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SETRIS PROJECT

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The SETRIS project consortium consists of:

No	Name	Short Name	Country
1	Newcastle University	UNEW	UK
2	European Conference of Transport Research Institutes	ECTRI	Belgium
3	AVL List GmbH	AVL	Austria
4	BMT Group Limited	BMT	United Kingdom
5	Centro National de Competencia en Logistica Integral	CNC-LOGISTICA	Spain
6	The European Earth Friendly Logistics Association AISBL	CO-TREE	Belgium
7	Stichting Dutch Institute for Advanced Logistics	DINALOG	Netherlands
8	German Aerospace Center	DLR	Germany
9	Forum des Laboratoires Nationaux Europeens de Recherche Routiere	FEHRL	Belgium
10	Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.v	Fraunhofer IML	Germany
11	Instytut Logistyki I Magazynowania	ILiM	Poland
12	Promotion of Operational Links with Integrated Services	POLIS	Belgium
13	Ships & Maritime Equipment Association of Europe	SEA EU	Belgium
14	Union Internationale des Chemins de fer	UIC	France
15	Union Internationale des Transports Publics	UITP	Belgium
16	The Association of the European Rail Industry	UNIFE	Belgium
17	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek	TNO	Netherlands
18	European Organisation for the Safety of Air Navigation	EUROCONTROL	Belgium

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Draft 1.1	19/02/2013	ECTRI: projects to be added	UITP
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FOREWORDS

The **Strengthening European Transport Research and Innovation Strategies project** (**SETRIS**) is a project funded under the European Union (EU)'s Horizon 2020 research and innovation Programme, specifically targeted at strengthening the research and innovation strategies of the transport industries in Europe. SETRIS assists the 5 **European Technological Platforms** (**ETPs**) to define their common research steps for strategy and programmes in alignment.

The main objectives of **WP1 "*Connecting passengers for seamless travel and sustainable mobility*"** within SETRIS are:

- To outline challenges to achieve connected passenger for seamless travel and sustainable mobility (as delivered in D1.1),
- To define truly integrated **urban** transport system from across related ETPs (D1.2),
- To define truly integrated **long distance** transport system (D1.3),
- To define the necessary steps and actions to be taken by all stakeholders to satisfy the goal of a fully connected travel experience, affecting the **urban** and **passengers transport modes** (to be delivered in this D1.4), so formulation of a design specification of a fully connected travel experience can be identified,

- To define the necessary steps and actions to be taken by all stakeholders to satisfy the goal of a fully connected travel experience, affecting the **urban passengers transport modes** (to be delivered in D1.5), so formulation of a design specification of a fully connected travel experience can be identified.

The deliverable D1.4 summarises the progress of the existing urban **Strategic Research & Innovation Agendas** (**SRIAs**) during the last 5 years, including the relevant European Commission (EC)-funded research that have directly contributed to the roadmaps and vision activities of the ETPs. The concerned **European Road Transport Research Advisory Council** (**ERTRAC**) and **European Rail Research Advisory Council** (**ERRAC**) SRIAs are analysed within a cohesive and coordinated approach to provide the key building blocks for tight cooperation, e.g. focusing on common structural challenges and targets.

Besides ERRAC (represented by the **UITP**) and ERTRAC (represented by **AVL**, **FEHRL** and **POLIS**), other partners have contributed to the development of the deliverable: **European Conference of Transport Research Institutes** (**ECTRI**) and **Newcastle University** (**UNEW**).

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1. EXECUTIVE SUMMARY

The scope of this deliverable is limited to the **urban** sector. Both **private** and **public urban transport** modes have been considered.

This deliverable D1.4 aims to explore the different **SRIAs**, dealing with urban transport, published in the last 5 years. The goal of this exercise was to better understand the general developments of the roadmaps, as well as to identify new scopes. The conclusions, considering the deliverable D1.5 "EC-funded research contribution to roadmapping of long distance transport", may outline how the SRIAs reflect future transport scenarios and update their content, to bring common opportunities facing the new EU challenges. On the other hand, it may support the identification of the synergies between the various urban roadmaps and especially the way in which they are developed, including the EU tools.

Main author of this report was SETRIS partner UITP, representing ERRAC, with contributions from **AVL**, **FEHRL** and **POLIS** representing ERTRAC; and additional support from **ECTRI** and **UNEW**.

Main EU-funded research projects that have been contributing to the development of these SRIAs show a clear continuous timeline during the last years: in other words from 2009 to 2016 (figure 1). However, previous EU projects, such as SAFIER, CAPIRE, ERTRAC and ERTRAC II have contributed to these developments. It includes both the necessity of boosting (and updating) a common EU approach where the new EU goals may find a place to be discussed, and intent to re-join the voices of the actors participating in the well-known ETPs for further discussions, as part of an active and dynamic process. First EU projects supported the update as a single-mode initiative (e.g. ERRAC ROADMAP). Further steps intensified a multimodal approach, first partial (FOSTER-ROAD, FOSTER-RAIL), then covering all transport modes (SETRIS).

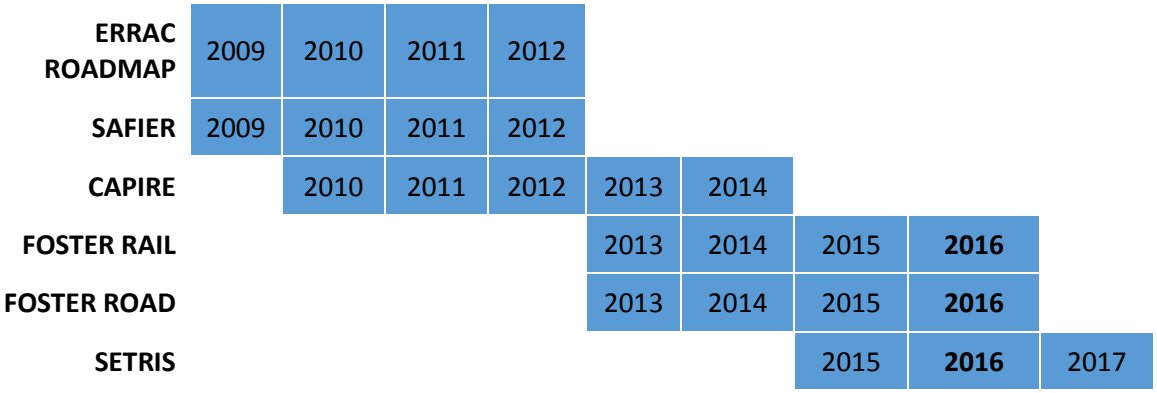

Figure 1: EU projects - Timeline

The following analysis of the added value of each SRIA shows the necessity of the European support to build an arena to discuss further strategies in the transport sector. It may be illustrated with the new multi-modal perspective, impulse from the transport ETPs, following a well-noted EU vision, and now extended and supported by SETRIS. The ETPs agree on the relevance of this multi-modal approach and collaborate to overcome further challenges.

Last, the structures are based not only on a transport mode base, but on a set of topics per transport mode. According to the last roadmaps, adding topic-related roadmaps to the main sector SRIA(s) may enable the identification on common areas, e.g. challenges, or potentialities, e.g. technologies, and may allow a better implemented European multi-modal reality.

SETRIS Project coordinated by:

2. INTRODUCTION

2.1. SCOPE

Transport sector needs to find answers to make the best possible use of the potential of its services. Therefore, it is important to take into account a broad vision that emphasizes the possible interactions between transport modes. It should address not only the technical but also the structural/governmental and financing aspects (i.e. political, economic and operational) as discovered in the review of the ETPs' roadmaps reports reported in SETRIS D1.1. This deliverable focuses its attention on the EC financial support of the SRIAs.

While the scope of the long distance passengers transport modes is addressed in D1.5, the scope of the deliverable D1.4 is limited to the **urban sector**. This approach may appear contradictory with the Transport Advisory Group (TAG). Indeed, the TAG defines in its June 2014 paper (chapter "Conceptual framework for our review of the challenges[1]") the necessity of improving the integration between urban and inter-urban transport. As the actors are not common, SETRIS structure is based on an independent analysis of both types of transport for a later integration in a single system. This deliverable is set within the first (urban) step. Nevertheless, this deliverable has been developed in parallel with D1.5, to provide a similar structure and focus. A common approach will help the development of the following steps, as the integration of short and long-distance transports (air, water and surface land modes) should be addressed in the following activities of SETRIS.

On the other hand, if we consider the whole transport system as an ecosystem, then, some references to the freight transport are needed, as far as the passenger transport infrastructures could not be perceived as 'isolated ecosystems'. Indeed, the **integration of long-distance transports** (air, water and surface land modes) and **short distance transport** should be foreseen.

Considering a temporal scope, this deliverable is focused on the **last 5 years**. A longer and wider temporal scope would be high-time consuming and would produce non applicable/pertinent results. External financing opportunities and structures may change frequently. So, a 5 years window allows us to analyse the updated financing structure, as well as the last challenges and priorities in the structure of the SRIAs.

However, the research, development and innovation chain is not always restricted to the SRIAs. Certainly main activities are oriented towards these goals.

- Although SRIAs are the outcome of a consensus among all stakeholders in a sector, individual entities could have their own priorities.
- In addition, the European Research and Innovation programme (currently Horizon 2020) has a great impact in polishing the main European research and innovation activities. It means, drawing common goals and targets in the European sector. If considering the budget involved by the EC in this programme (nowadays nearly €80 billion of funding available over 7 years: from 2014 to 2020), as well as the private investments it attracts, it is clear the huge impact it has.
- Furthermore, the new European Research and Innovation programme (Horizon 2020) promises to trigger the breakthroughs.

In that framework it is vital to analyse the development and updating of the SRIAs, to boost their role in the research and innovation arena by refining their subjects, as well as the context. It is important

[1] Consultation of the Horizon 2020 Advisory Groups - Response of the Transport Advisory Group; June 2014; Page 7

to realize that SRIAs and H2020 targets are in line, and what progress can be if a good understanding between the main actors involved in the process takes place. A good collaboration will lead to a stronger and more efficient European market.

Since the objective of D1.4 is to collect EC-funded research contribution to roadmapping of urban - short distance transport, main desk research has been based on the official ERTRAC and ERTRAC websites. Other website platforms: Community Research and Development Information Service (CORDIS) (http://cordis.europa.eu) and TRIP Transport Research and Innovation Portal (http://www.transport-research.info/) are also used to validate the funded projects reported through the ETPs and previous experiences. As D1.5 proposes, one key indicator that the research projects were aiming at addressing the strategic research and innovation framework is through identification of the type research of '**Coordination, Support and Action, CSA**' instead of Research and Innovation Action (RIA). In addition, this information has been collected with the collaboration of the currently in development EU funded projects, in other words, including the main references they actually use for their own SRIAs.

2.2. STRUCTURE

In accordance with D1.5, the structure of the deliverable is the following: chapters 3 and 4 summarise the rail and road SRIAs developments – direct EC-funded research contribution mainly. The chapters are based on the same schema including i) **challenges**, ii) **enablers** and iii) **targets** with a special attention to the EU projects (figure 2). This structure is based on the one provided by previous SETRIS activities:

- **Challenges**: Needs to be solved by the updating of the SRIAs;
- **Enablers**: Specific measures and financing opportunities where the SRIAs development was based. Practical and cost-effective solutions faced by the SRIAs;
- **Targets**: Specific objectives to be achieved with the help of one or more enablers, in order to address one (or more) challenges.

The outcomes should help the consortium during the following steps in SETRIS.

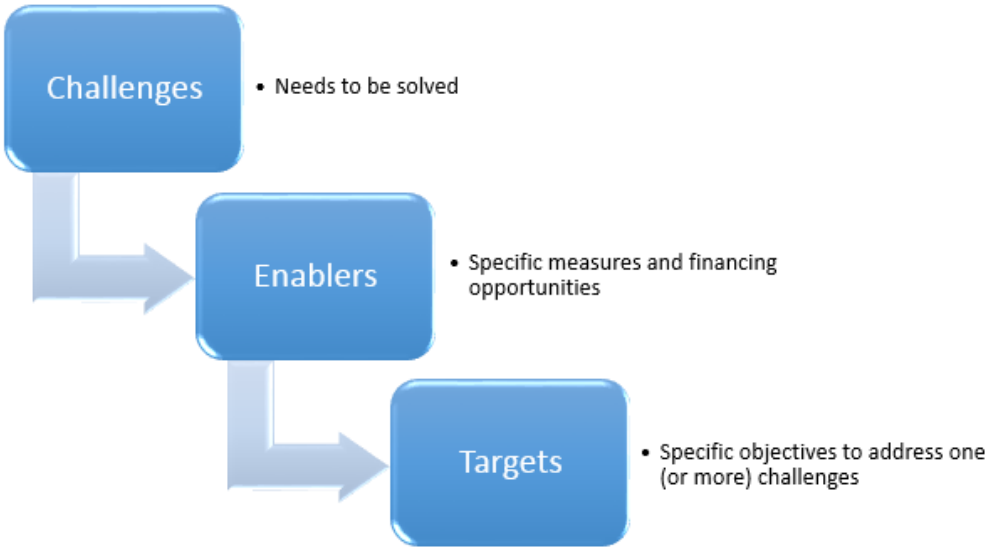

Figure 2: Challenges, enablers and targets

2.3. EXPECTED IMPACTS

Among the most important expected impacts of this assessment, some specific overall benefits are:

- Assessment of complementarity and consistency levels of the SRIAs;
- A much stronger understanding and relationship between challenges and further possibilities/opportunities;
- A clear vision about the strengths and weaknesses of the SRIAs updating process:
    - Identification of the policy context based on EU-funded projects aiming to update the SRIAs: characterization, developments and impacts;
    - Key lessons from the implementation phase of such schemes, e.g. enablers and barriers;
    - Clear identification of the critical changes;
- A common realigned ETP transport vision, based on a reinvigorated harmonized innovation strategy:
    - A clear statement to fulfill the first-and-last mille approach thanks to the urban transport modes;
    - Facilitating the following joint ETP collaboration, e.g. contributing to bigger European scale goals considering the other ETPs perspectives and vision;
    - Facilitating a joint ETP collaboration addressing a single (urban and long distance) passengers transport SRIA.

Resulting from this assessment, credible joint implementation opportunities and plans could be better developed.

3. ERRAC

ERRAC - the ETP for rail transport (from conventional, high speed and freight applications to urban and regional services) was conceived as a single European body with both the competence and capability to help revitalize the European rail sector and make it more competitive, by fostering increased innovation and guiding research efforts at European level. ERRAC believes that a number of strategic R&D&I topics that are being developed by other sectors will help rail stakeholders make significant progress in the years to come.

ERRAC is convinced that research and innovation will enable the European rail sector to retain its leadership at the international market level and increase its competitiveness. Since its start in 2001, ERRAC has produced a number of important and influential documents, such as the Joint Strategy for European rail Research – Vision 2020, the SRRA and its 2007 updated version, the Suburban and Regional Railways Landscape in Europe (2007 and its 2015/2016 update), Light Rail and Metro Systems in Europe, Rail Research in Europe, a comparison of the Member States public research programmes with the ERRAC SRRA, Railroute 2050, etc. The named Rail SRAs (also called SRRAs or SRRIAs) define the strategic roadmaps for railway research, development and innovation that account for both the evolution of technology as well as radical changes or breakouts. They aim to provide a guide to future actions in public and private funding programmes to ensure that research is adequately supported and funded.

- ✓ **2002**: **First SRRA** called "**Strategic Rail Research Agenda 2020**" focused on the need of interoperability on a continental scale. The first ERRAC SRRA published in 2002 set ambitious targets for the growth of European railways. These are still relevant, but some updating has been necessary in order to take into account the latest developments and breakouts. Thereby, a number of factors had affected progress towards these targets, providing new challenges.
- ✓ **2007**: The following document, **ERRAC SRRA**[2] addressed the need to improve the customer experience through better performance, and to improve the cost effectiveness of rail in the freight and passenger transport areas as well as to assist the deployment of interoperability. Railway is perceived also as "quality of life" in the EU. In other words, the ERRAC SRRA clearly addressed both the seven clusters[3] set by the rail stakeholders as well as the five activities[4] reflecting the strategic and policy challenged facing Europe, as defined by the European Commission for the FP7 'Transport' theme.
- ✓ **2012**: **ERRAC SRRIA** – Based on the **ERRAC ROADMAP EU project**: **9 – interrelated – Rail Research Roadmaps**, as described in the following sub-chapter.
- ✓ **Currently**: On-going **FOSTER-RAIL EU project**: that support the updating of the previous **SRRIA roadmap (new ERRAC SRRIA 2014)** and the **10 rail-related Roadmaps updating** – all expected for **2016**, as described in the las sub-chapter of this section. This next SRRIA will be defined to better guide and inspire future research and innovation over the coming decades.

[2] http://demo.oxalis.be/errac/errac_website/wp-content/uploads/2013/06/SRRA-2007.pdf

[3] 1) Intelligent mobility, 2) Energy and environment, 3) Personal security, 4) Test, homologation and Safety; 5) Competitiveness and enabling technologies, 6) Strategy and economics and 7) Infrastructure.

[4] 1) Greening of surface transport, 2) encouraging modal shifts (long distance) and decongesting transport corridors, 3) ensuring sustainable (sub)urban transport, 4) improving safety and security and 5) strengthening competitiveness.

Moreover, a joint initiative with ERTRAC was developed in 2013, to address the common "Urban Mobility" topic, where both platforms detected the necessity of working together (chapter 5.1). Therefore, the SRIAs developed during the last 5 years (table 1) are:

- ✓ Urban mobility roadmap – ERRAC + ERTRAC;
- ✓ Strategic Rail Research and Innovation Agenda (SRRIA). 2014. ERRAC.

Table 1: ERRAC - SRIAs

Year	SRIA	Added value	Involved stakeholders
2013	**Urban mobility roadmap**[5]	1st joint roadmap for urban mobility Defining key rail research themes	ERRAC + ERTRAC 21 partners: similar composition stakeholders' type to the above but with some differences in countries representation
2014	**Strategic Rail Research and Innovation Agenda (SRRIA)**	Last update vision of the rail sector[6] Defining rail business scenarios	ERRAC vision 20 partners: 4 large industrials, 3 R&D, 6 rail association, 4 operators (including infrastructure managers); 3 public authorities

Nevertheless, these roadmaps are not only urban transport focussed. Indeed, scope includes long distance transport. Therefore, some of the goals and targets are focused in different arenas. This deliverable contains the main descriptions of the roadmaps that address both distances, including EU budget, website links, partners' description, etc… If applying to long distance, a shorter description will be also provided in D1.5. These sub-chapters have been developed in a collaborative approach.

During the last years, certainly many European research projects dealing with rail research have been performed. Indeed, to answer the challenge of a well-balanced and high quality European rail system, more effective, more reliable, providing better accessibility, and more energy efficient, it is important to ensure an optimum mix between the various transport options and technologies. In that framework, conclusions from different specific EU projects may have an impact on the specific technological content of the SRRIAs. However, the list of all the EU projects that contribute somehow to the SRRIAs updating is complex and large. E.g. covering the period 2000-2010, there were about 30 projects. Therefore, only the EU projects with a direct goal of updating the SRRIAs are described in the following sub-chapters (3.1 and 3.2).

The same approach was considered for ERTRAC's chapter and sub-chapters.

[5] See chapter 5.1 "Eurforum and the Urban Mobility Working Group".

[6] See chapter 3.2 "Foster-Rail".

3.1. ERRAC ROADMAP

ERRAC ROADMAP (06/2009-07/2012) addresses the broad support challenges of FP7-SST-2008-RTD-SST.2008.2.5.1 - Interoperable rolling stock and 5.2.2 "Competitive transport operations" and through a level 1 CSA[7] - CA - Coordination (or networking) actions.

- Total cost: 1 683 513 €.
- EU contribution: 1 540 994 €.

ERRAC ROADMAP[8] followed the vision elaborated through the prior ERRAC Strategic Rail Research Agenda (2007) and supporting documents that described the areas of research that needed to be undertaken, in order to deliver the technologies identified as necessary for the future railway.

ERRAC ROADMAP covered research related to all types of freight and passenger rail services, as well as their interaction with other modes within the transport system (high speed and conventional rail over long, medium and short distances, as well as urban rail and co-modal services) and how they interact with other transport modalities. Through its work it implemented the ERRAC Strategic Rail Research Agenda (SRRA) by setting the agenda and describing the targets up to 2020, identifying what was needed to get there, what steps to take, how to facilitate this, what barriers to overcome, in other words to manage the way forward towards realising the "Vision 2020" for a sustainable European railway system.

- Coordinator: UIC.
- Partners: European Rail Infrastructure Managers; Community Of European Railway And Infrastructure Companies; UITP; Network Rail Infrastructure; Bombardier Transportation Sweden; MerMec; SNCF; University Of Newcastle; Trenitalia; Italcertifer; Ansaldo Sts; European Federation Of Railways Trackworks Contractors; Instituto Superior Tecnico; Tata Steel Uk; Knorr-Bremse Systeme Fur Schienenfahrzeuge Gmbh (Kb); UNIFE; TRV; Eurnex; EPF; Rete Ferroviaria Italiana.

ERRAC ROADMAP is based on the previous strategic documents already produced by ERRAC, on the previous ERTRAC SRRAs used as a reference for research actions to target better urban mobility jointly defined by ERRAC ROADMAP and ERTRAC; and other previous EU projects, such as EURFORUM. European, regional and national research programmes were also linked to the project through the Member States' inputs and their National Technology Platforms, through the involvement of the appropriate experts. Furthermore, among other research organisations within the frame of the EC and initiatives, we should highlight the ERA-NET Transport, the Transport Advisory Group (TAG), the DG TREN TRKC (Transport Research Knowledge Centre, funded under the 6th FP and its successor TRIP Transport Research and Innovation Portal) and the Transport Committee.

ERRAC ROADMAP was based:

- On the 7 research clusters (priorities) and the key technologies identified by the previous 2007 SRRA, that needed to be developed: 1) Intelligent mobility, 2) Energy and environment, 3) Personal security, 4) Test, homologation and Safety; 5) Competitiveness and enabling technologies, 6) Strategy and economics and 7) Infrastructure.

[7] Coordination and Support Action

[8] http://www.errac.org/publications/errac-roadmap-wp-01-the-greening-of-surface-transport/

- On 5 strategic themes reflecting the strategic and policy challenges faced by Europe, as defined by the EC for the FP7 "Transport" theme (5 WPs): 1) the greening of surface transport, 2) encouraging modal shifts (long distance) and decongesting transport corridors, 3) ensuring sustainable (sub)urban transport, 4) improving safety and security and 5) strengthening competitiveness. The project compiled nine separate roadmaps to achieve these five strategic objectives. The ERRAC members chose to "translate" these pillars into the 5 priorities of the FP7 Transport program and thus have developed 9 – interrelated – Rail Research Roadmaps as follows:

  Greening of surface transport:

  1. Energy roadmap
  2. Noise and vibration roadmap;
  3. Sustainable design and procurement roadmap;

  Modal shifts (long distance) and decongesting transport corridors:

  4. Passenger roadmap;
  5. Freight roadmap;

  Sustainable (sub)urban transport:

  6. Urban, sub-urban and regional research roadmap;
  7. Urban mobility research roadmap;

  Safety and security:

  8. Improving safety & security roadmap;

  Strengthening competitiveness:

  9. Strengthening competitiveness roadmap which includes rail infrastructure).

In addition, ERRAC ROADMAP analysed a number of case studies from previous rail-related research projects to draw important lessons for the sector. The outcomes of this project proved to be an invaluable blueprint for Europe's railways as they set off on the fast track to improved performance and competitiveness.

This project brought innovative and new techniques to the attention of stakeholders and largely communicated experience and study results.

3.2. FOSTER-RAIL

FOSTER-RAIL[9] (05/2013-04/2016) addresses the broad support challenges of FP7-SST-2013-RTD-1 SST.2013.6-1 Strengthening the research and innovation strategies of the transport industries in Europe. This Research action is a Level 1 CSA Coordination and Support Action aiming at supporting the land transport European Technology Platforms activities.

- Total cost: 1 836 674,85 €.

[9] http://www.errac.org/foster-rail/

- EU contribution: 1 659 439 €.

FOSTER-RAIL is currently assisting ERRAC and the other transport-related ETP (ERTRAC, WATERBORNE and partly ALICE) in defining research needs for their strategies and programmes in order to realise the objectives of the Europe-2020 strategy (specifically the Strategic Transport Technology Plan) and further on the vision of the White Paper 2011 for a competitive and resource-efficient future transport system. This is being done in consultation with the EC, the Member States and other Associated States (MS/AS) and based on the previous 9 Rail research Roadmaps (from the previous ERRAC ROADMAP). Therefore, FOSTER-RAIL updates the former ERRAC SRRA into a SRRIA (figure 3) for a common 2050 vision.

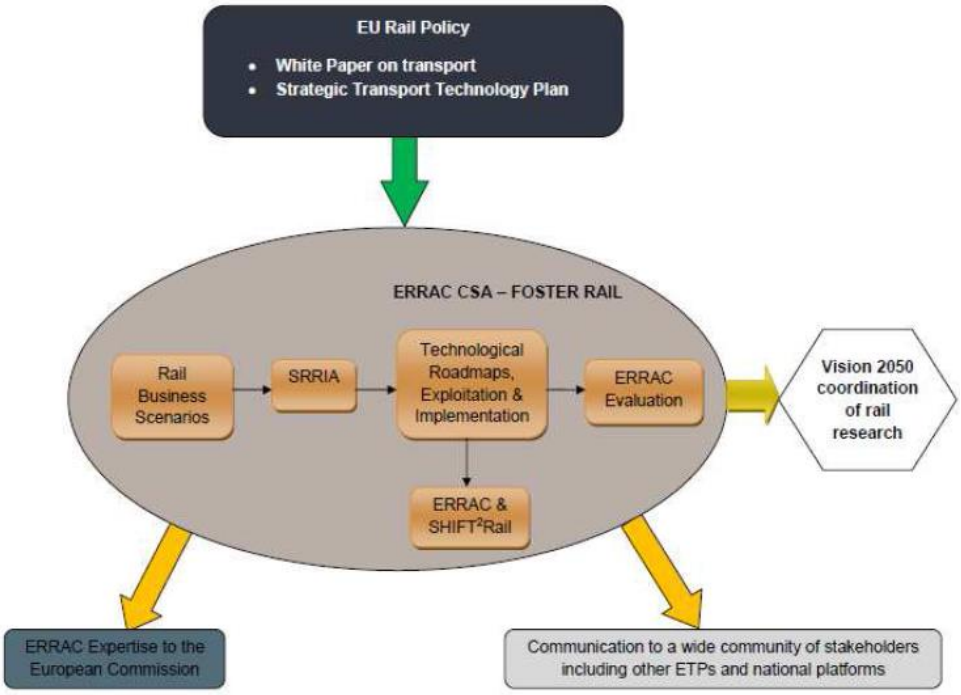

Figure 3: FOSTER-RAIL approach

The goal of FOSTER-RAIL is to strengthen the effectiveness of rail research and innovation capacities of the rail transport industries in Europe while adopting also a multimodal perspective. Especially, FOSTER-RAIL integrates the work done so far by ERRAC and its working groups and will further develop this. FOSTER-RAIL shall build on ERRAC-ROADMAP and continue to support and enhance cooperation between stakeholders, including decision-makers, and enhanced definition of strategic research and innovation needs. As regard research and innovation targeting co-modality and other multi-modal issues, FOSTER-RAIL addresses them in supportive cooperation with other transport modes.

- Coordinator: UIC.
- Partners: UNIFE; UITP; Eurnex; University Of Newcastle; TRV; Community Of European Railway And Infrastructure Companies; Fundación Ferrocarriles Españoles; Bombardier Transportation Sweden; Ansaldo; SNCF; Interoperabilita Zeleznicni Infrastruktury; Network Rail Infrastructure; Alstom Transport; Regie Autonome Des Transports Parisiens; Ferrocarril Metropolita De Barcelona; Associacao Do Instituto Superior Tecnico Para A Investigacao E Desenvolvimento; Deutsche Bahn (AG); GMBH; MerMec.

In reference with the SRIAs, FOSTER-RAIL is an essential support tool to provide a relevant Strategic Rail Research and Innovation Agenda. This is based on a number of key initiatives supported by the FOSTER-RAIL project: Rail Business Scenario for 2050, an in-depth overview of the Regional and Suburban Rail (passenger) market in Europe, a review of past EU-funded rail projects in order to assess which are the best topics and tools in EU research and innovation, etc. This last **SRRIA 2014** and its implementing roadmaps are currently the reference for future research agendas and technology roadmaps to be developed in the timeframe from now on until 2050. A strong rail sector is key to sustainable mobility in a low-carbon Europe. It is also essential for the growth of the European economy and for social cohesion. Rail must be a fundamental part of an integrated transport system, with each transport mode playing to its real economic strengths, to enable a more competitive European economy.

The SRRIA-2014 sets out research and innovation priorities structured around three sets of themes. 1) The first addresses the **attractiveness of rail and public transport** and the future demand that the rail sector aims to meet. 2) The second set includes three critical themes within a **sector-wide framework** and finally 3) the third set covers five well-established **asset-related themes**. Therefore, Foster-Rails updates a single whole common SRRIA-2014 roadmap, and 10 following rail-related specific Roadmaps as follows:

1.- Attractiveness of rail and public transport:

- ✓ Customer experience (present and future customer) roadmap;
- ✓ Strategy and economics roadmap;

2.- A whole system approach:

- ✓ Capacity, performance and competitiveness;
- ✓ Energy and environment roadmap;
- ✓ Safety (including certification) and security roadmap;

3.- Assets:

- ✓ Control, command, communication and signalling roadmap;
- ✓ Infrastructure roadmap;
- ✓ Rolling stock roadmap;
- ✓ IT and other enabling technologies roadmap;
- ✓ Training and education roadmap.

The new (current) single SRRIA 2014 is well placed to guide and inspire future research and innovation over the coming decades. The European Commission's framework programme for research and innovation "HORIZON 2020", launched in December 2013, includes a flagship initiative for rail research, the SHIFT²RAIL Joint Undertaking. It is the first Public Private Partnership (PPP) in rail research to seek focused research, innovation and market driven solutions by accelerating the integration of new and advanced technologies into innovative rail product and services, thus responding to the current mobility challenges. Through this last SRRIA, ERRAC reaffirms Europe's need to offer a well-balanced, business-led and strong programme of research and innovation for the railway system over the next decades.

4. ERTRAC

ERTRAC is the European Road Transport Research Advisory Council, the European Technology Platform which brings together the leading road transport stakeholders. It is recognized and supported by the EC.

Indeed, research and innovation are at the core of ERTRAC. ERTRAC[10] was the first Coordination Action (FP6-2002-TRANSPORT-1) supporting the creation of the ETP ERTRAC (October 2003 to January 2006). It provided the platform for all relevant stakeholders for establishing consensus on future road transport research directions. Main task were the organisation and technical support, required to facilitate ERTRAC achieving its mission. The primary mission of ERTRAC was to provide a strategic vision of European road transport in 2020, particularly with respect to R&D focused on breakthrough technologies; to set out strategies and roadmaps to realise this vision through the SRA and other associated documents.

- Budget: 800.000€;
- Coordinator: AVL;
- Partners: CLEPA, CRF, Concawe, ERF, Faurecia, FEHRL, Ford, POLIS, Renault, Bosch, Shell, Siemens, Vodafone, Volvo.

Later, ERTRAC II[11] was the second Coordination Action to support the ETP ERTRAC (February 2006 – January 2009). The Coordination Action (FP6-2005-TRANSPORT-4) supported ERTRAC by providing the management and organisational administration together with technical support, which was required to achieve the objectives. Main results were:

- The ERTRAC research framework was published;
- Assessment of European FP6 road transport research projects with respect to ERTRAC objectives;
- Overview of national road transport research activities and programmes in 17 European countries;
- Active contribution to the EC's European Technology Platform initiative;
- Transport research arena conferences co-organised by ERTRAC, CEDR and the EC;
- ERTRAC conferences in Brussels with special focus on climate change and future scenarios;
- The ERTRAC office in Brussels was established.

The objectives of ERTRAC II were satisfied at full extent. The dissemination and use of results comprised various activities, which partly already started during the first ERTRAC project. The overall strategy for the dissemination of results as developed in the first ERTRAC project was continued. The web-site (please see http://www.ertrac.org) is regularly updated. In addition, a web-mail tool was

[10] http://cordis.europa.eu/result/rcn/52071_en.html

[11] http://cordis.europa.eu/result/rcn/47413_en.htm

established for an improved e-mail communication of the main stakeholders, in particular the secretary and the chairman.

- Budget: 1.550.000€;
- Coordinator: AVL;
- Partners: CLEPA, CRF, Concawe, ERTICO, Faurecia, FEHRL, Ford, POLIS, Renault, UITP, Volkswagen.

The key urban mobility related roadmaps produced during ERTRAC II were:

- ✓ European Bus System of the Future (June 2011);
- ✓ Towards an integrated Urban Mobility System (June 2011);
- ✓ Road user behavior and expectations (May 2011);
- ✓ Electrification of road transport (November 2010, updated in June 2012);

Currently, ERTRAC covers a wide spectrum of activities[12]:

- ✓ Provide a strategic vision for road transport research and innovation in Europe;
- ✓ Define strategies and roadmaps to achieve this vision through the definition and update of a Strategic Research Agenda and implementation research roadmaps;
- ✓ Stimulate effective public and private investment in road transport research and innovation;
- ✓ Contribute to improving coordination between the European, national, regional public and private R&D activities on road transport;
- ✓ Enhance the networking and clustering of Europe's research and innovation capacities;
- ✓ Promote European commitment to Research and technological development, ensuring that Europe remains an attractive region for researchers, and enhancing the global competitiveness of the transport industries;
- ✓ Support the implementation of Horizon 20250, the European Framework Programme for Research and Innovation.

The key publications developed in the last 6 years are (table 2)[13]:

- ✓ ERTRAC Strategic Research Agenda 2010;
- ✓ ERTRAC Road Transport Scenario 2030+;
- ✓ ERTRAC Research and Innovations roadmaps;
- ✓ ERTRAC MAP for Horizon 2020;
- ✓ 19 technical roadmap reports;
- ✓ 2 implementation plans for Horizon 2020 transport work programmes.

[12] www.ertrac.org

[13] All ERTRAC publications are available at http://www.ertrac.org/index.php?page=ertrac-research-agenda-and-plans

Table 2: ERRAC - SRIAs

Year	SRIA	Added value	Involved stakeholders
2009	**ERTRAC Road Transport Scenario 2030+**	Forward-looking guide to the challenges of the European road transport system, and opportunities for R&D. Basis for the SRA	More than 40 experts representing all ERTRAC stakeholders
2010	**ERTRAC Strategic Research Agenda**	The SRA provides decision makers with clear, integrated research and innovation priorities that are based on a consistent systems approach	Input from 5 ERTRAC working groups coordinated by the WG leaders
2011	**ERTRAC Research and Innovations roadmaps**	System approach including 3 key elements + 4 enabling research and innovation domains = 9 technology roadmaps Link to major EC initiatives	Each technology roadmap is based on different ERTRAC working / expert groups: 9 ERTRAC working groups coordinated by the WG leaders
2013	**ERTRAC MAP for Horizon 2020**	ERTRAC input to the Horizon 2020 programme based on the technical ERTRAC roadmaps	ERTRAC WG leaders, coordinated by the ERTRAC office
2013	**Urban mobility roadmap[14]**	1st joint roadmap for urban mobility	ERRAC + ERTRAC

The Scenario, SRA and MAP cover the entire road transport sector, which is within ERTRAC organised in several pillars:

- Urban Mobility
- Long Distance Freight Transport
- Energy & Environment
- Road Transport Safety & Security
- Global Competitiveness
- Connectivity and Automated Driving (since 2015)

As it happened while analysing the ERRAC roadmaps, these roadmaps are not only urban transport focussed. Indeed, scope includes long distance transport. Therefore, some of the goals and targets are focused in different arenas. This deliverable contains the main descriptions of the roadmaps that address both distances, including EU budget, website links, partners' description, etc… If applying to long distance, a shorter description will be also provided in D1.5. These sub-chapters have been developed in a collaborative approach.

[14] See chapter 5.1 "Urban Mobility Working Group".

Similar to ERRAC, many European research projects dealing with road transport research have been performed in the last years and may have an impact on the specific technological content of the SRIAs and roadmaps. However, this report covers only the initiatives which directly supported ERTRAC during the last 5 years.

4.1. FOSTER-ROAD

The FOSTER-ROAD Support Action (March 2013 – December 2016) answers the challenges in FP7-SST-2013-RTD-1 SST.2013.6-1 Strengthening the research and innovation strategies of the transport industries in Europe (same call than FOSTER-RAIL). It enables the ETP to create and implement the needed research and innovation strategies for a sustainable and competitive European road transport system.

- Total cost: 2 008 982,57 €.
- EU contribution: 1 982 274 €.

FOSTER-ROAD supports the establishment of consensus-based plans and roadmaps addressing the key societal, environmental, economic and technological challenges in areas such as road transport safety, urban mobility, long distance freight transport, global competitiveness, road transport automation and all issues related to energy and environment. Wherever relevant it aims at fostering multi-modal issues. Bringing together all relevant stakeholders, FOSTER-ROAD will prevent unnecessary fragmentation and duplication of research efforts, resulting in transport solutions for more efficient energy use, better air quality, enhanced safety and security, and smoother mobility.

- Coordinator: AVL List GmbH.
- Partners: CRF, Concawe, Continental Automotive, ERTICO, FEHRL, Fundación AIC, POLIS, Renault, Ricardo, Bosch, Scania, UITP, AUTH, Valeo, Volkswagen, Volvo Technology.

The FOSTER-ROAD activities include project monitoring, strategic research agendas, implementation plans and recommendations for European and national Research and Innovation / Research and Development programmes. It also supports the coordination of research on European and national level and carries out comprehensive dissemination activities. Key deliverables addressing urban mobility are:

- “Clustering of Multi-modal Research and Innovation Issues“, a report created together with the ETPs ERRAC, ALICE and Waterborne, submitted in August 2014;
- “Urban Freight Research Roadmap”, created together with ALICE, submitted in November 2014;
- “Roadmap for Cross-Modal Transport Infrastructure Innovation”, created together with ERTRAC, ERRAC, Waterborne, ACARE and ECTP, submitted in June 2013;
- “Land-Use and Transport Interactions, Integrated Research Initiative”, submitted in June 2013.

An update of the “European Roadmap towards an Integrated Urban Mobility System“, published in 2011, as well as an update of the “Electrification of Road Transport” roadmap, published in 2012, are foreseen (2016). Overall it can be stated that FOSTER-ROAD provides the best opportunity to maintain, strengthen and widen the activities to further develop the multi-stakeholder road transport research area, for the high-quality research of societal and industrial relevance in Europe.

4.2. PREVIOUS ERTRAC SUPPORT ACTIONS

Other EU projects addressing these updates are SAFIER, the support action prior to FOSTER-ROAD and CAPIRE, the support action for the European Green Vehicles Initiative (EGVI) – European Green Cars Initiative (EGCI)[15].

- **SAFIER**

SAFIER is a Support Action that allows the development of ERTRAC. During SAFIER the above mentioned Vision 2030, the SRA and many ERTRAC roadmaps were created. The concept of the SAFIER project was derived from the mission of the European technology platform ERTRAC, which is to provide the framework to overcome the challenges facing the road sector and:

- Provide a strategic vision for the road transport sector, with respect to R&D;
- Set out strategies and roadmaps to achieve this vision through the Strategic Research Agenda (SRA) and other associated documents;
- Stimulate increased and more effective public and private investment in R&D in the road transport sector;
- Contribute to improving cooperation between European Commission (EC), national, regional and private R&D actions on road transport within the ERA;
- Enhance networking and clustering of the R&D capacity in Europe;
- Promote European commitment to research and technological development (RTD) thus ensuring Europe an attractive location for researchers.

The key objectives were to achieve consensus amongst a broad range of stakeholders represented in ERTRAC and other relevant bodies. These objectives were achieved within the course of the project, communicated to all relevant transport and energy stakeholders, and presented widely at international conferences. Through this activity, SAFIER made a tangible contribution, through the alignment of public and private research activities, towards the step changes/radical technology changes that are urgently needed to address the challenges facing Europe today and in the future. It also included project- and programme monitoring, networking and many dissemination activities.

- Programme/call: Enablers; FP7/SST.2008.6.0.2: Stimulation of International Cooperation within Surface Transport Research;
- Duration: February 2009 – October 2012;
- Budget: 1.500.000€;
- Coordinator: AVL;
- Partners: CRF, Concawe, Delphi, ERTICO, FEHRL, POLIS, RWTH Aachen, UITP, Valeo, Volkswagen, Volvo.

[15] The EGVI has been confirmed as a follow-up of the EGCI PPP.

- **CAPIRE**

CAPIRE is a Coordination Action within the framework of the European Green Cars Initiative (EGCI) and is intended to support the implementation of this public–private partnership (also called PPP).

The project focused on the definition of the potential Flagships projects which could foster the competitiveness of the European Automotive Industry in the domain of Transport Electrification as well as in the development of technologies and services to reduce the European CO_2 footprint.

Major outcomes of CAPIRE was a dedicated roadmap based on an elaborated and deep analysis of R&D needs, respective milestones and supporting measures. The goal is to increase by a joint approach of the involved economic sectors and the public authorities the competitiveness of European Automotive Industry in the domain of energy efficient, safe, non-polluting and CO_2-free vehicles at the global scale. To be broad enough, this strategy has to be based on the three technology pillars of the EGCI:

- Passenger cars and LCV: to reduce local pollution, emission of greenhouse gases, and noise by accelerating electrification of vehicles and provision of a dedicated infrastructure for the connection to CO^2-free energy sources;
- Trucks and Buses: to improve overall efficiency of transport of people and goods by the development of more effective vehicles, standardized load carriers and supporting ITS/ICT systems;
- Logistics: to increase the efficiency of goods transport by optimizing loading rate of trucks and mixing different energy saving transport vectors as rail transport and road transport.

CAPIRE prepared and supported the realisation of the Public Private Partnership EGVI. It focussed on two major fields: a careful consideration of options for the aims, shape, and implementation paths of EGVI, and the identification of technology milestones and the respective research needs and supporting measures. The strategy was based on three technology pillars: Passenger cars and light commercial vehicles, trucks and busses as well as logistics.

- Programme/call: Enablers; FP7/GC-SST.2010.7-6: Implementing Public-Private Partnership in the EGCI;
- Duration; December 2010 – November 2014;
- Budget: 2.153.301 €;
- Coordinator: Renault;
- Partners: AVL, P&G, CRF, Bosch, VDI/VDE-IT, Volvo, Valeo, Iberdrola, TfL, Continental, Hidria, TUEV Rheinland, Solaris Bus.

5. OTHER MULTIMODAL EU PROJECTS AND JOINT APPROACHES

For urban passenger transport modes, the collaboration is after some years a reality cross ETPs – ERRAC and ERTRAC. These cross modal collaborations have been supported through the EC CSA funded projects that required key stakeholders of each transport ETPs to start collaborate with other ETPs, but also through particular initiatives such as the "urban mobility working group". However, the collaboration is still due to be realized regarding the short and long distance transport modes, therefore to complete the long distance travel including the first-and-last miles. Conclusions in D1.5 are similar. Where it is said "Collaboration between ERRAC/ERTRAC with ACARE is certainly key to addressing roadmap for 'long distance transport for passenger'", same idea applies to urban transport.

5.1. EURFORUM AND THE URBAN MOBILITY WORKING GROUP

Nowadays, under the current "FOSTER" CSAs, ERRAC and ERTRAC work together in a permanent ERTRAC "Urban Mobility" Working Group[16] coordinated by POLIS. Furthermore, WATERBORNE and ALICE started contributing to the works of this working group. The partnership is constituted of ERTRAC and ERRAC members, as well as ALICE and WATERBORNE members. Among others these are parties involved: ACEM, DENSO, ika-RWTH, TNO (EARPA), VUB-MOBI, AIT (ECTRI), DLR (ECTRI), IFSTTAR (ECTRI), UITP (ERRAC), ERTICO, Lindholmen Science Park, CRF, Renault, BRRC (FEHRL), SP, POLIS, London Councils, INESC/TEC University of Porto, Sernauto M2F and UPM.

The initiative is partially based on the EURFORUM project (FP6; April 2007-December 2008), who involved key urban mobility stakeholders in the definition of research priorities for the sector so as to ensure a better coordination of the research. The project covered all relevant transport modes, including rail, and focused both on technology-oriented and on policy-oriented research. It served as a reference for the design of the roadmap for urban mobility, together with the recommendations produced by the thematic Working Group of ERTRAC on Urban Mobility – Indeed, most of the final report outcomes are still relevant[17].

The urban mobility working group addresses all aspects of the urban mobility system, the vehicle, the infrastructure and services. It works on both passenger and urban freight transport. This working group pays a special attention to the integration of the urban mobility system, and to all aspects related to land use and user behaviours. It has demonstrated the importance given by the two sectors – road and rail- and the EC to a proper cooperation between the representatives of all the rail and road transport research stakeholders.

Urban mobility should evolve towards enhanced mobility and greater efficiency. For this purpose, all modes of transport should be fully exploited in a complementary way, to offer the most convenient overall journeys for passengers and goods, guaranteeing a high level of accessibility and achieving the highest energy efficiency. This requires their integration, ensuring that their complementarity is guaranteed through intermodal solutions. It also consists in the integration of the most energy efficient vehicles in the network.

To further integrate the urban mobility network and services, obstacles, real and perceived, related to the transfer of travellers / passengers / drivers from one mode to the other should be reduced to their minimum. It would involve breaking the barriers between the management systems of the

[16] http://www.ertrac.org/index.php?page=urban-mobility

[17] It has issued the following agenda: http://www.ectri.org/Documents/Activities/WG/SRA_EURFORUM.pdf

various modes to bring them together as much as required to reach the optimum balance to improve accessibility and the energy efficiency of the system as a whole.

The advantages are clear: a more integrated urban mobility network enables the use of new mobility services in the urban environment. The greater integration of public and private modes of transport, of collective and individual modes, will lead to greater room to create incentives and management tools influencing not only vehicles traffic but also the movement of people and goods. Ultimately, it is an essential component of the future smart city with the deeper integration of mobility in its urban environment and with the other network industries such as energy.

However, some issues need to be updated and to be further developed[18]. The ERTRAC urban mobility working group is currently preparing an update of the European Roadmap "Towards an Integrated Urban Mobility System" (previous version issued in 2012). In this update, the working group will assess the status of current detailed roadmaps on the integration of urban traffic and travel information; the integration of ticketing and charging services for all mobility related charges in urban areas; Interchanges for passenger travel and transport; Interfaces for a more efficient urban freight delivery; and Integrating urban mobility management, update where necessary and define new areas of activity for R&I in urban mobility if needed. The updated roadmap is expected in June 2016.

5.2. OTHER EU PROJECTS

Several projects dealt in a way or another with urban & rail mobility. They have fed back specific thematic areas in the transport sector as follows:

- ✓ With DG RTD, the project TIDE[19] - Transport Innovation Deployment for Europe (FP7; April 2013 – April 2014) published its 'Research recommendations on urban transport innovation'[20] in 2015. The document provides research recommendations connected to the project's working areas (pricing, non-motorised modes, urban ITS, public transport governance and electromobility). It outlines research topics, actions and formats that need to be addressed in future research programmes on the European level. Current research gaps on urban transport innovation are identified, targeting the European Commission in particular, but also other stakeholders (e.g. technology platforms such as ERTRAC and ERRAC, large research organisations, industry) that are active in transport and mobility research on the European level.
- ✓ With DG MOVE, the project TRANSFORuM[21] (FP7; February 2013 – January 2015) proposed to offer a "fresh approach" to helping to implement four key goals of the European Transport White Paper. The project initiated a discussion forum of relevant actors by organising meetings and thematic groups on White Paper goals. Indeed, there are two goals addressing urban passenger and freight transport respectively in this White Paper: i) To halve the use of 'conventionally-fuelled' cars in urban transport by 2030; and to phase them out by 2050; and ii) To achieve 'essentially CO_2-free city logistics' in major urban centres by 2030. These goals

[18] ERTRAC Working Group on Urban Mobility, European Roadmap Towards an Integrated Urban Mobility System, Version June 7, 2011

[19] www.tide-innovation.eu

[20] TIDE, D 5.4 Research recommendations on urban transport innovation, 2015

[21] http://www.transforum-project.eu/

are meant to help solve three main problems: to reduce greenhouse gas emissions, to reduce the dependence of oil as a propulsion source and to reduce local air and noise pollution. These goals are to be achieved essentially without compromising the benefits that high mobility provides to urban areas. Electric vehicles utilizing renewable energy sources are foreseen as part of the solution, but a much broader range of measures combined in intelligent ways are likely to be needed to achieve the goals. Based on this way of thinking, and on an active engagement of several urban transport stakeholders in a dialogue process, TRANSFORuM has released different outputs, including four "Roadmaps" towards the previous four goals of the European White Paper on Transport: i) clean urban mobility, ii) long-distance freight, iii) high-speed rail and iv) multimodal transport information, management and payment systems. Furthermore, it has released "Recommendations on Joint Actions across Thematic Areas" and a "Strategic Outlook" (looking beyond 2030).

- ✓ With DG RTD, the project 3iBS[22] (intelligent, innovative, integrated Bus Systems project; FP7; October 2012 – March 2015) contributed to the development of a new generation of buses adapted to the specificities of the European cities, more attractive for passengers and more efficient and economic to operate. To reach this goal, 3iBS committed to stimulate coordinated research and exploit bus-system innovations, support deployment and implementation of key solutions, promote exchanges of knowledge and best practices on an international scale. Capitalising on the results of previous and ongoing research activities, 3iBS focused on 7 innovation topics with high potential in strengthening the competitiveness of the bus in the urban environment, namely: accessibility, optimized operation for special events, level of service, intermodality, modularity, IT standardization for public transport and energy efficiency. For each key topic a set of outstanding study cases from the experience of PT operators was analysed to fill the gap between the concepts defined and tested in previous research projects, including the European Bus System of the Future (EBSF) and the actual implementation of their input in the real experience of operators. Backbone of 3iBS, the Roadmap for Innovative Bus Systems[23] supported the European and National in identifying the main areas and priorities for further research about Bus Systems. The research on urban bus systems is now continued by EBSF_2, ZeEUS, Eliptic and other EU projects.

[22] http://www.3ibs.eu/en/home

[23] http://www.uitp.org/sites/default/files/Position_Papers/European%20%20Roadmap%20-%20European%20Bus%20System%20of%20the%20Future.pdf

6. CONCLUSION

SETRIS D1.4 is summarising the status of existing SRIA as well as identifying where relevant EC-funded research have directly contributed in the past five years to the roadmaps and vision activities of the ETPs towards addressing urban passenger transport.

The general figures and experiences show the continuous support of European structures through EU projects, particularly through the current CSA. These CSA initiatives allow the development of the ETPs' strategic reports. All ETPS have collaborated and continue doing so, based on the prior successful final documents. These good results boost their collaboration.

However, figures may not be compared to the intangible but valued outputs of the roadmapping activities. Thanks to them last year's EU funding research activities and private European initiatives are more and more aligned, and EU stakeholders may discuss in a neutral arena between them and the EU institutions. Nevertheless, it is certainly difficult to measure in a quantitative way the impact and value of these discussions. Figures will not be exact, so they will create an image of underappreciated outcomes. Intangible and medium-long term effects are part of the impact of a CSA. In addition, the outcomes, such as the coordination and updating of new strategies between the transport-related ETPs and other technology platforms at both EU and national levels prevent from duplicating efforts, in other words, duplicating investments and time. These figures may be considered as part of the positive results of the deliverables.

Furthermore, efforts are more and more focused on strategic technologies and challenges. Indeed, this exercise enables the bridge between transport modes. Technical issues and challenges may be shared to unify efforts, as part of the join strategies. E.g. FOSTER RAIL is developing a whole Rail-sector roadmap, as well as 10 specific rail-related roadmaps (table 3). These 2 levels may address technical and sector-related topics. However, further implementations will offer more data to measure the real success and acceptance of this structure. First positions remain positive.

Table 3: EU Projects – Added value to the ERRAC and ERTRAC SRIAs

	ERRAC		ERTRAC	ERRRAC + ERTRAC
EU projects	**ERRAC ROADMAP**	**FOSTER-RAIL**	**FOSTER-ROAD**	**SETRIS**
Added value	SRRA directly considering the EU-FP7 2020 vision	Strengthen the effectiveness of rail research and innovation capacities of the rail transport industries in Europe + adopting also a multimodal perspective	A broad range of road transport stakeholders to develop a common vision and strategy for research and innovation	5 ETPs together
		Updating Rail Business Scenario for 2050 + In-depth overview of the Regional and Suburban Rail (passenger) market in Europe Partial collaborations	ERTRAC MAP for Horizon 2020; Technical roadmap reports; Implementation plans for Horizon 2020 transport work	Enhanced collaboration between ETPs

	ERRAC		ERTRAC	ERRRAC + ERTRAC
EU projects	**ERRAC ROADMAP**	**FOSTER-RAIL**	**FOSTER-ROAD**	**SETRIS**
		with other ETPs	programmes. Collaboration between ERRAC, ALICE and WATERBORNE	
Horizon	2020	2050+	2050+	2050+
Document(s) produced	1 SRRA based on: 7 research clusters and 5 strategic EU themes	1 whole-approach SRIA 10 following rail-related specific Roadmaps	Key deliverables addressing specific challenges for urban mobility (e.g. Cross-Modal Transport Infrastructure Innovation, Land-Use and Transport Interactions, etc.)	Key deliverables addressing both i) people & ii) goods perspectives, and considering "people", iii) urban & iv) passengers perspective. Perspectives are addressed respectively and as a whole.

In addition, at urban passenger transport modes level there is a strong cross-modal collaboration, based on EU funded projects and singular not EU funded initiatives. D1.1 briefs the analysis in a table (table 4, below). However, the collaboration is still due to be realized regarding the short and long distance transport modes, therefore to complete the long distance travel including the first-and-last miles. Conclusions in D1.5 are similar.

Table 4: Cross ETP modal collaboration – urban approach derived from SETRIS D1.1

	URBAN MOBILITY	
MODAL COOPERATION	CURRENT COOPERATION LEVEL	REQUIRED FOR FUTURE SRIAS
Road-Rail	Strong	Yes
Road-Air	Medium	Yes
Road-Waterways	Non-existing	To be explored
Rail-Air	Medium	Yes
Rail-Waterways	Non-existing	To be explored
Air-Waterways	Non-existing	To be explored

Lastly, technological challenges seem to be well addressed. Nonetheless, other strategies may be further analysed, i.e. political, economic and operational mainstream strategies in supporting research and development. However, it is possible to say that there are measures/funding mechanism to address political/economical/operational of SRIA through those CSA projects.

7. GENERAL REFERENCES

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- ✓ SETRIS D1.2 Truly integrated urban transport system, Brussels. UITP. (2015)
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7.2. LIST OF ACRONYMS (ALPHABETIC ORDER)

- ✓ AIC: Automotive Intelligence Center
- ✓ BRRC: Belgian Road Research Centre
- ✓ CSA: Coordination and Support Action
- ✓ DG: Directorate-General
- ✓ EARPA: Association of Automotive R&D organisations
- ✓ EC: European Commission
- ✓ ECTRI: European Conference of Transport Research Institutes
- ✓ EGCI: European Green Cars Initiative
- ✓ EGVI: European Green Vehicles Initiative
- ✓ EPF: European Passengers' Federation
- ✓ ERRAC: European Rail Research Advisory Council
- ✓ ERTICO: ITS Europe partnership
- ✓ ERTRAC: European Road Transport Research Advisory Council
- ✓ ETP(s): European Technology Platform(s)
- ✓ EU: European Union
- ✓ iKa: Institut für Kraftfahrzeuge - Institute of Automotive Engineering
- ✓ FP7: 7th Frame Work Programme
- ✓ M2F: Move 2 Future; Plataforma Tecnológica de Automoción - Automotive Technology Platform
- ✓ MOBI: Mobility, Logistics and Automotive Technology Research Centre
- ✓ PPP: Public–private partnership
- ✓ R&I: Research and Innovation
- ✓ RWTH: Rheinisch-Westfälische Technische Hochschule Aachen - Université technique de Rhénanie-Westphalie à Aix-la-Chapelle
- ✓ SETRIS: Strengthening European Transport Research and Innovation Strategies project
- ✓ SNCF: Société Nationale des Chemins de Fer – French National Society of Railways
- ✓ SRA: Strategic Research Agenda
- ✓ SRRA: Strategic Rail Research Agenda

[24] http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=15059&no=1.

- ✓ SRIA(s): Strategic Research & Innovation Agenda(s)
- ✓ TAG: Transport Advisory Group
- ✓ TfL: Transport for London
- ✓ TNO: Netherlands Organization for Applied Scientific Research
- ✓ TRKC: Transport Research Knowledge Centre
- ✓ UPM: Universidad Politécnica d Madrid
- ✓ VUB: Vrije Universiteit Brussel - Free University of Brussels

7.3. LIST OF TABLES

7.4. LIST OF FIGURES