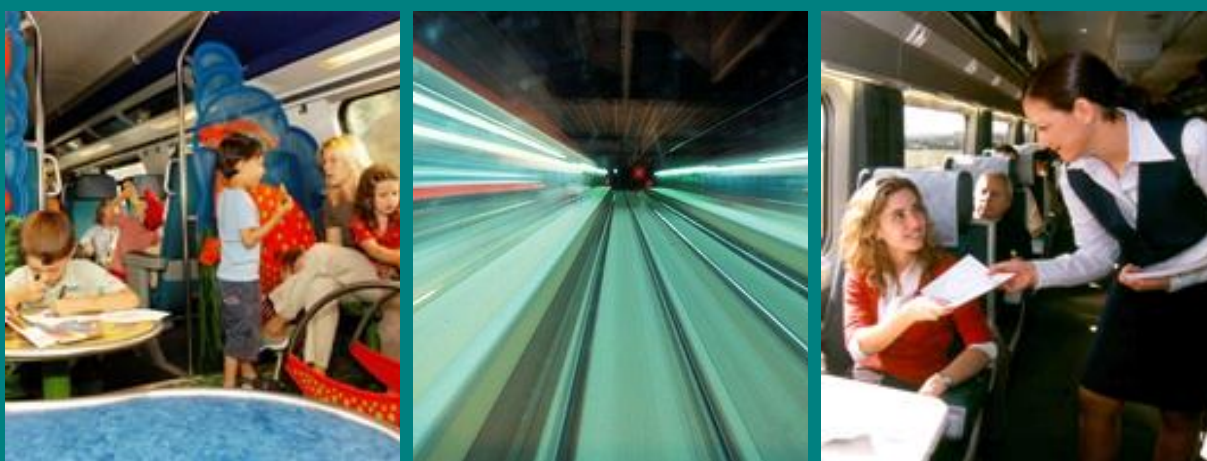


# ERRAC WORK PACKAGE 02: Encouraging modal shift (long distance) and decongesting transport corridors

## Draft Passenger Roadmap

MAY 2011



ERRAC WP 02 leaders  
Bo Olsson, Trafikverket

ERRAC Secretariat WP 02 Trafikverket & Unife  
Lea Paties lea.paties@unife.org  
Malcolm Lundgren malcolm.lundgren@trafikverket.se

<http://www.errac.org>

## Table of contents

<b>1. Scope of the Passenger Roadmap .....</b>	<b>3</b>
<b>2. Passenger Research in Europe (State-of-the-art) .....</b>	<b>4</b>
2.1. Today's position (State-of-the-art) .....	7
2.2 Mega trends (State-of-the-art).....	9
2.1. General issues (State-of-the-art) .....	10
<b>3. Identification of Gap Themes .....</b>	<b>11</b>
<b>3.1 General Requirements Gaps.....</b>	<b>11</b>
3.1.1 Societal Expectations and Managing cost and Value for money .....	11
<b>3.2 Innovative Products and Services Gaps .....</b>	<b>11</b>
3.2.1 General passenger train Technology Issues .....	11
3.2.2 Development of Regional, Intercity and High Speed Trains .....	12
3.2.3 New services, Air and Rail Complementary or Competing.....	12
3.3.1 Integrated Information Systems and TAP-TSI standards - non physical connectivity.	13
3.3.2 Integrated Journeys.....	13
3.3.3 Capacity Management and Handling Disruptions.....	13
<b>3.4 Stations and Infrastructure Gaps.....</b>	<b>14</b>
3.4.1 Accessibility .....	14
3.4.2 Orientation systems.....	14
3.4.3 Personal safety and security .....	14
3.4.4 Transport hub waiting areas and platforms .....	14
3.4.5 ERTMS and Capacity.....	15
<b>3.5 Tools and Policy - Integration of Transport Modes Gaps .....</b>	<b>15</b>
3.5.1 Policy Changes to Create Economic Incentives for Introduction of Innovations .....	15
3.5.2 Journey Time Reductions (by higher speeds).....	15
3.5.3 High Speed Extensions.....	16
3.5.4 Interoperability for the Seamless Journey .....	16
3.5.5 Greening .....	16
3.5.6 New Stations and Lines .....	16
<b>3.6 The Complete Scorecard.....</b>	<b>17</b>
3.7 Prioritisation.....	22
<b>4. The Vision .....</b>	<b>24</b>
<b>5. The Passenger Roadmap .....</b>	<b>25</b>
<b>Annex .....</b>	<b>36</b>
References .....	36
Selection of relevant long distance (rail) projects .....	36
Questionnaire.....	38

## Authors

ERRAC WG 02: Passenger Core Group: European Passenger Federation, NewRail, Trafikverket, Unife, VTI

Extended Passenger Core Group: CER, EURNEX, Signosis, Vectura

## 1. Scope of the Passenger Roadmap

The railway is an **integral part of the transport system** and is usually interdependent with other modes in delivering door to door transport services. The ERRAC long distance passenger roadmap focuses on **regional and interregional train passenger services** as part of a **multimodal transport chain**. Commuter, metro and light rail services are covered by the ERRAC WG 03 Roadmap for urban mobility. If long distance passenger services are to increase their competitive advantage over other modes they must deliver increased customer satisfaction: they must be attractive, efficient and affordable. This is vital if we are to meet ever more-demanding sustainability goals and to promote sustainable economic growth and the integration of Europe's regions. The key to reaching the **sustainability goals** is to achieve better **connectivity**. This functions at **two levels**: developing ways of ensuring that **passengers do not feel inhibited from using the rail system** (e.g. physical ease of access, dealing with those things that potential users might perceive as threatening their personal security, readily understandable information on times and fares) and **promoting complementarity** between different types of rail service and between those services and other modes (e.g. forging seamless links between high speed rail and urban transit systems). If we are to achieve a significant modal shift the issue of both **physical** (how to get to the train station) and **non-physical** (ICT) interconnectivity must be addressed.

## 2. Passenger Research in Europe (State-of-the-art)

In 2001, the European Commission issued a White Paper<sup>1</sup> with an action programme for European transport policy through to 2010. This was updated in the mid-term review of 2006<sup>2</sup>. The new white paper on transport<sup>3</sup> speaks of a shift of 50% of the interurban passenger transport on average distances from road to rail and a 60% reduction of transport-generated emissions by 2050.

The 2001 White Paper described plans for revitalising the rail sector. It led to a number of initiatives which were supported by new legislation, including that creating the European Railway Agency and what was known as the Third Railway Package<sup>4</sup>, which included extension of the protection of passengers' rights to the rail sector<sup>5</sup>. It emphasised the importance of various ways of keeping the EU at the forefront of transport service provision and technology:

- The network effects and in particular, with regard to passenger transport, the integration of aviation with high-speed rail are seen as a crucial development
- Interoperability to help improve the capacity of rail systems and competitiveness of rail services
- "Soft infrastructures", like intelligent transport systems for road (ITS<sup>6</sup>) and traffic management systems for rail (ERTMS<sup>7</sup>)

**The new white paper** builds on the previous white paper and the result of the midterm review. At the heart of the Transport 2050 roadmap is the need for a transformation in the rail sector so that it becomes more attractive and succeeds in carrying a very significantly increased share of the market for passenger and freight over middle distances (>300 km) by 2050. At the same time the aim is to triple the length of the current high-speed rail network by 2030 whilst facilitating multimodal journeys and the complementarity of modes. It acknowledges that quality, reliability and accessibility are key to the promotion of public transport and a shift to its use from less sustainable modes. It says that **'people are at the centre of EU transport policy'** and the following the implementation of legislation to protect passengers' rights when travelling by each of air, rail, water and bus or coach, when making a journey citizens should be able to take advantage of common general principles applied across all modes<sup>8</sup>.

The **ERRAC Strategic Rail Research Agenda 2020** has a vision for the future of rail where strategic objectives include seamless passenger services, integrated mass transit systems, fully interoperable infrastructure and services as well as a sustainable transport chain. The EU, with the creation of the single **European Rail System** and the associated measures to ensure its interoperability, is working towards the establishment of a system fit for all.

---

<sup>1</sup> COM(2001) 370.

<sup>2</sup> COM(2006) 314.

<sup>3</sup> COM(2011) 144.

<sup>4</sup> Notably Regulation (EC) No 1335/2008 amending Regulation (EC) No 881/2004

<sup>5</sup> OJ L 315, 3.12.2007, p. 14-41, Regulation (EC) No 1371/2007.

<sup>6</sup> COM(2008) 886 and COM(2008) 886/2.

<sup>7</sup> COM(2005) 903.

<sup>8</sup> For more detail see Commission Staff Working Document accompanying the White Paper SEC(2011) 391 Final

We need to enhance **interconnectivity** if, ultimately, we are to deliver on the greening and decarbonisation goals. This requires us to address both ease of access to the rail network – making it seem easier and more attractive for people to use – and the **enhancement of interconnectivity** between long **distance rail and local public transport**. Better timetabling, improving the attractiveness of station locations and the convenience of their layouts and ICT tools for trip planning and ticket purchasing is a challenge that has to be met for a modal shift to occur.

Article 28 of Regulation (EC) No 1371/2007 on Rail Passenger Rights & Obligations sets out certain provisions relating to service quality standards. It says that: The EC Regulation 1371/2007 about Passenger rights etc, Article 28; Service quality standards states that

1. Railway undertakings shall define service quality standards and implement a quality management system to maintain service quality. The service quality standards shall at least cover the items listed in Annex III.

2. Railway undertakings shall monitor their own performance as reflected in the service quality standards. Railway undertakings shall each year publish a report on their service quality performance together with their annual report. The reports on service quality performance shall be published on the Internet website of the railway undertakings. In addition, these reports shall be made available on the Internet website of the ERA.

The minimum Service Quality Standards covered by Annex III include:

- Information and tickets,
- Punctuality of services, and general principles to cope with disruption to services,
- Cancellations of services,
- Cleanliness of rolling stock and station facilities (air quality in carriages, hygiene of sanitary facilities, etc.).
- Customer satisfaction survey,
- Complaint handling, refunds and compensation for non-compliance with service quality standards,,
- Assistance provided to disabled persons and persons with reduced mobility.

In the standardisation field, Technical Specifications for Interoperability (TSI) have been developed by the **European Railway Agency (ERA)**. These include the **TSI PRM** (People with Reduced Mobility) to ensure accessibility of trains and stations, **TSI TAP** (Telematic Applications for Passengers) to provide passengers with information before and during the journey, reservation and payment systems, luggage management and management between trains and with other modes of transport. All of these will set up the framework of the European railways for the coming decades.

The work being carried out by the **UIC Passenger Forum** is important since it is both a source for research topics and a tool for implementing research results into leaflets. Example of relevant leaflets are the **UIC leaflet 140** Eurostations defining a common framework for station design across Europe to ensure accessibility and **UIC leaflet 413** which describes measures to facilitate travel by rail, both of which feed into the TSI PRM.

Railway undertakings, infrastructure managers and passenger organisations carry out regular surveys to measure customer satisfaction and identify trends that indicate passenger expectations such a Network Rail's **Vision 2030**. In addition periodic **National Passenger Surveys** provide an official national measure of **passenger satisfaction** with rail travel while the European Commission is beginning to collate comparative information on customer

satisfaction in the context of its annual report to the Council and Parliament on monitoring the development of the rail market<sup>9</sup>.

Railway undertakings, infrastructure managers and passenger organisations carry out regular surveys to measure customer satisfaction and identify trends that indicate passenger expectations such as Network Rail's **Vision 2030**. In addition periodic **National Passenger Surveys** provide an official national measure of **passenger satisfaction** with rail travel.

Other activities include qualitative research:

- on **passengers' priorities** at stations
- **passenger requirements and experiences** with the **provision of information** at various stages of the journey
- passenger aspirations for **rolling stock design**
- passenger attitudes to **e-ticketing** and station **retailing**.

Stated preference research determines:

- passengers' priorities for rail **service improvements** at national and regional level
- the drivers of **passenger satisfaction** and **dissatisfaction**
- how people **access stations** and their attitudes towards adequate car parking provision as a determinant of rail travel
- the impact of **overcrowding** on passengers' perceptions
- passenger perceptions of **personal security** on the railway

We know from regression analysis of passenger satisfaction data derived for the very large twice yearly British National Passenger Survey (which samples the views of over 50,000 passengers who have just undertaken a trip by rail) that a very limited number of issues stand out above all others as the drivers of passenger satisfaction and passenger dissatisfaction. In Britain punctuality and reliability is by far the most important driver of passenger satisfaction (being greater than all the other factors combined) while the way in which railway undertakings deal with delays has an even greater influence as the main driver of passenger dissatisfaction. A further independent study has identified the following issues as passengers' top five priorities for improvement:

- Price of train tickets offer excellent value for money
- Sufficient train services at times I use the train
- At least 19 out of 20 trains arrive on time
- Passengers are always able to get a seat on the train
- Company keeps passengers informed if train delayed

The EC is in May 2011 carrying out a public consultation concerning multi-modal passenger information. The consultation will also be a first input to the elaboration of specifications for multi-modal travel information foreseen under Directive 2010/40/EU. It is planned that the outcome of this consultation will be presented at a workshop, which will be held in June 2011 in Brussels.

The attachment lists a number of relevant policy documents as well as research projects that relate to the roadmap.

---

<sup>9</sup> COM(2009) 676 and SEC (2009) 1687, Annex 23.

## 2.1. Today's position (State-of-the-art)

The 2011 White Paper, “**Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system<sup>10</sup>**”, opens with a statement which recognises that transport is fundamental to our economy and society, that mobility is vital for the internal market and the quality of life of Europe's citizens as they enjoy their freedom to travel. Transport enables economic growth but it must also be sustainable if we are to meet the challenges to our environment and the future of human society. The White Paper places particular emphasis on the increasing importance of quality, accessibility and reliability of transport services if, amongst other things, there is to be a significant modal shift away from less sustainable transport modes and the needs of an ageing population are to be met. Attractive frequencies, comfort, easier access, better connectivity, reliability of service and intermodal integration are identified as the main characteristics of service quality. The availability of information over travelling time and routing alternatives is seen by the White paper as equally relevant to ensure seamless door-to-door mobility. A multimodal European transport information, management and payment system is seen as complementing the EU's provisions for the deployment of intelligent traffic systems in the field of road transport envisaged by Directive 2010/40/EU. As in the previous White Paper, “**European Transport Policy for 2010: time to decide**”, the Commission asserts that people should be at the heart of EU transport policy.

The targets of the European transport policies cannot be reached without modal shift of travels from road to public transport. This underlines the importance of seamless end-to-end journeys. Changes between modes or operators should not be obstacles to being able to make a seamless end-to-end journey, whatever the modes involved. Europe-wide standards for interchanges should therefore be developed. The railways must cooperate with other stakeholders in order to facilitate easier travel.

Railways can facilitate integration of regions and labour markets. Long distance commuting has been a major growth sector in many member states. This makes it possible for the citizens to live and work where it's most suitable. Business models for effective interchange management must therefore be elaborated. Safety and perceptions of personal security are important to passengers. They must feel able to trust the railways that trains and stations are safe and secure. Measures to accommodate the needs of children and those travelling with them are especially important. Common Europe-wide standards for interchanges should therefore be developed. Providing accessible, affordable, punctual services on demand with easy transfer between modes can be an important contributor to customer satisfaction. Long distance commuting has been a major growth sector in many MS. There is more to be done to align better the constituent elements of a journey with the needs of passengers: better coordination between modes and operators, improved information systems, improved connectional times and better access to rail are all deserving of further research. Cooperation between stakeholders on door to door travel chains together with better information systems, minimizing delays and ensuring easier access to rail are some elements where research efforts can contribute to improvements for passengers and thus make rail a better travel option.

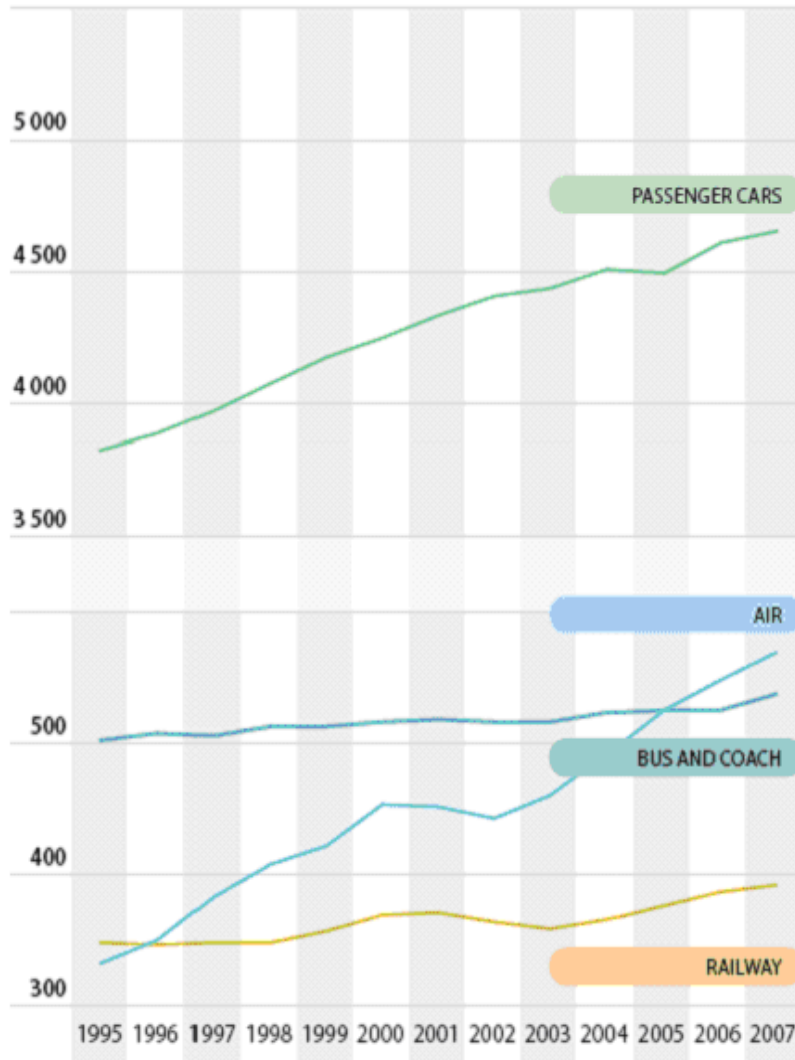
---

<sup>10</sup> COM(2011) 144 final



## EU-27 Performance by Mode for Passenger Transport – 1995-2007

billion passenger-kilometres



Source: EU energy and transport in figures, statistical pocketbook 2009

This graph clearly shows an increase in overall passenger numbers with cars and aviation clearly attracting most of the additional volume. However, this also represents a clear opportunity for potential modal shift to rail in the regional and long distance travel sectors. In 2007, rail only had a 7% of the surface transport share in the modal split for the EU27 countries. Sustainability and the ability to bring regional cohesion (particularly high speed rail) are some of the key benefits that rail can better deliver.

## 2.2 Mega trends (State-of-the-art)

ERRAC has identified a number of mega trends. The most relevant for the long distance passenger Roadmap are discussed below.

- **E-27 economic growth leads to increased demand of transport**

Continuing economic growth of the European Union and the efforts to integrate countries and regions will increase demand for regional and interregional passenger travel, both for work and for leisure. This growth may be vulnerable to fluctuations in economic activity although the impact of down-turns is likely to be greatest on the freight market.

- **Sustainable development**

The need to align economic development with sustainability will affect the way people travel. However, while the rail sector presently has something of an advantage in terms of greenhouse gas emissions it will need to innovate if it is to retain this advantage in the face of improvements being made by other modes.

- **Impact of demographic changes**

The increase in the proportion of the population represented by older people, combined with improvements in their active life-expectancy and their relative spending power, will influence changes in the mobility requirements of passengers. These changes will be heightened by an increasing move towards the concentration of population on urban and semi-urban settlements rather than rural dispersal. This could be an advantage for rail (and metro) but the need for intermodal coordination increases.

- **Higher presence of women in the work force**

An increase in the proportion of the workforce made up by women can be foreseen. More women will travel to work and more women will own cars. The needs of women concerning such things as personal security must be considered and the implications for rail analysed.

- **Customer perception of rail**

The perception that both the public generally and potential passengers specifically have of rail are important factors in attracting new rail users. The European Commission's Rail Market Monitoring Scheme has shown that consumer satisfaction with "Extra urban transport" (including long distance rail) is very low while "New motor vehicles" ranks highest among 19 services and goods markets<sup>11</sup>. This highlights the rail sector's quality problems.

- **Increased competition and liberalisations of the railway market in Europe**

The railway market for passenger services is gradually opening to new entrants. 2010 has seen the opening up for international passenger services (with cabotage) and the EU is contemplating further market opening. Advantages and drawbacks of competition between operators from a customer perspective is an important topic.

---

<sup>11</sup> COM(2009) 676 and SEC (2009) 1687, Annex 23.

- **Security needs as a barrier**

The increasing threat to the security of public spaces and transport systems in particular will require the introduction of additional measures that could pose a barrier for the mobility of passengers as do passengers' perceptions of personal security when using public transport.

## **2.1. General issues (State-of-the-art)**

- **Cooperation between different modes to facilitate door to door travels**

Rail transport is increasingly used as part of the multimodal transport choice made by passengers to complete their door-to-door journeys. This poses a critical need to deliver a more integrated service including coordination of information delivery and timetables between often competing operators for instance. A clear cooperation framework would be necessary in order to effectively deliver the necessary connectivity in order to achieve a seamless travel experience.

- **Availability of well functioning nodes for modal transfer**

Interchanges between rail and other modes must be user friendly in order to facilitate connectivity. Signage and other information at stations should be easily accessible, as should travel and ticketing information.

- **Fast adaptation between supply and demand**

Peak hour demand or sudden demand changes should be dealt with in a flexible way. Passengers should not have to stand in train corridors on regional and interregional train services. This should not exclude yield management pricing aimed at more even utilisation of rolling stock and other resources.

- **Accessibility for disabled people and people with reduced mobility**

The railway system should be accessible for all passengers, including disabled people and others with reduced mobility. A set of priorities should be worked out from which it is possible to decide cost effective solutions that can be implemented within reasonable time spans. Passengers may face problems with the sufficiency of timetable and connectional information, support facilities at stations and help with movement from stations into the train. These matters are covered by Regulation (EC) No 1371/2007 and by the TSI-PRM.

- **Systems for providing traffic information at times of disruption**

Public transport users often have difficulties in getting accurate information on train delays and how it will affect connecting journeys by other modes or Railway Undertakings. The competitiveness of rail would be enhanced by systems that enable passengers to access a comprehensive picture of how their end-to-end journey is likely to be affected by disruption to any part of the journey. A number of FP7 projects are working with this.

- **Harmonised passenger rights**

Harmonised passenger compensation arrangements that are applicable if services are cancelled or delayed and which can function in cross border situations will become more important as European integration progresses. Regulation (EC) No 1371/2007 deals with the rail sector and other Regulations deal with the air traffic sector and, prospectively, with coach and bus and maritime journeys. The PT sector (UITP) has pointed out that having different regulation is not practical for different modes when intermodal trip chains are becoming the norm.

### **3. Identification of Gap Themes**

The Roadmap Philosophy is to identify problems that impede rail from playing the role it must have in door to door travels for the achievement of Europe's ambitious sustainability targets. This has been done through a gap analysis which is structured in the form of themes in a Scorecard. Milestones have been set (2015, 2020, 2030) when the problems should be resolved. Chapter 5 contains the roadmap where with arrows indicating the need for research, demonstrations or regulatory framework changes for removing the problems in the scorecard.

The implementation of the roadmap should lead to a higher system capacity (necessary to accommodate higher passenger volumes and enable greening of Europe), whilst maintaining the safety levels, at lower costs and at the same time provide a service quality that meet customers' expectations. This also includes managing the connections in a holistic way in order to achieve seamless door to door journeys. Or another way to put is that you need easy access to the trains if you want them to be fully utilized.

#### **3.1 General Requirements Gaps**

##### **3.1.1 Societal Expectations and Managing cost and Value for money**

The first section of the scorecard contains a number of parameters that the stakeholders at the ERRAC WG II identified to be relevant for describing, in general terms, properties, trade-offs and qualities of tomorrow's rail system supporting a sustainable Europe. Those items have been grouped into an area called societal expectations.

The management of cost and value for money requires basic knowledge about the rail systems cost structure. The development of a high level model of the whole system cost would facilitate the prioritization of the research needed to meet the societal expectations.

#### **3.2 Innovative Products and Services Gaps**

The rail system needs to attract the customers by offering innovative new products and service concepts. Trains and services need to be renewed in order to promote connectivity and make rail the natural mode of choice for long distance passenger journeys.

##### **3.2.1 General passenger train Technology Issues**

Methods for cross technology optimization would facilitate the development of new trains such as lighter trains with active suspension for better comfort and high (electrical) integrated

brakes for reduction of rail depreciation. Attractive, from a passenger perspective, trains with low seat kilometre costs are necessary. This is a necessary prerequisite for a virtuous circle benefitting the customers, the operators and the suppliers.

### **3.2.2 Development of Regional, Intercity and High Speed Trains**

Regional trains stops more frequently and would for time tabling reasons benefit from technical solutions that would speed up embarkation and disembarkation, enhance physical connectivity without compromising the comfort. Ways to handle bicycles, prams and support for people with reduced mobility are important. Such things often take away paying space for the operators which mean that business aspects have to be considered.

### **3.2.3 New services, Air and Rail Complementary or Competing**

As a rule of thumb, a conurbation-to-conurbation rail journey time of up to three hours or so is likely to be competitive with air - suggesting that it is to think of high speed rail as a credible alternative for journeys of up to 650-700kms on the basis of current technology and prevailing passenger attitudes. In a report commissioned by DG Tren<sup>12</sup> air and rail market shares and future trends are analysed. The report suggests that rail journey times are the single most important factor determining market share but the variability is large. Other important factors are frequency, average access time to stations/airports, reliability, price and service quality. The arrival of low cost airlines poses a challenge for rail to reduce operating costs. The report indicates that substantial gains market share rail vis à vis air can be achieved by higher average speeds and/or substantial cost reductions. Where rail connects to airport terminals there is room for complementarity rather than competition. Passenger can travel by rail instead of taking a short distance flight to connect to a long distance flight. Ticketing and luggage services to facilitate such arrangements and seamless security checks done once would enhance such a development.

---

<sup>12</sup> Air and Rail Competition and Complementarity, Steer Davies Gleave, August 2006

### 3.3 Information and Journey Planning Gaps

Huge quantities of travel information are produced everyday by different systems that are often not very well integrated and which requires human interaction to for sorting and processing. Often the information about delayed or cancelled trains are more accurate and quickly spread by social media than by the railway's themselves. Accurate, easily accessible information and ticketing systems is essential for increasing the attractiveness of rail as a part of a door to door journey.

#### 3.3.1 Integrated Information Systems and TAP-TSI standards – non physical connectivity

The first step in a trip is to find the desired connections from starting point to destination. The information system has to be integrated in several senses. There might be **different train companies** involved, and information about them needs to be obtainable through a common information source. Passengers generally don't want to have to bother with needing to access different information systems. All information has to be attainable in one system. And not only is it desirable to have information about the services provided by different Railway Undertakings: passengers may wish for easy access to information about travel to the station and travel from the station at the end of the train trip, whichever part of EU territory is involved.. A lot of trips are made **internationally** with starting point in one country and destination in another country. Those systems have to be interconnected, so the passenger can use them for his or her direct planning.

Neither paper nor ticketless solutions, as they are described in the current proposal for the TAP-TSI standard for long distance rail journeys, are applicable in the growing number of regional or local networks where control has been automated using contactless systems. The ability to issue long distance tickets in a format that would be compliant with contactless systems could open up new intermodal solutions for long distance door-to-door internet remote ticket sales. To meet this need, a standard data model for electronic tickets, usable on smart cards or on any other similar mobile electronic devices (e.g. NFC smart phones), should be developed for a long distance ticketing that enables compatibility with local transport fare management systems in future. This standardisation work item should form part of TAP-TSI.

#### 3.3.2 Integrated Journeys

There is always a risk that the connections are missed when passengers have to change trains or make connections between services or modes. There are often rules about the way in which passengers should be treated in such circumstances. However, in general terms this situation should not occur and the planning should aim to **enhance connectivity** and whenever possible **avoid broken connections**.

#### 3.3.3 Capacity Management and Handling Disruptions

Service disruptions can cause significant problems for passengers. The management of such events is the largest driver of passenger dissatisfaction. However disruptions will never totally disappear, and there is a need to handle them well when they arise. Information about disruption to services should be relayed as soon as it is known

Passengers often have an understanding attitude to problems for which the operator does not appear to have had responsibility but passengers also expect that problems to be addressed in the best possible way. This means that staff training is extremely important.

The next question that the traveller is going to ask is: which are the alternative routes that I could use in order to arrive in the destination city as soon as possible after the originally planned arrival time? In case of severely degraded mode or if rail goes down completely e.g. due to harsh (winter) weather the system – on a global level – should be able to compensate for that. This means mobilising capacity in other modes such as air or road. The argument holds

### **3.4 Stations and Infrastructure Gaps**

The ideal end-to-end journey is one which is ‘**seamless**’ for passengers, even if it involves a change of mode or operator. This “seamless” trip can be achieved by giving attention to several **physical conditions in the infrastructure**. Improving the **interconnectivity** between operators and modes serving stations is a major issue for achieving seamless journeys.

#### **3.4.1 Accessibility**

Most of the measures required to meet the need of passengers with reduced mobility also benefit passengers more generally. For example, information should be both written and aural; clear sign-posting speeds the flow of passengers who are in a hurry as well as those with reduced mobility. For many passengers a station will be an unfamiliar environment in an unfamiliar place. Getting on and off trains can be a challenge for almost all passengers, particularly where there are variances between platform height and the carriage floor. Well-planned carriage exits can facilitate speedier embarkation and disembarkation. Information has to be easy to find and easy to understand, which is essential for all travellers. Trains that are not accessible may give the impression of being old-fashioned and out of date.

#### **3.4.2 Orientation systems**

Station layouts need to be clear and easy to understand. The layout of stations, as far as possible, should be logical from a passengers’ perspective: for example, ticket offices for different operators should not be in different parts of the station. Links to the nearest or most frequently used public transport connections need to be made obvious. Good signage provides a safety net but is not always sufficient on its own.

#### **3.4.3 Personal safety and security**

Well lit open spaces and CCTV can make people feel less vulnerable, particularly if staff are also visible. Well-functioning real-time information also promotes confidence in the system as can the presence of reasonable number of other passengers. People engaged in anti-social behaviour need to be removed from the premises as soon as possible.

#### **3.4.4 Transport hub waiting areas and platforms**

Waiting areas are essential, especially in the case of disturbances in the traffic. Shelters need to be sufficiently large to accommodate passengers reasonably comfortably when there are significant delays to services. Responsibility for stations should rest with those who can

look after the needs of all users particularly where a station is served by more than one operator. All users should be treated in a fair way.

### **3.4.5 ERTMS and Capacity**

In order to accommodate more trains on the network it is necessary to complete the ERTMS system on the major European axis i.e. TEN-T network.

## **3.5 Tools and Policy – Integration of Transport Modes Gaps**

The ambitions of the new European transport white paper have to be supported by tools for spatial planning, economic appraisal – from a European perspective - of infrastructure and stations and policies that encourages market uptake of innovations.

### **3.5.1 Policy Changes to Create Economic Incentives for Introduction of Innovations**

Introduction of innovative train concepts with for example attractive passenger features, optimisation of energy cycles and sustainable train-infrastructure interaction should be supported by policy schemes that give incentives for this. An obvious case is track fees that encourage track friendly train running gear.

### **3.5.2 Journey Time Reductions (by higher speeds)**

Competitive door to door journeys on longer distances often mean that the rail part of the travel chain must achieve substantial travel time reductions. This implies investing in ways of making better use of existing infrastructure, constructing new lines, improving local connectivity with the high speed legs of the journey and in reducing the constraints caused by bottlenecks. **Introduction of new high speed services** relate to commercial and governmental priorities as well as EU policies. What's important in making rail journeys more competitive is increasing the reliability of the end-to-end journey and reducing the time that it takes overall. This may imply other measures than construction of new (dedicated or not) lines. Apart from fast day time trains **Interconnection of cities by attractive night services**, with car sleepers, first class only, with shower and toilet, as well as couchettes is another option. In some corridors **night seating fast** trains can be a solution, since that is a low-cost alternative, although good enough for many customers.

The importance of substantial journey time reductions for capturing new markets is demonstrated by the success rail has experienced on connections such as Paris-Lyon, London-Paris or Madrid-Seville. If rail travel times station to station can be reduced to around 3 hours it will beat competition from rivaling modes such as air and cars.



### **3.5.3 High Speed Extensions**

A gradual extension of the high speed net and closing of missing links in order to make it truly European is necessary. The high speed net should be connected to major airports access to and from its nodes should by other transport modes should be easy. The necessary shift from other modes to high speed rail which follows from the greening targets will make capacity utilisation an issue. Optimal capacity utilisation depends on parameters like speed and traffic mix.

### **3.5.4 Interoperability for the Seamless Journey**

The accomplishment of the seamless journey requires a whole range of measures to be taken such as; multifunctional and on international lines multilingual train crews that can service the passengers with information about estimated arrival times, information about connections and catering and (already mentioned) common standards for signage, orientation and ticketing.

### **3.5.5 Greening**

If GHG emissions are to be drastically reduced spatial planning has to be used so that homes, workplaces, schools, sporting facilities can be reached by the use of public transport. The means of transportation themselves should be powered by energy from renewable sources.

### **3.5.6 New Stations and Lines**

Planning and evaluating new cross border lines poses special challenges since they involve member states with sometimes different views on prioritization of investments. Development of tools to better assess benefits of better cross border connections might facilitate the realization of a better functioning European rail network. These tools such as the one regarding stations may also be useful within the individual countries.

New lines sometimes create new stations, perhaps located outside the traditional railway “catchment” areas. To avoid the “airport syndrome” where 80-90 % of passengers reach the airport by car the, localisation, design and connection to other “feeder” modes needs further study.

### 3.6 The Complete Scorecard

General requirement gaps	Milestone 1	Milestone 2	Milestone 3	Sustainable Europe
	2015	2020	2030	
Societal expectations	Freedom to travel sustainably	Quality jobs & working conditions	Reliability of the rail transport sector (increased)	
	Analysis of demographics	Full transparency of multimodal door-to-door travel across EU		
	Accessibility; reliability; user-friendliness	Travel safely & affordable	Mobility for all	
	Trade off between societal, environmental, safety, security, mobility	Rail travel is the most preferred mean of travel for most people		
		Evolution of government modes; Priv vs Public; systems of systems		
		High quality sophisticated sustainable services	Personalised transport	
Managing costs & value for money	High-level model of whole system cost			

Innovative products and services gaps	Milestone 1 2015	Milestone 2 2020	Milestone 3 2030	Service Offerings
General passenger train technology issues	Develop methods for cross technology optimization - aero/vehicle dynamics, energy & virtual homologation	Trains equipped to meet passenger expectations		
	Light weight car body prototype, active suspension and high integrated brake; Ensure TSI's don't inhibit innovations	Trains w. low seat-km cost		
	Interoperable coupling between different producers trains		Non damaging train / track interaction	
Development of regional trains	Technical solutions for fast and comfortable embarkation/disembarkation	Rub out train differences regional, intercity, highspeed)	Multimodal carriages	
	Bicycles, prams and aids for people with reduced mobility on train			
Development of intercity trains	Flexible configuration of first/second class coaches to respond to demand; Through train design to aid mobility for short station platforms			
		Adaptive interiors configuration for different users, family activities, mobile office, group travel; Below floor luggage space; Possibility to travel forward, 1 person coupes		
Development of high speed trains	High speed (optimal) on dedicated lines and higher speed on conventional lines			
	Develop and test knowledge about motion sickness, comfort, track forces & tilting			
New Services	Interconnection of cities by attractive night services; Optimisation of journey time (regional & intercity); User-oriented operation, eg. shuttles, express services (regional & intercity); Make service more attractive with added value products (eg intern	New high speed services; Intelligent transport schemes; Develop high(er) speed train concepts that can service shorter distance high speed service offer (acceleration, weight)	Integrated personalised solutions considering passenger needs; Information systems development	
		You by the travel, the operator handles the connections and transport, like shuttle bus between hotel & flight in a charter trip		
Air and rail complementary or competing	Ticketing and luggage services to facilitate modality	Seamless security checks done once; Development of concept of the "trusted traveller"		
		Minimal easy travel schemes easy to perform for all; 2020: Dynamic re-routing of passengers to ensure journey completion		

Information and journey planning gaps	Milestone 1	Milestone 2	Milestone 3	Service Quality
	2015	2020	2030	
Integrated information systems; Intelligent & seamless information technology system for transport modes across Europe	Integrated information systems (handling the whole journey across modes and different mobility providers)	Interconnected information systems irrespective of mode or territory;		
TAP-TSI to develop standards for electronic information, booking and payment; (smart ticketing)	Standard data model for electronic tickets	Ticketless journeys (EU level) compatible with local transport fare management systems ; Standardisation of ticketing procedure and ticket information		
	Interavailability and through ticketing across modes - possibility to buy a pair of tickets between any pair irrespective of operator			
Integrated journeys	Avoiding broken connections	Consumer trip planning tool, cross modes, optimised travel from various perspectives		
Capacity management and handling disruption		Optimization tools widely used; Resilience augmented through centralised "crisis" management; automated train operation	Train Eurocontrol	
		Global resilience in transport system in case of disruption - mobilise capacity in one or two modes to compensate for difficulties in another one	ATOoperation + driverless	

Stations and infrastructure gaps	Milestone 1	Milestone 2	Milestone 3	Value for Money door to door
	2015	2020	2030	
Spatial context	Understanding the potential strengths and weaknesses of rail in facilitating sustainable spatial planning	Improving the spatial appeal to passengers of the urban environments in which transport hubs are located	Using rail co-modally in urban spatial planning to make best use of environmental resources and minimise land take	
Accessibility	Written and aural information and clear sign posting	Speedier embarkation and disembarkation of trains		
Orientation systems	Logical station layouts. Good signage. Locational maps and information on onward local ground transportation options	Common Europe wide standards for signage and orientation		
Personal safety and security	Well lit open spaces. Visible staff.	CCTV surveillance	More durable, attractive, vandal resistant and affordable construction materials in public areas	
Transport hub waiting areas and platforms	All users treated in a fair way	Comfortable waiting areas. Research, understand and, where feasible, accommodate passengers' varying priorities at different hubs		
ERTMS and Capacity	ERTMS fully implemented on major axis (TEN-T)			
			Using GPS instead of ground based system (Galileo)	

Tools and policy - Integration of transport modes gaps	Milestone 1 2015	Milestone 2 2020	Milestone 3 2030	Competitiveness Trends&Policy
Policy changes to create economic incentives for introduction of innovations	Premium for energy and environmental performance			
Journey time reductions (by higher speeds)	Look at traveltime for optimization	High speed rail to be complemented by efficient local connections across modes		
High Speed Extensions	Closing High Speed Gaps			
	Define optimal speed network capacity usage for different operating mix scenarios, domestic/international			
Interoperability for the seamless journey	Multifunctional on board staff for better serving customers needs; Integration of urban & rail network			
Greening	Land use and spatial planning that plans around sustainable efficiencies of public transport; 60-80% of energy used to operate train is from renewable sources; develop common methods for cost benefit analysis of cross border business			
New stations and lines	Tools to appraise localization, design and connection to other feeder modes	all core network airports to the rail network	Rail has substituted 80% of EU traffic < 1000 km, airports serve international traffic (long haul)	
	Tools to assess cross border investments and impact on regional economics		Good mass transit between stations and city centres 24h service	
	Consistent and resilient integrated transport mode network with co-modal traffic nodes (TEN-T focus)			
Accountability	Passenger rights			

### 3.7 Prioritisation

Chapter 3 is a collection of issues that are discussed in the networks of those experts who participated in the roadmap workshops of 3 March 2010 and 6 April 2011. In spring 2010 additional questionnaires was circulated too and answered by a select number of people representing users, industry and academia. These responses do not claim to be scientifically underpinned but should rather be seen as a tentative way of validating the opinions that came out from the workshop. The respondents were asked to rank 8 questions by importance on an ascending scale 1 to 5. The respondents point out

- importance of better value for money
- better knowing customer needs (Reliable service performance to satisfy identified customer needs)
- simpler and easier ticketing using electronic devices
- better passenger information especially in managing disruptions
- timetabling that better caters to demand (frequency, less changes between different trains and waiting times between trains at stations)
- more affordable rolling stock
- travel time reductions
- closing high speed gaps

The respondents represent operators, passenger organisations and academia from Denmark, Germany, Finland, France, Poland, Spain, UK and Sweden. The interpretation of the results must be handled with care. However, the people involved in the roadmapping are experts in their fields and the roadmap to a large extent reflects discussions and priorities that these experts have in their respective networks. Therefore and with confidence the three single most important steps to be taken by the rail business in the near future to better serve customer needs are Passenger information systems, Reliable service performance to satisfy identified customer needs and customer friendly ticketing and time tabling.

From a general European perspective the roadmap makes the case that correct information regarding service offerings including prices and orientation in stations, platforms and on board trains including information that allows travellers to manage disruptions are one of the three most important problems to address. Knowing customers needs is important for putting together a product that cater to the individual passengers or segments. This includes things like prices, comfort factors at stations and on trains, time table scheduling, journey times and easy and simple ticketing systems which we ranked together with timetabling at number three.

One can argue that all of the above are constituent parts of what gives the rail customer value for money.

The other items; cheaper rolling stock, travel time reductions and closing high speed gaps had lower average ratings and somewhat wider spread around the mean which reflect less consensus among the respondents. One should nevertheless keep in mind that in some relations shorter journey times is an issue which makes rail attractive compared to other modes. Cheaper rolling stock should be an issue for operators since the capital investment of rolling stock is a major profitability factor. Lower capital costs means money for business development, lower ticket prices and creates margins for faster fleet renewal. Likewise is closing of high speed gaps an issue that may be of major importance for some countries but less so for other countries which already have an extensive high speed networks.



#### **4. The Vision**

If long distance passenger services are to increase their competitive advantage over other modes they must deliver increased customer satisfaction: they must be attractive, efficient and affordable. This is the way to attract more passengers. It must be made easy to plan a trip and to reserve, pay for, collect and use tickets, not just for the rail portion but for the end-to-end journey.

Information must be extensive in terms of regions, companies, additional facilities, as well as countries. Connecting trams and buses have to be included as well as information on car parking facilities, etc...

National ticket systems must include all companies. International tickets must be sold in many channels and according to an upgraded TCV, giving access to multi-multi relations between countries.

Persons not needing to reserve seats must be able to use a compatible ticket that can be used in all regional and local system, either with a credit function or with a stored value function – or both in the same card.

Disruptions to planned services must be handled in an imaginative way, taking account of the situation from the perspective of the passenger. This requires that special attention should be given to the training of staff in handling such events

The introduction of high speeds services should be accelerated. This means investing in ways of making better use of existing infrastructure and in reducing the constraints caused by bottlenecks for some shift from heavy road investments to high speed rail will take place. Spending on roads should concentrate on maintenance in order to keep roads in an acceptable condition.







Car-sharing is likely to play a larger part in supporting the needs of long-distance rail travellers, particular for those who are lighter users of private transport. The use of an always clean and ready filled car can be combined with attractive trains and public transport. And train trips will differ in price and quality thanks to the increased competition. The same thing will happen in the regional public transport, where high quality systems, charging premium prices will attract new users to use public transport. Taxi use will increase, due to smarter use of means of transport. Many big stations that previously did not have enough bike parking facilities have turned to bike parking. This can make commercial sense since ten bikes can use the area of one car while car-sharing allows more effective use of car parking space .since those cars normally are used much more intensely.

## 5. The Passenger Roadmap

The arrows in the roadmap shows the need for research and development, demonstrations, changes in regulatory framework necessary for market introduction of the items that are listed in the roadmap. The research implications have been analyzed by EURNEX. Only blue and or green arrows indicate that there is no need for additional EU funded research in order to achieve market introduction. The research implications have been analyzed by EURNEX. Only blue and or green arrows indicate that there is no need for additional EU funded research in order to achieve market introduction. EURNEX has also made a commented prioritization of items which they think are important to address with research and where they have particular research capacities. The EURNEX prioritization is indicative and meant to serve as a basis for further discussions.




  
 Research&Development, Demonstration, Regulatory Framework, Market introduction

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030			
General Requirements	Societal Expectations	Freedom to travel sustainably			X						Sustainable Europe	
		Analysis of demographics										
		Accessibility, Reliability, User friendliness			X							
		Trade off between societal, environmental, safety, security, mobility			X							
		Quality jobs & working conditions						X				
		Full transparency of multimodal door-to-door travel across EU						X				
		Travel safely&affordable						X				
		Rail travel is the most preferred mean of travel for most people						X				
		High quality sophisticated sustainable services						X				
		Reliability of the rail transport sector increased										X
		Mobility for all										X
	Personalised transport											X
Managing costs & value for money	High-level model of whole system cost			X								

*Accessibility, Reliability, User friendliness*

- *Accessibility in time (frequency of services) and in space (stations location, equipment and intermodal services)*
- *Robustness of services against external perturbations (hard weather, strikes, relevant social events, etc.)*
- *Continuity of services to be ideally approached in any moment, without reservation, without timetable knowledge, without physical barriers, without security controls*

*Trade-off between societal, environmental, safety, security, mobility*

- *Trade-off investigations as public decision support tools*
- *Societal relevance of safety and environmental impacts (e.g. external costs quantification)*
- *Societal relevance of security measures against mobility and personal rights (e.g. bad practices from aviation to be avoided)*

*High-level model of whole system cost*

- *Life cycle costs analysis for the whole system (infrastructure, vehicles, etc.) from the collective viewpoint*
- *Life cycle analysis for single viewpoints: users (generalised costs, including time, comfort, etc.), RU (mainly operational costs and vehicles costs), IM (mainly maintenance and renewal costs)*

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030	
<b>Innovative products and services</b>	General passenger train technology issues	Develop methods for cross technology optimization - aero/vehicle dynamics & energy, virtual homologation	[Yellow arrow]			[Green arrow]		[Blue arrow]		
		Light weight car body prototype, active suspension and high integrated brake	[Yellow arrow]			[Pink arrow]		[Blue arrow]		
		Interoperable coupling between different producers trains		[Blue arrow]						
		Trains equipped to meet passenger expectations	[Yellow arrow]					[Blue arrow]		
		Trains with low seak-km cost	[Yellow arrow]				[Pink arrow]		[Blue arrow]	
		Non damaging train/track interaction	[Yellow arrow]						[Blue arrow]	
										<b>Service offerings</b>

Cheaper Rolling Stock - system optimization

**Non damaging train/track interaction**

- Non aggressive interaction based on high level on-condition maintenance fed by bilateral (rail-wheel) monitoring
- Assessment of light vehicles and components (e.g. wheels, suspensions) role
- Assessment of innovative materials (e.g. for carriages, wheels, rails) role, taking into account safety requirements (e.g. crash resistance)

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030	Service offerings	
Innovative products and services	Development of regional trains	Technical solutions for fast and comfortable embarkation/disembarkation	Yellow arrow (2012-2013)	Pink arrow (2013-2015)	Blue arrow (2015-2017)						
		Bicycles, prams and aids for people with reduced mobility on train	Pink arrow (2012-2015)	Green arrow (2013-2015)	Blue arrow (2015-2017)						
		Rub out train differences between regional and intercity/high speed trains				Blue arrow (2017-2020)					
		Multimodal carriages						Blue arrow (2020-2030)			
	Development of intercity trains	Flexible configuration of first/second class coaches to respond to demand; Through train design to aid mobility for short platform stations					Pink arrow (2012-2017)	Blue arrow (2017-2020)			
		Adaptive interiors configuration for different users, family activities, mobile office, group travel; below floor luggage space; Possibility to travel forward, 1 person coupes	Yellow arrow (2012-2015)	Pink arrow (2012-2015)	Blue arrow (2015-2017)						
	Development of high speed trains	High speed (optimal) on dedicated lines and higher speed on conventional lines	Yellow arrow (2012-2013)	Pink arrow (2013-2015)	Blue arrow (2015-2017)						
		Develop and test knowledge about motion sickness, comfort, track forces, tilting	Yellow arrow (2012-2013)	Pink arrow (2013-2015)	Blue arrow (2015-2017)						

*Technical solutions for fast and comfortable embarkation/disembarkation*

- *Assessment of vehicle internal lay-out role*
- *Assessment of platform design role*
- *Assessment of passengers behaviours role and systems to facilitate virtuous behaviours (e.g. distribution along the platforms)*




















*High speed (optimal) on dedicated lines and higher speed on conventional lines*

- *Ideal design requirements for trains to circulate on dedicated high speed lines: quantitative approach and industrial costs analysis for construction and operation*
- *Ideal design requirements for trains to maximise their speed on conventional lines: quantitative approach and industrial costs analysis for construction and operation*

*Develop and test knowledge about motion sickness, comfort, track forces, tilting*

- *Extended experimental campaigns on motion sickness and comfort perceived by passengers against track forces and possible tilting operation*

- *Development of simulation methodologies and tools to quantify expected passenger perceptions in virtual environment to be used as support to vehicles and track design and operation planning*

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030			
<b>Innovative products and services</b>	<b>New Services</b>	Interconnection of cities by attractive night services; Optimisation of journey time (regional&intercity); User-oriented operation e.g. shuttles, express services (regional&intercity); Make service more attractive with added value products (e.g. internet)									<b>Service offerings</b>	
												
		New high speed services; Intelligent transport schemes; Develop high(er) speed train concepts that can service shorter distance high service offer (acceleration, weight)										
		You buy the travel, the operator handles the connections and transport, like shuttle bus between hotel & flight in a charter trip										
	Integrated personalised solutions considering passenger needs; Information systems development											
	<b>Air and rail complementary or competing</b>	Ticketing and luggage services to facilitate co-modality (security aspects important)										
		Seamless security checks done once										
Minimal easy travel schemes easy to perform for all												

**Interconnection of cities by attractive night services**

- *Market investigation in view of hotel style sleeping and dining comfort perception, looking for taking the whole demand within a 1000 km range*
- *Recommendations for limitation of noise and vibrations (vehicles design and soft driving style)*
- *Telematics application for high-comfort (e.g. Internet), user friendly check-in, on-board security and low cost operation (e.g. mostly unmanned operation)*
- *External cost saving in comparison with plane competitors and possible policy actions to be applied in favour of these services (e.g. by EU carbon tax extension)*

**Seamless security checks done once**

- *Technical and economic feasibility to host aviation check in and security controls in railway environment (e.g. on-board the trains and in the stations) towards rail services dedicated to increase airport accessibility for very long distance (over 1000 km)*

- *Technical and economic feasibility to host railway reservations and information systems in aviation environment (e.g. on-board the planes and in the airports) towards a fruitful win-win integration instead un-effective (from the collective viewpoint) competition*

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030	Service Quality	
Information and Journey planning	Integrated information systems	Integrated information systems (handling the whole journey across modes and different mobility providers)		→				→			
		Interconnected information systems irrespective of mode or territory		→			→				
		Interavailability and through ticketing across modes - possibility to buy a pair of tickets between any pair irrespective of operator		→							→
	TAP-TSI to develop a standard forelectronic information, booking and payment; (smart ticketing)	Standard data model for electronic tickets		→		→	→				
		Ticketless journeys (EU level) compatible with local transport fare management systems; Standardisation of ticketing procedure and ticket information				→		→			

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030	Service Quality	
Information and journey planning	Integrated journeys	Avoiding broken connections		Yellow arrow							
		Consumer trip planning tool, cross modes, optimised travel from various perspectives		Yellow arrow	Pink arrow		Blue arrow				
	Capacity management and handling disruptions	Optimization tools widely used; Resilience augmented through centralised "crisis" management; automated train operation		Yellow arrow		Blue arrow					
		Train Eurocontrol		Yellow arrow		Pink arrow		Green arrow	Blue arrow		
		Global resilience in transport system in case of disruption - mobilise capacity in one or two modes to compensate for difficulties in another one		Yellow arrow				Blue arrow			
		ATO operation and driverless trains		Yellow arrow		Pink arrow		Green arrow	Blue arrow		

*Avoiding broken connections*

- *Timetable optimization from users viewpoint*
- *Harmonised and flexible dispatching*
- *Possible integration of different services and RU*

*Consumer trip planning tool, cross modes, optimised travel from various perspectives*

- *Requirements for design and implementation of free use trip planning tools managing services provided by different operators in different surface transport systems*
- *Analysis of general and continuous accessibility to this services in time and spaces (e.g. Internet, mobile phones, public access points)*

*Optimization tools widely used; Resilience augmented through centralised "crisis" management*

- *International dispatching optimization (e.g. systematic exchange of information flows and cross-border centralised management of disruptions potentially investing international services)*
- *Dispatching optimization to increase capacity (e.g. centralised decisions also for local measures as traffic slow down)*
- *Dispatching criteria to manage big disruptions in view to reduce consequences for passengers (e.g. virtual planning of unplanned events by simulation)*

*Global resilience in transport system in case of disruption - mobilise capacity in one or two modes to compensate for difficulties in another one*

- *Protocols and procedures for flexible mobilisation of resources (e.g. trains , locomotives, integrating road/maritime services) by different RU (integration against competition in crisis situations) in order to minimise the negative effects of operators pulverisation*

*ATO and driverless trains*



- *Identification of specific short term application fields and technical/economic convenience for ATO in closed railway systems (e.g. single metro lines)*
- *Identification of potential long term application fields for ATO in open network railway systems (e.g. mixed manned/unmanned operation on conventional lines)*

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030	Value for Money door to door	
Stations and infrastructure	Spatial context	Understanding the potential strengths and weaknesses of rail in facilitating sustainable spatial planning									
		Improving the spatial appeal to passengers of the urban environments in which transport hubs are located									
		Using rail co-modally in urban spatial planning to make best use of environmental resources and minimise land take									
	Accessibility	Written and aural information and clear sign posting									
		Speedier embarkation and disembarkation of trains - infrastructure measures									
	Orientation systems	Logical station layouts. Good signage. Locational maps and information on onward local ground transportation options									
		Common Europe wide standards for signage and orientation									
	Personal safety and security	Well lit open spaces. Visible staff									
		CCT surveillance									
		More durable, attractive, vandal resistant and affordable construction materials in public areas									
	Transport hub waiting areas and platforms	All users treated in a fair way									
		Comfortable waiting areas. Research, understand and, where feasible, accommodate passengers' varying priorities at different hubs									
	ERTMS and Capacity	ERTMS fully implemented on major axis (TEN-T)									
		Using GPS instead of ground based system (GALILEO)									











**Understanding the potential strengths and weaknesses of rail in facilitating sustainable spatial planning**

- Historical role of railways in urban and rural spatial planning: learning from the past
- Land use planning requirements to increase bilateral virtuous influence of sustainable spatial planning and railway development in an integrated natural and human environment

Speeder embarkation and disembarkation of trains – infrastructure measures See page 30.

Comfortable waiting areas. Research, understand and, where feasible, accommodate passengers' varying priorities at different hubs

- Extended user needs investigation for a wide set of services and stations
- Setup of user oriented guidelines for railway terminals design (e.g. services spatial distribution)
- Setup of user oriented guidelines for railway terminal operation (e.g. service temporal availability)

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030	Competitiveness, Trends & Policy	
Tools and policy	Policy changes to create incentives for market introduction of innovations	Premium for energy and environmental performance									
	Journey time reductions (by higher speeds)	Look at travel time for optimization			X						
		High speed rail to be complemented by efficient local connections across modes						X			
	High speed extensions	Closing high speed gaps									
		Define optimal speed network capacity usage for different operating mix scenarios, domestic/international			X						
	Interoperability for the seamless journey	Multifunctional train staff for better serving customer needs; Integration of urban & rail network									
		Common standards for signage, ticketing and orientation									

Journey time reductions (by higher speeds)

- Intercity evaluation methods for market share assessment against competitor modes (e.g. planes)
- Investigation on technical and economic limits of intercity travel time reduction by actions on high speed lines in a long term perspective
- Investigation on technical and economic limits of intercity travel time reduction by integrated actions on different railway services and transport modes

High speed extensions

- Methodological study towards a multi-goal decision common support tool to be applied at European and National level to identify the most effective extensions and prioritisation for the high speed network
- Identification of extensions and prioritisation plans for specific European corridors (case studies to be agreed with the Commission responsible offices)

GAP	AREA	ITEM	2012	2013	2015	2017	2020	2025	2030	Competitiveness, Trends & Policy
Tools and policy	Greening	Land use and spatial planning that plans around sustainable efficiencies of public transport, 60-80 % of energy used to operate train is from renewable sources; develop common methods for cost benefit analysis of cross border business			X					
	New stations and lines	Tools to appraise localization, design and connection to other feeder modes			X					
		All core network airports connected to the rail network								
		Rail has substituted 80% of EU traffic < 1000 km, airports serve international traffic (long haul)								
		Tools to assess cross border investments and impact on regional economics			X					
		Good mass transit between stations and city centres 24 h service								
		Consistent and resilient integrated transport mode network with co-modal traffic nodes (TEN-T focus)								
	Accountability	Passenger rights								

### Greening

- Public transport planning instruments in a sustainable development framework (e.g. based on generation of energy from renewable sources)
- Development of common methods for extended cost-benefit analysis including external costs evaluation for cross border policy and actions selections in favour of sustainable mobility

## References

EC COM(200) 279 final COMMUNICATION FROM THE COMMISSION A sustainable future for transport: Towards an integrated, technology-led and user friendly system.

Policy effectiveness of Rail. EXTR@Web Publication 2006.

EC The quality of rail freight services COM(2008) 536 final

EC Proposal for a Regulation... concerning a European rail network for competitive freight COM(2008) 852 final.

**Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road etc.**

**Regulation (EC) No 1371/2007 of the European Parliament and of the Council of 23 October 2007 on rail passengers' rights and obligations**

EC Second (RMMS) report on monitoring development in the rail market COM(2009)676 final and SEC (2009) 1687

CER Report: European Transport Policy Progress and Prospects. Oct 2009

### ***Selection of relevant long distance (rail) projects***

#### **Selection of relevant long distance (rail) projects**

The EC TRKC, Transport Research Knowledge Centre, has recently (Jan 2010) published a Thematic Research Summary for Passenger Transport<sup>13</sup>. This document points out that the enlargement of the EU has opened up further opportunities for inter-urban passenger travel by rail, road or airplane, which has been and continues to be strengthened by improvements to the infrastructure (such as extensions of the high-speed rail links or raising of airport capacity), by more competition and greater co-ordination (such as the 'single sky' policy).

Many of the projects summarised for TRKC concern Urban Mobility, however. The umbrella project for urban mobility is CIVITAS<sup>14</sup> which has been running during FP 5, 6 and 7. On the border line between geographic perspectives and modes worked CROSSRAIL aimed at Integrating Local and Regional Rail Including Cross Border Aspects. More dealing with long distance transport is CONNECT<sup>15</sup> focusing on ITS and intermodal improvements.

Projects focusing on long distance (rail) transport are rare but some examples from LINKs Virtual Library [http://www.linkforum.eu/vl\\_search.phtml](http://www.linkforum.eu/vl_search.phtml) are presented below;  
The Economic Effects of High Speed Rail Investment by de Rus, Ginés  
[http://www.linkforum.eu/vl\\_content.phtml?id=399](http://www.linkforum.eu/vl_content.phtml?id=399)

---

<sup>13</sup> <http://www.transport-research.info/web/publications/thematic.cfm>

<sup>14</sup> <http://www.civitas-initiative.org/main.phtml?lan=en>

<sup>15</sup> <http://www.connect-project.org/index.php?id=9>

Classifying railway stations for sustainable transitions - balancing node and place functions by Reusser, Dominik E (et al)

[http://www.linkforum.eu/vl\\_content.phtml?id=366](http://www.linkforum.eu/vl_content.phtml?id=366)

The value of integrated multimodal traveller information and its potential contribution to modal change by Kenyon, S and Lyons, G; Southampton Univ, UK

[http://www.linkforum.eu/vl\\_content.phtml?id=291](http://www.linkforum.eu/vl_content.phtml?id=291)

Econometric modelling of competition between train ticket types by Toner, JP and Wardham, M, ITS, Leeds Univ, UK

[http://www.linkforum.eu/vl\\_content.phtml?id=286](http://www.linkforum.eu/vl_content.phtml?id=286)

Contrasting theory and practice of passenger Intermodality: about high-speed train (HST) stations and the implementation level of integrated transport attributes by Burkhardt, Kerstin, Institut d'Estudis Territorials, Barcelona

[http://www.linkforum.eu/vl\\_content.phtml?id=521](http://www.linkforum.eu/vl_content.phtml?id=521)

Air-rail integration has attracted a lot of attention in later years with several projects and articles in scientific journals, for instance;

Airline and railway integration, Transport Policy, Volume 13, Issue 5.

[http://www.linkforum.eu/vl\\_content.phtml?id=153](http://www.linkforum.eu/vl_content.phtml?id=153)

Air and Rail Competition and Complementarity. Final Report by SDG

[http://www.linkforum.eu/vl\\_content.phtml?id=249](http://www.linkforum.eu/vl_content.phtml?id=249)

Air rail intermodality from airlines perspective, Transport Studies Unit, Oxford University

[http://www.linkforum.eu/vl\\_content.phtml?id=371](http://www.linkforum.eu/vl_content.phtml?id=371)

Among other related rail projects listed in TRKC these can be mentioned

FLEXIBLE REISEZUGWAGEN Flexibly Usable Rail Cars for Efficient and Attractive Long-Distance Passenger Rail Traffic

FUTURAIL Job opportunities for the railway community of tomorrow

SAFEINTERIORS Train Interior Passive Safety for Europe

# Questionnaire

## ERRAC Passenger questionnaire outline

Background to the questionnaire;

Improving the performance and competitiveness of the European rail sector is one of the objectives of European transport policy. European rail research in the framework of ERRAC (European Rail Research Advisory Council) and EU FP7 must therefore support the development of the rail sector in the context of European transport and railway policy.

In the course of ERRACs work, for instance the workshop held in Brussels 3 March 2010, a number of areas have been identified as areas where further research should lead to an improved European rail sector. We, the small team described above, have been assigned to validate how these areas are perceived by stakeholders in the European rail sector. The EC has pointed out that we can't have everything – we must prioritise. Therefore we would be very grateful to find out what you think is most important on a 1 – 5 scale; 1 no importance --- 5 decisive factor. Think "what will make people choose rail?"

Below is a range of areas A – H which we would like you rank on the 1- 5 scale. You may add brief motivations for your ranking. You may add one or a few other areas but *only with a good motivation!*

The Draft Passenger Roadmap (February 2010) is attached as a more general background to the Roadmap work.

We would appreciate your response by 13 April 2010.

		Ranking 1- 5
A	Value for money	
B	Identification of customers' needs and expectations	
C	Ticketing – easy to understand incl intermodal applications	
D	Information to passengers - including management of disruptions	
E	Timetabling incl capacity enhancements and improved reliability	
F	Attractive and cheaper rolling stock	
G	Journey time reductions	
H	Closing gaps in the high speed network	
I	Any other item	