sized enterprises <input type="checkbox"/> In large companies <input checked="" type="checkbox"/> None of the above / not relevant to the project		
19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (FTE = one person working fulltime for a year) jobs:		<i>Indicate figure:</i> none

⁶ Open Access is defined as free of charge access for anyone via Internet.

⁷ For instance: classification for security project.

Difficult to estimate / not possible to quantify	<input type="checkbox"/>
I Media and Communication to the general public	
20. As part of the project, were any of the beneficiaries professionals in communication or media relations?	
<input type="radio"/> Yes	<input checked="" type="radio"/> No
21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?	
<input type="radio"/> Yes	<input checked="" type="radio"/> No
22 Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?	
<input checked="" type="checkbox"/> Press Release <input checked="" type="checkbox"/> Media briefing <input type="checkbox"/> TV coverage / report <input type="checkbox"/> Radio coverage / report <input checked="" type="checkbox"/> Brochures /posters / flyers <input type="checkbox"/> DVD /Film /Multimedia	<input checked="" type="checkbox"/> Coverage in specialist press <input type="checkbox"/> Coverage in general (non-specialist) press <input type="checkbox"/> Coverage in national press <input checked="" type="checkbox"/> Coverage in international press <input type="checkbox"/> Website for the general public / internet <input checked="" type="checkbox"/> Event targeting general public (festival, conference, exhibition, science café)
23 In which languages are the information products for the general public produced?	
<input type="checkbox"/> Language of the coordinator <input type="checkbox"/> Other language(s)	<input checked="" type="checkbox"/> English

Question F-10: Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES

- 1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]
- 1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)
- 1.3 Chemical sciences (chemistry, other allied subjects)
- 1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)
- 1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2. ENGINEERING AND TECHNOLOGY

- 2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)
- 2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]
- 2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as

geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

- 3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)
- 3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)
- 3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

- 4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)
- 4.2 Veterinary medicine

5. SOCIAL SCIENCES

- 5.1 Psychology
- 5.2 Economics
- 5.3 Educational sciences (education and training and other allied subjects)
- 5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary, methodological and historical S1T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

- 6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)
- 6.2 Languages and literature (ancient and modern)
- 6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S1T activities relating to the subjects in this group]

1. FINAL REPORT ON THE DISTRIBUTION OF THE EUROPEAN UNION FINANCIAL CONTRIBUTION

This report shall be submitted to the Commission within 30 days after receipt of the final payment of the European Union financial contribution.

Report on the distribution of the European Union financial contribution between beneficiaries

Name of beneficiary	Final amount of EU contribution per beneficiary in Euros
1.	
2.	
n	
Total	