TOWARDS A FULLY INTEGRATED TRANSPORT SYSTEM

Summary of the SETRIS Project Outcomes and Results

APRIL 2018

THIS PROJECT WAS IMPLEMENTED BY

Coordinated by

The SETRIS project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 653739

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FOREWORD

With the growth of the European economy, freight and passenger transport volumes have increased sustaining the prosperity of Europe's society. However, transport also comes with a wide range of challenges linked to pollution, safety, health and congestion. The European Commission aims to reduce these adverse effects, and the transport sector has a key role to play in making Europe more sustainable. The European Union is committed to reducing emissions, congestion and air pollution to improve the quality of life of European citizens and to reach the goals set by the Paris Agreement.

At the same time, we want to ensure that European transport is safe and our industry remains competitive on the global market. The European Commissioner in charge of Research, Science and Innovation Carlos Moedas calls to adopt new and radical thinking in the way we tackle global challenges. Research and innovation have never played such a distinguishing role in our competitive world.

The European Commissioner in charge of transport Violeta Bulc has made 2018 the "Year of Multimodality" - a year during which the European Commission will raise the importance of multimodality for transportation in the EU. This means above all promoting the use of different modes and combining them in an optimal and efficient way, exploiting the strengths and minimising the weaknesses of the respective modes. Multimodality requires careful coordination of transport modes and having effective interchanges between them. To develop an effective approach to challenges such as decarbonisation and in order to exploit opportunities such as digitalisation, the European Commission aims to address the multimodal transport system in a coordinated manner.

The European Technology Platforms (ETPs) on transport contribute greatly to addressing this challenge. As multi-stakeholder forums, the European Commission recognises them as key drivers for innovation, knowledge transfer and European competitiveness. To address multimodal transport comprehensively, we support the cross-modal and multidisciplinary cooperation of the ETPs, which has been at the core of the SETRIS project, funded under the Horizon 2020 Research and Innovation programme.

We look forward to the continuation of this cooperation between the transport ETPs, not least through the biannual Transport Research Arena, also supported by the European Commission.

Clara de la Torre
Director
DG Research & Innovation Transport
European Commission

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Director
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INTRODUCTION

In the SETRIS project (Strengthening European Transport Research and Innovation Strategies) the five transport sector related European Technology Platforms (ETPs) - road, rail, air, water and logistics - represented by a number of their platform partners, came together in a single collaborative initiative for the first time. This achieved a clear joined-up strategy to deliver innovation and deployment of research results by involving all relevant transport modes and stakeholders, as requested by the European Commission in its 2011 White Paper, 'Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system' -.

The partners brought, via well-established networks and expert groups, a wide range of knowledge and experience to the project, which in turn helped assisting the transport industries to deliver roadmaps, implementation plans and future policies and strategies stemming from the White Paper.

SETRIS sought to deliver a cohesive and coordinated approach to research and innovation strategies across all transport modes in Europe. The objective was to support progress towards a truly integrated transport system, looking more specifically at connecting passengers for seamless travel and sustainable mobility and at sustainable and efficient end-to-end logistics. To achieve this objective, it was important that all the ETPs reach similar levels of completion of their Strategic Research and Innovation Agenda (SRIAs). SETRIS supported this step. Through including specific measures for promoting a multi-modal and integrated transport system framework and benchmarking past research initiatives working towards the integrated transport SRIAs, realistic implementation plans for each SRIA could be produced in a coordinated framework. The development by the ETPs of a framework for longer-term cooperation was one of the key SETRIS outcomes. This framework paves the way for more dialogue and coordination between transport stakeholders in the future, and will expectedly contribute to further develop and move forward a truly integrated and multimodal transport system.

SETRIS also supported and shaped the development of the current and future Transport Research Arena (TRA) by providing inputs on all aspects (strategic, financial, practical and organisational) of the event in view to make it the leading European Conference for dialogue on transport research between industry, academia and public authorities for future mobility solutions.

Those many achievements and results of the SETRIS project have been nicely summed up in the current brochure which hopefully you will enjoy reading. Several sessions at TRA2018 in Vienna will also showcase SETRIS' findings; we will be glad to meeting you there to further discuss them.

Mark Robinson

Co-Coordinator SETRIS Project

ECTRI President

Future Mobility Group Lead - Newcastle University

STATEMENTS BY THE ETP PRESIDENTS

Christoph Schneider, ACARE Strategy and Integration Board, Co-Chairman

SETRIS provided a unique opportunity for cooperation between transport modes and for aligning research agendas. ACARE is happy on how we worked with the other transport modes, particularly in the field of long-distance freight. SETRIS also supported ACARE's current involvement in TRA 2018, which provides us with a truly intermodal platform for discussions.

Sergio Barbarino, ALICE Chairman

SETRIS has been a unique opportunity for cooperation and alignment of research agendas across all ETPs in the field of transport and logistics involving all transport modes.

It has deeply contributed to enhance and improve the cooperation framework leading to a common vision to truly integrated transport system

In fact, the main outcome of the project, the document *"A Truly Integrated Transport System for Sustainable and Efficient Logistics"*, has got a wide support by the community ending in a join ETP publication. SETRIS has also strengthen the ongoing collaboration in the Urban Mobility Working Group led by ERTRAC and with ALICE leadership on freight and the inclusion of ERRAC in the long distance freight transport discussion through the creation of an inter-platform discussion group.

Additionally, SETRIS has been an excellent tool to exchange practices with other platforms and has deeply contributed to frame the basic framework for ALICE to be developed in the future as the *"knowledge hub for logistics research and innovation"*. Through SETRIS, ALICE analysed 170+ R&I projects contribution to ALICE roadmaps implementation and this provided a strong grounded basis for future research and innovation recommendations to the Horizon 2020 Programme calls, as well as the framework to share and discuss advances through the "Collaborative Innovation Days" organised with the support of SETRIS and DG MOVE

Andy Doherty, ERRAC Chairman

In 2050, rail transport in Europe will provide the backbone of an intermodal "Mobility as a Service" within cities and beyond, for both passengers and goods, meeting the needs of customers, EU citizens and society. ERRAC recognises the suppliers and service organisations of the European rail industry as the world's thought leaders for railway products and services. To get there, a joint effort from all transport stakeholders will be required to provide a joint intermodal service. Thus, ERRAC values the collaboration between the ETPs and is committed to contributing to broader societal, economic and environmental goals through sustainable transport. Without question, ERRAC supports a joint transport strategy to develop an integrated transport system that is more efficient, sustainable and centred around end-user needs.

ERRAC values the contribution SETRIS has made to leveraging the challenge of inter-modality, extending the existing link with road transport to other transport modes, including long-distance ones. SETRIS had particularly supported ERRAC in updating its technology roadmaps and implementation maps, e.g. completing the assessment of the alignment of ERRAC priorities with national rail strategies. In addition, SETRIS offered an opportunity for ERRAC to develop its Rail 2050 Vision, which constitutes a strong basis for a new start. Vision 2050 incorporates the wider social and economic issues of human factors, noise and vibration in society, sustainability and environmental challenges, as well as digital enabling technologies as essential topics for intermodal cooperation. When the ERRAC was restructured during the SETRIS project, the project allowed the platform to re-think its own structure, including the dissemination strategy and technology priorities.

ERRAC is committed to continuing to cooperate with other transport modes. As a whole, SETRIS was perceived as key. ERRAC remains committed to develop synergies and cooperation initiatives with other ETPs. However, it acknowledges the need for support from the European Commission to establish sustainable collaboration between the ETPs thus ensuring that societal and economical challenges of Europe are fully tackled.

Stephan Neugebauer, ERTRAC Chairman

An efficient transport system is key to supporting the European economy and serving the society mobility needs. The development of Europe relies on efficient transport services for moving people and goods across the continent. European Technology Platforms have been working for more than ten years to anticipate changes and map the research and development needs for transport to gain in efficiency. All transport ETPs share this objective, and even although a lot of R&D efforts lie within the improvement of each mode individually, integrating the different modes is a highly critical matter for enhancing overall efficiency and getting European transport to work as one fully integrated system.

The goal of the SETRIS project was precisely to support this integration. Some important topics can be highlighted, such as inter-modality for freight transport, and integration of mobility services within cities. ERTRAC was involved in joint actions from the beginning with other ETPs to develop common roadmaps, such as the Integrated Urban Mobility Roadmap. The work lead by ALICE on logistics has proven to be of high quality, widely supported by the community, up to the joint publication of "A Truly Integrated Transport System for Sustainable and Efficient Logistics". The SETRIS project provided the right support to enable development of such joint work.

ERTRAC will continue to collaborate with other ETPs in these fields, where inter-modality and integration of services can provide clear added value to the European economy and society. Another useful task for SETRIS is its support to the Transport Research Arena conference, where all the ETPs are involved. They can present their work to a wide audience, including the entire research community but also decision makers from European, national and local levels.

The new SRA publication will be presented during the TRA 2018 in Vienna. The first chapter covers ensuring mobility in urban areas and the third chapter is on ensuring efficient and resilient road transport systems. This demonstrates the system approach that can only be realised via cooperation.

Henk Prins, WATERBORNE^{TP} Chairman

SETRIS has enabled WATERBORNE^{TP} to strengthen its cooperation with the other transport platforms. This has been beneficial for all partners involved; it reflects the interconnectedness of transport and fits the new structure of WATERBORNE^{TP,} which has set up a group to address Infrastructure & Logistics with respect to waterborne transport and where we look explicitly at the interaction between shipping and Inland waterway transport with other transport modes and logistics. This reflects the interconnectedness of today's transport and also the technologies related to safety, autonomy and electrification where we are also working with other platforms. All of these will, I am sure, contribute towards the foundation of activities within FP9. We look forward to our continued cooperation with other transport modes and with the ALICE platform to tackle the societal challenge of sustainable transport.

1 ABOUT THE PROJECT

Reference: John and Melanie Kotsopoulos_Flickr

The SETRIS project (Strengthening European Transport Research and Innovation Strategies) was funded under the European Union's Horizon 2020 Research and Innovation programme. It was specifically targeted at strengthening the research and innovation strategies of European transport industries.

In 2000, the European Council introduced the concept of European Technology Platforms (ETPs) as an instrument for further strengthening European research and innovation. The ETPs are essentially stakeholder forums and are recognised by the European Commission as key actors in driving innovation, knowledge transfer and European competitiveness. The Commission formally supports the ETPs, including those involved in SETRIS . The technology platforms define the medium- and long-term research agendas of the fields they represent and develop roadmaps to achieve the goals of each agenda. The four transport modes (rail, road, waterborne and air), along with the logistics industry, created their respective technology platforms between 2000-2003 and in 2013 to develop their Strategic Research and Innovation Agendas (SRIAs).

SETRIS aimed at delivering a cohesive and coordinated approach to research and innovation strategies across all four transport modes, identifying synergies between the SRIAs of the respective transport-related ETPs. This further considers the relationship between the ETPs and the relevant national platforms. The following ETPs were engaged in the SETRIS project:

- Advisory Council for Aviation Research and Innovation in Europe (ACARE);
- Alliance for Logistics Innovation through Collaboration in Europe (ALICE);
- European Rail Research Advisory Council (ERRAC);
- European Road Transport Research Advisory Council (ERTRAC);
- WATERBORNE TP.

SETRIS contributed to updating of each technology platform's SRIA, in particular to specific measures that could enhance a multi-modal and integrated transport system framework. Additionally, the project helped benchmarking past and present research initiatives on integrated transport SRIAs and their market uptake, while also looking to define comprehensive, credible and realistic implementation plans for each within a coordinated framework. SETRIS also successfully supported the delivery of a major European multimodal event on knowledge exchange and collaboration, supporting, shaping and contributing to the 2016, 2018 and future Transport Research Arena (TRA) conferences. This helped increasing the recognition and prominence of transport research and innovation activities in Europe.

SETRIS delivered a comprehensive set of strategic research and innovation priorities, which in turn led to credible implementation plans, reflecting the intermodality and cross-disciplinary nature of the integrated transport system. SETRIS aimed to contribute to a future intermodal European transport area as an initial stepping stone.

SETRIS began in April 2015 and ran for three years. The European Union funded the project under Grant Agreement 653739. The work was supported by representatives from the five transport-related ETPs. 18 core European transport research partners from both research and industries communities contributed to the different activities. The project was coordinated by ECTRI (the European Conference of Transport Research Institutes) and Newcastle University. While Newcastle University performed the project financial and administrative management, ECTRI, research network representing the multimodal transport research Community ensured that an objective, independent, and neutral view was kept in regard to the activities performed.

1. European Commission (2013) Commission Staff Working Document, Strategy for European Technology Platforms: ETP 2020, Brussels. Available at ftp://ftp.cordis.europa.eu/pub/etp/docs/swd-2013-strategy-etp-2020_en.pdf

2 STAKEHOLDERS

Reference: GVB Verbindt_Flickr

What was truly visionary about SETRIS was that it set out to identify synergies between the different transport sector technology platforms. Recognised by the European Commission as key actors in driving innovation, knowledge transfer and European competitiveness, the following ETPs fell within the scope of the SETRIS project:

2.1 ADVISORY COUNCIL FOR AVIATION RESEARCH AND INNOVATION IN EUROPE

The Advisory Council for Aviation Research and Innovation in Europe (ACARE) was formed following the launch of the 'Vision 2020' report on European aviation in 2001, instigated by the European Commission with the help of a so-called 'group of personalities'. Since then, there has been significant progress across the European air transport sector; close collaboration between ACARE stakeholders has developed successive releases of the Strategic Research Agenda (in 2002, 2004 and 2008), which are serving as guidelines for European research.

As a result of global changes experienced in the first decade of the 21st century, including greater understanding of environmental science, advances IT and the economic downturn, more challenging goals were set by Flightpath 2050 in 2011. In response, ACARE developed a new Strategic Research and Innovation Agenda (SRIA) in 2012 to enable this new vision to be realised.

The first edition of the SRIA emphasised the need to reduce emissions further, recommending maintaining and extending Europe's leadership in enhancing safety and security as air transport needs grow and developing excellent research infrastructure and education for the sector. However, even more significant changes occurred in certain key parameters in the last five years, prompting ACARE to update its SRIA to reflect the latest shift in priorities for European research in aviation.

ACARE stakeholders continue to provide leadership for the entire air transport and aeronautics community. This collaborative framework is essential for developing an ever-more successful air transport system for the future.

2.2 ALLIANCE FOR LOGISTICS INNOVATION THROUGH COLLABORATION IN EUROPE

The Alliance for Logistics Innovation through Collaboration in Europe (ALICE) was established to create a comprehensive European strategy for research, innovation and market deployment of logistics and supply-chain management innovation. ALICE supports and advises the European Commission on implementing logistics within Horizon 2020, the European Framework Programme for Research and Innovation. It was officially recognised as an ETP by the European Commission in July 2013.

ALICE is based on the need for an overarching view on logistics and supply-chain planning and control, where shippers and logistics service providers closely collaborate. ALICE engages with a wide variety of stakeholders, all operating in the logistics sector.

ALICE envisages a logistics future based on an open, global system of connected logistics networks, founded on physical, digital, and operational interconnectivity (access to resources), enabled through modularisation, standard interfaces and protocols. The aim is to see the moving, storing, producing, supplying and use of physical objects throughout the world in a manner that is economically, environmentally and socially efficient and sustainable. ALICE terms this concept the Physical Internet.

2.3 EUROPEAN RAIL RESEARCH ADVISORY COUNCIL

The European Rail Research Advisory Council (ERRAC) was set up in 2001 with the ambitious goal of creating a single European body with the competence and capability of helping transform Europe's rail sector and making it more competitive by fostering increased innovation and guiding research efforts at European level.

All Europe's major rail stakeholders are part of ERRAC, including railway undertakings, infrastructure managers, manufacturers, the European Commission, the European Union Agency for Railways, EU Member States, urban rail associations, academia and users' groups. This ensures the technology platform has a broad scope that covers all forms of rail transport, ranging from conventional, high speed and freight applications to urban and regional services. ERRAC's primary objective is to provide a common railway sector research and innovation vision for the European Institutions and key stakeholders. It will also contribute to shaping a favourable funding landscape for railway research and innovation, via calls for projects and joint undertakings such as Shift2Rail. ERRAC released its latest strategy document - Rail 2050 Vision - in December 2017.

2.4 EUROPEAN ROAD TRANSPORT RESEARCH ADVISORY COUNCIL

The European Road Transport Research Advisory Council (ERTRAC) is the ETP for road transport. ERTRAC's objectives are to provide a strategic vision for European road transport research and innovation. It is seeking to develop strategies and roadmaps for achieving this vision by defining and updating its Strategic Research Agenda (SRIA), implementing research roadmaps and by stimulating public and private investment in road transport research and innovation. ERTRAC aims to help improve coordination between European, national, regional public and private R&D activities on road transport, enhancing the networking and clustering of Europe's research and innovation capacities. By championing commitment to research and technological development, the ERTRAC technology platform helps ensure that Europe remains an attractive region for researchers. It enhances the global competitiveness of Europe's transport industries and supports implementation of Horizon 2020.

2.5 WATERBORNE TP

WATERBORNE TP is the technology platform that represents all stakeholders active in both marine and inland waterborne transport. Originally founded in 2005 as a follow up to the Maritime Industries Forum (MIF) and its R&D committee, this ETP provides research and development roadmaps and a vision for ensuring the competitiveness, environmental performance and safety of Europe's waterborne transport. Stakeholders include the EU associations covering deep and short sea shipping, inland waterways, ship yards, equipment manufacturers, the marine leisure industry, research and academia and classification societies. Internal research advisory groups (IRAGs) address issues as diverse as Vessels for the Future, Ports & Logistics and Blue Growth. EU Member States can appoint national delegates that can participate in the IRAGS and contribute relevant national strategies.

WATERBORNE TP published its first 'Vision 2020' paper in 2005 and its first strategic research agenda in 2006, followed by an implementation plan. The latest 'Vision 2030' paper was published in 2014, while an updated Strategic research and Innovation agenda (SRIA) is being finalised in 2018. A WATERBORNE TP declaration was published as a position paper at the beginning of the Horizon 2020 research and innovation programme. In February 2018 the platform was relaunched with a structure that included both associations and individual companies, which pay a small membership fee to help support a permanent secretariat. The visions and roadmaps from WATERBORNE TP are used by industry sectors, national R&D programmes and by the European Commission when defining the related content of its research work programmes.

3 RESEARCH SCOPE

Reference: Embarq Sustainable Urban Mobility by WRI

Transport directly affects all of Europe's citizens. Personal mobility and the movement of goods enable and enhance our quality of life and contribute to the EU's economic prosperity. Promoting efficient, safe, secure and environmentally-friendly transport is an aspiration for most stakeholders in Europe.

The ETPs have been working on how to deliver efficient and effective transport and contributing to achieving various EU policy objectives. Under the European Commission's research and innovation frameworks, the technology platforms have cooperated on multiple projects and on numerous occasions. However, the goal of SETRIS was to advance this cooperation on creating an intermodal and integrated transport system. The project envisaged a connected travel experience and set out to define the steps and actions required. This concept was based on the premise that efficient and effective travel should be both seamless and sustainable. SETRIS set out to identify the technical requirements to deliver the seamless integration of all transport modes, purposes and environments. These include protocol compatibility, physical integration and timetable coordination, commercial needs such as revenue distribution and policy requirements such as standardisation and GHG emissions. SETRIS fostered the necessary cooperation and integration between stakeholders in differing sectors and transport modes, encouraging them to

broaden their perspective for continued collaboration. SETRIS also assessed each relevant SRIA proposition on short-term transport integration. This allowed the SETRIS project to acknowledge the conclusions of the European Commission's Transport Advisory Group (TAG) report. In particular:

- Focusing research on the interfaces between transport technology, social acceptance and behavioural change;
- Emphasising the importance of integration while overcoming silo thinking that currently shapes much of transport research.

Over the three-year project period, SETRIS examined the ETP's research roadmaps in great detail identifying potential synergies and gaps. The research documented how the ETP collaboration developed across four research and innovation areas: urban mobility, urban freight; long-distance freight and transport infrastructure.

Table 1 summarises the ETP's research and innovation (R&I) area development in particular reference to technology platform collaboration.

Table 1: ETP R&I development (Source: SETRIS D1.1, 2015)

	ACARE	ALICE	ERRAC	ERTRAC	Waterborne
Urban mobility		✔	✔	✔	
Urban freight		✔		✔	
Long distance freight		✔	✔	✔	
Transport infrastructure	✔	✔	✔	✔	✔

To simplify, SETRIS associated the challenges of the literature, particularly those in the TAG report, with higher-level terms that formed the project's core research dimensions. These were:

- **Physical**: tangible/concrete transport infrastructure (capacity) and the associated materials/resources that operate on it such as vehicle fleets, ITS and transport technologies;
- **Political:** governance and management of transport operations at various levels, from local family clusters such as travel to school schemes up to national and international level, encompassing actors such as international aviation organisations;
- **Economic:** supply and demand of transport (value) for businesses, utilities, operations and beyond, for example, transport demand impact on economic growth and value for money;
- **Operational:** the dynamic functioning of transport (system/infrastructure) operations such as congestion relief, safety, noise mitigation and emission controls.

These four dimensions were based on the combined visions set out in the 2011 EU Transport White Paper and the Single European Transport Area, which together provided a clear and concise framework for SETRIS.

Based on the TAG report and the challenges and goals set out in the SRIAs, SETRIS analysed targets, obstacles, enablers and regulatory issues using the following classification:

- **Key characteristics:** components and requirements for a well-integrated transport system for passenger transport and logistics;
- **Targets and challenges:** practical and cost-effective solutions within a more resource-efficient, smart, sustainable and competitive transport sector;
- **Enablers:** specific measures and priorities that need to be addressed;
- **Adopters:** examples to act as lighthouse projects, measures for promoting and implementing innovative solutions, including adequate incentives, cross-border exchanges and developing an EU common approach network;
- **Regulatory issues and governance (dimensions):** governance of the processes required to reach consensus, implement change and influence enablers and adopters. The analysis of regulatory issues and governance principally focused on the role of enablers as future progress and development drivers.

For freight transport, SETRIS analysed the trends, policies and stakeholder incentives required to achieve an integrated transport system. It identified the specific components, characteristics and requirements for full integration. The project also addressed societal trends impacting the system, likely enablers and barriers as well as the individual plans of the different transport ETPs that would contribute to delivering such a system.

For passenger transport, the challenges set out in the TAG report were analysed according to their relevance within different temporal scopes. Along with the challenges and goals set out in the SRIAs, the project team created a common conceptual framework for intermodal transport. This highlighted the relationship between the SRIAs and the roadmaps along with the challenges and enablers for different transport modes in Europe.

The project stakeholders agreed a vision for the integrated transport system. This was based on the core challenges, enablers and visions as set out in the SRIAs, the TAG report and the White Papers. For passenger transport, SETRIS adopted the ACARE goal that 90 per cent of travellers should be able to complete their long-distance European journeys within four hours, door-to-door.

A genuinely integrated transport system for sustainable and efficient logistics is based on the open and global organisation of transport and logistics assets, hubs, resources and services from individual companies operating within an open environment. Such a system should be fully visible and accessible to market players, thus establishing a network of logistics networks. The objective of coordinating logistics, transport, infrastructure and supply networks is to move, store, supply and use physical objects worldwide in a way that is economically, environmentally and socially efficient, secure and sustainable. It should be based on physical, digital and operational interconnectivity, enabled through modularisation as well as standardisation interfaces and protocols.

While the goals for passenger and freight use different terminology and embody different approaches, they both stress the importance of frictionless and just-in-time interchanges between transport modes. This will require both appropriate infrastructure and a regulatory framework designed to support intermodality.

4 RESULTS OF INTERMODAL COOPERATION

Reference: De Lijn - Stefaan Van Hul

4.1 TOOLS FOR COOPERATION BETWEEN THE ETPS

The SETRIS project interviewed a broad range of representatives from the five different transport technology platforms. The interviews examined the assets, challenges and priorities for intermodal transport cooperation. This provided the basis for analysing cooperation potential between the technology platforms, feeding into the recommendations for effective future cooperation.

In general, ETP representatives emphasised the need to cooperate, recognising the potential this offers. Understanding the true nature of the full door-to-door journey was crucial when seeking to make frictionless travel fruition to reality. This is an area where a great deal of current of research, including real-time data availability as a critical input, is underway. Challenges such as congestion were considered to be intermodal; they both influence - and are influenced by - more than a single sector. Given this, the importance of approaching external stakeholders with a single, transport sector' voice rather than via individual modes is seen as vital. There was broad agreement on the enormous potential inherent in common research roadmaps and cooperation between transport modes.

The ETP representatives identified traditional thinking and competition between transport modes as the main challenge to cooperation. They also stressed that previous experience of intermodal cooperation had been less fruitful than anticipated, exposing competition issues. Other challenges the interviews revealed were differences in the target time horizons for different sector stakeholders - many of the inter-ETP cooperation activities target longer-term developments, while current mode-oriented business perspectives often focus on shorter term outcomes capable of delivering within five to eight years. This can complicate deployment of the results of cooperation.

The stakeholders said they appreciated the flexibility of the inter-ETP working groups as a means of cooperation. They could now be considered as starting points for more in-depth cooperation, potentially with other tools - such as EU projects, SRIAs or Joint Undertakings (JU) - at later stages. The SRIAs were perceived positively, and their role in fostering interaction acknowledged, but a number of representatives raised concerns over difficulties in becoming involved at later stages. The JUs were considered useful but risky, as well as being perceived as industry-driven. However, the stakeholders stressed that they appreciated collaborative development under the EU projects umbrella, which support technology transfer. Simpler and less time-consuming processes were seen as measures likely to win over more stakeholders.

For future cooperation, the priorities of the ETPs turned out to be diverse. Although all agreed that travel information was important as was the need for further research into the impact of autonomous vehicles. Stakeholders mentioned research and innovation on intermodal booking and ticketing, including new research on electric buses, as offering strong cooperation potential. They also emphasised the opportunities for strategic cooperation, particularly around the Framework Programmes. There were further possibilities for ad-hoc collaboration, such as first mile-last mile airport connection and the role of inland waterways in urban transport.

On steps and instruments, stakeholders agreed they should maintain discussions and continue to collaborate, but accepted that many challenges remain unsolved and will require further discussion. Given the recommendations and suggestions from the different ETPs, the Transport Research Arena (TRA) Conference seemed to offer the ideal forum to continue intra-ETP discussions.

4.2 THE TRANSPORT RESEARCH ARENA

The Transport Research Arena (TRA) Conference is a biennial event where researchers, industry representatives and policymakers meet to discuss and exchange ideas around European transport research and future transport solutions. Since the inaugural conference in 2006 in Gothenburg, interest in the TRA has grown steadily. The event now brings together all the transport related ETPs (ALICE, ERRAC, ERTRAC, WATERBORNE TP and ACARE since 2018) as well as other TRA member organisations including the European Conference of Road Directors (CEDR), the European Transport Research Alliance (ETRA) and the European Construction Technology Platform (ECTP). The event it is organised by a host from a European Country and co-organised by the European Commission

The event has undergone great evolution through the years. Each edition has brought a new stone to the building thanks to the support from the different European transport research stakeholders; it also faced major challenges with a changing location and a governance structure which shall adapt to new working environment and process.

The SETRIS project has contributed to provide inputs for assuring a smooth transition from one Conference to a new one, to support the continuous development of the Conference, and to consolidate the event, by both gathering the experience gained from the previous years and issuing further recommendations in view to guarantee the sustainability of the future conferences.

Besides supporting the participation of the different ETPs to the different TRA Committees of the 2016 and 2018 conferences, SETRIS has developed a number of guidelines and recommendations on the overall TRA aspects e.g. structure, organisation, sponsorship and communication strategy and financial model. It has operated according to TRA Management Committee's orientations and produced the different deliverables on that basis.

Most particularly SETRIS analysed the strengths and weaknesses of TRA through a SWOT analysis, it also benchmarked other major European and International events, considering that the conference is both appropriately positioned and has consolidated its reputation as a major international transport research conference. The analysis assessed the strong support by European and national institutions and the focus on quality results, as well its wide range of participants - academia, policy-makers and professionals - as strengths. However, the event was also perceived to be still in its infancy. It naturally faces competition from other major European and international transport policy and research conferences, such as the International Transport Forum Summit or the Transportation Research Board Annual Meeting as well as more specialised events for specific transport modes or sectors. External audiences may perceive the conference as being overly scientific and lacking prestige among high level policy-makers and industry leaders. Consequently, SETRIS suggests that the TRA acts to increase its visibility with European and national policy-makers and place greater emphasis on targeting transport economy and industry sectors. A better understanding of the perception of it activities, priorities and objectives could allow TRA to reach a broader audience and increase its visibility among decision makers and private sectors.

More effective communication that promotes a strong brand identity would support these recommendations. This would consolidate and sustain TRA's position against tough competition and let find its natural rythm, develop a unique identity and consequently increase influence on strategy for the future of a truly integrated transport in Europe. Wider media coverage shall also be seek in the future.

SETRIS also analysed the finances of previous TRAs. The results suggested that a clear business plan, based on a realistic financial evaluation, could help safeguarding the conference viability, as previously the host organisation had borne the full financial risk. This would involve constantly monitoring budget estimations and sharing and discussing these with the supporting organisations. This would eventually achieve SETRIS Deliverable 5.8, the final report on a TRA sustainable business model, to be published following TRA 2018.

Lastly, SETRIS also put together the tasks that a future support mechanism (e.g. permanent secretariat) would be requested to perform, also analysing the possible structures that could support such secretariat by proposing several possible scenarios.

FIND OUT MORE ABOUT TRANSPORT RESEARCH ARENA

- **SETRIS Deliverables 5.1 and 5.2** ..... Recommendations and final report on TRA structures;
- **SETRIS Deliverables 5.3 and 5.4** ..... Recommendations and final report on TRA practical organisation
- **SETRIS Deliverables 5.5 and 5.6** ..... Recommendations and final report on sponsorship and exhibitors' strategies for TRA;
- **SETRIS Deliverables 5.7 and 5.8** ..... Recommendations and final report on a TRA sustainable business model;
- **SETRIS Deliverable 5.10** ..... Handbook for TRA strategy aspects;
- **SETRIS Deliverable 5.11** ..... Report on the most relevant structure for supporting TRA continuous business.

4.3 RESULTS OF INTERMODAL COOPERATION

Strong cooperation between ETPs using intermodal working groups is already in place for some cross-cutting topics. These could be complemented through introducing temporary working groups that undertake in-depth studies of specific issues. Instruments such as EU research and innovation projects, SRIAs, JUs and Public-Private Partnerships were viewed as helpful for specific concrete issues and these should continue, particularly for ideas and concepts developed within the context of the inter-ETP working groups. An additional area for cooperation could be data provision and analysis; the ETPs regard this as highly important, as the analysis of transport-related results in the next chapter will demonstrate. For the ETPs, the TRA conference provides a basis for cooperation, offering a vital forum for discussing and promoting an integrated transport system.

5 TRANSPORT-RELATED RESULTS

Reference: Courier_transferring_urgent_mail_onto_a_high-speed_train by Qr189_Wikimedia_CC BY SA 3.0

5.1 PASSENGER TRANSPORT

5.1.1 Addressing Passenger Transport in Research and Innovation frameworks

As previously mentioned, the SETRIS project associated the challenges mentioned in the literature, in particular those within the TAG report, with higher-level terms that shaped the core research dimensions of the project. A group of passenger transport experts, representing their respective ETPs, were asked to what extent the challenges of the TAG report related to four dimensions - physical, political, economic and operational. Analysis of their responses suggests that, despite a focus on the physical dimension within the technology platform SRIAs, around half of the challenges were seen as primarily political, with only a few perceived as mainly economic. Only resilience and inaccessibility were significantly associated with the physical dimension, while noise, ICT and risk management were primarily viewed as operational issues.

Table 2: TAG challenges and dimensions

		DIMENSIONS			
		Physical	Political	Economic	Operational
TAG CHALLENGES	Congestion	2.17	3.17	2.33	2.83
	Inaccessibility	2.17	2.17	1.67	1.50
	Urban renewal	2.33	2.50	1.83	1.17
	Climate change	2.00	3.17	1.67	1.83
	Air pollution	1.83	2.67	1.83	2.50
	Noise	2.17	2.17	1.67	2.33
	Energy efficiency	1.83	2.50	2.67	2.17
	Alternate energy sources	2.00	2.67	1.83	2.00
	Resilience	2.33	2.00	1.67	1.50
	Demographic trends	1.67	2.67	1.83	2.33
	Ageing of population	1.33	2.17	1.50	1.33
	ICT	1.67	2.00	2.33	2.50
	Data management	1.00	1.50	2.00	2.17
	Risk management	1.67	1.67	1.67	1.83
	High-impact low probability events	1.67	1.67	1.67	1.83
	Health & safety (including life loss)	2.00	2.67	2.33	2.50
	Competitiveness	1.67	2.50	3.17	2.50
	Infrastructure maintenance	2.33	2.67	3.33	2.50
	Resource utilisation	2.00	2.33	2.67	2.17

SCALE

0	Not related
1	Somehow related
2	Moderately related
3	Related
4	Strongly related

However, topics seen as involving a physical and operational dimension were considered less significant than those attributable to a single specific dimension. Stakeholders perceived these to be important in all dimensions. In all topics, the links to other dimensions remain strong, suggesting a comprehensive approach taking account of the considerable complexity of the mobility system. To address all dimensions comprehensively, SETRIS proposed approaching the challenges based on categorisation, without neglecting the other dimensions of a topic.

The challenges of the TAG report were also matched to the enablers advanced by the ETPs in their SRIAs. Priorities and goals across the ETP roadmaps were clearly similar; however the ETPs had proposed different technological solutions. This highlighted the potential of joint efforts and the prospects for knowledge transfer. The SRIAs should strengthen these synergies in future to encourage consensus and enhance technological compatibility.

SETRIS similarly investigated the time horizon for solving these challenges. The ETP experts agreed that all are unlikely to be solved by 2020 and would require further time. Competitiveness, data management and ICT in particular requiring major effort, although not at the expense of the other topics within the same timeframe. In fact, the experts considered them to be longer term and entering into effect at a later stage. Likewise, SETRIS mapped the enablers mentioned in the ETP SRIAs side by side, ensuring greater coordination of the challenges and enablers, thus producing more effective research and innovation actions. The results illustrate to what extent enablers meet each challenge and the importance stakeholders attribute to each challenge and its corresponding enabler within a specific timeframe. This helps identify potential next steps for the roadmaps and/or implementation plans where available. However it was clear that some challenges, such as demographic trends, the ageing population and resilience require enablers not currently covered by the existing SRIAs. Others, such as new technologies, will play a crucial role, but are restrained by wider societal considerations such as the availability of qualified staff.

5.1.2 Integrated Urban Passenger Transport

The SETRIS project conducted extensive research on urban passenger transport using a series of semi-structured interviews, a literature review and an online stakeholder survey. This identified **four concrete priority areas** for supporting an implementation strategy for collaborative urban inter-modality.

Sharing **travel information** between different transport modes in real-time was important, along with integrated payment and ticketing. This should be considered as a cross-modal issue where different modes can cooperate on improving the passenger experience.

Automated vehicles are likely to significant impact urban transport. Transport stakeholders need to analyse and respond to this, particularly on how it will shape traffic management, public and private transport mode planning and urban mobility.

Infrastructure development and the need for effective physical links between long distance journeys and first and last miles remain an important issue, particularly when designing smart interchanges and hubs. Infrastructure is also a vital area for cooperation between air, road and rail travel modes.

There is mutual agreement on the need to **decarbonise the transport sector**. Technological aspects, such as electrification, should help drive collaboration between the road and rails sectors.

Specific topics expected to pave the way for collaborative urban inter-modality implementation have been identified within each of the four key priority areas. The instruments and measures to form a common implementation strategy will be debated further by the ETP communities and other transport stakeholders.

FIND OUT MORE ABOUT URBAN MOBILITY:

- **SETRIS Deliverable 1.6,** Urban mobility Transport: SRIA Implementation Plan

5.1.3 Integrated Long-Distance Passenger Transport

The ETP stakeholders were also surveyed on those topics they considered particularly important for developing integrated long-distance passenger transport. The targets, obstacles and measures were developed using earlier SETRIS research, as along with information sourced from the European Commission's recent communication, *An agenda for a socially fair transition towards clean and competitive and connected mobility for all.* (COM(2017) 283 final - 31.5.2017)

The following table summarises the existing cooperation potential.

Table 3: Summary of selected key aspects related to cross-modal connectivity

ROAD AND RAIL	ROAD AND AIR	RAIL AND AIR
TARGETS		
Opening dialogue between ERRAC and ERTRAC on formulating synergy around co-roadmap for addressing long-distance passenger transport services linked to EU core network priority framework.	Maintaining collaboration on developing a genuinely integrated transport system.	Maintaining a partnership on developing a genuinely integrated passenger transport system.
Joint ERRAC and ERTRAC working group to improve aspects of integrated long-distance passenger transport services.	Opening discussions to combine, rather than separate, other surface transport modes.	Improving understanding of the importance of integrated transport system in adopting the Core Network Transport policy framework.
	Focus on Core Network Transport policy framework on implementing strategic research priorities and innovations.	
OBSTACLES		
Market competition between modes.	Limiting road market for long-distance transport services, e.g. initiatives to reduce demand while other transport modes are inherently slow to respond to increases in demand.	Comparing the long-distance passenger transport market for rail and air against changing demographic trends.
The size of the market for different modes, e.g. road has a larger market share and employs more people	Mapping long-distance passenger transport demand	Identifying where long-distance passenger transport using rail and air becomes complimentary or competitive.
Governance legacy issues, such as rail has been traditionally state-managed rather than the non-public nature of road.		
REGULATORY ISSUES		
Too early to discuss the impact of Core Network Transport policy framework.	Promoting the Core Network Transport Policy framework towards strategic research priorities and innovations agenda.	Establishing a precise definition for the scale of long-distance transport systems within a Core Network Transport policy framework.
Technology transfer and cooperation on clean vehicles.		

More than 70 per cent of respondents believe that integrated mobility services and physical integration are vital for integration. Less than 50 per cent saw user information and network resilience as important. However, respondents consider the lack of operational strategies and business frameworks to support intermodality as fundamental barriers to integrated long-distance transport. These include shared data on service quality and infrastructure/service disruption for user information management. While protocol-related issues were perceived as lesser barriers to improving intermodal transport efficiency, they were seen as some of the most important steps required. Developing a common strategy for integrated, intelligent traffic-management systems was also seen as essential, while climate-change related targets, measures and obstacles were considered least important.

The survey addressed the mentioned topics, disregarding the time frame, which may explain the surprising results for **low-carbon transport** issues. In 2013, the ETPs decided to examine the issue in more depth. However, this is regarded as a long-term action and the 'zero-carbon footprint' vision will require a

sustained, long-term effort, making it an unrealistic short- and medium-term scenario.

SETRIS suggests focusing on joint data protocol development around different transport modes and novel approaches to infrastructure development. This can deliver **full integration of physical transport networks.** Such an approach would consider the impact on residents, propose inclusive and simplified planning and explore ways to incorporate the cost-benefits of door-to-door journeys.

The results suggest that **integrating mobility services** evolves around sharing real-time data, allowing a systemic approach to optimising transport capacity across networks and modes. Future activities could include improving data sharing protocols and research and policies on ways to share data and privacy.

This could apply to **user information management**, which requires standardised architectures allow universal travel information to be provided across modes.

Standardised communication and recovery protocols are potential areas for joint action in delivering a **secure and resilient network.** Disruption-forecasting models might use artificial intelligence and large-scale data analysis to deliver scenario planning for maintaining services as for aiding recovery from hazards.

FIND OUT MORE ABOUT LONG-DISTANCE TRANSPORT:

- **SETRIS Deliverable 1.7,** Long distance passenger's synergies report

5.1.4 Passenger Transport Conclusions

An oversight of door-to-door mobility adds value across all transport modes. Understanding the nature of user flows directly supports mobility, aiding infrastructure design and construction as well as system resilience by rerouting and real-time passenger information. Crucially, this feeds into how services are integrated, allowing a systematic approach to transport capacity, where services can be added in real-time if needed. Consequently, data-related issues are among measures most mentioned by respondents. A common data framework would help integrate services and infrastructure provision consistently, making a significant step in overcoming the institutional lack of cooperation in the sector. Real-time data for integrated payment and ticketing was highlighted as an interesting area for future cooperation.

However, SETRIS also identified that new operational strategies and business frameworks were needed to support intermodality, including shared data on service quality and infrastructure/service disruption for user information management. New business models that would simplify open data streamlining need to be developed.

Automation is also perceived as important as it is likely to impact all transport modes. Respondents agreed it was important to study the implications and develop appropriate policies. Automated cars are envisaged as a mode for suburban and rural areas, with mass rapid transit preferred in urban areas. Decarbonisation is seen as a priority; the road and rail sector foresee mutual learning on areas such as electric mobility and future cooperation on energy provision for road vehicles.

5.2 FREIGHT TRANSPORT

Low-carbon transport was seen as an important issue for freight transport. Reducing greenhouse-gas emissions are directly linked to fuel efficiency; with transport costs also a major issue for freight, economic considerations are also a major consideration.

SETRIS research suggests that better-integrated transport systems could support sustainable and efficient logistics. Measures to make freight transport as efficient and effective as possible include:

- **Infrastructure optimisation and development**, in particular:
  - Corridors and hubs that maximise the socioeconomic benefits of infrastructure.
  - Reducing congestion and improving safety and security.
- **Vehicle utilisation**, such as load factors and asset utilisation, including avoiding empty trips wherever possible.

Within an urban context, SETRIS envisages full integration of different freight flows within cities, allowing citizens to access goods and to dispose of waste. Integrating the flow of goods, improving coordination and energy efficiency measures will make future urban freight transport systems more sustainable and reliable.

Long-distance transport will become increasingly interconnected on physical as well as operational and management levels. Standards, such as modular load units, data-exchange formats and platforms and well-connected, seamless hubs will help deliver the

frictionless flow of goods across Europe and support environmental goals.

There were also a number of trends, enablers and challenges in integrating freight transport systems. Trends were societal influences such as the political goals of decarbonisation, energy efficiency and the optimal use of assets and infrastructure. Logistics systems need to respond to the emergence of the 'sharing' and 'circular' economies as well as marked demographic change in many European countries. The rise of e-commerce and product customisation will continue to shape freight transport streams and volumes. Increased volumes of smaller shipments sizes will change the ratio between personal shopping trips and shipping.

SETRIS recognises the role played by stakeholders, including the European Commission and its member states as enablers of an integrated freight transport system. Other enablers include technical advances in robotics and autonomous vehicles, the Internet of Things, Big Data processing and ICT, crowdsourcing and the sharing economy.

Other challenges identified for achieving an integrated freight transport system include a seeming lack of appetite for innovation within the logistics sector, strict, often conflicting regulations that hinder change and a lack of horizontal integration and collaboration. The gaps created by the absence of modular units, inadequate transhipment technology as well a lack of data collection standards and handling could further slow development.

5.2.1 Intervention Areas for Freight Transport

On the basis of these results and the ongoing projects, SETRIS benchmarked the existing roadmap and implementation of integrated freight transport. A proposal for an implementation plan was developed, covering eight intervention areas. These take account of the status of ongoing EU projects and initiatives taking into account new challenges and fresh topics.

1. *Integrating data frameworks and big data analytics as an method of improving decision-making in urban freight transport.*

   The integrated data framework will deliver a structured database for the current application of Big Data and will identify Big Data management good practices. In addition, this will develop and review business cases that support environmental goals and respond to broader trends such as the sharing economy and changing demographics.

   The framework aims to accelerate predictive analysis and enable more affordable and shorter procurement of data as well as deliver faster development of a regulatory framework and support programme for big data. This will improve the resilience of urban transport networks and encourage collaboration between the public and private sectors.

2. *Exploring new opportunities for achieving effective integration of urban freight and personal mobility: services and networks*

   This will develop new tools, methods and opportunities for transport flow integration and encourage their recognition in integrated urban mobility planning. By developing governance models and incentives that advance measures to integrate freight and passenger flows, this will help evaluate and run impact assessments pilot projects based on social, environmental and economic parameters.

3. *Improving the link between urban and long-distance freight transport services and infrastructure*

   Developing analytic models for planners on future goods flows could improve the link between urban and long-distance transport. This will help optimise placement and capacity design of connected hubs and transport. Meanwhile, pilot models could optimise how urban consolidation centres and micro-platforms are used, stimulating adoption of horizontal and vertical cooperation. This could be supported through piloting and evaluating different business and governance models on the roles and responsibilities of the hubs and services and the interaction between them.

4. *New business models for logistics services based on the sharing economy.*

   This aims to create innovative, sustainable and long-lasting cooperation and business models for logistics services. Multi-actor assessment frameworks will establish whether society is ready to embrace such approaches, what contribution they can make, whether they are economically and financially sustainable, their operational efficiency and level of innovation as well as the labour and environmental impacts.

   New governance models can encourage cross-sectoral cooperation between competing services. Removing barriers to collaboration will improve how assets are deployed, while business-led roadmaps will ensure quick market reach and uptake.

5. *Logistics in the full circular economy: new business models for horizontal and vertical collaboration*

Logistics can help deliver a truly circular economy, particularly when used to develop bundled services that integrate reverse supply chains and enable supply cycle management, rather than simply focusing on supply-chain management. This action seeks to develop related business models and identify the potential for economic gain from logistics and other sectors. It focuses on overcoming regulatory barriers and suggests setting up hub operations demonstrators, packaging containers and handling technology, which will improve understanding of how on how supply chains interact, how materials flow and the potentials for synergy.

6. *Bringing logistics into urban planning*

   Streamlining sustainable urban mobility plans (SUMPs) has helped integrate transport flows into urban development plans. However, many cities and regions still lack a comprehensive and evidence-based Sustainable Urban Logistics Plan (SULP). This action looks at developing recommendations for integrating logistics facilities within urban areas, particularly on urban consolidation centres and urban design.

   Analytical models can help efforts to redress any effects on quality of life, economic efficiency and stakeholders.

7. *Interoperable standard for modular urban loading units and autonomous deliveries.*

   Marine containers have shown that standardised modular loading units make cooperation and interconnectivity much easier. Modular loading units, compatible with existing maritime containers as well as with urban load unit and vehicle needs, will help develop integrated urban delivery systems. Handling technologies for these units would support the efficient operation of freight hubs further.

   This action proposes evaluating the economic and environmental impacts of this approach using large-scale pilot projects.

8. *Safety and security in urban freight*

   Cooperation between different stakeholders on higher standards for safety and security could significantly improve health and safety at work and reduce environmental risk and loss of goods. This action will assess the role of better human-machine interfaces, policies, vehicles and ICT as efficient, reliable and safe ways to improve security and safety. It will conduct an impact assessment and propose innovative solutions for maintaining the resiliency and robustness of urban freight systems.

For all these implementation areas, SETRIS estimated the potential impact of measures were they to be fully implemented. The following table gives an overview of the expected impacts.

Table 4: Estimated impact of intervention

Intervention Area / IMPACT AREA	1	2	3	4	5	6	7	8
NETWORK AND ASSETS								
Network Capacity/ Infrastructure/Assets	●○○	●○○	●○○	●●○		●●○		
ENVIRONMENTAL								
CO2		●○○	●●●			●●○	●○○	
Energy efficiency				●●○	●●○			
Environmental impact from the reintegration of resources					●●○			
Resilience and robustness								●●●
Saving resources and materials through reuse and recycling strategies					●●●			
COST								
Increased load factor				●●○			●○○	
Data acquisition Cost	●●○							
Operation Cost				●○○				
Lead Time				○○○				
Logistics Cost					●●○			
Handling Cost							●●●	
RELIABILITY								
Cargo safety and security							●●●	
Cargo loss due to theft or damage								●●●
Failed delivery								●●●
CUSTOMER SATISFACTION								
Customer Satisfaction								●●●

1. Integrating data frameworks and big data analytics as an method of improving decision-making in urban freight transport.
2. Exploring new opportunities for achieving effective integration of urban freight and personal mobility: services and networks
3. Improving the link between urban and long-distance freight transport services and infrastructure
4. New business models for logistics services based on the sharing economy.
5. Logistics in the full circular economy: new business models for horizontal and vertical collaboration
6. Bringing logistics into urban planning
7. Interoperable standard for modular urban loading units and autonomous deliveries.
8. Safety and security in urban freight

●●● High ●●○ Medium ●○○ Low ○○○ Very low

This overview clearly shows the enormous potential of the proposed actions. SETRIS expects significant savings in the environment and network capacity. Were the freight transport system to be better integrated, actions on safety, security and resilience would deliver substantial improvements.

5.2.2 Conclusions for Freight Transport

Unlike passenger transport, freight transport recommendations are largely driven by economics, making business models more significant. Such commercial thinking also influences the greater emphasis on environmental considerations, as improved fuel efficiency usually translates into greater profit. The concept of the circular economy addresses a similar dimension through seeking to avoid empty trips. The impact of e-commerce and a move towards increasingly local production driven by automation and customisation is creating uncertainty. However, the freight sector remains mainly the provenance of small and medium-sized companies, particularly in urban areas, and thus remains significantly fragmented. This makes data collection, analytics and openness overarching topics when considering vertical separation, where different operators might work together, for example, in the urban consolidation model.

For both the urban consolidation model and for general intermodality, standardised modular urban loading units are perceived as especially important. Ideally, they would be designed as interoperable units that are easily loaded and unloaded automatically at freight hubs. However, governance remains a common topic. It is seen as too strong, potentially hindering innovation in a number of areas. Meanwhile other areas such as data processing and planning, or common standards on modularisation require rigid regulation.

FIND OUT MORE ABOUT FREIGHT TRANSPORT :

- **SETRIS Deliverable 2.3** ..... Defining the concept of a 'truly integrated transport system for sustainable and efficient logistics'
- **SETRIS Deliverable 2.5** ..... Benchmark research and innovation activities II

5.3 CONCLUSIONS FOR THE INTEGRATED TRANSPORT SYSTEM

When comparing the freight and passenger transport section results, it is clear that both hold high expectations on understanding the door-to-door journey, improved hub development and infrastructure and service management.

They regard data collection, analysis, comparison and corresponding policies for data management and publication as highly important, attributing high gains to these aspects.

Similarly, establishing intermodal hubs and infrastructure remains an issue for both passenger and freight transport. Although activities on the issue have been ongoing for some years, further implementation and future data analysis will permit a more precise response to meeting the high expectations highlighted in the results.

Within the freight sector, integration with passenger transport has been highlighted. Stakeholders expect significant savings from transporting standardised loading units by (public) passenger transport modes or dedicated vehicles that use the public transport infrastructure. With the introduction of intermodal hubs and the increasing separation of services, passenger and freight concepts will increasingly become structurally similar, with the potential to benefit several business models.

In addition to data and governance, how to develop sustainable business models is a common topic for both passenger and freight transport. Although the concept of sustainable business models mostly relates to innovative areas such as data management, it also covers structural issues, including the operation of mobility as service interfaces and freight hubs, where revenue structures are currently unclear.

The ETPs agree on the need to prioritise decarbonisation, including the electrification of road transport, efficiency gains in freight transport and longer-term efficiency improvements.

6 GENERAL RESULTS AND RECOMMENDATIONS

Reference: CargoTramDresden by Serge Bystro_Flickr (CC BY 2.0)

The SETRIS project ran for 36 months as a joint effort of the ETPs. Its aim was to review and develop instruments for cooperation across differing transport modes. The use of strategic and research and innovation agendas (SRIAs) allowed the project to coordinate the technology platforms' research and innovation efforts.

The project results demonstrate that SETRIS managed to establish consensus on how the ETPs define the term "truly integrated transport system" and to show that each technology platform had drawn its own conclusions on the next steps required for an integrated transport system. The project stakeholders valued the collaboration between the ETPs highly; they understood the need for a common strategy in building a more efficient and sustainable integrated transport system. During the course of the project, the ETPs reviewed and revised their SRIAs to orient them to multi-modal and integrated transport solutions. They defined comprehensive, credible and realistic implementation plans for each SRIA within a coordinated framework. This incorporated the results of the project while maintaining the objective of further developing intermodal cooperation.

SETRIS helped monitor the progress of the research and innovation roadmaps, identifying gaps and recommendations for the Horizon 2020 research

framework programme. Joint research and innovation represents the preferred cooperation approach between the ETPs, and all support the concept of an event that promotes their cooperation. They also believe that the Transport Research Arena (TRA) Conference is the right forum to kick off further collaboration on specific topics. The ETPs also emphasised the value of cross-modal working groups. The SETRIS results suggest that instruments such as EU-funded projects, Joint Undertakings (JUs) or public-private partnerships can be useful in defining and developing specific aspects of an integrated transport system.

There needs to be continued effort from the ETPs in following up on the SETRIS activities including developing synergies and cooperation initiatives with other ETPs. Strategically, SETRIS led to agreement on six topics of common interest and potential cooperation:

1. Increased competitiveness of European transport stakeholders;

2. A holistic approach to identifying the means and opportunities for meeting the targets for decarbonising transport;

3. Information technology, new opportunities and threats such as cybersecurity and Big Data;

4. Implementing new mobility system concept;

5. Mitigation scenarios where progress on integration is slower than expected;

6. Transport system resilience.

There is a need to establish a framework for continuing to build consensus, promote and agree on cross-modal transport research topics and drive the agenda on a genuinely integrated transport system that includes specific targets up to 2030. Such a framework would assist the transport ETPs, the European Commission and Member States in defining cross-modal strategies as well as helping achieve the targets of the transport White Paper, the Digital Agenda and other European policies. In particular, the ETPs suggest the following actions:

- Developing, promoting and following up implementation of the cross-modal transport research agenda addressing, including topics outside those identified above;

- Establishing a joint working group to discuss cross-cutting research needs at a high level. This would monitor cross-modal, system and user-centric transport research projects and their impacts on ETP agendas and plans as well as on relevant European programmes. The joint working group would also organise workshops to present and discuss results, trends, exchange experience and to foster innovation;

- Identifying products, services and other value-added results generated through research projects that have achieved market uptake. Identifying barriers to deploying research results and improving framework conditions. Identifying results or clustered results that could be tested and/or deployed in TEN-T corridors;

- Exchanging practices and experiences within ETPs in processes such as methodologies for establishing roadmaps, project and programme impacts analyses, engagement processes with Member States and regions, defining key performance indicators and consensus building.

- Developing appropriate frameworks for collaborating at EU, Member State and regional levels;

- Supporting the wider dissemination of project results through workshops built around clusters of projects, special conference sessions, broad knowledge sharing and awareness of the latest industry-led cross-modal developments. The Transport Research Arena (TRA) Conferences planned for 2020 and 2022 editions should receive special attention and support.

SETRIS stakeholders found the project valuable for leveraging the engagement of regional clusters, national platforms and Member States and with industry via the research and innovation roadmaps and EU policy goals. In the coming decade, the challenges and opportunities facing new mobility services and connected freight transport will become fully apparent. SETRIS stakeholders are committed to using these to contribute to wider societal, environmental and economic goals.

References: De Lijn_Stefaan Van Hul

IMPRINT

Published on behalf of the SETRIS Consortium by

POLIS a.i.s.b.l

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Layout:

DEVISU Digital Document Design

Printed and distributed in April 2018

All SETRIS deliverables referred in the brochure will be made available on the SETRIS page of the TRIMIS website: https://trimis.ec.europa.eu/project/strengthening-european-transport-research-and-innovation-strategies

Summary of the SETRIS Project Outcomes and Results

APRIL 2018

The SETRIS project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 653739