European Commission

Review of the Common Transport Policy

Task 1.10 Intelligent Transport Systems and other transport-related research outcomes – Final Report

August 2009

Prepared for:

European Commission
Directorate-General Energy and Transport
DM 28 - 0/110
Avenue du Bourget, 1
B-1049 Brussels (Evere)
Belgium

Prepared by:

Steer Davies Gleave
Via Ugo Bassi 7,
40121 - Bologna
Italy

+39 051 6569381
www.steerdaviesgleave.com

Contents

FIGURES

TABLES

1 Intelligent Transport Systems and other transport-related research outcomes

Executive summary

1.1 Intelligent Transport Systems is the application of Information and Communication Technologies (ICT) to transport. ITS applications in transport is able to foster the effective use of the existing transport infrastructure, contributing in this way to reduced congestion and energy consumption and to support greener mobility. Moreover ITS can increase traffic safety, decrease accident rates and help combat car theft.

1.2 Since the 2001 White Paper, the EU has increased the promotion of Intelligent Transport Systems (ITS) and, in general, technology improvements in the transport systems. Annex IV of the 2001 White Paper specified objectives in this area, which was also the subject of a section of the Mid-Term Review.

1.3 Whilst the Galileo programme covers different modes of transport, other modes have specific telematic applications: ERTMS for rail; SESAR programme for air; SeaSafeNet system (as well as the LRIT and the AIS systems) for sea transport; and, the RIS system for inland waterways.

1.4 In road transport, until 2008, when the ITS Action Plan was adopted, there was no common EU approach to the deployment of ITS solutions to the sector. Even now, in road transport there is no single IT system but a set of different applications most of them aimed at enhancing higher safety standard in road transport ("Intelligent vehicle Initiative" and "eSafety" initiative).

1.5 For the road and inland waterways sectors, ITS solutions are in a research and development phase. At least, in the road sector, several projects were funded under the 5th and the 6th Framework Programmes (ICT and Transport, the road to safer, smarter driving, 2008) and other will be funded under the new, 7th, Framework Programme. In other sectors, such as maritime, rail and air transport, ITS solutions are approaching a deployment phase, even though further actions are needed to ensure effective implementation.

1.6 For the rail sector In particular, the quantitative analysis has revealed that while the adoption of the GSM-R component of the ERTMS system is well established in Europe and by the end of 2010, 60% of the foreseen network will be ready for operation, the adoption of the ETCS component is still slow. However in December 2008, co-funding by the EU of 17 different ERTMS projects was agreed.

1.7 In the sea sector, there are still some countries are not participating at any level in the SSN project.

1.8 Regarding the Galileo programme, this was launched and with the setting up, in 2002, of the Galileo Joint Undertaking (GJU), it entered into the development and validation phases. In particular, under the 5th and the 6th Framework Programme, different projects have been funded, mostly aimed at developing the ground infrastructure of the Galileo programme.

1.9 To conclude, while the principal lessons learnt in this policy area concern the importance of European coordination in this field as well as the promotion of international cooperation between the EU and other countries, the key challenges for the full deployment of ITS systems in the future are progress and take-up for their worldwide interoperability and harmonisation.

Introduction

1.10 Intelligent Transport Systems (ITS) are not ends in themselves, but a means to improve the efficiency, safety and environmental sustainability of the transport system.

1.11 The following sections will mainly provide a description of the actions taken by the EU in this field. By definition, the development of these systems are complex and long term projects. It is therefore not possible, at this stage, to judge whether the measures have been successful. Nevertheless, the conclusions will discuss a brief evaluation of the contribution given by the ITS to achieve the CTP objectives and of possible future developments.

1.12 The development of Intelligent Transport Systems (ITS) requires the application of Information and Communication Technologies (ICT) to transport, not only to the single transport modes, but also to the integration between modes.

1.13 In general terms the use of IT systems in transport has the advantage of fostering the effective use of the existing transport infrastructure, contributing in this way to reduce congestion and energy consumption and to support greener mobility. Moreover ITS can improve traffic safety, decrease accident rates and help combat car thefts.

1.14 In passenger transport, IT systems provide vital information to passengers and promote the development of public transport in towns and in their surroundings. In freight traffic, ITS support the management of supply chains ("intelligent logistics chains") by providing paperless information on the condition and on-time position of freight. Moreover ITS has an important role in achieving the goal of creating "green transport corridors" for freight, since it will help the integration (e.g. technical interoperability) of the different transport modes.

1.15 The need to support geographical continuity, standardisation and interoperability of services and systems, requires the direct intervention of the European Union that can coordinate the application of ITS and lead to cost reductions through standardisation.

Sources

1.16 To conduct the analysis in this policy area, the following sources were used:

- European transport policy for 2010: time to decide, White Paper [COM(2001)370]
- Keep Europe Moving - Sustainable mobility for our continent, 2006 White Paper Mid Term Review [COM(2006)314];
- Deployment of the European rail signalling system ERTMS/ETCS, [COM(2005) 298];

- Directorate-General Energy and Transport (2006), ERTMS - Delivering flexible and reliable rail traffic. A major industrial project for Europe;
- Signal (2009), The News Letter of ERTMS, n° 10 February 2009;
- SESAR Consortium (2008) SESAR Master Plan, Deliverable D5, SESAR Definition Phase Project co-funded by the European Commission and EUROCONTROL.
- DGTREN (2008), SESAR – Modernising Air Traffic Management in Europe;
- SDG (2005), SESAME CBA AND GOVERNANCE - Assessment of options, benefits and associated costs of the SESAME Programme for the definition of the future air traffic management system, Final Report;
- EMSA, (2009), SafeSeaNet Monthly Report, January 2009;
- First progress report on the implementation of the NAIADES Action Programme for the promotion of inland waterway transport [COM (2007), 770];
- Action Plan for the Deployment of Intelligent Transport Systems in Europe, [COM(2008) 886 final];
- Commission Communication of 15 September 2003, Information and Communications Technologies for Safe and Intelligent Vehicles, [COM(2003) 542 final];
- Commission Communication of 15 February 2006 on the Intelligent Car Initiative - "Raising Awareness of ICT for smarter, safer and cleaner vehicles" [COM(2006) 59 final];
- Commission Communication of 17 September 2007, Towards Europe-wide Safer, Cleaner and Efficient Mobility: The First Intelligent Car Report [COM(2007) 541 final];
- ICT for Clean & Efficient Mobility - Final Report, 2008, Working Group ICT for Clean and Efficient Mobility;
- Strategic Research Agenda. ICT for Mobility – update 2007-2008; 2008; eSafety Forum Working Group RTD, Ljubljana, 25/04/2008;
- ICT and Transport, the road to safer, smarter driving (2008); ICT Research - The policy perspective, ICT Results Editorial Service;
- Green Paper, Towards a new culture for urban mobility; COM(2007) 551 final;
- Freight Transport Logistics Action Plan, [COM(2007) 607];
- GALILEO - The European Programme for Global Navigation Services - 2nd edition 2005.

Structure for the remainder of the analysis

1.17 The rest of this section has been structured as follow:

- Summary of the policy;
- Legislative framework;
- Qualitative analysis;

- Quantitative analysis;
- Conclusions.

Summary of the policy

1.18 Since the 2001 White Paper, the EU has increased its role in actions aimed at promoting Intelligent Transport Systems (ITS) and, in general, technology improvements in the transport systems. Annex IV of the 2001 White Paper specified objectives in this area; the matter was also the subject of an entire section of the Mid-Term Review (section 7).

1.19 The different measures that the EU has set within the Common Transport Policy (CTP) to foster technology improvements in the transport systems can be grouped as follows:

- promotion of ITS in rail transport;
- promotion of ITS in air transport;
- promotion of ITS in sea transport;
- promotion of ITS in inland waterways transport;
- promotion of ITS in road transport in different priority areas, as identified by the Action Plan, as well as the promotion of specific initiatives such as the "Intelligent car" initiative and the eSafety project;
- application of ICT systems in specific areas such as (urban) freight transport and urban passenger transport;
- development and deployment of the European satellite radio-navigation system Galileo.

1.20 Most of these measures are connected to other tasks of this project, in particular the ERTMS system and the application of ICT to urban transport. The remainder of this section includes a brief description of each measure and the current situation on their state of implementation.

ITS and rail transport

1.21 European Rail Traffic Management Systems (ERTMS) aims to standardise the different rail signalling and speed control systems existing in different countries in Europe with the final goal of reducing barriers to entry into the market and of movement between Member States. This system is made up of two components: the the Global System for Mobile Communications – Railway (GSM-R) component, which is the radio systems allowing the exchange of information between the track and the train, and the European Train Control Systems (ETCS) component, which improves and standardises signalling. Installation is still ongoing on a number of networks across Europe of both the GSM-R and the ETCS component.

1.22 Commission Communication 298/2005 has pointed out that with an investment of €5 billion over the 2007-2013 period, critical mass will be reached in equipment installation which will, in turn, trigger a "snowball effect" leading to full application of ETCS. To ensure this, the EU will contribute 50% of the total eligible cost of these projects. Moreover, in order to encourage the Member States to submit

projects relating to the deployment of ETCS, in particular in relation to existing lines and rolling stock, the Commission intends to earmark a major part of the Trans-European network funds specifically for this purpose.

ITS and air transport

1.23 The Single European Sky ATM Research (SESAR) programme[1], aims to create a new generation of Air Traffic Management systems by standardising and modernising those currently used with scope to share information between different operators; increase punctuality and reduce flight times; achieve improved efficiency for the air sector; and, improve safety standards and lessen the environmental impact of air traffic. The SESAR programme has reached the end of its first phase, the "definition phase" (2004-2007). The next phase of the SESAR programme, the "development phase", covering the period 2008-2013, will aim to develop equipment, systems and standards as set in the definition phase.

1.24 Finally the "deployment phase", covering the period 2014-2020, will seek to build the new infrastructure at a wide scale both in Europe and in partner countries (such as the United States).

ITS and sea transport

1.25 The need to deal with the high vessel and tanker traffic figures[2] characterising the seas surrounding the European Union as well as the need to enhance safety and efficiency standards of maritime transport have fostered the development and the adoption (Directive 2002/59/EC) of Vessel Traffic Monitoring and Information systems. SeaSafeNet (Safe Sea Network) is one example of such systems. In particular, it allows data exchange between data providers and data requesters through the use of XML Messaging System (which is the core of SeaSafeNet). The system is accessible to the National administrations designated by the Member States to be responsible for the management of the system at national level and to the Local Administration (Port authorities, Coastal Stations, Vessel Traffic Service, etc.) designated by the National ones to be responsible to receive and send information.

1.26 Another important achievement in the diffusion of Traffic Monitoring Systems in maritime transport has been the decision of the European Council in 2007 to set-up an EU Long Range Identification and Tracking Data Centre to be managed by the Commission, in cooperation with Member States, in order to comply with the modification of the International Convention of Safety of Life At Sea (SOLAS), introduced in 2006 by the International Maritime Organization (IMO) concerning the development of a Long-Range Identification and Tracking system (LRIT). Moreover the Council agreed a number of actions related to the AIS (Automatic Identification System) data and AIS system development including: encouraging integration of AIS data into the LRIT system; and, progressing integration of LRIT and AIS information in the context of an EU AIS Master Plan.

---

1 The SESAR programme can be considered the technological component of the Single European Sky initiative

2 Even though the recent economic crisis has strongly reduced the current (ship) traffic figures and has downsized the future expectations of traffic growth.

ITS and inland waterways transport

1.27 The adoption of River Information Service (RIS) is one of the interventions set in the NAIADES European action programme (2007-2013) as well as in the project PLATINA,[3] both aimed at promoting the use of inland waterways mainly for freight transport. The aim of the RIS is to support the planning and management of traffic and transport/logistics operations by optimising the use of current infrastructure (waterways, locks, bridges and terminals). The key objectives are to increase competitiveness and improve safety.

ITS and road transport

1.28 The adoption of the 2008 Action Plan is the deployment at the Community level of Intelligent Transport Systems for road transport. While the general aim of the Action Plan is to foster the uptake of ITS services in road transport, the specific aims are: to increase interoperability; to set up an efficient cooperation mechanism between the different operators; and, to solve privacy and liability issues.[4] The Action Plan addresses six Action Areas with complementary priorities.

1.29 It should be noted that before the adoption of the Action Plan, the dissemination of ICT solutions for road transport was promoted by the "Intelligent Car Initiative"[5], started in 2006 with the aim of introducing smarter, safer and cleaner road transport in Europe and consequently to reduce road accidents, congestion, fuel consumption and CO2 emissions. One of the main components of this initiative is the e-Safety initiative which aims to introduce "Intelligent Vehicles Safety Systems" (IVSS) in road transport. The eSafety initiative is managed by the e-Safety Forum[6], which is a joint platform representing all major road safety stakeholders, and is supported and monitored by eSafety Support which is a joint industry-public sector initiative driven by the European Commission and co-chaired by ERTICO – ITS Europe (a multi-sectoral public-private partnership) and ACEA (Association of European Car Manufacturers).

ICT applications in urban freight and passenger transport

1.30 Within the wider applications of ICT solutions to road transport particular attention has been given to ICT solutions focused on freight transport (especially at an urban level) and to urban passenger transport. In freight, both the Freight Transport Logistics Action Plan as well as the Action Plan for the Deployment of ITS for road transport define specific action areas promoting the development and the implementation of traffic and freight management ITS services to be realised for long-distance freight transport as well as for urban freight transport.

1.31 All the interventions promoted (such as the use of RFID technologies together with specific applications of the Galileo satellite positioning system) focuses firstly on supporting the "eFreight" concept, and its possible successor "Intelligent Cargo",

---

3 This project started in 2008 and it is the platform for the implementation of the NAIADES

4 Taken from Action Plan

5 This initiative is a "flagship" project for the wider initiative "i2010 – Europe's digital-led strategy for Growth and Jobs".

6 The e-Safety Forum was established in 2003 with the adoption of COM(2003) 542 based on the results of the *e*Safety Working Group and other consultations.

with the final aim being to understand the physical condition as well as location of freight. Other interventions include those related to regulating, controlling and charging infrastructure access and use (e.g. electronic management of zones for delivery, electronic access control, etc.).

1.32 In relation to passenger transport, the Action Plan for Urban Mobility states that, in public transport, the use of ITS might ensure a better management of operations and new services. Particular attention is given to the implementation of intelligent payment systems using smart cards, which might guarantee higher interoperability between public transport services and with other services, as well as using the provision of adequate and interoperable multi-modal trip information for journey planning.

Galileo

1.33 Together with the diffusion of ICT/ITS applications, the 2000-2007 period has seen the start up of the Galileo programme, aimed at developing a European-controlled global satellite navigation system, which could substitute the current international systems and guarantee a reliable and precise service for Europe.

1.34 After an initial "definition phase" led by the Commission and the European Space Agency (ESA) in 2002, the GALILEO programme entered into the development and validation phases through the setting up of the Galileo Joint Undertaking (GJU). It has now moved into the deployment phase which is to be completed by 2013, when the European Navigation System will provide five main services, namely the Open Service, the Safety of Life Service, the Commercial Service, the Public Regulated Service and the Search and Rescue Service. A start-up phase will follow the deployment phase.

1.35 Different bodies and Authorities, such as the European GNSS Programmes Committee, the Galileo Inter-institutional Panel and the GNSS Supervisory Authority (GSA) have been set up to help the Commission in the overall management of the programme. Furthermore, EGNOS (European Geostationary Navigation Overlay Service), developed by ESA, complements the GPS system and it will provide its services to all European countries and has the built-in capability to be extended to other regions. GALILEO and EGNOS have already made some progress in delivering a whole range of 'reliability-critical' services, applications and business opportunities.

TRANS-TOOLS

1.36 TRANS-TOOLS is a research programme co-funded by the European Commission under the 6th Framework Programme. This project started in 2004 and involves 8 partners in 6 European countries who aim to develop a new European transport network model.

1.37 Current models have several shortcomings such as the lack of representation of traffic mix (short/long distances, freight/passengers), the lack of coverage of intermodality and freight logistics, and others including limited assessment of socio-economic and external effects.

1.38 The final report of the project was published in 2006. TRANS TOOLS is now the largest and most comprehensive European Transport model, structured in several sub-models, including the Transportation model, the Regional economic model, the Freight models and the Impact models. It covers the whole of Europe (in particular

it cover 55 countries), all modes, freight and passenger transport and it is characterised by a high level of detail.

1.39 Some of the major innovations of the TRANS-TOOLS model with respect to the previous versions are the following: new set up of a supply and demand model; intermodality for passengers and freight; inclusion of intercontinental freight flows; full coverage of Central and Eastern Europe; inclusion of logistics/freight chain and finally the inclusion of the effect of congestion on long-distance traffic. The TRANS-TOOLS model is IPR free and general available.

Legislative Framework

1.40 A summary of the relevant legislative framework for most of the measures considered in this task is reported below:

- ITS and rail transport
  - Directive 2008/57/EC of the European Parliament and of the Council on the interoperability of the rail system within the Community;
  - Directive 2004/50/EC of the European Parliament and of the Council amending Council Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and Directive 2001/16/EC of the European Parliament and of the Council on the interoperability of the trans-European conventional rail system;
  - Directive 2001/16/EC of the European Parliament and of the Council on the interoperability of the conventional rail system;
  - Directive 96/48/EC of the European Parliament and of the Council on the interoperability of the trans-European high-speed rail system;
  - TSIs (included in legislative framework for Task 1.1).
- ITS and air transport
  - Council Regulation 219/2007 of the Council, of 27 February 2007, on the establishment of a Joint Undertaking to develop the new generation European air traffic management system (SESAR);
- ITS and sea transport
  - Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC;
- ITS and inland waterways transport
  - Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community;
- ITS and road transport
  - Proposal for a Directive: Framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other transport modes [COM(2008) 887];

- Galileo
  - Council Decision 98/434/EC of 18 June 1998 on the agreement between the European Community, the European Space Agency and the European Organisation for the Safety of Air Navigation concerning a European contribution to the development of a Global Navigation Satellite System (GNSS);
  - Council Regulation (EC) No 876/2002 of 24 May 2002 setting up the Galileo Joint Undertaking.

Qualitative Analysis

1.41 This section reports the qualitative analysis of the CTP measures related to this task. In particular, the table below reports a preliminary assessment of each measure, while the SWOT analysis report a strategic analysis of the overall implementation of these measures.

TABLE 1.1 ASSESSMENT OF MEASURES FOR ITS AND OTHER TRANSPORT-RELATED RESEARCH OUTCOMES

Measures	Introduction of legislation or other initiatives
ITS and rail transport	**Some progress**. Deployment of ERTMS is underway. In particularly, these consist in: a) the adoption in 2005 of a Memorandum of Understanding (MoU) between the European Commission and the rail industry on the deployment of ERTMS and in particular of ETCS, on a key part of the European network: on six freight corridors. The implementation of the Directives 2007/59/EC concerning the harmonisation of train driver certification within the EU has not started; c) the adoption in 2008 of new TSI (Commission Decision 2008/386/EC) which guarantee that Europe's trains are equipped with ETCS and can travel on any line equipped with ETCS; and finally the appointment of a European coordinator for ERTMS (Mr Karel Vinck).
ITS and air transport	**Some progress**. The SESAR programme is under way (and a final evaluation will be possible only in the future) and to date this programme is in line with its timetable. The definition phase has been concluded with the adoption of the Air Traffic Management (ATM) master plan in 2008 which defines the work programme for the next phases of the SESAR programme and in particular the "technological and functional packages" needed to achieve the long-term targets. Moreover in 2007 the EU has adopted Council Regulation (EC) 219/2007 (then amended in 2008) which established the SESAR Joint Undertaking which will be the European Community body responsible for coordinate public and private funds (Community, Eurocontrol, industry and third countries) and guarantee a single management structure for the next phases of the programme, as well as a governance model for all actors involved. Finally, as further support for the full deployment of the SESAR programme, the EU and the USA have recently signed a cooperation agreement that will ensure coordination between their respective programmes, SESAR and NGATS, for the modernisation of air traffic control.

Measures	Introduction of legislation or other initiatives
ITS and sea transport	**Some progress (substantial).** In relation to the level of implementation of the SSN project, in January 2009 the great majority of Member States are participating in SSN via XML (EMSA, 2009). Moreover the implementation of the STIRES system will enhance the SSN system. In particular it will facilitate the exchange of AIS tracking data and the combination of such data with data from SSN and other systems
ITS and inland waterways transport	**Some progress**. As reported in the First progress report on the implementation of the NAIDES Action Programme, in order to implement the RIS Directive (2005/44/EC) three Regulations were adopted in 2007: 414/2007/EC, 415/2007/EC, and 416/2007/EC. These are aimed at adopting technical guidelines for the planning, implementation and operational use of RIS; at adopting technical specifications relating to vessel tracking and tracing systems (Inland AIS); and, to adopt common notices to skippers. Moreover the implementation of the Platina project will further facilitate European harmonisation, standardisation and implementation of River Information Services (RIS).
ITS and road transport	**Some progress (substantial).** The adoption of the Action Plan in 2008, which defines specific interventions, represents a big step forward in the development of an EU approach in this area. Moreover since 2001 the EU has financially supported, within the TEN-T grants programme, ITS projects that considered cross border deployment services. For the period 2007-2013, the TEN-T programme allocated €300 million for the funding of ITS road projects that, according to the co-modality vision, should promote the concept of the connected traveller and connected intelligent technologies as well as having an emphasis on cross border co-operation and continuity of service. With respect to the Intelligent car and the e-Safety Initiatives, in 2006 a Strategic Research Agenda was adopted (and then revised in 2007[7]), providing recommendations on the research topics to be addressed in the ICT for Mobility part of the 7th Framework Programme. The final report on ICT for Clean & Efficient Mobility, as well as the report on ICT and Transport (produced by the ICT Results[8]) provides information on case studies and projects implemented in this area. Finally it has to be noted that there has been progress in the full deployment of the eCall and the ESC system.
ICT application in freight and urban passenger transport	**Some progress**. While the recent adoption of specific Action Plans represented already an advance, in policy terms, in the application of ICT solutions to urban freight and urban passenger transport, it should be considered that, thanks to specific projects and initiatives, such as Bestufs (I and II) and Civitas (I and II), practical implementation of ITS solutions in these areas has taken place in some areas. Examples of ITS application in urban freight transport include the MOSCA Decision Support System (DSS) applied in the Stuttgart region in Germany; the eDrul platform applied in different cities (e.g. Eindhoven, Siena); and, the ME.R.CI. project in Genoa. Examples of ITS applications in urban passenger transport are the Nexus Call centre in Newcastle; the Midas project in Alborg; and, the TIDE project in London and Paris.

7 Indeed the eRTD working group of the eSafety forum has revised the Strategic Research Agenda after having evaluated the outcomes of the initial calls of the FP7 ICT for Mobility (on the base of submitted and accepted proposals).

8 ICT Results is an online editorial service established on behalf of the Information Society and Media Directorate-General, whose main aims are to raise visibility of ICT-funded research results, support project's access to markets and raise awareness of European ICT programmes and activities.

Measures	Introduction of legislation or other initiatives
Development of the European satellite radio-navigation system Galileo	**Some progress (but much still to be done).** Galileo programme is behind schedule. In the 2001 White Paper it was foreseen to be operational by 2008, while it is still at a development stage. The deployment phase started with the launch in 2005 of the first experimental satellite, GIOVE-A, and with the launch, in 2008, of GIOVE-B. Thereafter operational satellites should be launched. In 2006 the Galileo OS SIS ICD[9] (updated in 2008) provided a description of the requirements to be followed in the development of products and applications. Finally, to guarantee financial support of the development and validation phase of Galileo programme, the total estimated operating cost of the Galileo and EGNOS systems (amounting at €3,405 mil.) have been fully covered by EU multi-annual financial and research framework.

SWOT analysis

1.42 The table below report the SWOT analysis for this policy area of the CTP.

TABLE 1.2 SWOT ANALYSIS – ITS AND OTHER TRANSPORT RELATED RESEARCH OUTCOMES

Strengths	Strong support from the Commission and other stakeholders for the development of IT systems in all modes of transport. In air and rail sectors, IT systems are have reached an advanced phase of development. The Intelligent Car Initiative is a point of reference in Europe and is used worldwide as best practice
Weaknesses	Delay in the full implementation of ERTMS limits the development of an internal market. Limited development of PPS agreements in the development and the funding of ITS projects means that projects may be delayed due to funding restrictions.
Opportunities	ITS will lead to the achievement of higher level safety standards and pollution reduction in the management of future traffic flows. The full deployment of ITS applications, especially in rail and air transport, will allow a substantial reduction in operating cost in the provision of the actual services. ITS will make a significant contribution to the interaction of modes, working together in sophisticated logistics chains. The application of ICT to freight transport will integrate tracking and tracing and, in the longer term, also routing of freight across modes. The Galileo programme will benefit not only the transport sector but also other economic sectors. Moreover it will be useful both for public services as well for private users. The Galileo programme will enhance the participation of European industry in the developments of position and time determination technologies.
Threats	While for some programmes international cooperation has been established, the promotion of transport telematics requires the promotion or creation of comprehensive interoperability and therefore of the establishment of further international cooperation which if not undertaken could hinder the development of ITS solutions.

[9] Galileo Open Service Signal-In-Space Interface Control Document

Results

1.43 The qualitative analysis provided above, shows that overall most of the measures set by the EU in this policy have been undertaken, though they certainly are at a different stage of advancement.

1.44 The SESAR programme has enhanced cooperation between the different actors in the air industry. The Consortium established for the management of SESAR first phase brought together 29 companies and organisations with 20 associated partners and each contributed to the definition of the European ATM master plan. A study for the Directorate General Energy and Transport estimated that the SESAR programme could cut ATM costs by 50%. The full deployment of this programme in 2020 could also allow a substantial reduction of energy consumption (300-500kg of fuel on average per flight) and hence emissions (945-1575kg of CO2 on average per flight).

1.45 With the recent adoption of the 2008 ITS Action Plan in road transport, the EU is now involved in the application of telematics in all modes of transport. However while in some modes ITS are in a research and development phase, in others, (sea and especially rail and air transport), ITS are approaching the deployment phase. The Galileo programme is behind schedule, due mainly to the failure to secure funding from private investors, which cause the delay in the first place.

1.46 However, in the modes where ITS applications are well entrenched, further action is needed. In particular, in sea transport there are some Member States that are still not participating to the SSN project while in rail, ERTMS installation still has a long way to go.

1.47 Specific advances have been made in the development of the "Intelligent Car initiative" and its safety pillar, the "eSafety" initiative, as well as in the applications of ICT in urban passenger and freight transport.

1.48 Finally the applications of telematics have enhanced the development of agreements and cooperation between the different operators in the industry as well as, in the case of air transport, international cooperation among Member States.

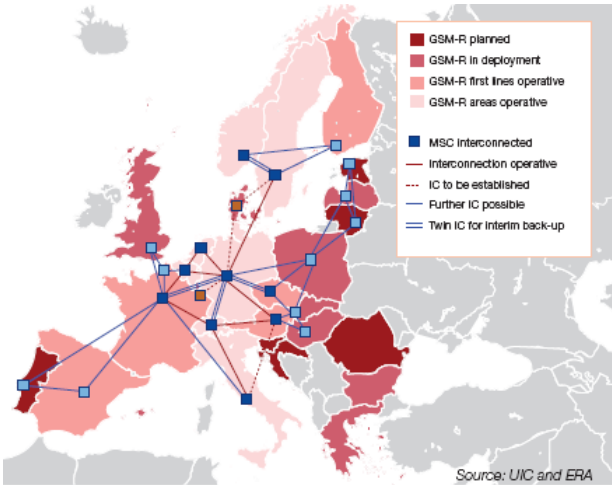
Quantitative Analysis

1.49 This section provides a quantitative analysis of some of the measures discussed above, in particular ITS application to rail and sea transport as well as the Galileo programme.

ITS and rail transport

1.50 The figure below shows the interconnections of neighbouring GSM-R networks as at 2008. As can be seen the implementation stage of the GSM-R component of the ERTMS system is well established in different EU countries.

FIGURE 1.1 GSM-R INTERCONNECTIONS ALREADY SET UP



Source: Signal (2009)

1.51 In particular the five EU countries where GSM- R implementation is complete are: Germany (24 000 km), Italy (8 500 km), Netherlands (3 000 km), Norway (3 000 km) and Sweden (8 500 km). In relation to implementation at the EU level, it is estimated (Signal 2009) that, according to the National Implementation Plans, by the end of 2010, 60% of the foreseen network will be ready for operation.

1.52 Finally the Table below report, the implementation up to 2008, of the ERTMS/ETCS component.

TABLE 1.3 ERTMS/ETCS IMPLEMENTATION STATUS - JUNE 2008

	Total n. of vehicles	Route length KM	Track length KM
Europe	3794	11887,6	17860,4
Rest of the World	1770	8478	13015
Total	5564	20365,6	30875,4

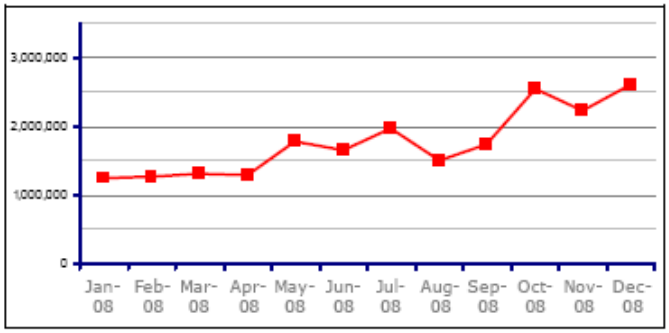
Note: the figures indicated the lines and the rolling stock in operations as well as contract signed per June 2008. Source: ERTMS website

1.53 The table shows that the deployment in Europe of the ETCS component is still slow. However it shows that countries outside Europe are also starting to embrace ERTMS as their train control system of choice. Moreover, in December 2008, co-funding by the EU of different (17) ERTMS projects was agreed (Signal, 2009).

ITS and Sea transport

1.54 The figure below shows the rising trend in the number of notification sent to SSN during 2008 by several reporting countries. In January 2009, the total number of notifications exceeded 3 million. Although the SSN request does not have the same positive trend as the SSN notifications (EMSA, 2009), a number of different Members State have now joined the SSS project.

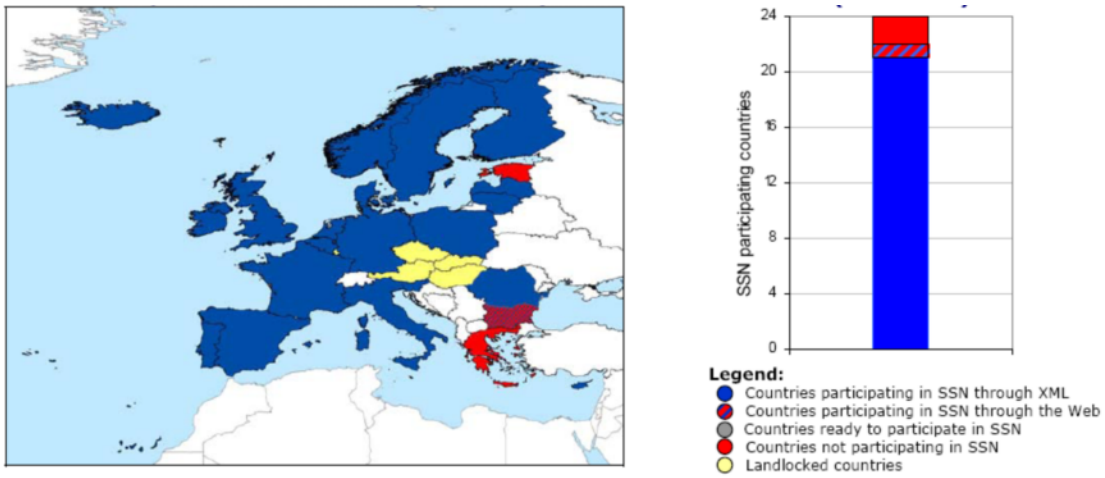
FIGURE 1.2 EU SSN NOTIFICATIONS IN 2008



Source: (EMSA, 2009)

1.55 The figure below reports a map showing the implementation status of the SSN in the different Member States. As can be seen, only two countries are not participating at any level at the SSN project, the others are already participating or ready to do it.

FIGURE 1.3 MS CURRENT STATUS – JANUARY 2009



Source: (EMSA, 2009)

Galileo

1.56 The only indicators provided for evaluating the level of implementation of the Galileo system is the number and type of projects funded under the different Framework Programmes (starting with the 5th). The number of projects funded, mostly aimed at developing the ground infrastructure of the Galileo programme, is a proxy for progress with the Galileo deployment phase, though, as mentioned above, it must be pointed out that it is well behind the original schedule.

TABLE 1.4 SELECTION OF GALILEO TRANSPORT-RELATED PROJECTS

Acronym	Full Name	Sector	Framework Programme
GALLANT	Galileo for safety of life application of driver assistance in road transport	Road transport	5th FP
INSTANT	Infomobility services for safety-critical applications	Sea and land transport	5th FP
NAUPLIOS	Improving safety in maritime navigation	Sea transport	5th FP
POLARIS	A navigation system performance-analysis tool	All modes	5th FP
GADEROS	Galileo Demonstrator for Railway operations Systems	Rail transport	5th FP
SCORE	Service of coordinated operational emergency and rescue using EGNOS	All modes	6th 1 Call
ADVANTIS	A centralised guaranteed integrity localisation service	Road infrastructure	6th 1 Call
VERT	Vehicular remote tolling	Road transport	6th 1 Call
MARGAL	Seamless Harmonised service	Port and harbours	6th 1 Call
MARUSE	Utilisation of Galileo within the maritime user communicty	Sea transport	6th 2 Call (Area 1A)
M-TRADE	Multimodal transportation supported by EGNOS	Multimodal transport	6th 2 Call (Area 1A)
GIANT	GNSS introduction in the aviation sector	Air transport	6th 2 Call (Area 1A)
GIROADS	GNSS introduction in the road sector	Road transport	6th 2 Call (Area 1A)
GRAIL	GNSS introduction in the rail sector	Rail transport	6th 2 Call (Area 1A)

Source: Galileo Joint Undertaking website

Conclusions

The overall impact of the policy

1.57 The 2006 Mid Term Review set the objective to foster intelligent mobility programmes, which in the majority of cases can be considered achieved. Indeed, after the adoption of the 2008 Action Plan for the deployment of ITS to road transport, the application of telematics is widespread in all modes of transport.

1.58 This application has the potential of drawing on the advantages of each of the transport modes working together in combination. Moreover ITS will provide their support to deal with the principal issues of the current transport systems: congestion, reliability, security, and environmental protection.

1.59 Finally the development and deployment of ITS in Europe as well as of the Galileo Programme will provide the opportunity for the EU industry and service providers to acquire the relevant knowledge and skills needed to compete on a global scale.

Contemporary developments

1.60 Some new developments in the context of ITS are set out below.

ITS and air transport

1.61 In January 2009, the European Commission agreed on new rules for the use of data links in ATM systems in Europe. Data link technology will allow communications between air traffic controllers and pilots by supplementing voice communications with an air-ground data link.

Galileo

1.62 In February 2009 an agreement was signed between the European Commission and the European Space Agency setting their cooperation in ensuring the deployment of the Galileo Programme. In particular, the ESA will manage the technical part of the Galileo and Egnos programmes, while the Commission will exercise audit powers. For the Galileo Programme the agreement concerns the deployment phase of the system the implementation of which consists in six main work packages to be put out to public tender.

1.63 Although the Galileo programme will require a large amount of resources to achieve full deployment, the programme is expected to have a massive impact on the EU economy. In particular, the system is projected to create more than 100,000 new jobs and a market for equipment and services worth some €200 bil. per annum by 2013. Moreover its applications will affect many sectors of the economy such as transport, energy, urban development, agriculture, telecommunications and banking services.

1.64 Finally, Galileo will overcome the shortcomings of the existing satellite navigation systems, and will offer more reliable and accurate services.

Lessons learnt and going forward

1.65 EU intervention is particularly valuable in this area, in particular to promote coordination within and outside the Union in this area and the need for international cooperation. Indeed European coordination in this field is needed to ensure Europe-wide deployment of ITS as well as making operative ITS research to bring benefits to the citizens and the business community alike. At the same time international cooperation between the EU and other countries (e.g. USA) is needed to guarantee world-wide interoperability of these systems.

1.66 Worldwide interoperability and harmonisation of ITS are key challenges for the full deployment of ITS systems in the future.

1.67 Future ITS solutions should consider a focus on measures aimed at improving energy efficiency and tackling climate change. In part, this should be oriented towards the development of those ITS solutions which can contribute effectively to the shift towards more sustainable modes of transport. The EU strategy for ITS seems to go in this direction, (eg statements by European Union representatives in the welcome letters for the next “ITS World Congress” to be held in September 2009).

Nevertheless, appropriately, the EU strategy for transport environmental sustainability is much focusing on the research of innovative solutions that can improve the environmental performances of transport activities (e.g. development of alternative fuels), as higher results can be expected from them.

1.68 Moreover further applications (e.g. ground infrastructure) should be developed in order to fully benefit from the satellite location capabilities that will be offered by EGNOS and Galileo.

1.69 Particular attention should then be given to the promotion of a common approach in the application of ITS solutions to public transport. Intelligent ticketing solutions are approached differently in each Member State (and usually in different ways within Member States) leading to limited integration. In this field, the Commission is also promoting studies aimed at understanding the current use of smart cards across Europe to evaluate whether there is potential for the standardisation of these systems across the EU.

1.70 Finally to achieve the full deployment of ITS in all modes of transport, especially in specific sectors such as rail and road, the EU has to provide its financial and management support, especially in the first phases of the different programmes, but it has to foster the contribution of the private sector (e.g. PPP agreements) in later stages.