

# FOSTER RAIL

## Future of Surface Transport Research Rail

Coordination and Support Action

Grant Agreement No 605734

Date of Annex I against which the assessment will be made: 16-03-2015

## Deliverable D6.3

*Evaluation of finalised projects with clear understanding of the market uptake mechanism*

<b>WP</b>	6	Monitoring to improve rail research innovation
<b>Task</b>	6.2	Evaluation of past rail projects

<b>Dissemination level</b> <sup>1</sup>	PU	<b>Due delivery date</b>	M24
<b>Nature</b> <sup>2</sup>	R	<b>Actual delivery date</b>	M26

<b>Deliverable lead beneficiary</b>	UNEW	<b>Deliverable responsible person</b>	Mark Robinson
<b>Email</b>	mark.robinson@ncl.ac.uk		

<b>Other contributors to the deliverable</b>	Cristian Ulianov Dan Otteborn
--	----------------------------------

Document Version	Date	Author(s)
D01	20/04/2015	Cristian Ulianov
D02	24/04/2015	Mark Robinson, Cristian Ulianov
D03	12/06/2015	Cristian Ulianov, Dan Otteborn
F01	29/06/2015	Mark Robinson, Cristian Ulianov

<sup>1</sup> Dissemination level: **PU** = Public, **PP** = Restricted to other programme participants (including the JU), **RE** = Restricted to a group specified by the consortium (including the JU), **CO** = Confidential, only for members of the consortium (including the JU)

<sup>2</sup> Nature of the deliverable: **R** = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

## Table of Content

Executive Summary .....	3
List of tables.....	4
List of figures .....	4
1. Introduction .....	5
2. Objectives .....	6
3. Methodology.....	8
4. Evaluation of past projects .....	12
4.1 Finalised evaluations.....	12
4.2 Ongoing evaluations .....	14
4.3 Summary of data and statistics .....	15
5. Conclusions and recommendations.....	16
6. Reasons for outcomes.....	16
7. Lessons learnt.....	17
Appendix 1   Summary of projects evaluated by ERRAC Evaluation Working Group (2006 – 2015). .....	20
Appendix 2   Project evaluations by ERRAC Evaluation Working Group within Foster Rail project... .....	25

## ***Executive Summary***

An important part of the FOSTER RAIL project is the monitoring of rail research activity. Previously, the rail sector did not know the market impact of previous research and a great deal of research funding has been wasted on research that has had no demonstrable impact. This needed to change and ERRAC Evaluation Working Group (EWG) continues to evaluate completed rail projects within Task 6.2 of FOSTER RAIL project.

This Deliverable outlines progress made to date (months 1 to 24) within Task 6.2 activities only, and describes the progress on market impact evaluation of previous rail research.

The methodology is described including the selection of the projects to be evaluated, it is important to make sure that the projects have had an opportunity to have an impact to have been successfully disseminated and therefore the projects have to have been completed and finalised usually for at least 3 years. The fact that project are finished does create difficulties in contacting the people who know about the projects, but this is essential to ensure that the results of previous rail research is not.

The ***evaluation methodology*** is based on the analysis of project results and deliverables, together with a set of interviews to project participants and other stakeholders, aimed at determining the actual implementation and market uptake of the project results by the rail sector once the work has ended.

Once an evaluation is done the impact is available and can be used by follow-on projects and taken into account in future research. The recording of past research helps to improve the effectiveness of the ERRAC rail roadmaps by preventing duplication of previous research and identifying the gaps in future research.

As a result of the evaluation related to the key questions, the market uptake is determined and the presentation is completed in the final slides with the evaluation's conclusions, in particular:

- *Reasons for Outcome;*
- *Lessons Learnt.*

The evaluation activity in Foster Rail project builds on the previous work of the Evaluation Working Group, continuing and developing its tasks. The development and administration of ***ERRAC rail research database*** is an important activity within WP6, essential to support the evaluation of past research and achieve its main objectives.

WP6 has undertaken 24 project evaluations in the last 24 months, completed 10 evaluations and has 14 ongoing project evaluations at various stages of completeness. The completed evaluations have added to the previous EWG evaluations, meaning that 70 projects have been evaluated by ERRAC since 2006.

From WP6, ERRAC Evaluation Working Group (EWG) has developed guidelines to provide ERRAC Work Package leaders, and others who are proposing research topics, activities and actions at National and European level, with the information needed to ensure strong market uptake. This has resulted in improvement in the impact of the rail research proposed by ERRAC.

***List of tables***

Table 1 Ongoing project evaluations ..... 14

***List of figures***

Figure 1 ERRAC EWG general methodology (monitoring and evaluation) ..... 8

Figure 2 General statistics on the market uptake of rail research projects evaluated by  
ERRAC EWG ..... 15

Figure 3 Breakdown of projects included in the EWG database on categories of main work  
package (total – 171 projects) ..... 15

## 1. Introduction

The Foster Rail project has been developed to assist ERRAC and other land-transport related ETPs to define future research needs for their strategies and programmes, so as to realise the Objectives of the Europe 2020 Strategy and work towards the aims of the White Paper 2011<sup>3</sup>.

The CSA project itself comprises 8 Work Packages which, including project management and dissemination activities, interact to; enhance cooperation and communications between ETP, national platform and the Shift<sup>2</sup>Rail Joint Undertaking, define the a rail business scenario for 2050, assess existing strategies and roadmaps, develop these further to contribute to 2050 strategy fulfilment, assess the strategic and innovative impact of previous and new funded projects and programmes in terms of market impact and uptake. Work Package 6 (WP6) “Monitoring to improve rail research innovation” undertakes specifically the final actions mentioned.

WP6 (in both current Foster Rail and previous ERRAC Road Map projects) supports the ERRAC Project Evaluation Working Group (EWG). It addresses the strengthening of the effectiveness of research and innovation capacities of the rail sector in Europe by determining the implementation of previous research and monitoring of rail research projects from relevant programmes.

The EWG has previously used the evaluation method developed to evaluate 70 projects from over 170 projects in the ERRAC rail projects database, which is continuously enlarging.

The EWG helps to identify, check and support proposals that clearly fill a gap in the roadmaps and support ERRAC strategy particularly for strategic proposals for the good of the sector.

Previously, the rail sector did not know the market impact of previous research and a great deal of research funding has been wasted on research that has had no demonstrable impact. This needed to change.

WP6 of Foster Rail aids this effort through 3 Tasks:

- T6.1 Monitoring of Ongoing relevant Projects
- **T6.2 Evaluation of Past rail projects**
- T6.3 Case Studies

Deliverable 6.3 report outlines progress made to date (months 1 to 24) within Task 6.2 activities only, which within FOSTERRAIL will be conducted over 36 months.

This deliverable focuses on the market impact of previous rail research to improve use of research funding and to ensure a strategic approach to the prioritisation of rail research.

The selection of the individual projects is described as is how they are evaluated using the evolved methodology. It is important to make sure that the projects have had an opportunity to have an impact to have been successfully disseminated and therefore the projects have to have been completed and finalised. The fact that project are finished does create difficulties in contacting the people who know about the projects, but this is essential to ensure that the results of previous rail research is not. Once an evaluation is done the impact is available and can be used by follow-on projects and taken into account in future research. The recording of past research helps to improve the effectiveness of the ERRAC rail roadmaps by preventing duplication of previous research and identifying the gaps in future research.

---

<sup>3</sup> “Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system”

## **2. Objectives**

During the past years and previous Framework Programmes, a great number of important railway research projects have borne fruit. Additionally, out with the Framework Programmes, valuable work has been carried out on a national level, in private and public settings, within the major European organisations. When analysing the present situation of the rail transport system and thinking about possible ways of improvement, it is not easy to be fully aware of all relevant research carried out to date. As consequence valuable research results are lost and the risk of redundant results in new projects is significant. Building on previous experiences is difficult.

The ERRAC EWG plays an advisory role for European and national projects ideas in terms of market uptake or implementation, as it evaluates finished projects and analyses their success/failure factors and market uptake in order to communicate this information to the stakeholders in general.

The main objectives<sup>4</sup> of the ERRAC EWG are:

1. To provide essential information to stakeholders and roadmap producers on lessons learnt from the evaluation of past projects to promote a more systemic and focused approach to the use of funding resources and to enhance real market uptake of project results.
2. To provide a database of evaluations of previous European projects to support the ROADMAPS Work Packages and ensure that lessons from valuable research undertaken in the past are not forgotten.

Within these two broad objectives, further objectives can be highlighted:

- To determine the market impact of previous rail research, in order to improve use of research funding;
- To ensure a strategic approach to the prioritisation of rail research Project Evaluation;

The EWG coordinates among different stakeholders to carry out the important information needed for the sector in terms of R&D. The goal of this Foster Rail deliverable is to improve the methodology in order to scrutinise and assess the contribution of projects (starting, ongoing, and finished) to the ERRAC ROADMAPS and SRRA goals.

Foster Rail WP6 Objectives:

- Help to identify, check and support proposals that clearly fill a gap in the roadmaps and support ERRAC strategy particularly for strategic proposals for the good of the sector.
- Monitor on-going rail projects to validate their progress towards the impacts promised in the proposal.
- Evaluation of finalised projects
- Management of all relevant information concerning monitoring innovation aspects, achieved results, and review of all research projects and evaluations see to it that all are brought together in a common database, open to stakeholders and roadmap producers.
- Organisation of workshops to foster innovation aspects.

Specifically, the Foster Rail Task 6.2 Objectives:

- To ensure that the result of previous rail research can be taken into account for future projects, improving the effectiveness of the rail roadmaps

---

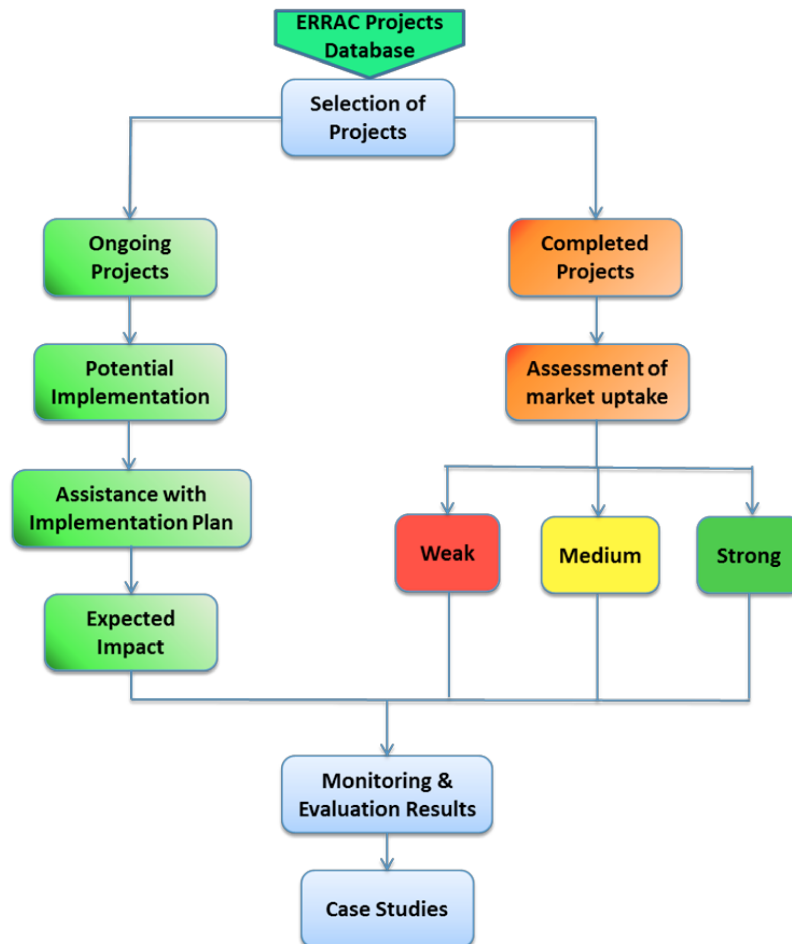
<sup>4</sup> Evaluation Working Group -ERRAC Roadmaps WP06 - PRELIMINARY REPORT, MARCH 2012

- To avoid weak market uptake of results by learning the lessons of previous research
- For the EWG to provide intelligence based on the project evaluations for input into future European Framework Programmes.

The body of this report will explain how this work has been initiated in the first 12 months of the Foster Rail project on determining the impact of past European research projects. The EWG evaluates completed projects from the ERRAC database which has details of all Rail-related past and current rail research funded by the European Commission. A methodology has been developed to evaluate the market impact of projects and assess the contribution of evaluated projects to the ERRAC ROADMAPS and Strategic Rail Research Agenda (SRRRA) goals. This information provides inputs to EC Project officers during the negotiation phase and during the course of the projects for project review. EWG has evaluated successfully completed rail research projects in order to analyse the success/failure factors related to actual market uptake and determine market uptake from an industry perspective in order to determine the return on research investment.

### 3. Methodology

The overall EWG philosophy and WP6 methodology are summarised within below Figure 1.



**Figure 1 ERRAC EWG general methodology (monitoring and evaluation)**

Overall, the WP6 focuses on the following **key activities**:

- Monitoring of ongoing projects
- **Evaluation of past research**
- Case studies

In order to support the main above activities, WP6 has to carry out **other activities**, namely:

- ✓ Administration of ERRAC projects database;
- ✓ Dissemination;
- ✓ Coordination with project coordinators and the EC.

The **evaluation methodology** is based on the analysis of project results and deliverables, together with a set of interviews to project participants and other stakeholders, aimed at determining the actual implementation and market uptake of the project results by the rail sector once the work has ended, according to the following definitions/criteria:



- **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 potential.
- **Medium Market Uptake:** A project is evaluated with medium market 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 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.

The evaluation is prepared as a presentation, using a **project evaluation template** to provide the EWG with guidance in evaluation of the past project. The presentation comprises the following **main parts**:

- I. *Fundamental Information;*
  - II. *Project Background;*
  - III. *Evaluation;*
  - IV. *Conclusions of the Evaluation.*
- 
- I. *Fundamental Information*

The first slide sets the scene offering relevant information on ERRAC, in general, and the EWG and its evaluation activities, in particular.

This is followed by specific project information, a summary cover slide that needs completing with the following information:

- *Project Acronym – contains Project denomination in Acronym form as used in FP Project;*
- *FP – the Framework Programme under which the Project is funded: FP 4, 5, 6 or 7 or eventually H2020;*
- *Programme Acronym – as in the call which enabled the project funding;*
- *Project Reference;*
- *Call identifier – as in the FP programme which funded the project;*
- *Total Cost – the total cost of the project consisting including both the EU contribution and the co-funding invested by participating partners;*
- *EU Contribution – the total amount of EU contributions for the project;*
- *Timescale – the starting and ending dates of the project;*
- *Project Coordinator (name and organisation);*
- *Web references – links of the project website and other relevant databases where the project may be registered;*
- *Presented by: - the expert who prepared the evaluation;*
- *Date evaluated – when the project was presented and evaluated;*
- *Market uptake – the level of market uptake, as agreed by the members of the EWG (S – Strong, M – Medium, or W – Weak);*
- *Follow on projects: Acronym(s) of such projects, if any;*
- *Other related projects: Acronym(s) of such projects, if any.*

The next slides present key information with respect to the project's foundation and development, namely:

- *Premise*
- *Rationale*;
- *Main Objectives*.

This is followed by information on the project consortium, i.e., the list of partner organisation, coordinator and contacts' details, completing thus the administrative data.

## *II. Project Background*

The following part of the presentation consists of the **background information** for supporting the evaluation, and is based both on the documentation gathered by the expert preparing the evaluation and on the interviews. The background is structured in the following sections:

- *Partners Interviewed* - a slide showing the persons which were interviewed about the project's results and implementation;
- *Project Description* – a comprehensive description of the project activities;
- *Achievements* – the project's claimed results and potential implementation.

## *III. Evaluation*

This part includes the project evaluation slides, which are completed with respect to the 12 key questions, based both on the facts identified by the evaluator expert and on the set of interviews with the projects' partners. **The interviews** carried out by the EWG members for the project evaluations are based on a set of questions, which are directed towards the past project participants and/or potential beneficiaries of the project results.

The first two questions relate to actual results of the project:

- 1. Were the results implemented in the design of new products and services? Were these new products/services put into commercial operation?*
- 2. Is new legislation and/or standardisation based on findings from this research project?*

The following questions assess the scale of the impact (if any):

- 3. Are the results implemented across Europe or only in a small number of Member States?*
- 4. Were the results of the project implemented outside Europe before being accepted in Europe?*

The next questions define how the impact is realised and if/how competitiveness is improved, and try and determine the qualitative and quantitative impacts:

- 5. Did the project increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design?*
- 6. Did the project increase competitiveness of railway transportation compared to other transport modes?*
- 7. Are the results of the project taken into consideration when preparing public tenders?*
- 8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability?*
- 9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality?*
- 10. Can benefits be assessed in financial terms?*
- 11. Applicability of results to future scenarios?*
- 12. Are the results useful for future and new projects (incl. modelling)?*

#### IV. Conclusions of the Evaluation

As a result of the evaluation related to the key questions, the market uptake is determined and the presentation is completed in the final slides with the evaluation's conclusions, in particular:

- *Reasons for Outcome;*
- *Lessons Learnt.*

The evaluation activity in Foster Rail project builds on the previous work of the Evaluation Working Group, continuing and developing its tasks. The development and administration of **ERRAC rail research database** is an important activity within WP6, essential to support the evaluation of past research and achieve its main objectives.

The database also contains the results of the evaluations carried out by the Evaluation Working Group. All rail research information related to finalised and ongoing projects is targeted and gathered for the monitoring and evaluation activities.

The ERRAC projects' database was initially developed and further completed within the ERRAC Roadmaps project. The results of the evaluations carried out (including market uptake, reasons for outcome and lessons learnt) were later added in a separate section to the database, and it was completed with more options, versions and facilities.

The development of the internal ERRAC database consisted of the following **main activities**:

1. Identification of rail research projects – the main source of information was the official website of the European Commission, but a wide number of projects were known and directly suggested by the members of ERRAC Evaluation Working Group. Although just projects entirely dedicated to rail topics were initially considered, the database was enlarged afterward with other projects focusing on different topics (freight and logistics, urban mobility, etc.) and connected in a certain degree to rail sector.
2. Gathering of information – a summary of essential data related to each project was captured from reliable sources such as projects' official websites, European Commission website, other organisations involved in the rail/transport data management (TRKC, UIC, TRIP, etc.)
3. Filling the database – the information gathered on rail research projects was structured and categorised in a specific template which was developed. The Excel spreadsheet format was initially selected for managing all the information; multiple spreadsheets were further developed and used to populate the database.
4. Development, maintenance and update – the database was continuously developed and improved according to the specific activities and requirements of the Evaluation Working Group. The information had to be periodically updated, considering new identified European funded projects, and the outcomes of the evaluations made on the finalised projects.

## 4. Evaluation of past projects

ERRAC Evaluation Working Group (EWG) has selected and initiated the evaluation process of 15 past projects as the main activity within task 6.2 since the WP6 kick off within Foster Rail project. In the first 24 months, the EWG has finalised the market uptake evaluation of 10 completed projects and other 9 evaluations are ongoing.

### 4.1 Finalised evaluations

The evaluated projects and the overall evaluation results obtained for each to date are briefly summarised below.

**TIGER** Transit via Innovative Gateway concepts solving European Intermodal Rail needs

**TIGER DEMO** Trans-Rail Integrated Goods European-Express Routes Demonstrators

UNEW (Dan Otteborn and Cristian Ulianov) has prepared the documentation for the evaluation of **TIGER** project and its follow up, the pilot action **TIGER DEMO**, which aimed to develop a feasible European Intermodal Rail solution to EU ports and road congestion, by introducing a new business model via dry ports. The reduction of port congestion through dry ports & hinterland innovative distribution models and a better utilisation of existing resources aimed to increase the capacity on existing rail lines, reduce the costs and transit time. After the evaluation, it was concluded that these projects have a **strong market uptake** (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

**CANTOR** Coordinating Noise Transportation Research and Engineering Solutions

UNEW (Dan Otteborn) has prepared the documentation for the evaluation of **CANTOR** project, which aimed to enhance the knowledge and disseminate information on noise pollution. More specifically, the main aim was to engage experts from the vehicle manufacturing industry chain, from system to component level, government agencies and renowned research groups, and to focus jointly on improved performance with a reduced impact on the environment, enabling a balanced system cost and maintaining comfort in road, rail and waterborne vehicles. After the evaluation, it was concluded that this project has a **weak market uptake** (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

**NEWOPERA** New European Wish: Operating Project for a European Rail Network

UNEW (Dan Otteborn) has prepared the documentation for the evaluation of **NEWOPERA** project, which aimed to contribute to invert the declining trend of EU railways by implementing the introduction of the dedicated rail freight networks concept, backed by a sound socio-economic and environmental assessment, and set up sound methodologies for the distribution of traffic flows over railway networks. After evaluation, it was concluded that this project has a **strong market uptake** (detailed evaluation in (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

**INMAR** Intelligent Materials for Active Noise Reduction

UNEW (Dan Otteborn) has prepared the documentation for the evaluation of **INMAR** project, which aimed to develop new complex multifunctional passive, semi-active and active materials, material structures and technologies for active noise reduction. After evaluation, it was concluded that this project has a **strong market uptake** (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

**InteGRail** Intelligent Integration of Railway Systems

UNEW (Dan Otteborn) has prepared the documentation for the evaluation of **INTEGRAIL** project, which aimed at developing an Intelligent Coherent Information System by integrating the main railway systems. The objective was to achieve a higher level of coordination and cooperation between the key railway processes. The benefit will be higher levels of performance (in terms of capacity, average speed and punctuality), safety and optimised usage of resources. After evaluation, it was concluded that this project has a **weak market uptake** (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

**INESS** Integrated European Signalling System

UNEW (Dan Otteborn) has prepared the documentation for the evaluation of **INESS** project, which aimed to define and develop specifications for a new generation of interlocking systems, and extend and enhance thus the standardisation process according to the current European policies. The specific technical objectives were:

- To define a common kernel of validated standardised functionalities for future interlockings;
- To propose one or more standardised system architectures and the relevant functional interface with the adjacent subsystems optimised for ERTMS L2 and L 3;
- To develop a common business model and the associated business cases and cooperation models to support intelligent migration strategies for ERTMS;
- To develop a road map (exploitation plan) towards interoperable, standardised interlocking platforms, and implement the concept of self-aware intelligent trains.

The Evaluation Working Group has concluded that the project has a **medium market uptake** (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

**CarCIM** Integration of Two-Component Ceramic Injection Moulding for Large-Scale Production of Novel Multifunctional Ceramic Components for Automotive and Railway Applications

UNEW (Mark Robinson) has prepared the documentation for the evaluation of **CarCIM** project, in relation with the market uptake in the rail sector (the project addressed solutions for automotive industry, as well). The project was designed to develop and test prototypes produced by 2 component ceramic injection moulding (2C-CIM) and demonstrate the capability of low-cost, large-scale shaping of complex ceramics. The project resulted in four 2C-CIM prototype parts, which were tested and assessed. One of the prototypes was relevant to rail sector, the ceramic braking pads for high speed trains. The evaluation concluded that this project had a **weak market uptake** with respect to the envisaged implementation in the rail sector (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

**CALM** Community Noise Research Strategy Plan**CALM II** Advanced Noise Reduction Systems

UIC (Dennis Schut and Axel Gougelet) has prepared the documentation for the evaluation of **CALM** project and its follow up, **CALM II**. CALM project aimed to establish a new thematic network to define a strategic plan for future noise research which is required to promote EU wide noise reduction and to improve the quality of life in Europe, in order to support the further development of the EU noise policy. The overall strategic objective of the follow-up project was to synchronise and encourage the European transport noise research through a holistic system approach involving all related research areas. CALM II was designed to facilitate the networking of organisations, the coordination of activities and the exchange and dissemination of knowledge so as to optimise research efforts, reach critical mass, strengthen the complementarity and coherence of noise research objectives and enhance the impact at a European level.

The Evaluation Working Group evaluated the projects and agreed that they had a **strong market uptake** (detailed evaluation in Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project).

## 4.2 Ongoing evaluations

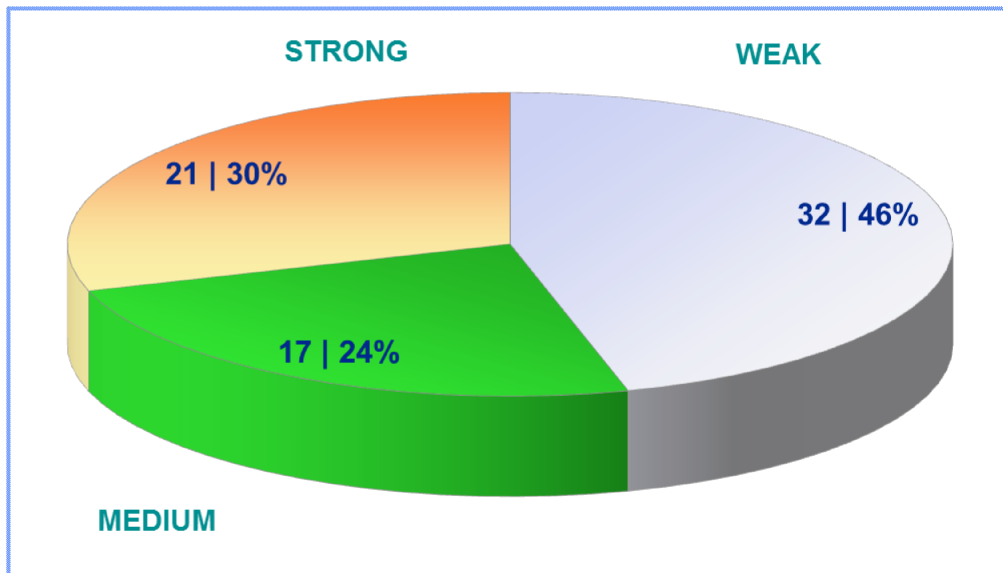
Apart from the finalised evaluations presented in the previous section, the EWG has selected other projects and proceeded with their evaluation. The other 14 projects currently under evaluation are listed in below Table1.

**Table 1 Ongoing project evaluations**

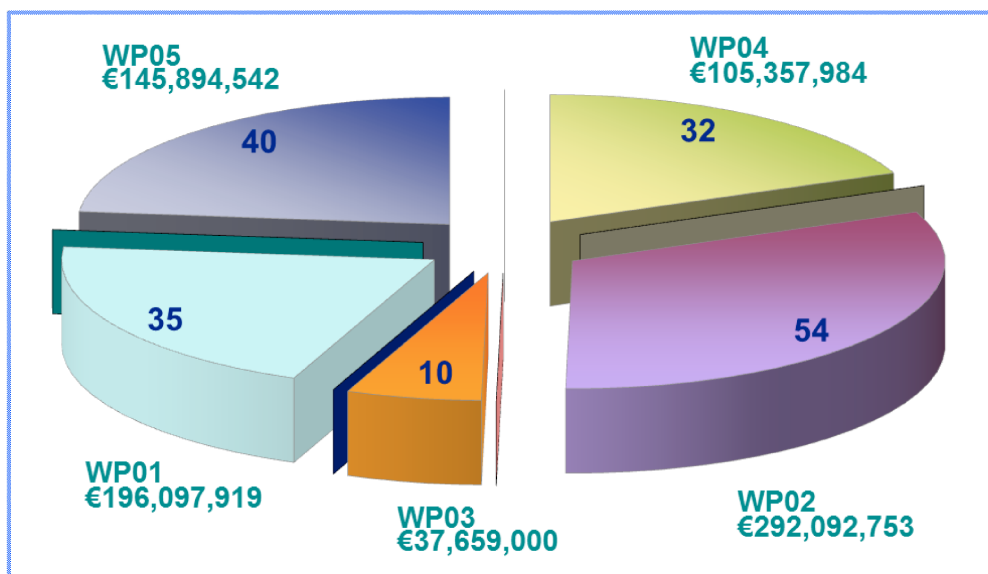
Project acronym	Project full title
<b>INNOTRACK</b>	Innovative Track Systems
<b>MODURBAN</b>	Modular Urban-guided Rail Systems
<b>MODSAFE</b>	Modular Urban Transport Safety and Security Analysis
<b>SPURT</b>	Seamless Public Urban Rail Transport
<b>ERRVIN</b>	Managing the Dynamic Interaction Between the Vehicle and the Infrastructure
<b>RAILENERGY</b>	Innovative Integrated Energy Efficiency Solutions for Railway Rolling Stock, Rail Infrastructure and Train Operation
<b>Q-CITY</b>	Quiet City Transport
<b>CO-ACT</b>	Creating Viable Concepts for Combined Air/Rail Cargo transport
<b>URBAN TRACK</b>	Urban Rail Infrastructure
<b>BRAVO</b>	Brenner Rail Freight Action Strategy Aimed at Achieving a Sustainable Increase of Intermodal Transport Volume by Enhancing Quality, Efficiency, and System Technologies
<b>EUDD</b>	European Driver's Desk
<b>EUDDPLUS</b>	European Driver's Desk Advanced Concept Implementation
<b>INFRACLEAR</b>	Rail Infrastructure Clearance Management

### 4.3 Summary of data and statistics

The overall situation of rail research projects evaluated by ERRAC EWG is summarised in Appendix 1 Summary of projects evaluated by ERRAC Evaluation Working Group (2006 – 2015). A number of 66 projects had been evaluated in the period 2006 – 2014. Figure 2 below shows the statistics on the market uptake of these evaluated projects.



**Figure 2 General statistics on the market uptake of rail research projects evaluated by ERRAC EWG**



**Figure 3 Breakdown of projects included in the EWG database on categories of main work package (total – 171 projects)**

- WP01 - The greening of surface transport;
- WP02 - Encouraging modal shift and decongesting transport corridors;
- WP03 - Ensuring sustainable (sub) urban transport (including modal shift, suburban and regional rail, light rail and metro, and sustainable urban mobility);
- WP04 - Improving safety and security;
- WP05 - Strengthening competitiveness.

## **5. Conclusions and recommendations**

1. Make it clear that projects should search for viable solutions in terms of applicability and cost implications, and develop real business cases;
2. Think of future market uptake and what happens after project ends: the project as an enabler and not an end to itself;
3. Clearly define scope, inputs and deliverables of project at inception. Specify meta-goals of projects and develop implementation strategy/ plan (a mandatory critical factor), identifying targeted users for dissemination of results;
4. Clarify ownership of project results and deliverables at inception;
5. Select committed partners really interested in finding and applying viable solutions (e.g. for new products, involve companies that actually make them to avoid barriers to implementation);
6. 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);
7. Set-up a Steering Group of experts/stakeholders familiar with context at play, to be in charge of advisory aspect and exploitation of results once the project has ended;
8. Plan for knowledge retention and dissemination at inception;
9. Establish clear communication channels and frequency of exchange;
10. Conduct a regular review on post-project progress (possibly electing a project responsible/promoter).

## **6. Reasons for outcomes**

The ERRAC Evaluation Working Group (EWG) has developed guidelines to provide ERRAC Work Package leaders, and others who are proposing research topics, activities and actions at National and European level, with the information needed to ensure strong market uptake. The guidelines should also be used by project proposal coordinators before submission and project coordinators during the project execution with advice on how to initiate, build and lead a successful research project in terms of market uptake. These recommendations are based on the evaluation work carried out by the members of the group. The ERRAC Evaluation Working Group determines the market impact of previous rail research to improve use of research funding and to ensure a strategic approach to the prioritisation of rail research. The major aspects to come out of these guidelines are defined below.

There needs to be a sound business case (preferably quantitative). It is important to ensure that the results of previous rail or other relevant research are taken into account for the proposal, and there should be no wasteful duplication of results. The need for the project should be demonstrated with market analysis included in the project proposal. The target of the proposal and the implementation of project results should not be against the strategic interests of any stakeholders. As far as possible ensure that future investments based on the project results are taken into account prior the start of the project. Projects should search for viable solutions in terms of applicability and cost implications, and develop real business cases (from inception).



It is crucial to build a strong and appropriate consortium which involves key stakeholders of the sector (train manufacturers, suppliers, operators, infrastructure managers) and selecting committed partners really interested in finding and applying viable solutions. So that there is no confusion between partners it is necessary to define clearly the scope, inputs and deliverables of the project and the partners' responsibilities at the start of the proposal building. Ensure partners have the financial capacity to support the project activities.

Clarify at an early stage the ownership of project results. It is good practice to have a system so that the ownership of the concept and patents (Intellectual Property Rights) have been taken into account at project inception. Ensure that the owner of the results is identified from the beginning and is prepared to exploit the results.

As the project is part funded by the EC, dissemination and exploitation of project results is a key aspect and to achieve efficient dissemination and exploitation it is important to specify the specific market implementation goals of the project. This can be enhanced by developing an implementation strategy/ plan (a mandatory critical factor) including the identification of early implementer(s), identifying targeted users for dissemination of results. At an early stage identify deliverables that have the potential to become a European standard, enhance an existing standard or be used as a guideline. A plus point is the establishment of an Advisory Group of experts, stakeholders and end-users familiar with context at play, to be in charge of the advisory aspect and consensus building related to the exploitation of results once the project has ended.

## **7. Lessons learnt**

### **How to ensure a Strong market uptake**

Roadmaps completed have established a level of knowledge to accurately predict a success in market uptake.

As a result it is possible 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.

A good process of thinking in advance, based on lessons learnt from other projects, can lead to a much better focus to help devise new rail research projects that can guarantee concrete market uptake, offering widely acknowledged improvements and solutions for the future rail industry and market in general.

### **1. Consortium building:**

#### **Avoid weak and inappropriate partnership:**

- Involvement of key stakeholders of the sector (train manufacturers, suppliers, operators, infrastructure manager)
- Selection of 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 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);
- Ensure the partners have the financial capacity to support the project activities.

## **2. Ownership of project results:**

- The issues related to the ownership of the concept and patents (Intellectual Property Rights) have to be properly taking into account at project inception;
- More emphasis on the fact that subsequent projects (in the same area) are taking into account the deliverables;
- What happens with the results once the project is over?
- Set-up a formal process to handover the results to the institution entitled to implement them

## **3. Sound business case (if applicable):**

- Market analysis should be included in the project proposal;
- Ensuring that the implementation of project results are not against the strategic interests of any stakeholders;
- Ensure that future investments based on the project results are taken into account prior the start of the project;
- Projects should search for viable solutions in terms of applicability and cost implications, and develop real business cases (from inception);
- Divided business case: the ownership of implementation of project results is not clearly defined

## **2. Ownership of project results:**

- The issues related to the ownership of the concept and patents (Intellectual Property Rights) have to be properly taking into account at project inception;
- More emphasis on the fact that subsequent projects (in the same area) are taking into account the deliverables;
- What happens with the results once the project is over?
- Set-up a formal process to handover the results to the institution entitled to implement them

## **3. Sound business case (if applicable):**

- Market analysis should be included in the project proposal;
- Ensuring that the implementation of project results are not against the strategic interests of any stakeholders;
- Ensure that future investments based on the project results are taken into account prior the start of the project;
- Projects should search for viable solutions in terms of applicability and cost implications, and develop real business cases (from inception);
- Divided business case: the ownership of implementation of project results is not clearly defined

## **4. Relations with other projects:**

- Avoid duplications, repetitions, overlaps of research projects (analysis of the potential past projects in the area of work) – EWG database is available for further information;
- Need for follow-up project identified from the beginning of the project;
- Include a proper input (if necessary) from past or ongoing research projects.

### **5. Proficient management:**

- Ensure that the implementation of the project objectives is reached taking into account strategic and financial considerations;
- Ensure that co-ordination and a common comprehensive strategy are established between the different consortia building new projects in a specific domain;
- Establish clear communication channels and frequency of exchange within the consortium;
- Conduct a regular review on post-project progress (possibly electing a project responsible/promoter).

### **6. Dissemination and exploitation of project results:**

- Clearly define the scope, inputs and deliverables of the project at inception. Specify meta-goals of projects and develop implementation strategy/ plan (a mandatory critical factor), identifying targeted users for dissemination of results;
- Set-up a Steering Group of experts/stakeholders familiar with context at play, to be in charge of advisory aspect and exploitation of results once the project has ended;
- Plan for knowledge retention and dissemination at inception.

**A checklist** was developed to be used before submission and during project execution.

Major aspects include:

- *Sound business case*
- *No duplication*
- *Market analysis provided*
- *Target of proposal and implementation of project results*
- *Viable solutions sought*
- *Strong consortium*
- *Clarification of ownership of project's results*
- *Clear dissemination and exploitation plan*
- *Motivation and willingness to continue forward market uptake after the completion of the research project*

### Appendix 1 Summary of projects evaluated by ERRAC Evaluation Working Group (2006 – 2015)

Work Package / Area (main)	Project Acronym	Subject and Scope	Coordinator	Market uptake	FP	Evaluation prepared by	Evaluation Date
<b>WP01</b> The greening of surface transport	<b>CALM</b>	Community Noise Research Strategy Plan	Mr. Helmut List AVL List GmbH, Graz (A)	<b>S</b>	<b>5</b>	Dennis Schut	10/06/2014
<b>WP01</b> The greening of surface transport	<b>CALM II</b>	Advanced Noise Reduction Systems	Mr. Helmut List AVL List GmbH, Graz (A)	<b>S</b>	<b>6</b>	Dennis Schut	10/06/2014
<b>WP01</b> The greening of surface transport	<b>CANTOR</b>	Enhance the knowledge and disseminate information on noise pollution.	Prof.Anders Nilsson - Kungl Tekniska Högskolan-Stockholm (SE)	<b>W</b>	<b>6</b>	Dan Ottenborn	28/01/2014
<b>WP01</b> The greening of surface transport	<b>CONVURT</b>	Control of Underground Vibration	Mr.Michael Gellatley - London Underground Ltd.	<b>M</b>	<b>5</b>	Andrew Foster	11/09/2007
<b>WP01</b> The greening of surface transport	<b>CORRUGATION</b>	Urban Rail Track Corrugation in heavy metro & light rail	Dr.Patrick Vanhonacker - Dynamics, Structures and Systems international (Belgium)	<b>M</b>	<b>5</b>	Luisa Velardi	25/01/2008
<b>WP01</b> The greening of surface transport	<b>EMC-ARTS</b>	CCS Sub-System: EMC impact on Signals	Prof.Maurizio Mazzucchelli - Centro Interuniversitario di Ricerca Trasporto-Genoa (It)	<b>W</b>	<b>5</b>	Davide Pifferi	06/07/2010
<b>WP01</b> The greening of surface transport	<b>GREEN</b>	Improvements to heavy duty engine - automotive and rail vehicles	Ms. Monica Ringvik-Volvo Powertrain Aktiebolag	<b>W</b>	<b>6</b>	Mark Robinson	19/05/2010
<b>WP01</b> The greening of surface transport	<b>INFRASTAR</b>	Surface coating of high stress parts of the rail surface	Mr.Peter Van Klingereren - AEA Technology Rail BV (NE)	<b>W</b>	<b>5</b>	David Fletcher	18/07/2008
<b>WP01</b> The greening of surface transport	<b>INMAR</b>	Active Noise Management for road and rail applications	Prof.Holger Hanselka - Fraunhofer Gesellschaft zur Forderung der Angewandten Forschung E.V. München (DE)	<b>S</b>	<b>6</b>	Dan Ottenborn	07/03/2014
<b>WP01</b> The greening of surface transport	<b>PROSPER* (not EC funded)</b>	Environmental Assessment for all mainline and urban transit Rolling Stock	Thomas Melham by University of Glasgow (UK)	<b>M</b>		V. Andriès ALSTOM	11/12/2007
<b>WP01</b> The greening of surface transport	<b>RAVEL</b>	Environmental Assessment Methodology - All Mainline and Urban Transit Rolling Stock	Mr. Michael Schmmmer	<b>M</b>	<b>4</b>	V. Andriès ALSTOMt	11/12/2007
<b>WP01</b> The greening of surface transport	<b>REPID</b>	Environmental Assessment for all mainline and urban transit Rolling Stock	Mads Bergendorff (UIC)	<b>M</b>	<b>5</b>	V. Andriès ALSTOM	11/12/2007
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>CarCIM</b>	CERAMIC Components for the Automotive and Rail Sector	Dr. Tassilo Moritz - Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung E.V. (FHG) -Karlsruhe (DE)	<b>W</b>	<b>6</b>	Mark Robinson	28/04/2015
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>CARGOSPEED</b>	Road Rail Intermodality	Mr.Karsten Bruenings - BLG CONSULT GmbH (DE)	<b>W</b>	<b>5</b>	Mark Robinson	19/05/2010
<b>WP02</b> Encouraging modal	<b>CATIEMON</b>	Catenary monitoring for interoperable cross border operation in passenger and	Dr.Uwe Henning - SIEMENS AG - München (DE)	<b>W</b>	<b>6</b>	Christophe Cheron	11/09/2007

shift and decongesting transport corridors		freight rail transport					
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>EDIP</b>	Multiple unit operation of freight trains	Mr.Salomon Berner - TEKELEC SYSTEMES (Fr)	<b>W</b>	<b>5</b>	Christophe Cheron	13/10/2006
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>ERTMS Test Preparation Rail 2.1.1/2.1.5</b>	Users Specification of the complete ERTMS System	Mr C. Carganico - EEIG ERTMS Users Group- Bruxelles (BE)	<b>S</b>	<b>4</b>		
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>EUFRANET</b>	European Freight Railway Network	Mr.Fei Jiang - Institut National de Recherche sur les Transports et leur Sécurité (Fr)	<b>W</b>	<b>4</b>	Karsten Krause	19/06/2006
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>FIRE</b>	Freight Information on the Railway Environment	Ing.Gino Di Mambro - Ferrovie dello Stato SpA (It)	<b>W</b>	<b>4</b>		22/08/2006
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>F-Man</b>	Rail Car Asset Management of International Freight Wagons	Prof.Stefano Savio - University of studies of Genoa (It)	<b>W</b>	<b>5</b>		22/08/2006
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>HEROE</b>	Harmonisation of European Rules for ERTMS operation	Mr.Claudio Traverso - EEIG ERTMS users group Bruxelles (BE)	<b>W</b>	<b>4</b>	Luisa Velardi	11/12/2007
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>HISPEEDMIX</b>	High Speed Freight on the European HS Network	Mr.Paolo De Cicco - FS SpA - Rome (It)	<b>W</b>	<b>4</b>	Karsten Krause	19/06/2006
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>IN.HO.TRA</b>	Innovative Intermodal Freight Wagons	Mr.Christoph Seidelmann - Studiengesellschaft für den Kombinierten Verkehr E.V.- Frankfurt a M. (DE)	<b>W</b>	<b>5</b>	Frank Michelberger	08/07/2009
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>INTELFRET</b>	Intelligent Freight Train	Mr.Gheorghe Barbu - Foundation European Rail Research Institute- Utrecht (NL)	<b>W</b>	<b>4</b>	Sonal Mitra	11/12/2007
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>LISA</b>	Light Foam Structures for all transport modes	Mr.Rüdiger Dorner (DE)	<b>W</b>	<b>5</b>	Andrew Foster	30/05/2007
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>NEWOPERA</b>	Development of Rail Freight Networks	Consorzio per la Ricerca e lo Sviluppo di Tecnologie per il Trasporto Innovativo - CONSORZIO TRAIN (It)	<b>S</b>	<b>6</b>	Dan Ottenborn	29/01/2014
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>OPTIRAILS</b>	Optimisation of Rail Traffic Corridors via ERTMS, etc	Mr.Maurice Genete -SYSTRA (Fr)	<b>S</b>	<b>4</b>	Aurora Ruiz	
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>OPTIRAILS II</b>	Optimisation of Rail Traffic Corridors via ERTMS, etc	Mr.Michel Leboeuf -SYSTRA (Fr)	<b>S</b>	<b>5</b>	Aurora Ruiz	
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>RAILSERV</b>	Enhancing competitiveness of Rail Freight	Mr. Wladimir Segercrantz - Technical Research Centre of Finland (Fi)	<b>W</b>	<b>5</b>	Luisa Velardi	18/07/2008

<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>REORIENT</b>	Seamless international rail freight transportation, focusing on up to 10 trans-European corridors	Mr.Mario Moya - Ingenieria de Sistemas para la Defensa de Espana, S.A. (E) and Johanna Ludvigsen TOI	<b>W</b>	<b>6</b>	Luisa Velardi	26/03/2008
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>SANDWICH</b>	Lightweight road, rail & marine applications of Composites	Dipl.-Ing.Jochen Zerrahn - Jos. L. Meyer GmbH (DE)	<b>W</b>	<b>5</b>		
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>TIGER</b>	European Intermodal Rail solution to EU ports and road congestion.	Consorzio TRAIN (I) Valerio RECAGNO	<b>S</b>	<b>7</b>	Dan Ottenborn	07/03/2014
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>TIGER DEMO</b>	European Intermodal Rail solution to EU ports and road congestion.		<b>S</b>	<b>7</b>	Dan Ottenborn	07/03/2014
<b>WP02</b> Encouraging modal shift and decongesting transport corridors	<b>TRACAR</b>	Traffic and cargo supervision system	Mr.Guy Robinson - Mercury Communications Ltd (UK)	<b>W</b>	<b>4</b>	Luisa Velardi	31/01/2007
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>BESTUFS</b>	Urban Freight Best practise	Mr.Hans Hubschneider - PTV PLANUNG TRANSPORT VERKEHR AG (DE)	<b>W</b>	<b>5</b>	Cristian Ulianov	16/09/2010
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>BESTUFS II</b>	Urban Freight Best practise	Mr.Hans Hubschneider - PTV PLANUNG TRANSPORT VERKEHR AG (DE)	<b>W</b>	<b>6</b>	Cristian Ulianov	16/09/2010
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>CROSSRAIL</b>	Integration of Tramtrain Systems	Hans-Ole Skovgaard - Scanrail Consult Scandinavian Engineers & Planners (DK)	<b>W</b>	<b>5</b>	Cristian Ulianov	06/07/2010
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>ESCARV</b>	EMC impact investigation for mainline Rolling Stock & Infrastructure Sub-Systems	Stefan Schmidt- ABB Daimler Benz transportation GmbH (DE)	<b>W</b>	<b>4</b>	Davide Pifferi	16/09/2010
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>EURFORUM</b>	Urban Mobility Research Forum	Mr.Laurent Franckx - Union Internationale des Transports Publics (BE)	<b>S</b>	<b>6</b>	Yves Amsler Caroline Hoogendoorn	13/12/2011
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>LIBERTIN</b>	Light Rail Thematic Network: standards and testing	Dr.Eng.Udo Sparmann - Transport Technologie Consult Karlsruhe GmbH (DE)	<b>S</b>	<b>5</b>	Yves Amsler Caroline Hoogendoorn	
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>UGTMS</b>	Urban Guided Transport Management System	Mr.Guy Bourgeois - Régie Autonome des Transports Parisiens	<b>M</b>	<b>5</b>	Dan Otteborn	09/03/2006 07/09/2011
<b>WP03</b> Ensuring sustainable (sub)urban transport	<b>UNIACCESS</b>	Design of universal accessibility systems for public transport	Dr.Javier Urruzola - Grupo Interes Accesibilidad Transporte A.I.E. (E)	<b>W</b>	<b>6</b>	Mark Robinson	27/01/2010
<b>WP04</b> Improving Safety & Security	<b>ALJOIN</b>	Aluminium Jointing for all transport modes	Dr. Giampaolo Vaccaro - D'Appolonia SpA- Genoa (It)	<b>S</b>	<b>5</b>	Mark Robinson	28/05/2008
<b>WP04</b> Improving Safety & Security	<b>ALJOIN plus</b>	Aluminium Jointing for all transport modes	Dr. Giampaolo Vaccaro - D'Appolonia SpA- Genoa (It)	<b>S</b>	<b>5</b>	Mark Robinson	28/05/2008
<b>WP04</b> Improving Safety & Security	<b>DARTS</b>	Tunnel Technologies for Urban Use	Mr.Arne Steen Jacobsen - Cowi Consulting Engineers and Planners AS-Denmark	<b>M</b>	<b>5</b>	Luisa Velardi	24/06/2008
<b>WP04</b> Improving Safety & Security	<b>FIT</b>	European thematic network on fire in tunnels	Mr.Alfred Haack Studiengesellschaft für unterirdische Verkehrsanlagen EV - DE	<b>M</b>	<b>5</b>	Luisa Velardi	27/01/2010
<b>WP04</b> Improving Safety &	<b>HUSARE</b>	Managing the human factor safely in	Dipl.-ing. Ruediger Wiedemann - TsV Euro	<b>W</b>	<b>4</b>	Luisa Velardi	11/12/2007

Security		Multicultural and Multilingual environments	Rail - Köln (DE)				
<b>WP04</b> Improving Safety & Security	<b>SAFETRAM</b>	Crashworthy structures for LRVs (streetcars & Tram/Trains)	Eng.Manuel Norton -Bombardier	<b>S</b>	<b>5</b>	Andrew Foster	
<b>WP04</b> Improving Safety & Security	<b>SAMNET</b>	Safety Targets & Philosophy for Mainline Rolling Stock and Infrastructure Sub-Systems	Mrs. Elisabeth Dupont-Kerlan - Institut National de Recherche sur les Transports et leur Sécurité-France	<b>S</b>	<b>5</b>	Cristian Ulianov	13/12/2011
<b>WP04</b> Improving Safety & Security	<b>SAMRAIL</b>	Safety Management approach for the EU's Railways for implementing the European Railway safety Directive	Dr Swapan Mitra - Atkins Rail Euston Travel - London (UK)	<b>S</b>	<b>5</b>	Cristian Ulianov	13/12/2011
<b>WP04</b> Improving Safety & Security	<b>SIRTAKI</b>	Safety improvement in Road - Rail Tunnels	Antonio Marques - ETRA Investigacion y desarrollo SA - ES	<b>M</b>	<b>5</b>	Luisa Velardi	27/01/2010
<b>WP04</b> Improving Safety & Security	<b>TRAINS SAFE</b>	Vehicle Passive Safety	Mr Peter Wells, Advanced Railway Research Centre at the University of Sheffield (UK)	<b>M</b>	<b>5</b>		
<b>WP04</b> Improving Safety & Security	<b>UPTUN</b>	Safety in Railway Tunnels	Mr. Jan Alexander Dekker-Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk onderzoek Tno Delft (NL)	<b>M</b>	<b>5</b>	Luisa Velardi	27/01/2010
<b>WP04</b> Improving Safety & Security	<b>VIRTUALFIRES</b>	Real time emergency simulator for assessing the fire safety of tunnels, for training of rescue personnel and for planning rescue scenarios.	Mr.Gernot Beer - Technische Universität Graz - A	<b>M</b>	<b>5</b>	Luisa Velardi	27/01/2010
<b>WP05</b> Strengthening competitiveness	<b>CAESAR</b>	Coordination action for the european strategic agenda of research on intermodalism and logistics	Dr.Valerio Recagno - Consorzio per la Ricerca e lo Sviluppo di Tecnologie per il Trasporto Innovativo (It)	<b>S</b>	<b>6</b>	Giorgio Travaini	06/07/2010
<b>WP05</b> Strengthening competitiveness	<b>EUROMAIN</b>	Train to Trackside Maintenance Protocols	Mr.Gernot Hans - BOMBARDIER transportation GmbH	<b>S</b>	<b>5</b>	Andrew Foster	15/05/2006
<b>WP05</b> Strengthening competitiveness	<b>EUROPAC</b>	Vehicle -infrastructure interaction through pantograph-catenary contact	Mr.Louis-Marie Cleon - SNCF-Paris (Fr)	<b>M</b>	<b>6</b>	Christophe Cheron	11/12/2007
<b>WP05</b> Strengthening competitiveness	<b>EUROPE-TRIO</b>	Traffic optimisation	Ing. Pierluigi Guida - FS SpA- Rome (It)	<b>W</b>	<b>4</b>	Luisa Velardi	02/10/2008
<b>WP05</b> Strengthening competitiveness	<b>EUROPE-TRIP</b>	Integrated Railway Planning Environment	Ing. Pier Luigi Guida - RFI-Rome (It)	<b>W</b>	<b>4</b>	Luisa Velardi	02/10/2008
<b>WP05</b> Strengthening competitiveness	<b>EUROPE-TRIS</b>	Telematic Railways Information System	Ing. Pierluigi Guida - FS SpA- Rome (It)	<b>W</b>	<b>4</b>	Luisa Velardi	02/10/2008
<b>WP05</b> Strengthening competitiveness	<b>HVB</b>	High Voltage Booster - Reducing the number of sub-stations on lightly used lines	Dr. Marina Fracchia-Università degli Studi-Genoa (It)	<b>M</b>	<b>4</b>	Christophe Cheron	25/01/2008
<b>WP05</b> Strengthening competitiveness	<b>INTEGRAL</b>	Train and Track Condition Monitoring Networks	Mr.Drewin Nieuwenhuis - Union of European Railway Industries (BE)	<b>W</b>	<b>6</b>	Dan Otteborn	16/06/2014
<b>WP05</b> Strengthening competitiveness	<b>PROMAIN</b>	Enhancing maintenance and management of rail infrastructure through the application of new tools and methodologies	Mr.Franz Quante-Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung E.V. (FHG) -Karlsruhe (DE)	<b>W</b>	<b>5</b>	Andrea Lindner	10/12/2008
<b>WP05</b> Strengthening	<b>ROSIN</b>	Train Bus Protocol Standardisation	Mr.Ulrich Schmidt - AEG	<b>S</b>	<b>4</b>	Andrew Foster	15/05/2006

## FOSTER RAIL / D6.3 – F01

competitiveness			Schienenfahrzeuge GmbH (DE)				
<b>WP05</b> Strengthening competitiveness	<b>SMITS</b>	Catenary monitoring and Diagnostics	Dr.Siegfried Birkle - SIEMENS AG (DE)	<b>M</b>	<b>5</b>	Christophe Cheron	25/01/2008
<b>WP05</b> Strengthening competitiveness	<b>SUPERTRACK</b>	Sustained performance of railway track	Mr.Philippe Renard - SNCF (Fr)	<b>M</b>	<b>5</b>	Christophe Cheron	25/01/2008
<b>WP05</b> Strengthening competitiveness	<b>Sustainable Bridges</b>	Assessment of huge traffic demand on longer lives	Prof.Ingvar Olofsson - Skanska Sverige AB - Stockholm (SE)	<b>S</b>	<b>6</b>	Andrea Lindner	28/05/2008
<b>WP05</b> Strengthening competitiveness	<b>TRAINCOM</b>	Communication system for telematics applications in the railway field, integrating the on-board network (e.g. TCN), GSM radio links and Internet technologies	Mr.Erich Renner - SIEMENS Aktiengesellschaft (DE)	<b>S</b>	<b>5</b>	Andrew Foster	15/05/2006



***Appendix 2 Project evaluations by ERRAC Evaluation Working Group within Foster Rail project***

Project acronym	Project full title	Market uptake
<b>TIGER</b>	Transit via Innovative Gateway Concepts Solving European Intermodal Rail Needs	<b>Strong</b>
<b>TIGER DEMO</b>	Trans-Rail Integrated Goods European-Express Routes Demonstrators	<b>Strong</b>
<b>CANTOR</b>	Coordinating Noise Transportation Research and Engineering Solutions	<b>Weak</b>
<b>NEWOPERA</b>	New European Wish: Operating Project for a European Rail Network	<b>Strong</b>
<b>INMAR</b>	Intelligent Materials for Active Noise Reduction	<b>Strong</b>
<b>INTEGRAIL</b>	Intelligent Integration of Railway Systems	<b>Weak</b>
<b>INESS</b>	Integrated European Signalling System	<b>Medium</b>
<b>CARCIM</b>	Integration of Two-Component Ceramic Injection Moulding for Large-Scale Production of Novel Multifunctional Ceramic Components for Automotive and Railway Applications	<b>Weak</b>
<b>CALM</b>	Community Noise Research Strategy Plan	<b>Strong</b>
<b>CALM II</b>	Advanced Noise Reduction Systems	<b>Strong</b>



## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

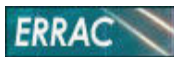
## ERRAC Project Evaluation Working Group (EWG)

Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

## Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes



## ERRAC Project Evaluation Group

### TIGER

EVALUATION FROM 2014

Project acronym: Transit via Innovative Gateway concepts solving European-intermodal Rail needs  
FP: 7

Programme acronym: TIGER

Project Reference: 234065

Call identifier: SST.2008.2.1.6

Total Cost: 13.595.279,00

EU Contribution: 8.633.020,00

Timescale: 01.10.2009-30.09.2012

Project Coordinator: CONSORZIO TRAIN

☐ Presented by: Newopera

☐ Date evaluation: 07/03/2014

☐ Market uptake: Strong

☐ Follow up projects: TIGER DEMO

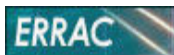
☐ Other related Projects:

Web references: [www.tigerproject.eu](http://www.tigerproject.eu)



## PROJECT OBJECTIVES

- INTRODUCE A NEW BUSINESS MODEL VIA DRY PORTS
- REDUCE PORT CONGESTION THROUGH DRY PORTS & HINTERLAND INNOVATIVE DISTRIBUTION MODELS
- UTILIZE BETTER EXISTING RESOURCES
- INCREASE THROUGHPUT CAPACITY ON EXISTING RAIL LINES
- INDUSTRIALIZE & OPTIMIZE TRANSPORT
- REDUCE COSTS
- REDUCE TRANSIT TIME & PRODUCE BETTER SERVICES
- INTRODUCE INNOVATIVE LOGISTICS SOLUTIONS & BEST PRACTICES
- SHARE BENEFITS BETWEEN THE ACTORS
- INTERNATIONALIZE THE ADOPTED SOLUTIONS



## Background

### Details

- FP 7 SST 2008.2.1.6
- Total Cost: 13.595.279,00
- EU Contribution: : 8.633.020,00
- Start and duration: 01.10.2009-30.09.2012 36 Months
- Scientific Coordinator: HACON Gmbh

### Partners

•Newopera	Eurogate	Rivalta Terminal Eur.
•Consorzio Train	Trenitalia	Terminal S. Giorgio
•Hacon	RFI	DB Netze
•Unife	Hafen Hamb.Mark	Italcontainer
•Hamburg Port Auth.	Genoa Port Auth.	Kombiverkehr
•E/Log	Liguria Region	Sogemar
•Bologna Interporto	Tecnicas Territ.Y Urbanas	



## European Rail Research Advisory Council

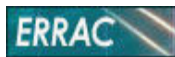
### TIGER

Transit via Innovative Gateway concepts solving European-intermodal Rail needs

#### Partners/Personalities interviewed:

Organisation	Country	Name of interviewee
Hamburg Transport Minister	Germany	✓ Frank Horch
Former President Parliament	Italy	✓ Luciano Violante
Eurogate	Germany	✓ Thomas Eckelmann –B. Bruegelmann
Consorzio TRAIN	Italy	✓ Valerio Recagno
NewOpera	Belgium	✓ Franco Castagnetti
F&L	Belgium	✓ Frank Arendt – Gavin Roser
DUSS DB NETZE	Germany	✓ Wolfgang Mueller – Alexander Stern
KombicoInsult /KV	Germany	✓ Uwe Sondermann- Rainer Mertel
Autorità Portuale Genoa	Italy	✓ Luigi Merlo – Luciano Boselli
Hamburg Port Authority	Germany	✓ Sebastian Doderer – Axel Mattern
Hacon	Germany	✓ Marian Gaidzik-Lars Deiterding
Terminal San Giorgio	Italy	✓ Maurizio Anselmo
Hupac	Switzerland	✓ Aldo Croci

5 5



## European Rail Research Advisory Council

### TIGER

Transit via Innovative Gateway concepts solving European-intermodal Rail needs

#### Partners/Personalities interviewed:

Organisation	Country	Name of interviewee
RFG	UK	✓ Lord Tony Berkeley
Athens Tech University	Greece	✓ Dimitros Tsamboulas
IKEA	Italy	✓ Milena Benzi
Hamburg Forwarder Assoc.	Germany	✓ Will van der Schalk
Dakosy	Germany	✓ Evelyn Eggers
Gruppo Messina Shipping	Italy	✓ Ignazio Messina
Mortara Intermodal Terminal	Italy	✓ Davide Muzio
EIA	Belgium	✓ Peter Wolters
TTU	Spain	✓ Emilio Fernandez, Rodrigo Perez
Port of Barcelona	Spain	✓ Santiago Milà
Gefco	France	✓ Antoine Mengin

6 6



## European Rail Research Advisory Council

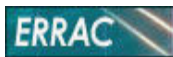
### Background



	Total TEU	Average TEU
2008	1.674.227	8.372
2005	1.308.581	6.543
2000	986.608	4.933
1995	733.155	3.666
1990	600.958	3.005

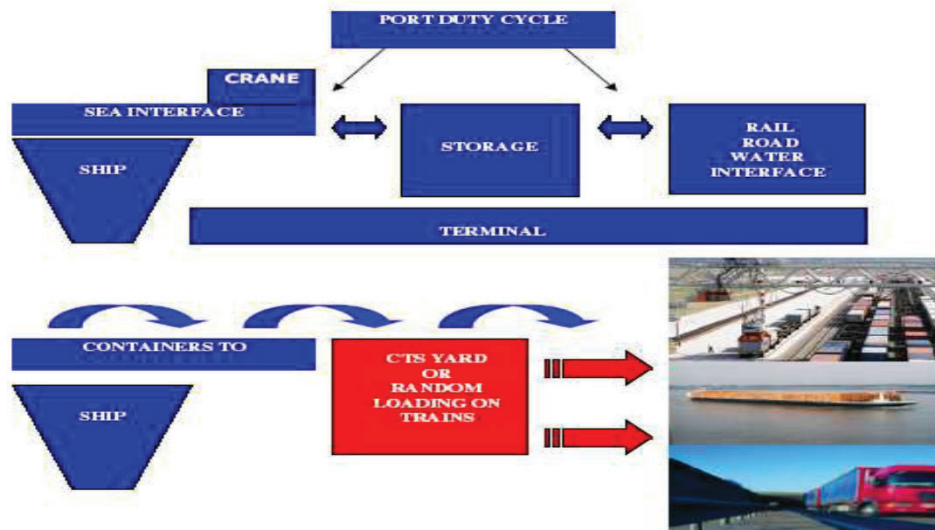
➤ Emma Maersk over 14000 TEUs

### NO CHANGES IN OVERLAND INFRASTRUCTURES



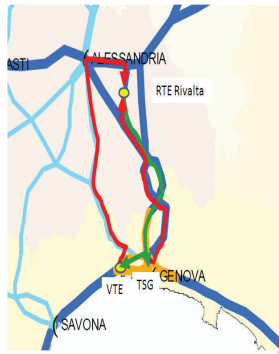
## European Rail Research Advisory Council

Background : Crisis Point Moved to Port Cts Yard from there to Inland Distribution either via Rail, Road & Inland waterways

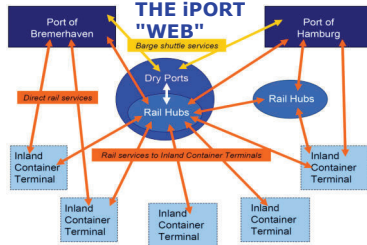


## The Project 4 Demonstrators – 4 Separate Solutions -4 Geog.Areas

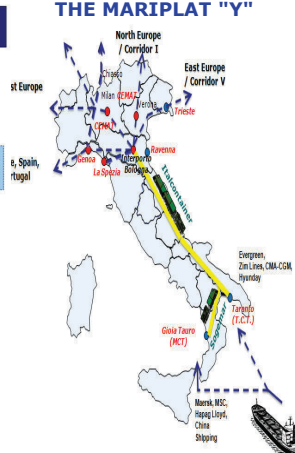
### THE GFC "LOOP"



### THE iPORT "WEB"



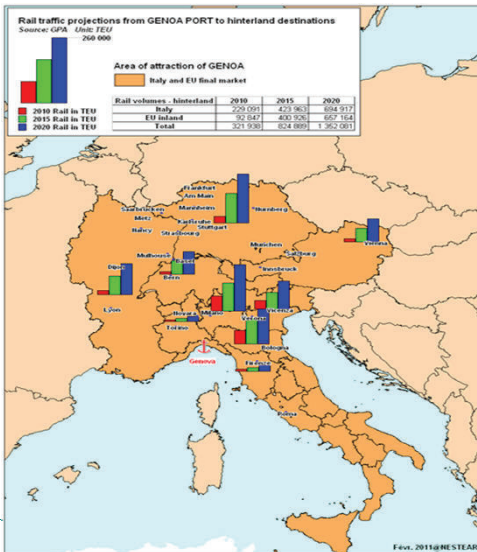
### THE MARIPLAT "Y"

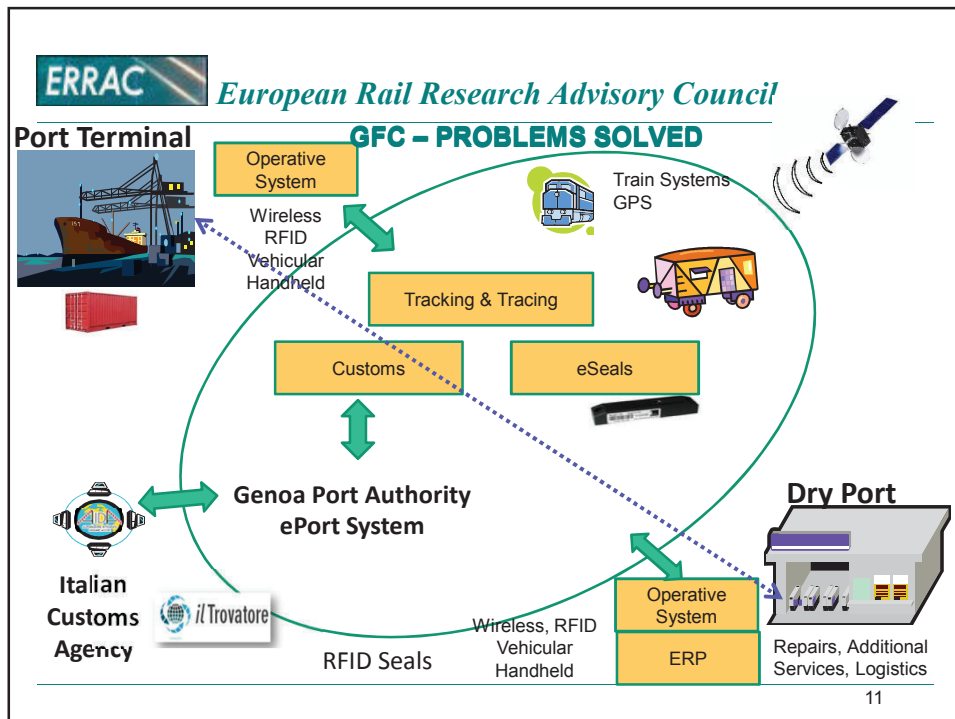


9

## GENOA COMPETITIVE REACH BEFORE & AFTER TIGER

Structure of the services of combined transport of Genova





**ERRAC** *European Rail Research Advisory Council*

**GFC Achievements**

<ul style="list-style-type: none"> <li>Best Practices</li> </ul>	<ul style="list-style-type: none"> <li>Cooperation between 3 different terminals in the Genoa Port: PSA Voltri, ATI Ignazio Messina - TSG</li> <li>Introduction of new operational concepts involving processes + technologies + rules</li> <li>RTE authorized as Genoa Port Customs Authority</li> <li>Deployment of ICT Technologies in the whole logistic chain: T&amp;T, Integrated CTS management systems producing shorter transit time &amp; service improvement</li> </ul>
<ul style="list-style-type: none"> <li>Technologies innovations</li> </ul>	<ul style="list-style-type: none"> <li>New Business Model for "shuttle train loading and dispatching"</li> <li>E-customs, E-seals, E-freight</li> <li>Electronic seals, reading devices, Gates in gates out applied</li> </ul>
<ul style="list-style-type: none"> <li>Investments</li> </ul>	<ul style="list-style-type: none"> <li>TSG + RTE € 5M in eligible costs</li> <li>TSG+RTE invested more than € 10 MM on GFC</li> <li>In addition to RTE investments of € 100 MM</li> </ul>
<ul style="list-style-type: none"> <li>Results &amp; Achievements</li> </ul>	<ul style="list-style-type: none"> <li>Sea Port dwell time &amp; transit time reduction 37%</li> <li>Operational costs &amp; service quality improvements</li> <li>Improved geographical accessibility &amp; competitive reach</li> <li>Extended quay concept: Volumes exceeding 40000 TEU were moved with about 500 shuttle trains</li> </ul>

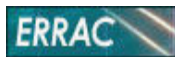
12



## Achievements

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>Market conditions for full uptake into implementation TIGER DEMO</li></ul> | <ul style="list-style-type: none"><li>Pilot upgrade into full commercial scale operating about 500 shuttle trains from Genoa Port to RTE &amp; continue thereafter.</li><li>RTE throughput capacity up to 1 MM TEUs/Year</li><li>Fine-tuning of Hardware &amp; Software Tools applied in the TIGER pilot phase</li><li>Complete Rail Tracks connection on the various Genoa Terminals for another 20% transit time reduction</li><li>Complete personnel training on systems &amp; operations</li><li>Stabilized KPI management &amp; monitoring</li><li>Demonstrate the need of 3rd Rail tunnel through the Apennines</li><li>Liguria Region to identify another inland Terminal behind the Mountains (Alessandria) for another step change in its Ports productivity.</li></ul> |
|--|--|

13



## MARIPLAT – PROBLEMS SOLVED

- Introduction of innovative Production Model
- Operations started on 7<sup>th</sup> March 2012
- Joint Commercial strategies; MARIPLAT logo
- ICT integration of all MARIPLAT Partners
- MARIPLAT Demonstrator, Planning /Management control
- Production highly Innovative services at lower costs to Market by Integrating maritime/overland traffic



14



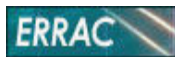


## European Rail Research Advisory Council

### Achievements

<ul style="list-style-type: none"> <li>Best Practices</li> </ul>	<ul style="list-style-type: none"> <li>2 Ports Traffic bundling: "Y" scheme</li> <li>Rail service opening to operators in competition</li> <li>Cooperative approach between intermodal operators</li> </ul>
<ul style="list-style-type: none"> <li>Technologies &amp; innovations</li> </ul>	<ul style="list-style-type: none"> <li>Longer &amp; heavier trains on the Adriatic line</li> <li>New wagons technology deployment</li> <li>ICT technology track &amp; trace and traffic planning &amp; management</li> </ul>
<ul style="list-style-type: none"> <li>Investments</li> </ul>	<ul style="list-style-type: none"> <li>Rail Infrastructures in Taranto &amp; Cattolica for 9'6"</li> <li>Introduction of common ICT Platform</li> <li>Joint Marketing strategy</li> <li>New wagons</li> </ul>
<ul style="list-style-type: none"> <li>Results &amp; achievements</li> </ul>	<ul style="list-style-type: none"> <li>9'6" CTS traffic on the whole Adriatic Rail line</li> <li>Taranto City by pass with dedicated Port Rail line</li> <li>Common ICT Platform accessible to operators in Bologna</li> <li>Common Marketing strategies for MARIPLAT</li> <li>Overland set timetable Taranto &amp; G. T. operators</li> <li>Competitive advantage Vs. N. African Ports</li> </ul>

15



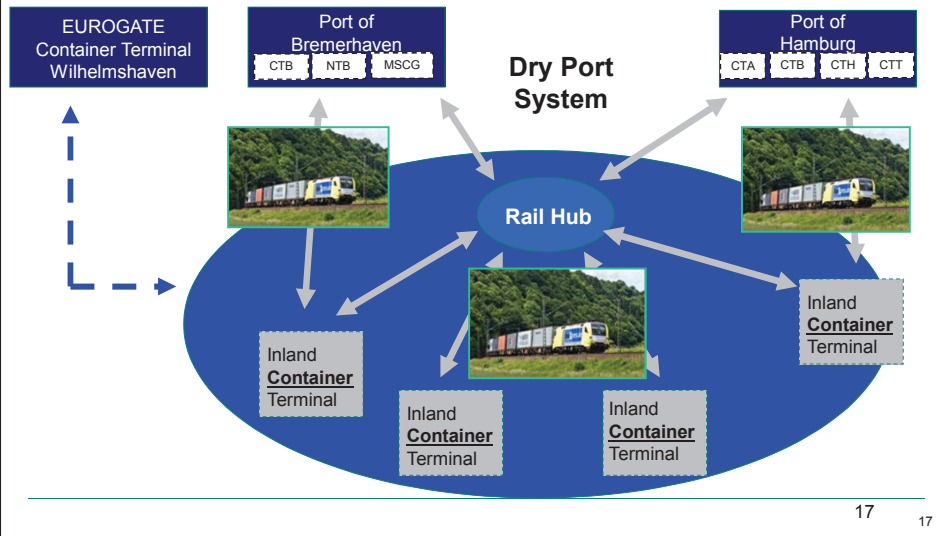
## European Rail Research Advisory Council

### Achievements

<p><b>Market uptake conditions for full commercial implementation into TIGER DEMO postponed due to changing infrastructure &amp; traffic flows condition.</b></p>	<ul style="list-style-type: none"> <li>Gioia Tauro has maintained its traffic volumes with increased projections.</li> <li>Taranto is undertaking major infrastructures works in the Port for dredging for accommodating larger CTS Vessels in future and for building the Logistics Park. This has reduced its throughput from 1M TEUs to 200K TEUs making impossible the traffic bundling with Gioia Tauro traffic during the project lifetime .</li> <li>The Y system implemented during the pilot phase to be resumed after the Taranto major works completion.</li> <li>The MARIPLAT budget of TIGER DEMO into the three remaining Demonstrators.</li> </ul>
---	---

16

iPORT – PROBLEMS SOLVED

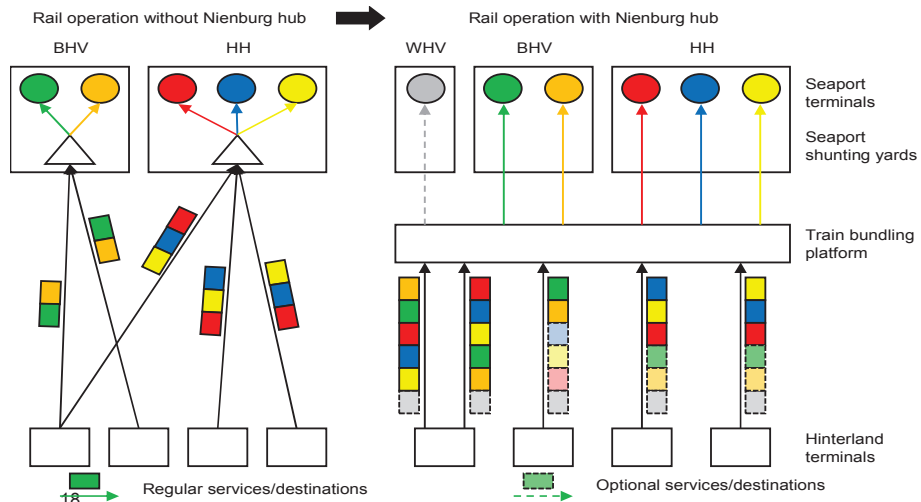


17

17

Achievements

Hinterland process via "Close to the port" train bundling platform in Nienburg

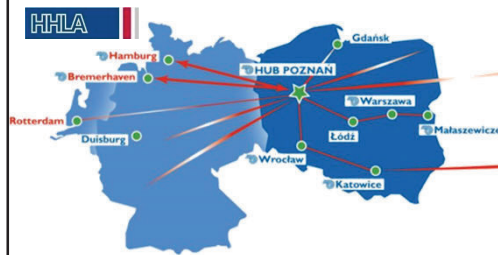


## Achievements

Optimisation of hinterland processes via a “Close to the market” concept

A) Findings of TIGER were used for the implementation planning of Hub Poznan

B) Major parts of this concept are tested in an existing terminal (Munich Riem)



19

## iPORT Achievements

<b>Best Practices “Close to Port”</b>	<ul style="list-style-type: none"> <li>▪ “Close to the Port” concept realised at Nienburg rail hub;</li> <li>▪ Pilot phase: 3 trains/week (export, weekend service) scaled up to 18 trains/week at project conclusion . More than 400 trains moved and 32000TEU. Operation replicated in Bremen 80 Trains 7000TEU</li> <li>▪ Centralised maintenance and repair concept;</li> <li>▪ Terminal dedicated trains: No shunting in the seaport.</li> </ul>
<b>Technologies &amp; Innovations</b>	<ul style="list-style-type: none"> <li>▪ Bundling concept in Nienburg → Traffic optimising;</li> <li>▪ IT tool to support wagon dispatching and slot management.</li> </ul>
<b>Investments</b>	<ul style="list-style-type: none"> <li>▪ Infrastructure adaptations + lease in Nienburg;</li> <li>▪ IT tool (Steering and monitoring);</li> <li>▪ Additional staff in Nienburg for new rail production concept;</li> <li>▪ Additional wagons: Backup fleet for balancing irregularities during pilot phase.</li> </ul>
<b>Results &amp; Achievements</b>	<ul style="list-style-type: none"> <li>▪ New rail production very successful;</li> <li>▪ Dwell time on Hamburg seaport rail net reduced by 92 %;</li> <li>▪ Increased punctuality in the seaport terminals to 85 %;</li> <li>▪ Overall improved competitiveness of intermodal transport already in the first test operation phase;</li> <li>▪ Decongestion objective: achieved.</li> </ul>

20

20

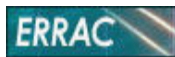


### iPORT Achievements

<b>Best Practices “Close to Market”</b>	<ul style="list-style-type: none"> <li>Layout definition for maritime inland terminals needs;</li> <li>TIGER findings used for Poznan hub planning;</li> <li>TIGER concept testing in Munich Riem;</li> <li>Increased shuttle train frequency between seaports &amp; Munich;</li> <li>Poznan hub &amp; shuttle concept.</li> </ul>
<b>Technologies &amp; Innovations</b>	<ul style="list-style-type: none"> <li>Process optimisation along the hinterland chain;</li> <li>Hinterland customs processes finalisation;</li> <li>“BLU Opti”: Optimisation of hinterland processes;</li> <li>Train monitoring with customer interface.</li> </ul>
<b>Investments</b>	<ul style="list-style-type: none"> <li>New hub in Poznan;</li> <li>Set-up of new or upgrading of existing intermodal links;</li> <li>Planning for new greenfield inland terminals financed by private investors will proceed.</li> </ul>
<b>Results &amp; Achievements</b>	<ul style="list-style-type: none"> <li>Increased punctuality up to 85-90 %;</li> <li>Optimised utilisation of train capacity;</li> <li>Optimised utilisation of Infrastructure capacity;</li> <li>Same capacity with 15-20 % less trains;</li> <li>Constantly maximum train capacity;</li> <li>Reduced transit time Hamburg – Poznan 18 h → 12 h.</li> </ul>

21

21



### iPORT Achievements

<b>Market uptake conditions for full implementation into TIGER DEMO</b>	<ul style="list-style-type: none"> <li>Market → Demand for overall seaport rail service concept <ul style="list-style-type: none"> <li>Containers in import &amp; export direction</li> <li>Optimised, terminal dedicated services for seaport &amp; hinterland terminals</li> <li>“Everyday” service (weekend &amp; weekdays)</li> <li>Integrated seaports with rail volumes too small for own dedicated hinterland block trains (Wilhelmshaven)</li> <li>Implemented additional rail hub with rail-rail transshipment and access to further hinterland destinations (Bremen)</li> </ul> </li> <li>→ Proved commercial, technical and operational feasibility;</li> <li>Continue the optimization of existing infrastructure and service providers for fulfilling quicker results;</li> <li>TIGER innovations into TIGER DEMO full commercial services is a natural stepwise implementation;</li> <li>Continue dissemination of cooperative business models between different actors along the supply chain;</li> </ul>
---	--

22

22

### MEGA HUB – PROBLEMS SOLVED



### MEGA HUB Achievements

<b>Best Practices</b>	<ul style="list-style-type: none"> <li>Integration of „medium-size“ and „small-size“ terminals into nat/int networks. Rail-rail transshipment performed in dedicated Hubs</li> <li>Operational concepts implementation for train to train transfer</li> <li>Double sided electrified frictionless rail access reducing costs</li> <li>Direct trains entrance &amp; exit without shunting reducing costs</li> </ul>
<b>Technologies &amp; innovations</b>	<ul style="list-style-type: none"> <li>Improved IT-System in terminal operation including timing control of rail-rail transfer</li> <li>IT system for train capacity management</li> <li>IT-System for Real-time train monitoring with ETA-information</li> </ul>
<b>Results &amp; achievements</b>	<ul style="list-style-type: none"> <li>Lehrte new Hub investments of ca. 105 Mio. €</li> <li>Extension of Hamburg-Billwerder of 30 Mio. €</li> <li>New Hub in Duisburg of 50 Mio. € - start of operation in 2013</li> <li>München-Riem 3rd module of 25 Mio. €</li> </ul>

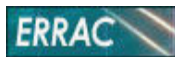


## MEGA HUB Achievements

### Market uptake conditions for full implementation into TIGER DEMO

- Continued into full commercial basis the infrastructure adaptation of terminal-layout including double-sided electrified rail access, gantry cranes equipped with positioning system and collision protection with trains.
- Implemented the timing & controlling of crane operation for optimized direct rail-rail-transfer
- Developed into full commercial basis the strong IT-Support on improved IT-systems for Terminal & Intermodal operators
- Disseminated the direct train entrance solution with momentum and direct exit
- Developed the Central capacity management of hub-trains, real-time train controlling and timing
- Achieved full close co-operation between RU, TO and IM

25



### TIGER Pilots

### TIGER DEMO Transition & Upgrading

### TIGER DEMO Full Market Uptake

- Completed management of the full logistic chain from O/D
- Interoperable collaboration platform ready to be used between SE Asia and the EU intermodal chain customers
- Industrial dimension of CTS transfer from Genoa to Rivalta Terminal Europe and into Europe from there



26

## TIGER -TIGER DEMO – GFC – Full Market up-take Success Story

- TIGER Project forecasted a **total volume of 1,985,000 TEUs** performed by Port of Genoa in 2015
- In 2012 the Genoa Port achieved CTS traffic in excess of 2MM TEUs 3 years ahead of target
- 500 shuttle trains during project lifetime
- Reduction of transit & dwelling time by 37%+ planned further 20%
- Increased Competitive reach for Accessible Area



A dedicated video has been published summing up the GENOA - GFC TIGER DEMO Success Story

27

### TIGER Pilots

### TIGER DEMO Transition & Upgrading

### TIGER DEMO Full Market Uptake

#### NIENBURG( wagons shift)

- Rail operator: boxXpress;
- Nienburg infrastructure rented by boxXpress;
- 4 hinterland terminals connected in Southern Germany with Hamburg CTA, CTB & EUROKOMBI;
- Optimal dedicated trains;
- Optimal timing for seaport: Pull-concept
- Wagon group exchange in Nienburg by electric line locomotives → lean rail production

#### BREMEN( CTS shift)

- Fully loaded shuttle trains from Bremerhaven/Hamburg to Bremen operated by ACOS;
- 90 TEU per train for all German hinterland destinations;
- Containers are either buffered in Bremen or shifted immediately to other trains for the final destination;
- Container storage and dispatching in dry port according to consignee instructions;
- Shuttle train service to be extended to Wilhelmshaven:

28

### Nienburg

- 3 trains (export) per week within TIGER;
- TIGER DEMO: demonstration of export and import flows;
- Number of trains increased to 12 trains per week in TIGER DEMO;
- 18 trains per week in the full-scale demonstration phase;
- In total, more than 400 trains via the rail hub system during the project lifetime, transporting 32,000 TEU.

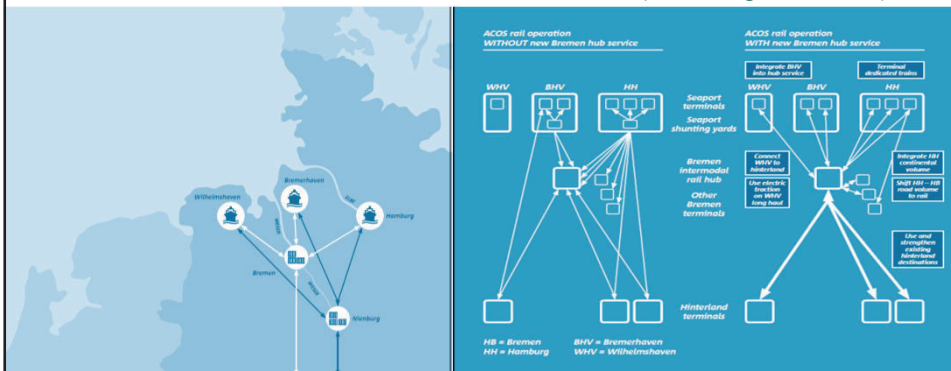
### Bremen

- TIGER DEMO demonstrator started March 2013 with weekly round trip;
- increased to 8 trains per week;
- Optional services to Wilhelmshaven, depending on market demand;
- 80 trains via Bremen, transporting more than 7000 TEU.

29

### iPort - Full Market Uptake

- Traffic industrialisation to all terminals Nienburg – Bremen - Munich Riem - Nuremberg - Mannheim - Frankfurt – Stuttgart;
- Services improvements both on rail and inside seaports;
- Shift of short distance road traffic from road to rail (Hamburg – Bremen).



30



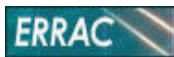


### **TIGER + TIGER DEMO - iPort - Success Story**

- Bremerhaven exceeded 6 MM TEUs 3 years ahead of TIGER forecast;
- Dwell time on Hamburg seaport rail network reduced by 92 %;
- Slot utilisation of Hamburg seaport terminals increased up to nearly 100 %;
- Trains punctuality in Hamburg seaport terminals improved to 85%;
- Reduction of operating costs by avoiding shunting movements in the port;
- Traffic industrialisation in Bremen dry port achieved;
- Environment benefits by using electric traction in Nienburg for shunting instead diesel traction inside the seaport;
- Better utilisation of existing resources achieved by centralised maintenance and repair facilities in Nienburg securing better equipment utilisation.



A dedicated brochure has been published summing up the iPort TIGER + TIGER DEMO success story - **a full Video was presented at Intermodal Europe in Hamburg on October 9<sup>th</sup> with a statement from Eurogate President Thomas Eckelmann**



#### **TIGER Pilots**

#### **TIGER DEMO Transition & Upgrading**

#### **TIGER DEMO Full Market Uptake**

#### **MEGAHUB**

- Lehrte Construction;
- Munich Riem extension;
- Duisburg new Terminal;
- Hubs having industrial scale;
- Double sided electrified access for momentum operations;
- High performance Gantry Crane servicing several Rail tracks;
- ICT technology;
- Technical management tool;
- Capacity management tool;
- Train monitoring.

#### **TRIESTE to FRANKFURT link**

- Start in October 2013
- 3 departures in both direction
- Departure days: Tue, Thu, Sat
- North-South (22h):
- 21:00 CT\* → 19:30 PT\* day B
- South-North (23,5h):
- 06:30 CT\* → 06:00 PT\* day B
- Maritime and continental transport
- Shorter transit time to Greece
- Train monitoring on entire train run
- Hub function at Trieste
- Capacity management system
- Closing time, Pick-up time

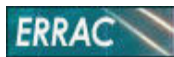


### TIGER - TIGER DEMO - MEGAHUB – Full Market Uptake

- Implementation of the Capacity management system in Munich on 18.08.2013
- Procurement of new double pocket wagon for the transport of semi-trailers on the new service Trieste – Frankfurt
- Start of a new train between Trieste and Frankfurt in October 2013.

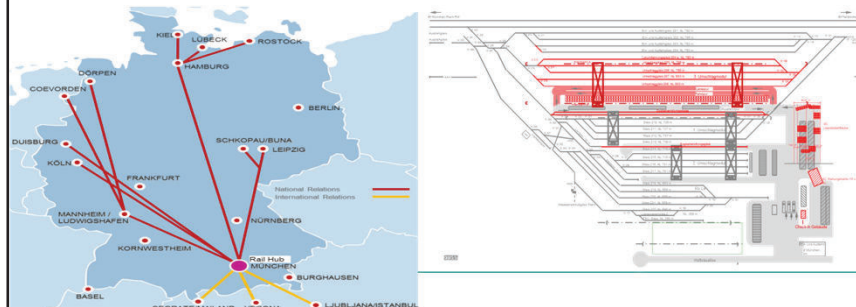
Development of transshipment volume in Rail-hub  
Munich-Riem during TIGER/TIGER DEMO

Market segment	increase 2010 - 2013
continental	8%
maritime	19%
gateway	18%
total	13%



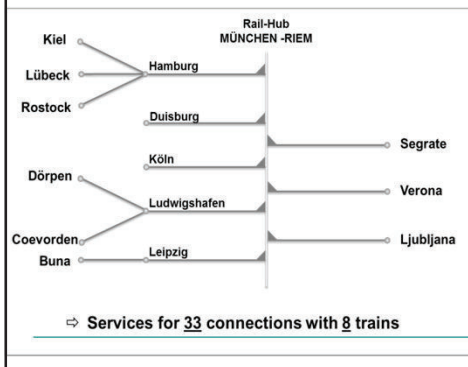
### TIGER -TIGER DEMO – MEGAHUB - Full Market Uptake

- New Terminal investments in Lehrte – Munich Riem - Duisburg
- Double-sided electrified frictionless rail access
- Industrial chain through high performance gantry cranes
- ICT-system for terminal operation including rail-rail
- ICT-system for capacity mgmnt & space guarantee at hub connections.
- Real-time train monitoring with ETA-information



### **TIGER - TIGER DEMO – MEGAHUB – Success Story**

- Improved service quality through 33 services connections
- Increased Volumes up to 70% - Reduced costs in Hubs
- Efficient Train Monitoring Systems
- Capacity mgmnt for train loading optimization & slot guarantee
- Energy efficiency through train momentum



### **Evaluation:**

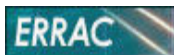
1. Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation - **YES**.
  - **TIGER -TIGER DEMO** market uptake far exceeded the expectations at the project start up. Although hoped the Sea Ports and Rail operators supported with determination the proposed business model transforming it into permanent rail services continued to be scaled up after the project termination. This is due to the extraordinary economic results achieved.
  - **GFC** moved volumes of 40000 TEU with more than 500 shuttle trains from Genoa to RTE, continuing thereafter. This became a permanent feature with RTE being approved full Genoa Customs Area
  - E Customs E Seals E freight procedures tested and in operation



### Evaluation:

- Transit time+dwelling time reduced by 37% + 20% to be further achieved when Genoa Port Rail investments completed
- ICT Technology implementation, Gate in Gate Out by automatic reading devices.
- 3 Terminals TSG+Messina+PSA supporting the service
- **iPort** introduced “Close to the Port” “Close to the Market” business models.
- For Close to the Port via Nienburg services were scaled up from 0 to 18 trains a week during project lifetime with 400 trains moved and 32000TEU continuing thereafter.
- Shunting in the seaport totally eliminated
- Centralized Preventing maintenance implemented
- Dwell time in Hamburg sea port reduced up to 90%
- Train punctuality increased by over 85%
- In March 2013 the business model was introduced in Bremen terminal replicating Nienburg. 80 trains moved 7000TEU continuing.

37



### Evaluation:

- The “Close to Market “ was realized in Munich Riem and Poznan
- Substantial Increase train frequency with secondary terminals being linked via Munich Riem.
- Poznan transit time reduced from 18 to 12 hours.
- Constant full train capacity achieved.
- BLU Opti train management and customers interface implemented
- **MEGAHUB** fulfilled Munich Riem Extension improving services through 33 rail connections within Germany and Cross Border
- Driven Lehrthe Mega Hub under construction
- Driven Duisburg completion in 2013
- Driven expansion in Frankfurt and Stuttgart
- Train Monitoring Systems implemented with Capacity mgmnt for train loading optimization & slot guarantee in real time
- Energy efficiency through train momentum –Double sided electrified access- direct train entrance – no shunting in terminal -

38

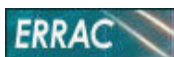


**Evaluation:**

- High performance Gantry Crane
- Munich Riem Capacity increase up to 19%
- New SERVICE Baptized Frankfurt-Ludwigshafen to Trieste
- 3 departures weekly in Each direction
- New Double Pocket Wagons T3000 deployed transporting 2 full semitrailers 4m high, 135 tons total weight- 100 Tons payload
- Trimodal Road- Rail Sea being a prosecution to Greece- Turkey



**ALL SERVICES CONTINUING AFTER PROJECT CLOSURE**



**Evaluation:**

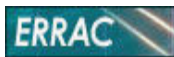
- 2 Is new legislation and standardization based on findings from this research project -It is up to the EU Commission to adopt this project results as best practices for any emerging future decision making. The project had influence on German Dutch and Italian Transport plan. In Italy TIGER project entered into the Italian legislation for Ports system restructuring with the picture of the Genoa Demonstrator included into the plan for increased accessibility. ESPO and other Intermodal Association are using it as example.
- 3 Are the results of the project implemented across Europe or only in a small number of Member States. YES The project itself through 5 dedicated workshops disseminated its results through "Internationalization of the demonstrated solutions" Work Package". Final workshop was at INTERMODAL EUROPE 2013 In Hamburg. Final event in Genoa on Dec 13<sup>th</sup> 2013. During the workshops contacts were established with other EU Ports such as Barcelona, Valencia, Marseille, Le Havre, Rotterdam, Antwerp.
- 4 Are the results of the project implemented outside Europe before being accepted in Europe. TIGER was presented at an official Ministerial Delegation from Thailand who came in Italy specifically for that purpose. They visited in addition to Genoa the Hubs involved in the Project. Tiger was presented at DUBAI exhibition by Hamburg Marketing.



### Evaluation:

5. Did the projects increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design. YES since the project results delivered more efficient and competitive services at inferior costs and continuing thereafter.
6. Did the project increase competitiveness of the railway transportation compared to other transport modes. YES. The new economy of scale generated at sea by the giant CT vessels require on land an industrial dimension that only rail and inland waterways can deliver, not road. TIGER project was instrumental for proving rail competitive advantage.
7. Are the results of the project taken into consideration when preparing public tenders. YES The project is strengthening the EU Ports competitive profile making them to have accessibility to new attraction zones. Port Authorities are Public bodies. Those participating to the project included Tiger business model into their procurement culture.
8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability. YES – Hamburg is now connected with several trains/day to Prague- Poznan and via Munich they reach Austria, Hungary, Italy, Slovenia, Croatia. Genoa is increasing its penetration to Switzerland, France, Austria, Hungary. Frankfurt and Ludwigshafen are now connected via Trieste to Greece and Turkey. All of them integrating all modalities. The services are permanent features.

41



### FIRE: Evaluation Evaluation criteria:

9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality YES. They are all Intermodal and in the case of Germany to Trieste Greece and Turkey "Trimodal"
10. Can benefits be assessed in financial terms - YES as per declared official substantial economic results supported by declarations of the Chief executives.
11. Applicability of results to future scenarios - YES These innovative solutions/services/routings/investments/technologies are consolidated and continue to produce and maximize results in future. The increased productivities make the Tiger Business model a consolidated business model.
12. Usefulness of research procedures for future projects (incl. modeling) YES. Research is very useful for promoting technologies evolution innovations and new business models. When projects have strong market uptake impacts they become drivers for future investments programs and innovative commercial activities

The Tiger achievements were recognized by Thomas Eckelman Eurogate chairman of the Board – Mr. Frank Horch Hamburg Transport Minister, Dr Luigi Merlo President of Genoa Port Authority and summed up in a published book.

42

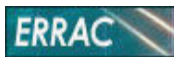


## Reasons for outcome

TIGER since its conception in May 2007 before the economic downturn was totally market driven with the objective of solving traffic problems in the EU Ports affected by serious congestion. When TIGER started in October 2009 recession started, congestion disappeared and the economic circumstances totally changed from the project conception. The Consortium formed by key market players was strong, did not panic because of the traffic downturn and took the recession as an opportunity for making the necessary changes to old encrusted practices. The planned investments were executed, the equipment and technologies were introduced and continued thereafter. The project plan continued, the innovations and technologies implemented and the economic/service efficiency results which started to appear became themselves the drivers for further innovations initiatives. The original pilots are upgraded for full permanent market fruition.

The TIGER project partners through the innovative services introduced in the market place have increased their competitive profile. The TIGER demonstrated solutions can be replicated elsewhere in Europe modified for the local morphological situations and circumstances. Rail Intermodality has gained awareness of its transport industrialization possibilities and economy of scale generation opening up new horizons. The Hubs/dry Port role has been greatly enhanced by this project as integral part of the future Rail Freight network.

43



## Lessons learnt

- Projects must have a strong/sound market uptake foundation with consortium partners being key actors in the market place
- Transport industrialization a key project driver to be demonstrated proved to be a winner. Rail Freight is a capital intensive business. The only way by which Rail Freight can gain new spaces is by developing intensive widespread utilisation & fast asset rotation.
- Horizontal cooperation between various partners sometimes competing between themselves, proved to be key for generating critical mass. The TIGER Project in Hamburg, Genoa, Bremerhaven but also in Gioia Tauro, Rivalta, Taranto, Bologna, Munich Riem acted as aggregator putting together otherwise fragmented interests.
- There are redundant productivities to be extracted from the EU rail system. Nienburg which was a disused rail yard was given a new life, new mission, new work with relative modest investments. There are many of those in Europe. Not only Green field project must be planned but also Brown Field projects based on what we have got.
- Fragmentation is enemy of industrialisation & standardisation vital rail freight ingredients. It is also enemy of Technology innovation, transport system implementation. Technologies are available but not enough implemented because of excessive fragmentation. When aggregation-horizontal co-operation is achieved implementation becomes easier.
- Tiger demonstrated that Sea Ports must regain their original mission of linking sea with land other operations to be executed elsewhere (Dry Ports/Hubs) for maximizing productivity.

44



## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

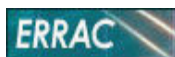
## ERRAC Project Evaluation Working Group (EWG)

Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

## Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes



## ERRAC Project Evaluation Group

### CANTOR

EVALUATION FROM Jan 2014

Project acronym:	Cantor	<input type="checkbox"/> Presented by:	Dan Otteborn
FP	6, 2005	<input type="checkbox"/> Date evaluation:	228/01/2014
Programme acronym:		<input type="checkbox"/> Market uptake:	Week
Project Reference:		<input type="checkbox"/> Follow up projects:	
Call identifier:		<input type="checkbox"/> Other related Projects:	
Total Cost:	964 000 €		
EU Contribution:	600 000 €		
Timescale:			
Project Coordinator:	Prof. Anders Nilsson KTH		
Web references:	Interviewed	Siv Lett Bombardier	





## Objectives of the project

The overall aim of CANTOR is to engage experts from the vehicle manufacturing industry

Chain from system to component level, government agencies and renowned research groups,

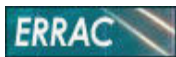
To focus jointly on improved performance with a reduced impact on the environment,

Enabling a balanced system cost and maintaining comfort in road, rail and waterborne vehicles

The means to achieve this goal is by accumulating and transferring the technology of existing knowledge and information on new prediction tools, measurement techniques, research plans and material data, as well as on new educational programmes applied to vehicle acoustics.

A concrete aim of the project was to develop a larger follow project with more concrete deliverables

47



## Background

### Partners

- Università degli studi di Ferrara
- Chalmers SE
- Institut National des sciences appliquées de Lyon FR

48



## Background

Technical university Berlin DE

KU Leuven- Research and development BE

University of Southampton UK

Advisory Board:

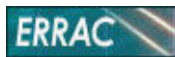
Bombardier and Scania SE

BBM DE

SNCF and Alstom FR

LMS BE

Fiat IT



## Achievements

The project delivered a number of documents including the draft specification for the intended larger follow-up project. However no follow-up project was initiated.

No evidence that the project stimulated a network which was not already in existence based on normal contacts between academic and manufacturing researchers in a specific field.

The project has not left any evidence of having contributed to the establishment of a network or contributed to the survival of such network.

### **Evaluation:**

1. Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation NO
2. Is new legislation and standardization based on findings from this research project NO
3. Are the results of the project implemented across Europe or only in a small number of Member States NO
4. Are the results of the project implemented outside Europe before being accepted in Europe NO

---

51

### **Evaluation:**

5. Did the projects increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design NO
6. Did the project increase competitiveness of the railway transportation compared to other transport modes NO
7. Are the results of the project taken into consideration when preparing public tenders NO
8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability NO

---

52

## **FIRE: Evaluation**

### **Evaluation criteria:**

9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality  
NO
10. Can benefits be assessed in financial terms NO
11. Applicability of results to future scenarios NO
12. Usefulness of research procedures for future projects (incl. modeling)  
NO, the intended follow-up project did not materialize.

## **Reasons for outcome**

- The only concrete objective of the project was to create a large follow-up project when this did not happen there was no substance left.
- Manufactures are seeking contacts with academia on specific problem when these problem occur if no in house solution can be found...
- To much divergence in the project rail, road and waterborne very
- Little common problem

## Lessons learnt

- Do not engage in such un specific general project specially when the future is out of control Follow up did not materialize. .

55

## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

### ERRAC Project Evaluation Working Group (EWG)

#### Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

#### Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes

56



## ERRAC Project Evaluation Group

### NEWOPERA

EVALUATION FROM January 2014

Project acronym: NEWOPERA  
FP 6

Programme acronym:

Project Reference: FP6 – 006172

Call identifier: SUSTDEV-2002-3.3.1.3.1

Total Cost: € 3.944.015

EU Contribution: € 3.596.946

Timescale: 45 Months – 01.01.2005 -30.09.2008

Project Coordinator: Consorzio TRAIN

❑ Presented by: Dan Otteborn

❑ Date evaluation: 28.01.2014

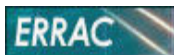
❑ Market uptake: Strong

❑ Follow up projects: TIGER – TIGER DEMO  
– MARATHON - VIWAS

❑ Other related Projects: TREND and  
REORIENT

Web references: [www.newopera.org](http://www.newopera.org)

57



## NEWOPERA

### New European Wish Operating Project for European Rail Network

**Premise:** The centrality of rail in a pan-European dimension is the ultimate goal of the European Transport Policy encouraging long-term sustainable mobility and promoting a competitive environment. In order to achieve this goal, a modal shift towards rail is necessary, while reverting the erosion of the rail freight market share. The NEW Opera project will contribute to this goal by assessing ways for:

- Implementing the ERRAC Strategic Rail Research Agenda 2020 by capturing the threefold increase in
- freight volumes by 2020.
- Providing grounds for the establishment of 15.000 km of new and existing lines predominantly dedicated to freight.
- Revitalising the rail business by applying NEW business models and a NEW service culture through the use of freight dedicated infrastructure.
- Envisaging transitions from the existing rail business model based on rail infrastructure dual use, to one
- more capable of capturing market demands and achieving productivity and efficiency gains based on
- dedicated freight networks.

58 58

## NEWOPERA

New European Wish Operating Project for European Rail Network

### Rationale:

Mr Jan Scherp of the European Commission introduced the NEW Opera project as an important milestone towards competitive rail freight services. NEW Opera can be seen as complementary to the regulative approach of the European Commission to trigger the modal change, with a special focus on high-performance rail freight infrastructure.

NEW Opera was a Coordinated Action in the area of joint European railway research. NEW Opera studied the necessary step changes for achieving a long-term scenario 2020 of a core network predominantly dedicated to rail freight. NEW Opera coordinated and cooperated with the Coordinated Actions TREND and REORIENT of the same call for proposals.

## Objectives of the project

- NEW Opera will contribute to invert the declining trend of EU railways by:
  - Implementing the **introduction of the dedicated rail freight networks concept** backed by a **sound socio-economic and environmental assessment**.
  - **Setting sound methodologies for the distribution of traffic flows** over railway networks;
  - **Precisely localizing traffic flows** in the European area so as to give development forecasts;
  - **Providing a sound analysis of transport demand and supply** over railway networks;
  - **Establishing simulation and modeling tools of traffic flows** on medium and long-term
  - Providing an **efficient decision-making tool**
  - Removing the barrier for achieving **Shift to Rail**. Shift to rail will not take place automatically but has to be induced by competitive costs and services
  - Envisaging and proving the **sustainability and environment** dimensions.



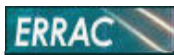
## Background

### Details

- FP 6 - FP6 – 006172
- Total Cost: € **3.944.015**
- EU Contribution: € **3.944.015**
- Start and duration: **01.01.2005 -30.09.2008**
- Scientific Coordinator: **Consorzio TRAIN**

### Partners

Consorzio TRAIN, F & L, ALSTOM, NESTEAR, TRANSFESA, RAIL4CHEM, Ansaldo Breda, LKW Walter, CEMAT Stora Enso, Rail Traction Co, Bombardier Transp, Autorità Portuale Genoa, GYSEV, SIEMENS Transp, Kombiverkehr, DB Netz, RFF, PRORAIL, UNIFE, SOGEMAR, ERMEWA, DHL, Volkswagen Transport, Port Autonome du Havre, RFI



## NEWOPERA

New European Wish Operating Project for European Rail Network

### Partners/Personalities interviewed:

Organisation	Country	Name of interviewee
Consorzio TRAIN	Italy	<input checked="" type="checkbox"/> Valerio Recagno
European Freight F&L	Belgium	<input checked="" type="checkbox"/> Franco Castagnetti
UIRR	Belgium	<input checked="" type="checkbox"/> Eugenio Muzio/Rudy Colle
CER	Belgium	<input checked="" type="checkbox"/> J. Ludewig/ L. Lockmann
SNCF	France	<input checked="" type="checkbox"/> A. Toubol /F. Adroit
RFF	France	<input checked="" type="checkbox"/> H. Du Mnesnil, J.P. Orus, C. Keselievic
DB	Germany	<input checked="" type="checkbox"/> Hedderich, Harald Heusner
KTH	Sweden	<input checked="" type="checkbox"/> Prof. Bo Lennart Nelldal
Karlsruhe Univ.	Germany	<input checked="" type="checkbox"/> Prof. Werner Rothengatter
Montreal Univ.	Canada	<input checked="" type="checkbox"/> Prof. Marc Gaudry
La Sapienza Univ	Italy	<input checked="" type="checkbox"/> Prof. Antonio Musso
Bombardier Transportation	Sweden	<input checked="" type="checkbox"/> Andrew Foster/ Dan Ottebon
RFG	UK	<input checked="" type="checkbox"/> Lord Tony Berkeley



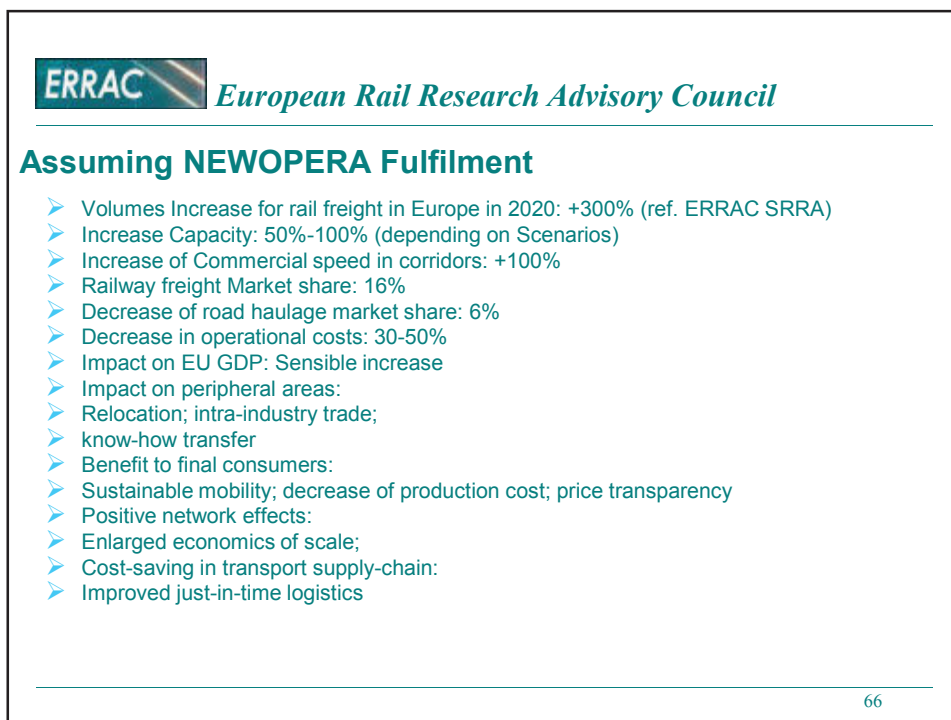
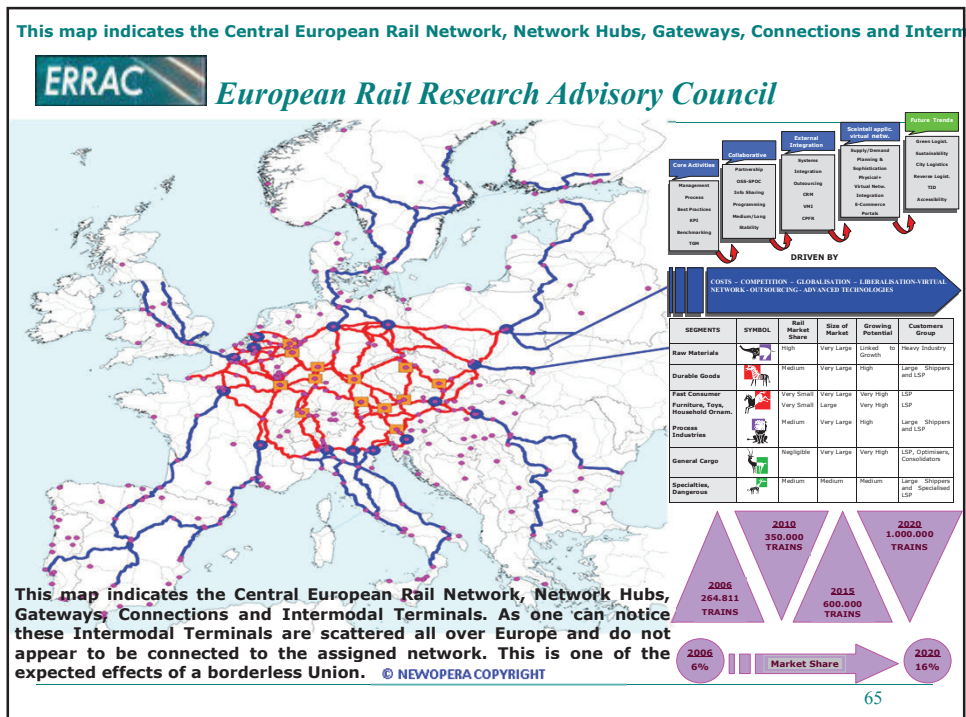
## Background

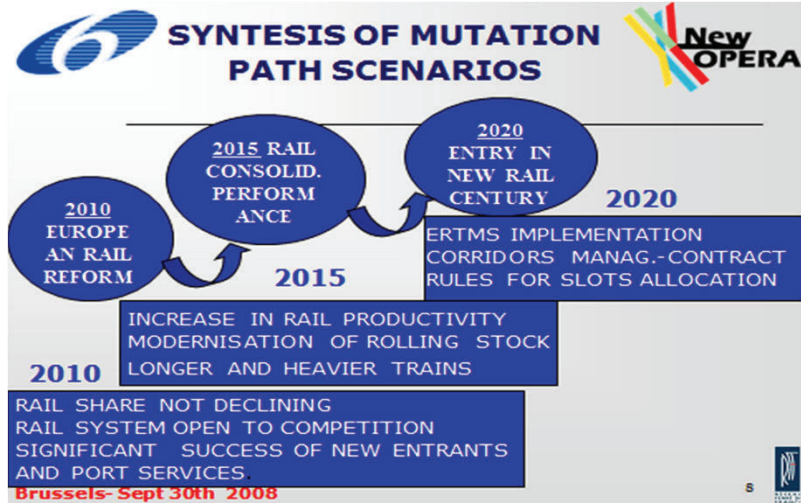
The rebalancing of transport modes will not take place automatically. Assuming NEWOPERA approach of establishing a Rail network predominantly dedicated to Freight the following goals are to be set:

- Significant increase of speed on the main European corridors up to 100% . Actual measurements made on railway networks (RFF) show, that the most critical point is the time lost on nodes to leave priority to passengers trains rather than the speed of the freight train.
- Increase in reliability and consistency of rail services competitive with those offered by road (hypothesis taken from EUFRANET).
- Important reduction of cost due to increase rotation of rolling stock, increase of “effective” driving hours of drivers and possible increase in length of trains: these are expected to lead a reduction from 30% up to 50% of operating costs.
- Very significant increase in rail network capacity due to more homogenous speed of the trains, pointing at bottlenecks which have to be removed.
- Better combined utilization of new infrastructure for High Speed Train and former rail lines, leading to an improved combination of lines respectively dedicated to freight or to passengers, avoiding conflicts between types of traffic

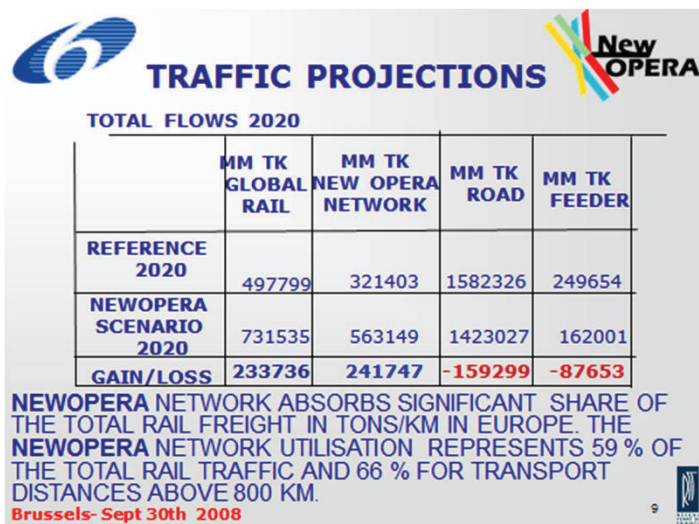
**Achievements:** This Artistic impression of NEWOPERA dedicated rail freight network produced in year 2000 at project conception was forward looking when compared to TENT network and European Rail Network for Competitive Freight, arrived 13 years later.







67



**TRAFFIC PROJECTIONS**

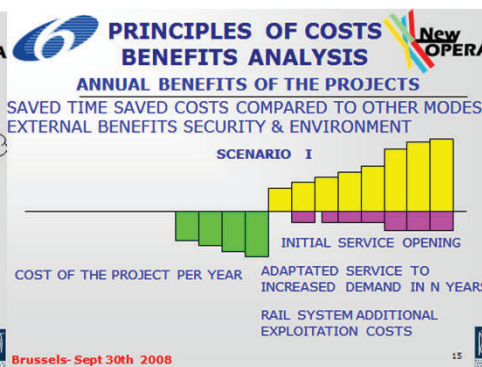
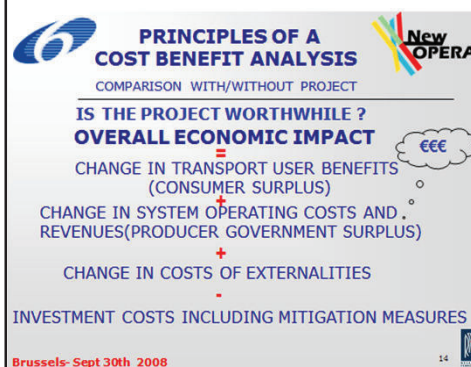
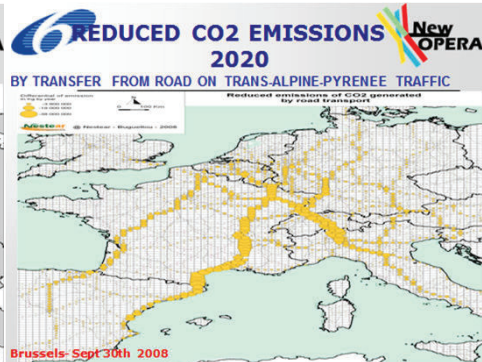
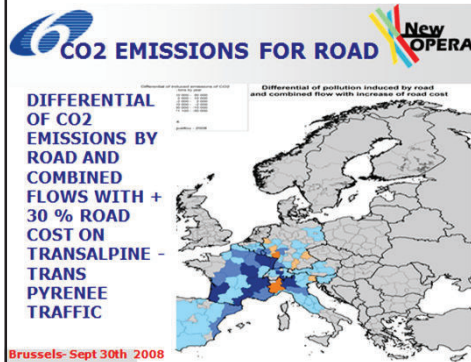
**TOTAL FLOWS 2020**

	MM TK GLOBAL RAIL	MM TK NEW OPERA NETWORK	MM TK ROAD	MM TK FEEDER
REFERENCE 2020	497799	321403	1582326	249654
NEWOPERA SCENARIO 2020	731535	563149	1423027	162001
GAIN/LOSS	233736	241747	-159299	-87653

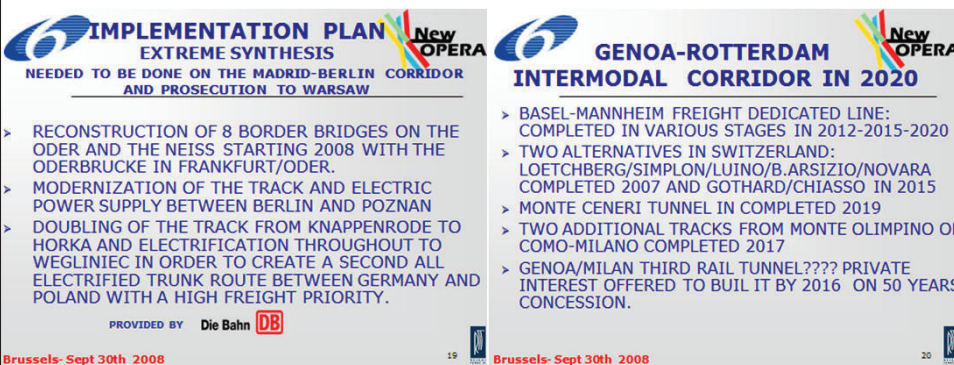
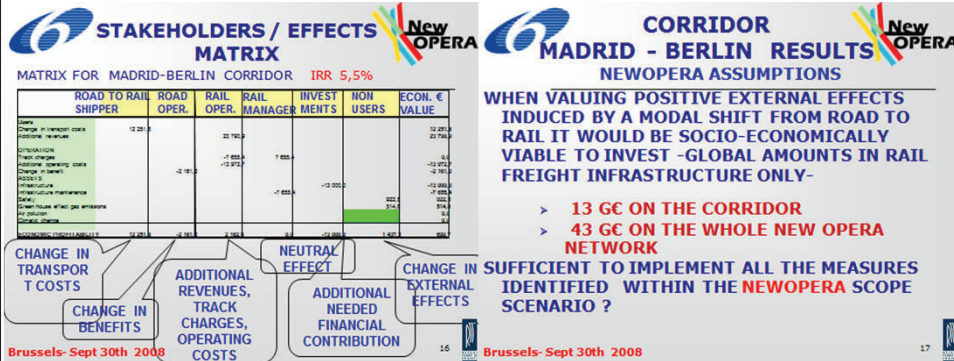
NEWOPERA NETWORK ABSORBS SIGNIFICANT SHARE OF THE TOTAL RAIL FREIGHT IN TONS/KM IN EUROPE. THE NEWOPERA NETWORK UTILISATION REPRESENTS 59 % OF THE TOTAL RAIL TRAFFIC AND 66 % FOR TRANSPORT DISTANCES ABOVE 800 KM.

Brussels- Sept 30th 2008

68









## GENOA-ROTTERDAM TECHNICAL DETAILS

- FULL CORRIDOR OPENING 2020
- HUGE CAPACITY GENERATED FOR FREIGHT
- GAUGE "C"
- MAXIMUM GRADIENT 12‰
- CORRIDOR DISTANCE REDUCTION
- REDUCTION 50% ON PREVIOUS TRANSIT TIME
- CORRIDORS MANAGEMENT IN OPERATION
- HUBS AND TERMINALS ON THE LINE MUST BE ADEQUATE TO NEW CAPACITY (B.ARSIZIO-NOVARA-WOIPPY-MANNEHEIM-RTD-ANTWERP)
- LONGER TRAINS 1000 TO 1500 MT
- STANDARDISED EUROPEAN ERTMS/ETCS LEVEL 2
- SIGNALLING SYSTEM LEADING TO LEVEL 3

Brussels- Sept 30th 2008

21

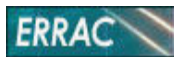


## BETUWE LINE INTERMODAL CORRIDOR IN 2020

- DEDICATED TO FREIGHT IN 2007 RTD-ZEVENAAR
- EMMERICH/OBERHAUSEN BY 2015
- GAUGE "C"
- TECHNICAL SPECIFICATION DOUBLE STACK
- LONGER TRAINS 1500M
- CORRIDORS MANAGEMENT
- STANDARDISED EUROPEAN ERTMS/ETCS LEVEL 2-3
- HUBS/TERMINALS ADEQUATE TO NEW CAPACITY
- LINE'S CAPACITY DOES NOT MAKE NECESSARY DOUBLE STACK FOR THE TIME BEING

Brussels- Sept 30th 2008

22



## NEWOPERA PROJECT STRENGTHS AND ORIGINALITY

- VARIETY OF POSSIBILITIES HYPOTHESIS & REAL COST/BENEFIT ANALYSIS
- SCENARIOS TO BE COMPARED TO A "IF NOT" STRATEGY (IF NOT MEANS NEW MOTORWAYS MEGA TRUCKS CONGESTION, CLIMATE CHANGE etc)
- TOTAL INFRA INVESTMENT LIMITED AND REALISTIC MAXIMISE THE USE OF EXISTING INFRASTRUCTURE
- RECOMMENDATIONS TO BE ENCOURAGED :
  - ROLLING STOCK UPGRADE(EIB ?)
  - ELECTRIC LOCOMOTIVES(INCITATIVE TOLLS ?)
  - UPGRAIDING SIDINGS AND EQUIPMENT FOR LONGER TRAINS
  - INSTITUTIONAL COOPERATION

Brussels- Sept 30th 2008

23



## BASIC CONCLUSIONS IN EXTREME SYNTHESIS

HARMONISE TECHNICAL PARAMETERS  
REMOVING BOTTLENECKS  
FACILITATE OPERATION  
REMOVE ADMIN. BARRIERS

INCREASE CAPACITY  
IMPROVE INTEROPERABILITY  
ELIMINATE DISCREPANCIES  
PROVIDE SEAMLESS TRAFFIC

NO NEED TO BUILD FROM SCRATCH A NEW FREIGHT NETWORK FOR ACHIEVING MODAL SHIFT TO RAIL  
PROPER ADAPTATIONS COUPLED WITH THE COMPLETION OF ONGOING PROJECTS - EXISTING NETWORK CAN SUSTAIN A THREEFOLD INCREASE OF TRAFFIC IF PROPER MEASURES RECOMMENDED BY NEWOPERA PROJECT ARE IMPLEMENTED

INVESTING IN RAIL IS THE RIGHT CHOICE FOR DEALING WITH THE FREIGHT TRAFFIC INCREASE. IT IS THE BEST COST-EFFECTIVE SOLUTION FOR SOCIETY

Brussels- Sept 30th 2008

24

## Evaluation:

1. Were the results implemented in the design of the new products and services?  
Were these new products/services put into commercial operation. The rail network design envisaged at the NEWOPERA project conception is being implemented:
  - The greatest Market uptake is the Betuwe Line investment to full operational profile
  - Betuwe Line is being scaled up with further 2 Billion € Investment in the Emmerich /Oberhausen leg in Germany for accessing the Ruhr area
  - The Iron Rhine upgrading from Antwerp to Germany for accessing the Ruhr area is the object of negotiation between the Countries involved. This is judged to be a strategic connection for the Port of Antwerp. This is a dedicated cargo Rail Line.
  - The Port of Antwerp invested inside the port area in 3 rail terminals which have been immediately utilized and filled up with rail traffic
  - The Port of RTD in its Masvlake 3 has planned a dedicated Rail CT terminal for exiting the traffic in an industrial way with volumes coherent with the Betuwe Line capacity
  - As a result of these actions the Modal split of both Antwerp and RTD ports which had a modest rail share of about 5% with the rest being moved either by road and barges in roughly equal quantities has jumped now to 15% in about 5 years and growing.
  - The Basel – Mannheim quadrupling East of the Rhine is being realized as per program making two additional rail tracks available for freight
  - In Switzerland Loetichberg is fully operational, the Gothard in the course of completion(2016)

75

## Evaluation:

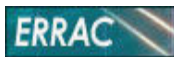
- Monte Ceneri Tunnel in Switzerland is set to be completed in 2019 for debottlenecking the Gothard line to Chiasso
- In Italy RFI has approved the investment on Monte Olimpino Tunnel and debottlenecking the Como Milano line coherent with the additional capacity of Gothard Tunnel realizing in practice a rail freight two tracks corridor from Milano to North Sea
- A new agreement has been recently signed between Italy and Switzerland for upgrading the Gallarate Luino rail tracks up to 4 meters "gauge C" high gauge and 750 meters length trains debottlenecking the Genoa RTD corridor increasing the productivity of Loetichberg Line where the maximum gradient is 12% all along the line.
- In Italy the 3<sup>rd</sup> Milano /Genoa Tunnel is already in execution while the restructuring of the entire Genoa rail network is also in execution with an investment of € 600 MM.
- The ERTMS level 3 has already been decided although it will take few more years to come to full fruition
- The trains of 1500 meters length have been favourably tested between Lyon and Nimes
- The corridors Management at least on the OSS is in operation via Rail Net Europe as indicated inside the project. The Corridors Governance is being examined at EU level. For each TEN T corridor a manager responsible for each corridor has been already named.
- The Gallarate/Busto Arsizio terminal has been doubled to be the biggest in Europe for Intermodal traffic serving the Milano/Antwerp/RTD corridor. The Novara CT terminal is also being expanded, with MELZO Milano supported by SBB becoming ready to receive 750 M trains and doubling its CT capacity.

76



### Evaluation:

- In the Ports of Hamburg and Bremerhaven bottlenecks have been removed, bridges built and terminals upgraded allowing the doubling of traffic by 2016 up to 400 trains/day from the 200/250 trains/day moved now.
- The TIGER project has introduced new services to/from these ports & the hinterlands
- A massive investment program is in course of execution in Germany for hinterland terminals. Lehrte the new mega hub is in execution. Munich Riem new module is operation since 2012. Duisburg new DUS terminal completed, with new modules in Stuttgart and other terminal in execution. Total investment 500MM in terminals facilities.
- All the measures indicated by the project are in course of execution or already executed.
- The German Part indicated into the project is in course of execution. The Berlin Poznan line modernization is nearing completion. The new Border bridge in Oderbrücke is in service. Other bridges already in operation. The Kappenrode-Horka-Wegliniec freight line is on its way and is due to be completed in 2016. Delays due to Nimby attitude is affecting the Geltendorf – Lindau electrification project. This is the missing link of the Munich – Zurich International axis which is now due to be completed by 2020.
- The underground by pass of the double track bottleneck in Rastatt is in full swing and expected to be completed by 2023. This will remove the last capacity limitation between Karlsruhe and Offenburg which is already 4 rail track throughout.



### Evaluation:

- The Brenner second rail Tunnel is in execution and terminal capacities both in the Verona Area and in Austria are being expanded.
- The Turin Lyon new Tunnel in Valle Susa despite the very strong “Green” opposition has started and the base tunnel excavation is in execution. The French and Italian Government have renewed confirmation of this execution.
- The doubling of Genoa/Ventimiglia rail line connecting via France to Spain is in course of execution.
- The doubling of La Spezia/ to Parma rail line across the Apennines is in course of execution for prosecution to Brescia and Verona for the Brenner Tunnel. It is connecting the Tyrrhenian Sea with the North sea also linking the Tyrrhenian sea to Corridor 5 in Brescia.
- Both the Loetichberg and the Gothard despite having debottlenecked the line, need further works along the corridor. On the Loetichberg line the Simplon tunnel needs refurbishing due to be completed by 2018. On the Gothard the Basel-Ertstfed section needs to be adapted to 4 meters 4 angles trucks gauge which will be completed by 2019-2020.
- Thanks to all these actions the full corridor Rotterdam Genoa will be fully standardised to the most advanced gauge/technologies by 2019/2020 up to Gallarate/Milano and from Milano to Genoa the third tunnel across the Apennines already in execution is due to be ready not before 2025.



## Evaluation:

2. Is new legislation and standardization based on findings from this research project. Yes. NEWOPERA Project has fathered the European Rail Network for Competitive Freight legislation which was passed by the EU Parliament on 2011. This was achieved through CER that promoted PERFN Preferential European Rail Freight Network, mitigating the word "Dedicated" with "Preferential". This "semantic" modification allowed the legislator through the Parliament Rapporteur to make the issue Passengers – Freight competing for the same rail track more "politically" acceptable. NEWOPERA involved at that time Gabriele Albertini chairman of the EU Parliament Transport Committee as well as Paolo Costa MP.
3. Are the results of the project implemented across Europe or only in a small number of Member States. The TEN T network and its full implementation expected by 2030 is the actual demonstration of the NEWOPERA Project recommendations validity. For the Investments in course of execution refer to point 1. For the total European network refer to the TEN T network and the European Rail Network for Competitive Freight legislation
4. Are the results of the project implemented outside Europe before being accepted in Europe. NEWOPERA was a European research. A dedicated presentation was made on NEWOPERA under the UIC auspices to the Russian Railway who perceived NEWOPERA Project as being the FLAGSHIP Project in the Union. Regular Intermodal service connections were introduced following the NEWOPERA project. The Transiberian service linking Peking to Hamburg operated by DB Schenkers, and the Trans Asia via Kazakhstan operated by Trans Eurasia Logistics.

79

## Evaluation:

5. Did the projects increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design. Projects such as TIGER, TIGER DEMO, MARATHON, VIWAS, SPIDER PLUS, CAPACITY4RAIL are proving the NEWOPERA recommendations in the market place increasing competitiveness, effectiveness and shifting traffic to Rail.
6. Did the project increase competitiveness of the railway transportation compared to other transport modes. Tiger Project from NEWOPERA introduced a new business model in the sea Ports/Hinterland destinations via Dry Ports proving a formidable success story both for costs savings and service performances.
7. Are the results of the project taken into consideration when preparing public tenders. Yes TEN T network is included in Public Tenders. It is certain that NEWOPERA project influenced the implementation of the TEN T corridors. It was the first project to introduce "Officially" the Rail Freight dedicated lines approach provoking a new philosophy in Europe about the need to give more priority to freight trains if shift to rail is to be achieved and environmental benefit to be pursued.
8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability. The Betuwe line cross border expansion up to Oberhausen in the Ruhr area, as well as the Iron Rhine from Antwerp to the Ruhr together with the Genoa RTD debottlenecking all along the line, the new Brenner tunnels and Valle Susa on Lyon/Turin prove the NEWO entering into the full implementation phase.

80

### Evaluation:

9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality: *Very much so.* The generation and availability of additional capacity on the European rail network is a pre-requisite for effective competition. NEWOPERA has seen the advent of newcomers into the traction/full trains/intermodal operators field. RTC, RAIL4CHEM, TRANSFESA were project partners. They have been incorporated into bigger companies. Many newcomers have obtained EU traction licenses. Some have been very successful such as BoxXpress, Acos TX logistics, ERS, etc others have been consolidated into bigger companies. The traditional intermodal operators such as Kombiverkehr, Hupac have obtained licenses. Without the additional capacity being generated by the NEWOPERA project implementation the competition to the Incumbents would have been only theoretical.. NEWOPERA advocated the need to interoperability and rolling stock cross acceptability well before ERA constitution.
10. Can benefits be assessed in financial terms: *Yes.* One can argue on the figure produced by the RAILPAG system elaborated by RFF, but they are as good as any other system. In fact RAILPAG is the only model incorporating all the costs dimensions. The investments being carried out on rail and debottlenecking prove this point. The EU Commission drive in favor of sustainable mobility and the internalization of external costs through Eurovignette stand to indicate that the Railpag system is correct for calculating the IRR rate of return of the rail infrastructure investments.

81

### Evaluation:

- 11 Applicability of results to future scenarios. *Yes* The EU White Paper is going in this direction both for 2030 and 2050 vision.
- 12 Usefulness of research procedures for future projects (incl. modeling). *Modeling have been used extensively during the project lifetime and in the production of the results for NEWOPERA scenario.*

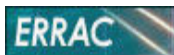
82



### **Lessons learnt**

- Consortium had to win scepticism & opposition. Some incumbents were against.
- The Viareggio accident proved the need to move away from city centres the cargo traffic in the same way ring roads motorways diverted juggernauts
- NEWOPERA indicated , OSS application, multi channel distribution approach, service segmentation, wagons fleet rejuvenation, costs benefit analysis, positive environmental impacts, decongestion approach, shift to rail drive, rail freight industrialization, research on actual traffic data movements, technology impacts
- NEWOPERA indicated that it was necessary to transport more with the available resources opening up to longer faster and heavier trains & Transport industrialisation for increased competitiveness
- NEWOPERA indicated a step change in Wagons tech for higher productivity. New wagons T3000' carrying 2 trailers of square gauge & 9'6" high Cts. Are operative
- NEWOPERA indicated the Cooperative approach between operators already existing in other transport modes such as Air, Sea, Road

83



### **Reasons for Outcome**

- Clever Prediction of future traffic flow already at the project conception phase in 2000 paved the way for legislation in 2011
- High focus on a realistic business case with demanding targets of costs reduction
- Skilful and active project management able to unify and enthusiasm both project internal and external stakeholders
- The Project worked with an active implementation during the project conception phase right up to the final end of the project
- Extensive analysis of "IF NOT" scenarios and consequences
- Right mix of partners
- Riding and supporting decided investment in infrastructure and hubs
- Several associated EU projects supported the implementation.

84



## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

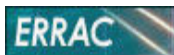
## ERRAC Project Evaluation Working Group (EWG)

Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

## Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes



# ERRAC Project Evaluation Group

## INMAR

EVALUATION FROM March 2014

Project acronym:

FP: 6

Programme acronym:

Project Reference:

Call identifier: NMP2-CT-2003-501084

Total Cost: € 27 M

EU Contribution: About 50%

Timescale: Jan 2004 to Jan 2008

Project Coordinator: Prof. Dr-ing Holger Hanselka

☐ Presented by: Dan Otteborn

☐ Date evaluation: 07.03.2014

☐ Market uptake: Strong

☐ Follow up projects: Not known

☐ Other related Projects: Cantor

Web references: <http://www.inmar.info> <http://cordis.europa.eu/projects/501084>

## **INMAR | Intelligent Materials for Active Noise Reduction**

### **Main Objectives**

- New complex multifunctional passive, semi-active and active materials and material structures
  - Actuator and sensor system based on the developed materials, fully operational under harsh environment, high and broad-band load and under large deformation.
  - Their manufacturing technologies.
  - Novel miniature control and electronics system for multifunctional materials and for the actuator and sensor system.
  - Simulation and optimization tools for the design of intelligent systems
  - Technologies to integrate intelligent materials system in structural components.
  - Methods and procedure to assess their reliability, environmental impact and life-cycle including condition monitoring.
- 

87

## **Background**

### **Details**

- FP
- Total Cost:
- EU Contribution:
- Start and duration:
- Scientific Coordinator:

### **Partners**

- Totally there were 44 partners in the project of them only 2 were railway related, Bombardier and Lucchini.
- 

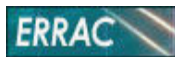
88



## Background

The INMAR project was created at a time when new technology for noise abatement was starting to appear on the market, so called active noise abatement simultaneously the pressure to decrease noise become stronger and stronger.

The project was consequently created at the right time



## Achievements

According to the website with last update April 2008, just after the closing of the project the project published 19 newsletter, press releases and publications.

None of these reports were about specific rail issue.

Rail was subject to one sub WG dealing with Wheels & brakes, Powertrain & bogies, and ventilation

### Evaluation:

1. Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation?  
**Yes Bombardier use the results**
2. Is new legislation and standardization based on findings from this research project?  
**No**
3. Are the results of the project implemented across Europe or only in a small number of Member States?  
**Yes Bombardier have implemented the result as standard on all trains**
4. Are the results of the project implemented outside Europe before being accepted in Europe?  
**Yes see above point 3**

91

### Evaluation:

5. Did the projects increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design: Yes It helped satisfying demanding requirements for noise reductions
6. Did the project increase competitiveness of the railway transportation compared to other transport modes: Yes it increased the rail particular diesel traction ability to meet noise requirements so that no advantages exist compared to other mode of transport in the noise domain.
7. Are the results of the project taken into consideration when preparing public tenders: Yes indirectly through noise level specifications.
8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability. No

92

### Evaluation:

9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality  
Yes, Noise are not so much an issue now.
10. Can benefits be assessed in financial terms **No**
11. Applicability of results to future scenarios: Yes Usefulness of research procedures for future projects (incl. modeling)

### **Reasons for outcome**

- The project was launched at the right time addressing a real problem of relatively high scientific complexity.
- The strong driver for implementation was there through the demanding customer requirements on noise levels.
- The right technical team from Bombardier was involved, i.e. the centre of competence for noise and vibrations (which is also involved in TSI and standardisation process).
- ....



## Lessons learnt

- It is possible to implement results from a multi mode research project where rail is only a small part providing that the focus of research is to solve a real problem existing at the time of research execution. Researches and implementers should be very close to each other or the same team.
- A clear route to market was overseen from the start of the project.
- The existence of a specialised topical department (i.e., the excellence centre within Bombardier) was empowered and trusted to make this implementation possible.

95

## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

### ERRAC Project Evaluation Working Group (EWG)

#### Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

#### Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes

96

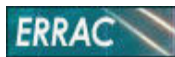


## ERRAC Project Evaluation Group INteGrail

EVALUATION FROM April 2014

Project acronym:	INteGrail	<input type="checkbox"/> Presented by:	Dan Otteborn
Fp:	FP6	<input type="checkbox"/> Date evaluation:	16/04/2014
Programme acronym:	Intelligent integration of railway Systems	<input type="checkbox"/> Market uptake:	Weak
Project Reference:		<input type="checkbox"/> Follow up projects:	No
Call identifier:		<input type="checkbox"/> Other related Projects:	No
Total Cost:			
EU Contribution:			
Timescale:	2008-2009		
Project Coordinator:			
Web references:			

97



## Objectives of the project

The INteGrail project aims at developing an INTELLIGENT COHERENT INFORMATION SYSTEM by integrating the main railway systems. The objective is to achieve a higher level of coordination and cooperation between the key railway processes. The benefit will be higher levels of performance (in terms of Capacity, average speed and punctuality), safety and optimised usage of resources.

### The direct project objectives are:

- Increase capacity and efficiency by intelligent integration of railway systems.
- Favour convergence and integration between rolling stock, infrastructure, signalling systems, train control and traffic management.
- Allow for full remote supervision of trains from a control centre.
- Achieve automatic monitoring of train status and equipment condition
- Implement the concept of self-aware intelligent trains.
- Maintain the current high safety level in railways.
- Implement predictive maintenance and lean maintenance concepts.
- Implement intelligent system management and dynamic path allocation.
- Improve passenger information and information system interactivity.
- Improve interoperability based on new open standards.
- Pave the way for implementation of TSIs.

98



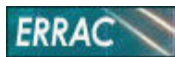
## Background

### Details

- FP 6
- Total Cost:
- EU Contribution:
- Start and duration: 01012005-
- Scientific Coordinator:

### Partners

- total: 39 partners



## Background

**Coordinator:** UNIFE

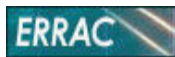
Alstom	Ceske drahy a.s	ANSALDO BRED A
MAV	Unicontrols	Structon Rail
Bombardier	Deuta-Werke GmbH	Heriot-Watt University
Siemens	IMEC	OFFIS university oldenburg
D'Appolonia	Tevevic nv	Seebyte. Ltd
FAV	Kontron nv	University of Chile
AEA Technology rail	INREDS	Wireless future
Ansaldo	University of Birmingham	ADIF
CAF	Corridor X	Network Rail
Nortel networks	Prorail	SNCF
Laboratori G. Marconi	UIC	RFF
ATOS orgin	ATOC	RFI
Mermec	Trenitalia	



## **Partners interviewed:**

<b>Name</b>	<b>Organisation</b>	<b>Feedback</b>
Antonio Ruggieri	ATSF	Some minor internal use
Paolo Umiliacchi	CNC	No known use
Imrich Korpanec	UIC	No known use. Railway undertakings negative to the project at the beginning and trough out completion.
Wolfgang Steinicke	Fav	No answer
Thomas Meissner	Fav	No answer
Gerhard Lange	Siemens	No answer
Didier Abeele	Alstom	No answer (has left Alstom)
John Amooore	Network Rail	No answer

101<sup>101</sup>



## **Achievements**

Project claimed benefits arise as a result of implementation of the above stated objectives

- Enhanced integration through implementation of high-speed communication backbone
- Removal of bottlenecks through better information flow and decision support
- Enhancing safety as a prerequisite for increased capacity
- Improve safety by harmonisation
- Improve safety by optimised maintenance
- Increase capacity by better availability and reliability of rolling stock and infrastructure
- Creation of new service for passenger using available and new infrastructure
- Define a migration path from existing to future technologies and applications

102

### Evaluation:

1. Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation? **NO, possibly only in small company specific applications.**
2. Is new legislation and standardization based on findings from this research project? **NO**
3. Are the results of the project implemented across Europe or only in a small number of Member States? **NO, no implementation at all.**
4. Are the results of the project implemented outside Europe before being accepted in Europe? **NO**

103

### Evaluation:

5. Did the projects increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design? **NO**
6. Did the project increase competitiveness of the railway transportation compared to other transport modes? **NO**
7. Are the results of the project taken into consideration when preparing public tenders? **NO**
8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability? **NO**

104

### Evaluation:

9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality?  
**NO**
10. Can benefits be assessed in financial terms? **NO**
11. Applicability of results to future scenarios? **Yes, possibly**
12. Usefulness of research procedures for future projects (incl. modeling)? **YES, possibly**

105

### **Reasons for outcome**

- Implementation of InteGrail research outcomes would have required deep cooperation between independent stakeholders in the rail sector
- Decision on such cooperation and its economical consequences would have to be taken on a very high level, a level never made aware of InteGrail and probably not interested to quickly go to required level of cooperation and sharing of operative data.
- There were no plan on how a possible implementation would be realised after project end. No agreement among the 39 partners on a future implementation.
- The project was too ambitious to implement and therefore nothing was achieved

106

## Lessons learnt

- A project with 39 partners doing bits and pieces here and there is very difficult to bring to real implementation....
- A project aiming at created vast and unseen level of cooperation among individual independent stakeholders must ensure that this is achievable before doing all research and development..

107

## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

### ERRAC Project Evaluation Working Group (EWG)

#### Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

#### Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes

108



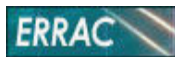
## ERRAC Project Evaluation Group INESS

Evaluation from March 2015

Project acronym:	INESS	<input type="checkbox"/> Presented by:	Dan Otteborn
Fp:	FP7	<input type="checkbox"/> Date evaluation:	03/03/2015
Programme acronym:	Integrated European Signalling systems	<input type="checkbox"/> Market uptake:	Medium
Project Reference:		<input type="checkbox"/> Follow up projects:	No
Call identifier:	FP7-SST-2007-RTD-1	<input type="checkbox"/> Other related Projects:	No
Total Cost:	16 598 365 Euro		
EU Contribution:	10 265 769 Euro		
Timescale:	2008-2011		
Project Coordinator:	UIC		

Web references:

109



## Objectives of the project

The INESS project aimed to define and develop specifications for a new generation of interlocking systems and, thus, to extend and enhance the standardisation process according to the current European policies.

It aimed to further lead to industry being more directly involved with Infrastructure managers in developing innovative solutions for the future based on an enhanced and common understanding of the operational requirements needing to be delivered into the railway transportation system.

**The main scientific and technological objectives** were the following:

- To define a common kernel of validated standardised functionalities for future interlockings, including functionalities specially required by ERTMS L 2 and L 3 and which will support the common operational requirements of various railways.
- To propose one or more standardised system architectures and the relevant functional Interface between the interlocking and the adjacent subsystems optimised for ERTMS L2 and L 3.
- To develop a common business model and the associated business cases and cooperation models to support intelligent migration strategies for ERTMS and therefore accelerate the realization of European ETCS corridors and to realize cost reductions within the entire supply chain.

110

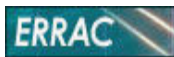




#### **The main scientific and technological objectives (cont.)**

- To develop a road map ( exploitation plan ) towards interoperable, standardised interlocking platforms.
- Implement the concept of self-aware intelligent trains
- Maintain the current high safety level in railways
- Implement predictive maintenance and lean maintenance concepts
- Implement intelligent system management and dynamic path allocation.
- Improve passenger information and information system interactivity
- Improve interoperability based on new open standards
- Pave the way for implementation of TSIs.
- To define standardised and optimised methods and tools for requirement management and for verification and validation.
- To identify an sufficient way for an interpretation of the safety case process according to the relevant CENELEC standard and to develop improvement strategies coherent with the yet to be harmonized requirements of the various national safety authorities thus reducing time and money for the safety case in industry by avoiding unnecessary or redundant processes. This activity has the potential to lead, in addition to the facilitation of the development of a harmonized approach by all such authorities.

111



## **Background**

### **Details**

- FP 7
- Total Cost: 16 598 365 Euro
- EU Contribution: 10 265 769 Euro
- Start and duration: 2008/06/05
- Scientific Coordinator: UIC

### **Partners**

- total: 31 partners

112

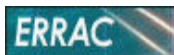


## Background

**Coordinator:** UIC

ADIF Centre	Network Rail	German Aerospace
ALMA	Prorail B.V	NUCLEO
Alstom	Railsafe Consulting	
Ansaldo STS	RFI	
AZD	RWTH Aachen	
Banverket	Scheith & Bachman	
BBR	Siemens	
Bombardier	University of Southampton	
DB Netz	TIFSA	
TUE University	Thales	
Eliop s.a	Technical University Braunschweig	
Funkwerk IT	Universidad de Madrid	
Invensys	University of York	
MerMec	UNIFE	

113



## Achievements Main outputs

Project claimed benefits arise as a result of implementation of the above stated objectives

- Common business model and the associated business cases and cooperation models to support intelligent migration strategies for ERTMS.
- Common kernel of validated standardised functionalities for future interlockings.
- Standardised and optimised methods and tools for requirements management and for verification and validation.
- Efficient way for an interpretation of the safety case process according to the relevant CENELEC standards.
- Standardised system architecture and the relevant functional interfaces between the interlocking and the adjacent subsystems.
- Standardised data flow design tools, file formats linked with system architecture.
- Training platform and training materials ensuring the wider dissemination and understanding of the INESS project result.

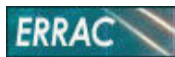
114



## *European Rail Research Advisory Council*

Emmanuel Buseyne	UIC	(Project manager)
Umberto Foschi	RFI	
Paolo de Cicco	UIC	
Ralf Kaminsky	Siemens	
Javier Serrano Lopez	TIFSA	
Angel Arranz	ADIF	Head of new technology
Norbert Kuhne	Thales	
Didier Gouttenegre	Alstom	
Maurizio Rosi	Ansaldo	
Vladimir Kampik	AZD	
Christer Löfving	Banverket	
Theo Lange	BT	
Dr Bernd Elsweiler	DB	
Frans Heijnen	Invensys	
Andy Doherty	Network rail	

115 115



## *European Rail Research Advisory Council*

### **Evaluation:**

1. Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation?
2. Is new legislation and standardization based on findings from this research project?
3. Are the results of the project implemented across Europe or only in a small number of Member States? **NO**
4. Are the results of the project implemented outside Europe before being accepted in Europe?

116

### **Evaluation:**

5. Did the projects increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design?
6. Did the project increase competitiveness of the railway transportation compared to other transport modes?
7. Are the results of the project taken into consideration when preparing public tenders?
8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability

---

117

### **Evaluation:**

9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality?
10. Can benefits be assessed in financial terms?
11. Applicability of results to future scenarios?
12. Usefulness of research procedures for future projects (incl. modeling)?

---

118



## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

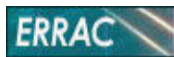
## ERRAC Project Evaluation Working Group (EWG)

Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

## Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes



# ERRAC Project Evaluation Group

## CARCIM

EVALUATION FROM 27 March 2015

Project acronym:	CARCIM	
FP:	6	<input type="checkbox"/> Presented by: C. Ulianov
Programme acronym:	FP6-2005-TRANSPORT-4	<input type="checkbox"/> Date evaluation: 27 March 2015
Project Reference:	031462.	<input type="checkbox"/> Market uptake (rail sector): Weak
Call identifier:	SUSTDEV-2005-3.2.2.2.4	<input type="checkbox"/> Follow up projects: none
	- Research domain 2.2	<input type="checkbox"/> Other related Projects: none
Total Cost:	€ 3,743,560	
EU Contribution:	€ 2,000,000	
Timescale:	September 2006- August 2009	
Project Coordinator:	Tassilo Moritz (Fraunhofer IKTS)	
Web references:	<a href="http://www.carcim.eu/">http://www.carcim.eu/</a>	

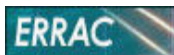


## CARCIM

### **Integration of two-component ceramic injection moulding for large-scale production of novel multifunctional ceramic components for automotive and railway applications**

**Premise:** The Carcim project was designed to develop and test prototypes produced by 2 component ceramic injection moulding (2C-CIM) and demonstrate the capability of low-cost, large-scale shaping of complex ceramics. The used four case studies to evaluate various combinations of ceramics to build on specific characteristics of individual materials. One for the rail sector was brake pads with a combination of good friction, strength and heat conductivity.

The results led to identification of several important requirements for the successful development of two-component ceramic parts. In addition, the Carcim project demonstrated the feasibility of applying 2C-CIM to produce complex ceramic shapes with novel properties. The results could lead to large-scale, low-cost production of ceramic components for the automotive and **railway industries**, with additional future applications **to be developed**.



## CARCIM

### **Integration of two-component ceramic injection moulding for large-scale production of novel multifunctional ceramic components for automotive and railway applications**

2C-CIM will facilitate production of advanced ceramic products at a large scale with increased functionality, high degree of complexity, but at a lower cost level in comparison to other shaping techniques. The reason is that ceramic materials offer the possibility to combine properties like electrical conductivity with electrical isolation, high toughness with extreme hardness and wear resistance, etc. Moreover, all these property combinations can be achieved in only one shaping step without additional joining processes by 2C-CIM.

This project aimed to launch 2C-CIM as a high-throughput production process for complex shaped ceramic components in Europe. Besides for automotive and **railway applications** this new technology is of enhanced interest for all branches requiring ceramic materials or property combinations as mentioned above, because novel products could be produced by using 2C-CIM which cannot be achieved today for technical or economical reasons.



## CARCIM

**Integration of two-component ceramic injection moulding for large-scale production of novel multifunctional ceramic components for automotive and railway applications**

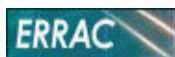
### Main Objectives:

The project resulted in four 2C-CIM prototype parts. Functional testing and verification such as techno-economical assessment of the complete processing chain had been carried out for the four parallel case studies:

- (1) ceramic glow plug,
- (2) ceramic gear wheel;
- (3) ceramic valve seat, and
- (4) ceramic braking pads for high speed trains.**

For developing the 2C-CIM technology for both, low pressure and high pressure injection moulding, one case study resulted in a prototype produced by low pressure injection moulding (glow plug) and three case studies are attributed to high pressure injection moulding (gear wheel, valve seat, and brake disc).

123<sub>123</sub>



## CARCIM: Background

### Details

- **FP** 6
- **Project Reference** 031462.....
- **Total Cost:** € 3,743,560
- **EU Contribution:** € 2,000,000
- **Timescale:** September 2006- August 2009
- **Project Coordinator:** Tassilo Moritz (Fraunhofer IKTS)

### Partners

- **Participants**
- AET DRUZBA ZA PROIZVODNJO VZIGNIH SISTEMOV IN ELEKTRONIKE D.O.O. Slovenia
- AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH Austria
- BAIKOWSKI France
- ROBERT BOSCH GMBH Germany
- CENTRO RICERCHIE FIAT S.C.P.A. Italy
- EVONIK DEGUSSA GMBH Germany
- FUNDICIONES DEL ESTANDA, S.A Spain
- **+ Others**

124<sub>124</sub>



## CARCIM: Background

### Partners interviewed:

#### Organisation

#### Name of interviewee

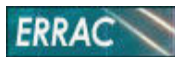
#### Country

ESTANDA

☒ Luis Angel ERAUSQUIN

Spain

125<sub>125</sub>



## CARCIM:Background

### Project description-Rail related:

The CarCIM project showed the feasibility of ceramic components with novel functionalities by two-component injection moulding. It emphasized the importance of non-destructive testing methods for ensuring the quality of the products in each processing step. Simulation of the processing chain can also be a helpful tool for avoiding problems in mould filling or with distortion and delamination of components. However, for improving the reliability of the simulation results further development work will be necessary. Tooling is a very challenging task for two-component ceramic injection moulding. For future works in this field more reworking cycles of the tool should be taken into consideration. The increase in difficulties for tooling in the case of two-component ceramic parts had been underestimated in this project. The rail demonstrator produced:

- braking pads - property combination high friction and mechanical strength/high strength with sufficient heat conductivity: Zirconia Toughened Alumina/Al<sub>2</sub>O<sub>3</sub>

The braking pads had been inserted into a steel braking disk in a casting process. A

bonding of the components in the steel disk could be obtained, and a braking test emphasized that the braking time from 180 km/h down to hold-up could be reduced by 17%.



## CARCIM: Background

### Achievement



**Case study 4:**  
Brake disc for  
high-speed  
trains

ESTANDA was involved in internal research activities on next generation brake disc concepts for railway applications. One of the strategic lines identified is to study the potential use of ceramic materials to enhance/modify specific features/performances of the conventional metallic discs. Among other possibilities, the use of ceramic inserts (small monolithic elements) is being considered. Basic targets are: reduction of weight, improvement of the braking performances and enhancement of thermal management. The use of ceramic inserts inherently affects the reduction of

127 127

## CARCIM: Evaluation Rail focus

1. Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation?  
**NO** – the project showed that the ceramic brake discs were theoretically better. Unfortunately they did not perform well with heat and they cracked and/or fell out of the brake housing.
2. Is new legislation and standardization based on findings from this research project  
**NO**
3. Are the results of the project implemented across Europe or only in a small number of Member States?  
**NO**
4. Were the results of the project implemented outside Europe before being accepted in Europe?  
**NO**

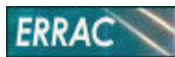
128 128



## CARCIM: Evaluation

5. Did the projects increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design?  
**NO**
6. Did the project increase competitiveness of railway transportation compared to other transport modes?  
**NO**
7. Are the results of the project taken into consideration when preparing public tenders?  
**NO**
8. Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability?  
**NO**

129<sub>129</sub>



## CARCIM: Evaluation

9. Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality?  
**NO**
10. Can benefits be assessed in financial terms?  
**NO** benefits
11. Applicability of results to future scenarios?  
**NO**
12. Usefulness of research procedures for future projects (incl. modeling)  
**Yes** – important to know other active research organisations, networking etc.

130<sub>130</sub>

### **CARCIM: Reasons for outcome**

- ✓ Steel brake discs are reliable and an industry standard product
- ✓ There is no business case to change to ceramics with poorer properties which make them less reliable

131<sub>131</sub>

### **CARCIM: Lessons learnt**

- ✓ Technically risky projects do not always have a positive result
- ✓ Working in a consortium is useful especially with the right partners
- ✓ New ideas come from networking

132<sub>132</sub>



## ERRAC Project Evaluation Group

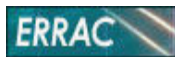
### CALM I

Meeting of 19<sup>th</sup> May 2010

Final evaluation: 10<sup>th</sup> June 2015

Project acronym:	GROWTH	<input type="checkbox"/> Presented by: N. Debachy (on behalf of D. Schut
FP: 5		
Programme acronym:	Competitive and Sustainable Growth	
Project Reference:	G4RT-CT-2001-05043	<input type="checkbox"/> Date evaluation: 18.05.10 / 10/06/2015
Total Cost:	655,800 EURO	
EU Contribution:	655,800 EURO	
Timescale:	01.10.2001 - 31.10.2004	
Project Coordinator:	J.Affenzeller	<input type="checkbox"/> Other related Projects:
	A.Rust of AVL List GmbH	CALM II (2004-2007)
Web references:	www.calm-network.com	COREN (starting end of 2010)

133



**CALM** : define the strategic plan for future noise research which is required to promote EU wide noise reduction and to improve the quality of life in Europe

### Overview:

The CALM network was to establish a Community Noise Research Strategy Plan based on the work and reports of expert Noise Working Groups appointed by the European Commission and in cooperation with the relevant industry sectors, research institutions and interest organisations.

The main focus is to clearly identify links and gaps between current noise abatement technology and future EU noise reduction and regulation goals in the fields of air traffic, road and rail transport, marine technologies and outdoor equipment.

134

## **CALM : Noise research Strategy for a Quieter Europe**

### Rationale:

Noise is a serious environmental problem throughout Europe. About 20 percent of the population is highly annoyed by environmental noise especially stemming from transportation. In the vicinity of very busy roads and airports the exposure to noise can be so strong that it may cause detrimental effects on health. The European Commission has started a new policy towards a quieter environment. It is based on a coherent set of regulations to limit the emission of noise from various sources and to assess and reduce the total exposure to environmental noise.

To support the further development of the EU noise policy, the European Commission has supported the creation of a new thematic network "CALM". It will define the strategic plan for future noise research which is required to promote EU wide noise reduction and to improve the quality of life in Europe.

135

## **CALM: Background**

### Details

 <b>FP5</b>	
 <b>Project Reference:</b>	<b>G4RT-CT-2001-05043</b>
 <b>Total Cost:</b>	<b>655,800 EURO</b>
 <b>EU Contribution:</b>	<b>655,800 EURO</b>
 <b>Timescale:</b>	<b>01.10.2001 – 31.10.2004</b>
 <b>Project Coordinator:</b>	<b>RUST, Alfred / AFFENZELLER, Josef</b> <b>AVL LIST GmbH A-8020 Graz, Austria / Hans-List-Platz 1</b> <b>Tel +43 316 787 253 / +43 316 787 1076</b>

### Partners

<input type="checkbox"/> <b>IMM -</b>	<b>University, Department of Psychology <i>Stockholm</i></b>
<input type="checkbox"/> <b>UBA -</b>	<b>Federal Environmental Agency <i>Germany</i></b>
<input type="checkbox"/> <b>BCC -</b>	<b>Birmingham City Council <i>UK</i></b>
<input type="checkbox"/> <b>YMPARISTO -</b>	<b>Ministry of Environment in <i>Finland</i></b>
<input type="checkbox"/> <b>UNOCOMA -</b>	<b>Ministero dell'Ambiente e Tutela del Territorio <i>Italy</i></b>
<input type="checkbox"/> <b>RWTUEV -</b>	<b>Ministry of Housing, Spatial Planning and Environment <i>Netherlands</i></b>

136

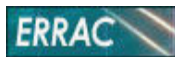


## CALM I and II: Background

### Partners interviewed:

<u>Organisation</u>	<u>Name of interviewee</u>	<u>Country</u>
SNCF	<input checked="" type="checkbox"/> Pierre-Etienne Gautier	France
SNCF	<input checked="" type="checkbox"/> Franck Poisson	France

137 137



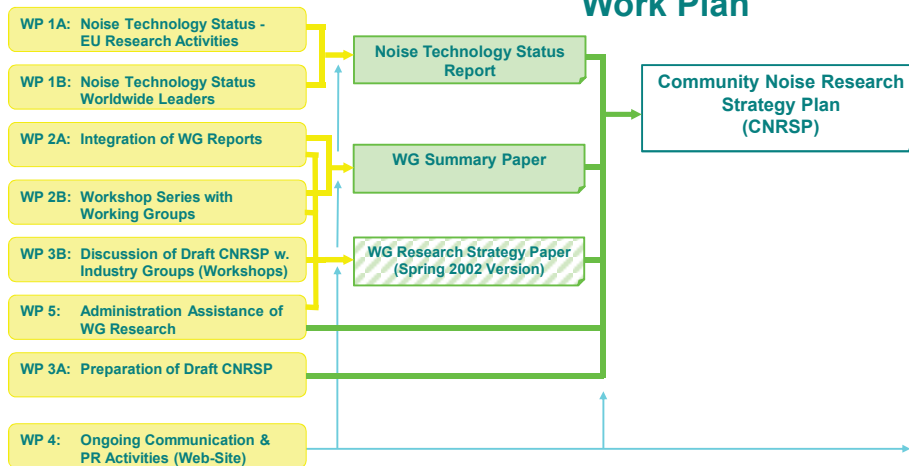
## CALM Project - Background

### Objectives:

- Establish a „Community Noise Research Strategy Plan“to support the transposition and implementation of the Environmental Noise Directive and to promote EU wide noise reduction”
- Aggregate achievements and results of the Noise Working Groups
- Define new technology requirements for new research areas
- Involve industry and research partners in preparation of policy guidelines to increase acceptance and awareness
- **Reveal synergy effects between different types of industry**  
(e.g. aeronautics, automotive, railway industry) leading to cost effective use of existing noise abatement technologies
- **Establish a communication platform for partners and the public**  
stimulating more environmental and political awareness of the community noise issue
- **Provide administration assistance for WG Research**

138

## Work Plan



139

## Specific Objectives

**WP 1 - RTD Activity Networking:**  
Monitoring European RTD activities and identification of remaining RTD needs

**WP 2 - Sectoral Integration:**  
Coordination of different noise sectors (including European Noise working groups, Research Advisory Councils and National Networks) and agreement on common research needs and targets

**WP 3 - Noise Research Strategies:**  
Updating of the CALM Noise Research Strategy Plan (with agreement of all stakeholders involved) and updating of CALM project data base

**WP 4 - Dissemination and Exploitation of Results:**  
EU-wide dissemination with special focus on new member states, candidate countries and young researchers (meetings, papers, presentations, brochures ...)

140

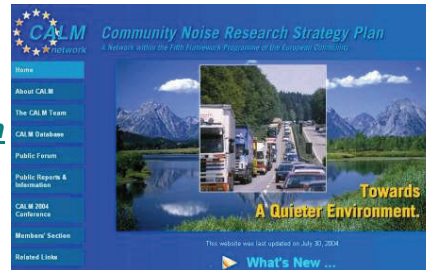
## Outcomes of CALM

- Website : [www.calm-network.com](http://www.calm-network.com)

- ◆ Public Information & CALM Reports
- ◆ Data Base about noise research projects (free access)

- Strategy Papers

- ◆ Strategy Paper 2002
- ◆ Updated Strategy Paper 2004



141

## Public Results

- Project Noise research Data Base on CALM Homepage with continuous updating
- Final CALM I Conference (with report) 2004
- Papers and Presentations at International Events once per year

142



### CALM: Evaluation

- 1- Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation?**

The main results of CALM I were the:

- ☐ Public noise research project data base on [www.calm-network.com](http://www.calm-network.com)
  - ☐ Strategy Papers 2002 and 2004 (noise research strategy plan and technology road maps)
- These results contribute to the planning of future (transport) noise research in Europe and setting-up of research programs (national, EU)

It is coherent for such type of projects (coordination and support activities)

- 2- Is new legislation and standardization based on findings from this research project?**

No, results not suitable as input to legislation and standardization but strong connections to legislation and regulations. One of the results were, as roadmaps, to draw how to face reinforced noise legislation.

- 3- Are the results of the project implemented across Europe or only in a small number of Member States?**

Across Europe

- 4- Were the results of the project implemented outside Europe before being accepted in Europe?**

No

143

### CALM: Evaluation

- 5- Did the project increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design?**

No, not directly. Only on long-term perspective via promoting research in railway noise

- 6- Did the project increase competitiveness of the railway transportation compared to other transport modes?**

No

- 7- Are the results of the project taken into consideration when preparing public tenders?**

Probably yes

- 8- Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability?**

No

144

## CALM: Evaluation

**9- Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality?**

No

**10- Can benefits be assessed in financial terms?**

No

**11- Applicability of results to future scenarios?**

Yes, to future noise research scenarios

**12- Usefulness of research procedures for future projects (incl. modeling)?**

The results support the planning of future noise research projects and programs

145

## Market uptake and lessons learnt

Market Uptake: medium to strong.

The goal of CALM I were to coordinate and to prepare future research activities on noise topics. Workshops organised gathered a relevant number of people from the transport sector. The documents / roadmaps produced were of good quality. CALM I helped the transport sector in a time of high level activity period about noise legislation to face and to prepare reinforcement of regulations.

146



## MARKET IMPACT EVALUATION

ERRAC was set up in 2001 and is the single European body with the competence and capability to help revitalise the European rail sector :

- To make it more competitive
- To foster increased innovation
- To guide research efforts at the European level

### ERRAC Project Evaluation Working Group (EWG)

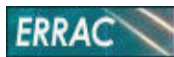
Objectives:

- Determine the market impact of previous rail research to improve use of research funding
- Ensure a strategic approach to the prioritisation of rail research

### Project Evaluation

- Individual projects are evaluated after they have been completed to ensure successful dissemination of project results
- To ensure that the results of previous rail research can be taken into account for future projects
- To avoid weak market uptake of results by learning the lessons of previous research
- The EWG will provide intelligence based on the project evaluations for input into future European Framework Programmes

147



## ERRAC Project Evaluation Group

### CALM II

EVALUATION FROM 10 June 2015

Project acronym:	CALM II	<input type="checkbox"/> Presented by: A.Gougelet for D.Schut
FP:	6	<input type="checkbox"/> Date evaluation: 10 June 2015
Programme acronym:	FP6-2003-Transport 3	<input type="checkbox"/> Market uptake: High
Project Reference:	TCA4-CT-2005-516237	<input type="checkbox"/> Follow up projects: none
Call identifier:	FP6-SUSTDEV-2 - Sustainable Surface Transport	<input type="checkbox"/> Other related Projects: CALM I (2001-2004), COREN (starting end of 2010)
Total Cost:	€ 500,000	
EU Contribution:	€ 500,000	
Timescale:	November 2004 - October 2007	
Project Coordinator:	Josef Affenzeller (AVL List GmbH) Alfred Rust (AVL List GmbH)	
Web references:	<a href="http://www.calm-network.com/">http://www.calm-network.com/</a> (defunct)	

148<sub>148</sub>



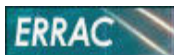
## CALM II

### Advanced Noise Reduction Systems

**Premise:** The overall strategic objective was the **synchronisation and encouragement of European transport noise research through a holistic system** approach involving all related research areas. CALM II was designed to facilitate the **networking** of organisations, the **coordination of activities** and the **exchange and dissemination** of knowledge so as to optimise research efforts, reach critical mass, strengthen the complementarity and coherence of noise research objectives and enhance the impact at a European level.

To complete its missions, CALM II would monitor European research activities and identification of research synergies, identify remaining research needs and setting research directions leading to updated noise research strategy plan; consider the situation in the new Member States and integrating the demands of national research initiatives support the exploitation and dissemination of European noise research results, increase public awareness of environmental noise and the awareness of noise research with young people (e.g. by involving promising young researchers with CALM II workshops).

149<sub>149</sub>



## CALM II

### Advanced Noise Reduction Systems

#### Rationale

Noise still belongs to the most concerned environmental pollutants. An estimated 80 million Europeans (ca. 20 % of the EU population) suffer from unacceptable noise levels. Estimations of the related annual financial damage lie between 0.2 and 2 % of the gross domestic product. This is an essential societal problem, and transportation is seen as the primary source. Accepting mobility as a basic human need and as an essential precondition for maintaining economic prosperity and wealth in an enlarging Europe, it is clear that the adverse effects of noise must be reduced while facing a continued increase in freight and passenger transport.

150<sub>150</sub>



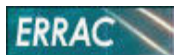
## CALM II

### Advanced Noise Reduction Systems

#### Main Objectives:

- Improved coordination and information exchange between different sectors and stakeholders leading to synergy effects for RTD, a cost effective and cross-sector use of existing noise abatement technologies and new cooperation structures
- Identification of new technology requirements, remaining research needs and setting of targets
- Comparison of European with Third Country status
- Support of the European Commission in setting up the agenda for future transport noise policy
- Support of the Research Advisory Councils in creating a vision and Strategic Research Agenda for future transport research
- Active involvement of promising young researchers
- Dissemination of transport noise state-of-the-art to new member states
- Maintenance and update of CALM homepage and CALM project database
- Promotion/presentation of CALM at international events and via publications
- Stimulation of network dynamics beyond FP6 (to FP7) to optimise synergies and efficiency of joint

151 151



## CALM II: Background

#### Details

- **FP** 6
- **Project Reference** TCA4-CT-2005-516237
- **Total Cost:** € 500,000
- **EU Contribution:** € 500,000
- **Timescale:** November 2004 - October 2007
- **Project Coordinator:** Josef Affenzeller & Alfred Rust (AVL LIST GmbH)

#### Partners

- **Participants**
- TÜV NORD Mobilität Germany
- Federal Environmental Agency Germany
- Birmingham City Council United Kingdom
- 01 dB Acoustics & Vibration France
- Adam Mickiewicz University Poland
- Ministero dell'Ambiente e Tutela del Territorio (UNACOMA) Italy
- Ministry of Housing, Spatial Planning and Environment (Ministry VROM) Netherlands
- Forum of European National Highway Research Laboratories (FEHRL) Belgium

152 152

## CARCIM: Background

### Partners interviewed:

#### Organisation

#### Name of interviewee

#### Country

SNCF	<input checked="" type="checkbox"/> Pierre-Etienne Gautier	France
SNCF	<input checked="" type="checkbox"/> Franck Poisson	France

153 153

## CALM II: Background

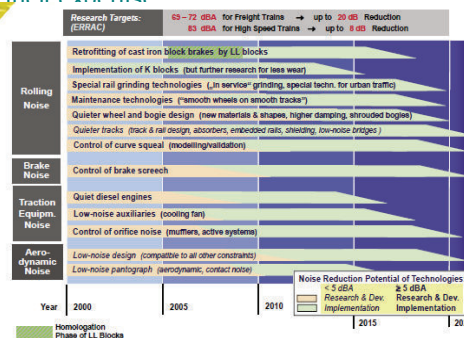
### Rail-related impact:

CALM II collaborated with ERRAC to list and collect data on all completed & ongoing rail noise projects concerning rail as well as to establish rail noise objectives in strategic documents. Railway people attended Workshops and networking events and contributed with their expertise

Several areas have been identified for future projects:

- Rolling noise
- Brake noise
- Traction Equipment Noise
- Aerodynamic noise

These research areas were divided in few sub-areas and a time line was established to foster projects development and implementation.



154 154



## CALM II: Structure

**WP1 (Networking of European transport noise research activities)** - designed for the monitoring of European noise research activities and noise abatement technologies at EU and national level across all relevant research areas of transportation noise, including outdoor equipment and generic issues like noise exposure, health and socio-economic aspects, city planning and infrastructure.

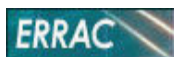
**WP2 (Sectoral integration of different areas of transport noise research)** – to improve the coordination and information exchange between different noise sectors and platforms with specific workshops together with the European technology platforms ACARE (aeronautics), ERRAC (rail), ERTRAC (road) and WATERBORNE (maritime).

**WP3 (Noise research strategies)** - designed for identifying technology gaps and research needs which is done in close co-operation with the European Noise Working Groups.

**WP4 (Dissemination and exploitation of results)** - focused on the information transfer and dissemination of results amongst all stakeholders, with a special focus on the new Member States and with specific workshops.

**WP5 (Network management, coordination and administration)** - to ensure an effective execution of the project including all administrative services like the organisation of meetings, reporting, etc.

155 155



## CALM II: Outcomes & Public Results

### ■ Updated project noise research Data Base on CALM Homepage

Free access (*now defunct*)

### ■ Workshops + Final CALM Conference (with report)

June 2005, Oct. 2005, March 2006, Sept. 2006 & June 2007 + Final Conference on Oct. 2007

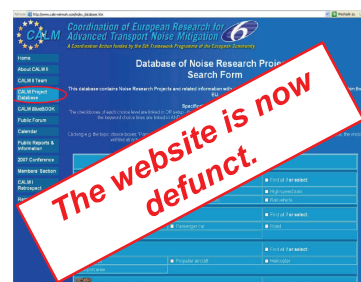
### ■ Blue Book (with CD-ROM)

Inventory of most relevant European noise research projects, May 2006

### ■ CALM Strategy for a Quieter Europe Feb. and Sept. 2007 updates

### ■ Papers and Presentations at International Events

once per year



156 156



## CALM II: Evaluation Rail focus

- 1. Were the results implemented in the design of the new products and services? Were these new products/services put into commercial operation?**

The main results of CALM I and CALM II were the:

- ☐ Public noise research project data base on [www.calm-network.com](http://www.calm-network.com)
- ☐ Blue Book 2006 (inventory of EU noise research projects)
- ☐ Strategy Papers 2004 and 2007 (noise research strategy plan and technology road maps)

These results contribute to the planning of future (transport) noise research in Europe and setting-up of research programs (national, EU)

It is coherent for such type of projects (coordination and support activities)

- 2. Is new legislation and standardization based on findings from this research project**

No, results not suitable as input to legislation and standardization but strong connections to legislation and regulations. One of the results were, as roadmaps, to draw how to face reinforced noise legislation.

- 3. Are the results of the project implemented across Europe or only in a small number of Member States?**

Across Europe

- 4. Were the results of the project implemented outside Europe before being accepted in Europe?**

No

157 157



## CALM II: Evaluation

- 5- Did the project increase competitiveness of the European railway sector abroad with regard to products, services, standards and system design?**

No, not directly. Only on long-term perspective via promoting research in railway noise

- 6- Did the project increase competitiveness of the railway transportation compared to other transport modes?**

No

- 7- Are the results of the project taken into consideration when preparing public tenders?**

Probably yes

- 8- Does the implementation of the project results help facilitate cross-border operations by problem-solving in the domain of interoperability?**

No

158 158



## CALM II: Evaluation

**9- Does the implementation of the project results help facilitate inter-modal operations by problem-solving in the domain of inter-modality?**

No

**10- Can benefits be assessed in financial terms?**

No

**11- Applicability of results to future scenarios?**

Yes, to future noise research scenarios

**12- Usefulness of research procedures for future projects (incl. modeling)?**

The results support the planning of future noise research projects and programs. Projects on noise reduction following CALM II were successfully developed and noise reduction is integrated in several Shift2Rail Innovation Programmes and, moreover, is a specific Cross-cutting activity.

159<sub>159</sub>

## CALM II: Reasons for outcomes

✓ Future significant reduction of environmental noise requires a well-balanced portfolio of research in both perception-related items and source-related topics

✓ Source-related research has to focus on: further develop and transpose the Environmental Noise Directive; improve the assessment of exposure to noise; enhance the knowledge on health effects and socio-economic aspects;

✓ Research in the field of noise perception shall contribute to: improving and adapting regulations closer to real world situations and developing noise reduction technologies and abatement procedures towards higher efficiency and cost-effectiveness

160<sub>160</sub>



## **Market uptake and lessons learnt**

Quality of Market Uptake: high market up-take.

The goal of CALM II, based on CALM I, was to continue to coordinate and to prepare future research activities on noise topics. Workshops and dissemination activity managed to reach a fair number of transport stakeholders. Strategic documents / roadmaps produced were of good quality. This networking project supported the transport sector in a time of high level activity period about noise legislation to face and to prepare reinforcement of regulations.