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**COMMISSION STAFF WORKING DOCUMENT**

***Accompanying document to the***

**COMMUNICATION FROM THE COMMISSION**

**Action Plan for the Deployment of Intelligent Transport Systems in Europe**

***and the***

**Proposal for a**

**DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**

**laying down the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other transport modes**

**IMPACT ASSESSMENT**

**{COM(2008) 887 final}**
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This report commits only the Commission services involved in its preparation and does not prejudge the final form of any decision to be taken by the Commission.

**Lead DG**: TREN

**Other services involved**: *SG, DG ECFIN, DG EMPL, DG ENTR, DG ENV, DG INFSO, DG RTD, DG TAXUD and JRC*

**Agenda planning or WP reference**: TREN/2008/035

## EXECUTIVE SUMMARY

*This working document assesses different strategies and actions the European Commission might undertake to improve the deployment of Intelligent Transport Systems (ITS) for road and their interconnections with other modes of transport.*

*ITS stands for Intelligent Transport Systems which apply emerging information and communication technologies (ICT) to transport. ITS are related to all transport modes and facilitate their interaction (co-modality) and interlinking. ITS applications have been developed in several modes of transport, leveraging functionalities of existing operations and services by boosting their effectiveness and cross-linking, and by providing better responses to user needs.*

*ITS applications and services have the potential to increase transport efficiency, safety and security, to reduce congestion and also to improve the environmental performance of the transport system. In addition, by supporting and improving effectiveness of transport operations, it can also be expected that ITS services will have a strong, positive influence on the competitiveness of the European manufacturing industries and on the economy in general.*

*Broader deployment of ITS, in particular a more generalised use of advanced instruments such as interoperable electronic toll payment and demand management systems, is crucial to several policies which the European Commission proposes to introduce, in particular for the greening of transport - based mainly on the internalisation of external costs.*

*Furthermore, the rapid growth of freight transport with consequent congestion, accidents, noise, pollution and energy use are among the economic, social and environmental problems that need to be addressed. Innovative solutions in road transport are clearly needed, but are currently not sufficiently developed nor deployed to face the challenges of fast-growing demand for freight and passenger transport.*

*In spite of their potential to contribute positively to transport policy objectives, ITS solutions in road transport are being taken up slower than expected and, in general, services are deployed on a fragmented basis as a result of, inter alia, transport authorities increasingly but in an uncoordinated way exploring options to better manage their transport systems. This leads to a patchwork of different national, regional and local solutions without clear harmonisation; users need to adapt to each of them and that is endangering the integrity of the single market throughout the EU.*

*As part of the current exercise, an intense effort was made to consult representatives of the public sector, industry and other interested parties, resulting in a number of priority application domains for EU-wide deployment of ITS and a set of potential measures to be launched in order to foster such process .*

*Considering the general objective to accelerate the uptake of ITS in Europe, the impact assessment considers three policy options, comparing their effects on specific objectives of interoperability, cooperation and (solving) privacy and liability issues.*

*A* *No additional new action (baseline scenario)*

*B* *Overcoming problems by concentration on enabling actions and application fields (functional open ITS platform, optimal use of road and traffic data, continuity of services and addressing privacy & liability)*

*B+* *Option B extended with a comitology procedure.*

*The main difference between B and B+ is the replacement of a High Level Group by a European ITS Committee assisting the Commission through the comitology procedure. The main advantage of Option B+ is a faster and more harmonised deployment of ITS services. The anticipated positive impacts on congestion, road safety and emissions will thus be reached earlier. That is why this option is more effective: Option B+ will save more lives and more time otherwise spent in congestion, and will reduce $CO_2$ emissions most.*

*Considering both their direct impact (boosting uptake of ITS) and indirect impact (supporting economic, social and environmental policies) the preferred option is Option B+.*

*Option B+ focuses on an limited set of 'horizontal' actions that address main identified bottlenecks and problem areas, and as such directly and indirectly foster development and consistent, harmonised deployment of ITS in Europe. Option B+ builds on broad concertation and cooperation with major stakeholders to get selected measures implemented, but also incorporates the mechanisms — whenever necessary — to allow the Commission, assisted by a European ITS Committee, to adopt such measures via a comitology procedure. This procedure will ensure an effective steering and management of the necessary processes at minimum administrative cost and should result in rapid positive impacts on congestion, safety and emissions.*

*The proposed legal instrument to set up this framework would be a Directive, which recognises the different levels of ITS use and deployment, while at the same time leaving the power and responsibility to the Commission to define, with the European ITS Committee, the technical details in support of the implementation of the Directive.*

# 1. INTRODUCTION

## 1.1. What are Intelligent Transport Systems (ITS)?

The mid-term review of the European Commission's 2001 White Paper on Transport Policy[1] suggests that **innovation** can play a considerable part in making road transport more efficient, safer and cleaner.

In particular applying available and emerging information and communication technologies (ICT) can help to deliver safe, efficient, sustainable and seamless transport of goods and people. These ICT applications are commonly known as **Intelligent Transport Systems (ITS).** ITS apply to all transport modes and facilitate their interlinking (co-modality). Typical applications include (multi-modal) trip planners, combined public transport ticket dispensers or River Information and Air Traffic Control Systems. Examples in road transport are dynamic traffic management with variable speed limits, Parking Guidance & Reservation, Navigation Devices and (Advanced) Driver Assistance Systems like Electronic Stability Control or Lane Departure Warning Systems.

The ITS action plan covered by the present impact assessment report was announced in the mid-term review of the European Commission's 2001 transport White Paper as the "launch of a major programme to roll out intelligent infrastructure for road transport."

## 1.2. Target

Though ITS are not limited to road transport, the **focus** in the present exercise is on the **Road Transport System and its interfaces with the other modes**. Other modes already have similar initiatives such as the Single European Sky ATM Research (SESAR) for air, the European Rail Traffic Management System (ERTMS) for rail, River Information Services (RIS) for inland waterway transport and SafeSeaNet and Vessel Traffic Monitoring and Information Systems (VTMIS) for maritime transport.

This impact assessment (IA) examines the options for action in favour of ITS for road transport in the EU and considers their likely effects. This IA is the basis for the ITS action plan, a set of dedicated measures to encourage take-up of ITS for Roads which the European Commission has planned to adopt in Autumn 2008, and for the accompanying legislative proposal on the setting up of a comitology procedure allowing the Commission, assisted by a Committee, to issue decisions in specific areas when necessary.

This impact assessment addresses the items listed in Art. 21(1) of the Implementing Rules and can therefore be regarded as an ex-ante evaluation.

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[1] COM(2006) 314: "New technologies coming to market in the near future will gradually provide new services to citizens and allow improved real-time management of traffic movements and capacity use, as well as the tracing and tracking of flows for environmental and security purposes. In addition to the obvious benefits to transport operators and clients, new systems will provide public administration with rapid and detailed information on infrastructure and maintenance needs. They will not only enhance driving comfort but also help to increase safety and security and to tackle wasteful transport patterns in the interest of environmental sustainability."

Obvious links exist between this exercise and the Logistics[2] and Urban Mobility Action Plans[3] as ITS are also used as a tool to optimise logistics and urban mobility. Examples are e-freight, smart freight distribution in cities and security of commercial and public transport.

## 2. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

### 2.1. Expertise

This impact assessment relies on results from various work carried out over the past years — EU research projects, support to deployment and customer surveys.

Since 1988, the Commission has financed several research and development programmes on ITS which have delivered many useful results and products which in some cases are still awaiting full exploitation. Useful input on the impact of in-vehicle safety systems has come from the SEISS and eImpact studies[4].

A number of Euro-regional ITS deployment projects have been financed under the Trans-European Transport Network programme and are about to be concluded, and work is being continued in the EasyWay[5] project.

The eSafety initiative has developed a roadmap covering in-vehicle applications implementation[6].

Use was also made of the results of some TRANSTOOLS[7] simulations of the policy options described in the present IA.

Finally contracts were signed with Ankerbold Consulting for the stakeholder interviews and with COWI-ECORYS[8] for providing methodological advice and collecting information for assessing the impact of actions.

### 2.2. Consultation of Stakeholders

#### *2.2.1. Meetings with public authorities, industry and other interested parties*

Thirteen high-level industry stakeholders' **interviews, related to the uptake of ITS and relevant issues,** were organised between November 2007 and end of January 2008. The persons interviewed were high-level personalities from the following stakeholder communities: national ministries of transport, government-owned development and deployment agencies for ITS, a city authority, a membership-based international

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2 COM(2007) 607.

3 To be adopted in early 2009; cf. http://ec.europa.eu/transport/clean/green_paper_urban_transport

4 SEISS (2005): Exploratory Study on the potential socio-economic impact of the introduction of Intelligent Safety Systems in Road Vehicles, eIMPACT (2008): Assessing the impacts of the socio-economic effects of Intelligent Vehicle Safety Systems (IVSS), their impact on traffic safety and efficiency, www.eimpact.eu.

5 http://www.easyway-its.eu.

6 http://ec.europa.eu/information_society/activities/esafety/forum/roadmaps/index_en.htm.

7 JRC report on TRANSTOOLS simulations of ITS Action Plan, 3rd draft (04.06.08).

8 COWI-ECORYS: Preparatory Study for an Impact Assessment on the EC ITS Action Plan, Final report, May 2008.

organisation bringing partners together to develop ITS-based services, a toll motorway operator, an ITS-based information service provider, a membership-based organisation representing the heavy road transport industry, representatives of the Directors of the National Road Authorities, a mobile telecommunications operator, an electronic components supplier to the automotive industry and an automobile and truck manufacturer. These interviews led to a first inventory of observations regarding the issues hampering the wider deployment of ITS, its market penetration and potential actions that could be undertaken to achieve a faster uptake of ITS. To consolidate the findings of the first interviews, two **workshops** were held, one on 22 February and one on 26 March 2008 with more than 200 participants in total.

An **eSafety forum**[9] (Ljubljana, 25 April 2008) was dedicated to the initiative, with some 35 participants debating supplementary actions.

Finally **Member States'** delegates discussed the rationale behind specific actions presented at a meeting in Brussels on 26 May 2008.

As such the Commission's minimum standards for stakeholder consultation have been met.

*2.2.2. Wider consultation of the public*

A questionnaire-based **survey** using the internet was launched at the end of February 2008, which generated 34 replies. The analysis of this survey has been published on the Europa website[10] and is explained below (see 1.2.4).

*2.2.3. Consultation of other Commission services*

An **inter-service group** composed of representatives of the Directorates-General concerned *(SG, ECFIN, ENTR, EMPL, ENV, INFSO, RTD, TAXUD and JRC)* was created to accompany the impact assessment. The group met 4 times between January and May 2008 and provided input to the impact assessment.

In addition to this inter-service group, an **ITS Steering Group** was set up in April 2007 with Directors from five different Directorates-General: *INFSO, RTD, ENTR, ENV and TREN*. This Group provided guidance on the preparation of the ITS Action Plan.

*2.2.4. Main results of the consultations*

Interviews:

The most important issues raised by the **high level stakeholders** interviewed can be listed as follows:

- ITS deployment should not be seen as an objective on its own but rather as a tool

[9] www.esafetysupport.org/en/news/esafety_forum_comments_on_ec_its_action_plan.htm.

[10] http://ec.europa.eu/transport/road/consultations/its_en.htm.

- ITS deployment needs to be accelerated especially in the fields of urban and freight transport.

Stakeholders pointed out the following priorities for European ITS:

- ITS deployment should be policy-led, combine a top-down approach with bottom-up and build intelligence into the transport infrastructure.

- It should enable better use of existing infrastructure and increase safety and efficiency on it.

- The responsibilities of the different players (EU, public authorities, industry, etc.) need to be clearly identified; business cases including public-private cooperation should be defined and a legal basis for actions needs to be established

- For stakeholder coordination, a high-level cross-sector coordination group is necessary involving all players and establishing the necessary link between developers, industry and public authorities.

- Interoperability needs to be agreed on a European level (as was the case to enable the deployment of GSM).

It was also pointed out that the ITS Action Plan should cover cross-border enforcement, standards on Human-Machine Interaction (HMI) (code of practice, legislation), a regulatory framework for the introduction of driver assistance systems, a legal framework for liability issues of e-Safety applications and the mandatory deployment of Electronic Stability Control (ESC)[11] to reduce fatalities.

In the context of enabling instruments, the stakeholders wanted a range of fora with all major players present, from EU level to local/regional level. The leading in-car services (speed alert, eCall, and real-time traffic information) need a coordinated deployment group of stakeholders, delivering against targets. The same should apply for road authorities and network operators in their domain. A platform for standardisation of procedures and consensus-building on data and data-exchange is needed.

Stakeholders stated that if customers will not pay for safety, mandates and regulatory instruments will be needed as an incentive to get safety-related ITS systems in place that will impact on the mass market.

The consolidated outcome of the interviews was used as a starting point for further discussions and fine-tuning during dedicated workshops and for setting up a broader internet consultation:

Workshops:

[11] On May 23, 2008 the European Commission proposed that all new cars from 2012 will have Electronic Stability Control (ESC) systems. Furthermore, lorries and other heavy vehicles should be fitted with Advanced Emergency Braking Systems (AEBS) and Lane Departure Warning (LDW) Systems as of 2013. These measures will reduce fatal casualties in traffic by an estimated 5000 a year. (IP/08/786).

Starting with this first set of observations and recommendations, **two public Stakeholders' workshops** were organised to discuss, group and fine-tune problem areas, objectives and potential actions. During this process a number of criteria were applied. Priority ITS application domains/ dedicated applications to be addressed should:

(1) contribute to high level European (policy) objectives in fields including safety, efficiency and environmental impact of transport systems,

(2) present a clear benefit to society and citizens by facilitating mobility in general or by improving the performance of transport operations in a co-modal environment, and

(3) be mature enough to be rolled out in a consistent manner or to have the potential to act as a catalyst for ITS systems or to offer synergies between these;

resulting overall in following **priority application domains** related to EU-wide ITS deployment **and proposed dedicated measures**:

(1) support for **traffic management and the interconnection of transport modes**, in order to optimise the use of the existing infrastructure and to better balance traffic demand over the networks. Dedicated measures include: support for wider deployment of (roadside-based) ITS infrastructure for information services, provision of warnings and dynamic speed harmonisation; the development and roll-out of interoperable road pricing and city access control mechanisms and the promotion of intermodality via provision of dedicated information and guidance to hubs;

(2) fight against **congestion on EU freight corridors and in cities**, by developing traffic forecast models, setting up effective Data Exchange mechanisms and enhancing cooperation among network operators. This action includes a promotion of load optimisation mechanisms and support for deployment of city-logistics and e-freight;

(3) promotion of **co-modality**, by providing dynamic multi-modal door-to-door travel information, interconnecting multi-modal travel planners and developing instruments for internalising external costs

(4) **safety & security of commercial transport operations** through the creation of secure rest areas and enhanced control of provisions for hauliers (resting and driving times). This action includes support to deployment of Advanced Driver Assistance Systems, e.g. dynamic guidance, Intelligent Speed Adaptation (ISA), Lane Departure Warning (LDW)

(5) improvement of **road safety** by fostering deployment of (autonomous) in-vehicle safety enhancing systems, e.g. Crash Avoidance Applications, Intersection Support Systems, eCall etc.

(6) provision of more reliable **Real Time Traffic and Travel Information** (RTTI) services, matching user expectations by supporting efficient travelling and reducing safety risks

(7) **efficiency of road transport and logistics operations**, by optimisation of pre-trip planning, dynamic fleet management and en-route trip recalculation; the development of local distribution centres and e-freight.

Where these domains fully comply with the 'principles' raised during the first batch of stakeholder interviews, they were also identified during the workshops as being equally important in their contribution to current (transport) policy objectives. The stakeholders did not agree on any hierarchy among these with regard to a potential prioritisation of actions.

The internet-based public consultation:

14 questions relating to current and future deployment of ITS were presented, and 34 replies were received. Most responses came from national public authorities:

- 79 percent of respondents believe that the uptake of ITS is too slow and less than expected. The main reason for this is, for 85 percent, the lack of Europe-wide coverage and of consistent deployment of ITS.

- 95 percent of respondents see ITS as an important tool to increase transport efficiency, mobility and road safety. A large majority judges that standardisation for ITS and provision of a coordination platform for the synchronised deployment of ITS are the main areas where the EU can provide added value.

- 79 percent of respondents are in favour of one common, open in-vehicle platform instead of separated platforms for each application.

Most stakeholders consulted are of the opinion that the European Union should take more responsibility for further deployment of ITS. The EU should be the main actor in the field of legislation, initiatives and financial support for ITS. National authorities should lead implementation and evaluation, whereas industry should foster cooperation with the other stakeholders in the ITS domain.

### 2.3. Follow-up of the recommendations made by the Impact Assessment Board

A **first version of the IA** was submitted to the Impact Assessment Board on 11 June 2008 and discussed in a meeting with the IAB, which took place on 9 July 2008.

On 15 July 2008 the Impact Assessment Board provided a set of recommendations to improve the first draft of the report. These recommendations were taken into consideration as follows:

- the nature of the problems to be addressed has been better explained, indicating more clearly what should be tackled at the EU level;

- the specific objectives of the ITS Action Plan and the content of the alternative policy options have been better linked to the problems described;

- the link with other EU policies such as internalisation of external costs has been emphasised in 2.2.2;

- the description and analysis of the policy options have been significantly improved, in particular as regards the choice of areas and criteria applied; the comparison of the expected benefits and implementing costs gives more detail of potential synergies and trade-offs within the policy options;

- the exact nature of the ITS Committee proposed in Option B+ has been clarified in 4.3, including a confirmation that an analysis will be carried out in the case of concrete measures proposed by the Committee;

- more information is given in 1.2.4 on the consultations carried out and the relevance of the stakeholders consulted;

- the limitations of the TRANSTOOLS assessment tool are indicated in 5.1.2;

- the revised report was examined at an additional meeting with the Inter-service Group on 23 July 2008 (with several units of TREN, INFSO and ENV participating), providing feedback and allowing further fine-tuning.

On the **second version of the IA** (submitted on 30 July 2008) the Impact Assessment Board gave some further recommendations on 8 September 2008, which were taken up as follows:

- the problem definition has been strengthened by providing a new sub-chapter on how the problem drivers affect the particular ITS applications (2.1.2);

- the consistency of priorities is shown in a new table which illustrates the link between the priority application domains and the chosen action areas (4.2);

- the reasoning and justification for not undertaking a full cost-benefit analysis at this stage has been expanded (5.1.1 and 5.5);

- the model scenarios used in TRANSTOOLS and related policy options have been further clarified (5.1.2);

- the main impacts are reflected in the Executive Summary;

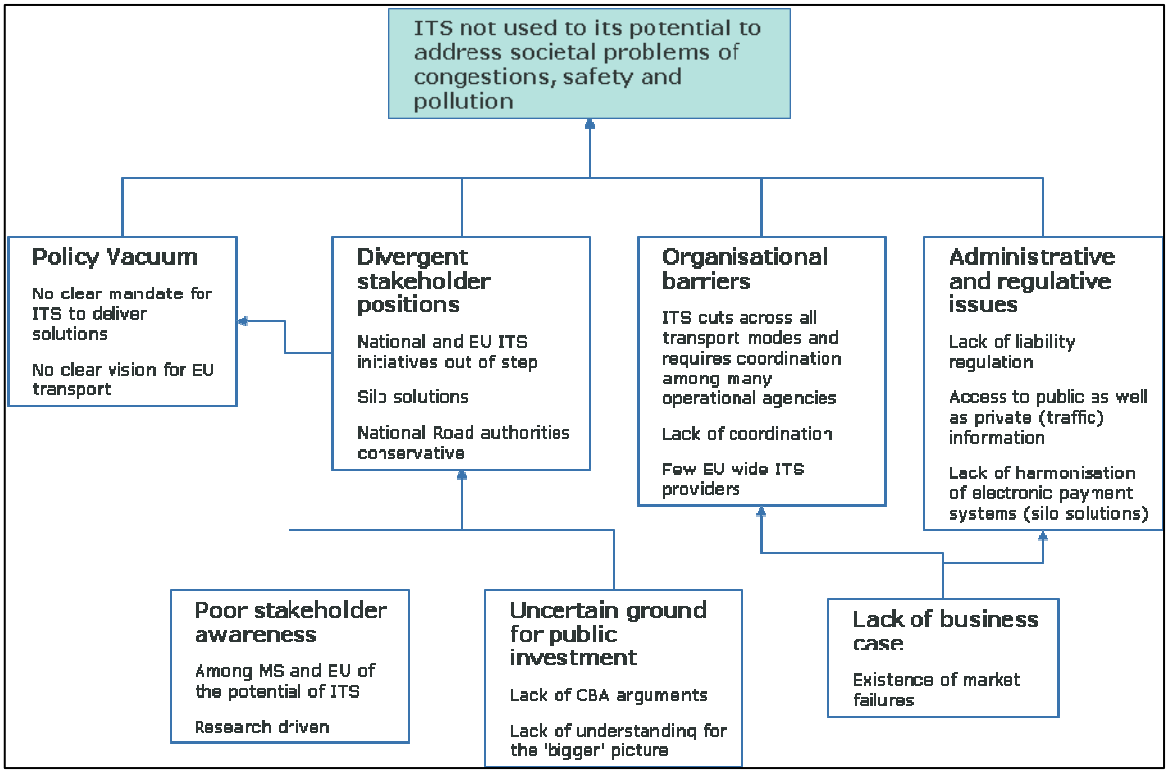
- finally, the participating services in the last Inter-service group meeting in July 2008 have been added (see above).

## 3. PROBLEM DEFINITION: WHY IS THERE A NEED TO ACT?

### 3.1. Nature of the problem

The mid-term review of the European Commission's 2001 White Paper on Transport Policy clearly stated that ITS can play a significant part in achieving (transport) policy objectives and reducing the negative effects of road transport. Where the benefits of ITS seem to be generally recognised **the uptake of ITS in road transport has been rather slow** and **fragmented**, mainly because of lack of cooperation among stakeholders, a low level of interoperability and unsolved privacy and liability issues. E.g. insufficient access to content has led to a low quality of services and in some cases to inappropriate use of

ITS; proprietary 'all in' silo solutions prohibiting sharing of components have kept prices of individual ITS applications and services high, affecting potential customers' willingness to buy.




As a consequence, **inefficient use is made of the ITS potential to support achievement of (transport) policy objectives** and **to fight the enormous and increasing challenges posed to road transport,** i.e. congestion; emissions, pollution and energy efficiency; accidents and security of transport operations.

Fig. 2.1: ITS problem tree (Source: COWI preparatory study)

– **Congestion**: official estimates[12] show that "road congestion costs, including commuting and leisure traffic as well as business and freight traffic, amounts to an average 1 percent of GDP in the European Union, with Britain and France at 1.5 percent." Over the past decades, transport has increased in line with economic growth but there is an obvious need to cope with growing demand: where real GDP grew by 2.4 % per year in the period 1995-2006, freight transport growth in EU-27 has been 2.8 % per year and passenger transport growth 1.7 %. Freight transport demand has increased more strongly for modes offering greater flexibility, in particular road transport (1995-2006: road freight +3.5 %, passenger +1.6 %). The increase of traffic demand has led to bottlenecks in corridors crossing densely populated areas and sensitive areas such as the Alps and the Pyrenees. More infrastructure is not a solution, especially not in the short term given the long planning and construction times for new infrastructure and the need to minimise capacity reductions caused by maintenance and local upgrades.

[12] European Conference of Ministers of Transport (ECMT), Leipzig, 2007.

– Negative **impact on the environment, inefficient use of energy** and dependency on fossil fuels: road transport has a significant impact on climate change: it accounts for 72 % of all transport-related $CO_2$ emissions — which have increased by 32 % between 1990 and 2005 while decreasing or stabilising in other sectors of the economy (such as industry and households) over the same period. The same applies to GHG emissions, which overall decreased in Europe by almost 6 % over the 1990-2005 period and where road transport accounts for an increase of 29 %.

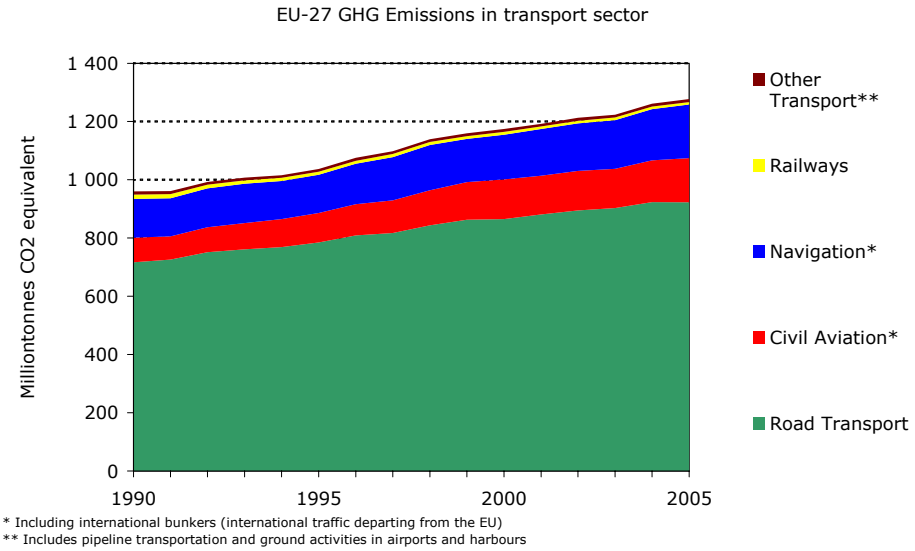



Fig. 2.2 EU-27 GHG emissions in transport sector

– **Air quality** in cities and other environmentally sensitive areas does not always meet the limit values set by European regulation and (road) transport is often a big contributor to air pollution in these locations — even if technological progress and regulation have had a considerable impact in recent years. Technological progress has also contributed to improvements in vehicle fuel efficiency, but gains have been neutralised by increased traffic and car size.

– **Accidents**: road fatalities have displayed a net reduction (-23.9 % since 2000 in EU-27) but there were still about 43 000 fatalities on the EU-27 roads in 2006, more than 6 000 above the intermediate target based on the target set by the White Paper: 50 % reduction in fatalities in 2010 compared to 2001. In more than 80 % of the road accidents, the driver happens to be at least partly responsible, appealing for applications reducing the drivers' workload or assisting them, and better (autonomous) safety systems

### *3.1.1. Problem drivers hindering ITS take up*

Three conditions are driving the problem. For some conditions market failure justifies some degree of public intervention. For example, continuous cross-border services can be regarded as quasi public goods, as there is little willingness-to-pay at this stage. Incomplete information and uncertainty, e.g. on privacy and liability rules, affects the market negatively. Additionally, a lack of vision and cooperation can be substantially tackled by a European approach.

**(1) (A lack of) interoperability of applications, systems and services**

- Silo solutions:

– Industry and private players develop 'all in' proprietary solutions based on limited sharing of content or required components, resulting in costly, standalone applications and services requiring high start-up investments and increasing risks of market failures;

– Member States develop individual solutions which are deployed at a local level, and are causing a fragmented technological spectrum that might endanger future harmonisation and standardisation; obvious examples are toll collection, congestion charging, multi-modal journey planners and public transport e-ticketing.

- **Lack of robust business models**: business models for several ITS applications are unclear or even lacking. In some cases investment and operation (costs) fall on specific stakeholders while benefits are hard to allocate, e.g. eCall.

- **Market inconsistency**: deployment of ITS services has led in some countries to de-facto monopolies, hindering competition and limiting opportunities for innovation, a typical market failure. For example this is the case when proprietary road charging devices, initially set up as part of a BOT–like operation for a dedicated part of a network (to be created), and as such benefiting in effect from almost mandatory installation in all vehicles frequently entering the area, are exported to larger networks or are used as an instrument for adding on additional services (e.g. parking payment systems, infotainment). Both scenarios give a competitive advantage to the road charging operator if other providers do not have access to the on-board unit.

**(2) (A lack of) concertation and effective cooperation among stakeholders**

- **No clear vision**: There is no clear European vision on how to make best use of the ITS tools to achieve the many EU policy objectives (transport, environment, energy, industry, etc.) and who will lead the deployment in certain areas (private or public sector).

- **Lack of a strong platform for concertation and cooperation**: ITS are a complex area where many stakeholders have to work together and to agree on synchronised actions (investments) in order to successfully launch new services and applications. A strong framework for the necessary concertation and cooperation between stakeholders is missing at the moment and organisational barriers still exist.

- **Limited awareness of the potential benefits of ITS**: Public authorities and decision-makers are not fully aware of the potential benefits offered by ITS, especially of the fact that ITS constitute a valuable tool for solving or alleviating mobility-related problems. They lack knowledge (especially at senior level) and are not driven by the need to make economies of scale and create synergies: when needed, solutions are simply bought. As a result applying ITS is not seriously considered as a substitute for today's commonly accepted solutions for solving bottlenecks, e.g. expanding or upgrading the

infrastructure. Over the many years it will take to adapt the infrastructure, full use will not be made of the currently available road capacity and many hours will be lost in unnecessary congestion. Initial deployment led by the public sector, considered to be a major trigger for private sector initiatives and developments will remain fragmented.

**(3) Unsolved privacy and liability issues**

- **No clear rules of legislation on privacy of data**: ITS implicitly require collection and exchange of (traffic) data, partly sensitive in terms of privacy policy, such as pay-as-you-drive insurance schemes, eCall, road charging etc. As such consumers will remain sceptical as to the added value of ITS applications and remain reluctant to buy or invest in them themselves.

- **Unclear distribution of responsibilities, absence of agreements on service ownership:** most ITS applications or services rely on integration of data to provide assistance to the user or even take over control from the driver in critical situations (e.g. in-vehicle systems such as emergency breaking, crash avoidance systems, etc). In the absence of clear responsibilities for the provision, sharing or re-use of data and components, and liability in case of failure, suppliers will remain very prudent and potential customers will remain reluctant to purchase.

*3.1.2. How are ITS applications domains affected by the problem drivers?*

The problem drivers are affecting the application domains mentioned and hindering their uptake as follows:

(1) support for **traffic management and the interconnection of transport modes:** the lack of **interoperability** of traffic management systems, developed at local or regional levels, and specific to one transport mode, prevents the use of existing ITS infrastructure across regional domains or borders or across transport modes. This slower or reduced uptake is worsened by the **lack of cooperation and concertation** among stakeholders: creating the conditions for interoperability of the system or continuity **of the services is therefore very difficult. In addition, the necessary exchange of traffic data requires legal** certainty on privacy and liability issues

(2) fight against **congestion on EU freight corridors and in cities:** the development of traffic forecast models to promote load optimisation mechanisms, and support for deployment of city-logistics and e-freight, are only meaningful when the implementation of this load optimisation is not hindered by a **lack of interoperability of the traffic management interfaces, for example**. Likewise, addressing congestion on EU corridors requires effective data exchange mechanisms: their development and uptake must be guaranteed by **effective cooperation** among network operators, and **data accuracy and reliability**

(3) promotion of **co-modality:** the provision of dynamic multi-modal door-to-door travel information requires data or information across different modes, i.e. from different sources or databases. It will be difficult to build such systems without addressing their **interoperability** or that of their interfaces. A **lack of cooperation** and concertation will hamper the development of such systems.

(4) **safety & security of commercial transport operations:** the implementation of secure rest areas for hauliers (resting and driving times), for example, requires access to the appropriate ITS system, and relies on common or at least **interoperable on-board vehicle platforms**. The security measures required must comply fully with the **data protection** provisions of the relevant EU directives

(5) improvement of **road safety:** the deployment of safety enhancing systems, such as collision avoidance systems, is currently rather low and usually offered as an "extra". An improvement of the situation could be expected as soon as **the interoperability** of the underlying technology or system is ensured (e.g. standardisation efforts on eCall are on-going), and a sufficient level of **concertation and cooperation** among stakeholders is achieved (e.g. infrastructure providers need to agree with vehicle manufacturers on the data exchange mechanism);

(6) provision of more reliable **Real Time Traffic and Travel Information** (RTTI) services: the lack of "seamless" traffic information on international journeys is a problem. **Insufficient cooperation among road authorities** on cross-border issues means they do not exchange enough traffic and incident data. There are mainly organisational barriers and outstanding liability issues which hamper the uptake of such "seamless" RTTI (e.g. absence of agreements on the provision and use of data between private and public stakeholders and no clear liability in case of failure).

(7) **efficiency of road transport and logistics operations:** logistics operations often use specific ITS solutions across their fleet to implement their "eFreight". However, whether for tracking and tracing or for transport efficiency, they need to exchange data with infrastructure providers. **Lack of cooperation** with other stakeholders, notably on the liability aspects relating to the exchange of reliable data, constitute a barrier to the uptake of ITS solutions.

*3.1.3. Relevance of ITS to (transport) policy and related objectives — why should the EU act?*

(1) As highlighted before, ITS clearly demonstrate a potential to support achievement of (transport) policy objectives, on condition that they are rolled out in a consistent, harmonised and synchronised way all over Europe. EU intervention is therefore required to guarantee interoperability, to ensure continuity across borders and modes, and to foster synergies (implying cost reductions) to be obtained for both public and private applications and services.

(2) The following transport policies and application areas will clearly benefit from a supra-national approach:

**Traffic management services** (tools for reducing congestion, pollution and accidents)

These services typically deal with cross-border, interoperability and standardisation issues:

- **Little cross-border traffic management**: Traffic management is mainly done at local, regional and national scale and seldom cross-border between neighbouring countries. Better coordination between neighbouring national or regional road authorities and interlinking of their respective traffic control centres, rerouting on long-distance corridors, could bring considerable benefits to road users, especially international hauliers.

- **Urban traffic management**: fragmented use of computer control systems for urban traffic control because of lack of open systems; this increases the price and limits the choice of city authorities especially when looking to expand basic systems.

- **Inappropriate instruments for demand management / access control:** several public authorities are interested in introducing charging schemes for the better use of their networks, and limiting traffic demand or controlling access on specific parts of it (including cities). Systems based on different technologies are being introduced in a number of cities but they are not flexible enough (e.g. London and Stockholm: only cordon pricing: once inside the city, no limitation in the number of km driven). If a more harmonised system could be developed, their prices would come down and they would become more affordable for small and medium-sized cities, leading to considerable gains in congestion and pollution reduction. The (ongoing) definition of a European Electronic Toll Service (EETS)[13] will be pursued and kept to a strict minimum, losing potential synergies of EETS with other applications and the setting-up of an integrated (European-wide) mechanism for mobile payment. As a result, the implementation and operation costs of dedicated charging schemes and city access strategies will remain high, lowering interest from potential new network owners and cities, whereas customers will have to live with (high costs related to) proprietary solutions.

**Traffic and travel information services (RTTI):** (tools for reducing congestion, pollution and accidents)

Launching of such services should be left to the market and to national/regional/local transport authorities, but common issues regarding interoperability and seamless operation of the services cross-border nevertheless justify EU intervention — e.g. the human-machine-interaction for presenting the information to the driver, which affects personal safety and cannot be tackled by the Member States individually; or the requirement to arrive at a common EU approach to guarantee safe use of ITS equipment in vehicles.

- **Access to data, enhanced monitoring and use of latest available information**: ITS are by definition based on data. Typical areas include road infrastructure and works data, circulation plans, traffic flow parameters and forecasts, but also public transport data, access restrictions and opening hours of terminals or industrial plants. Data can be static (public transport networks and schedules) or dynamic (actual travel times, occasional congestion). For

[13] Directive 2004/52/EC.

the moment this type of data is spread over public and private actors and the coordination and data-sharing between them is not optimal. For example traffic data collected for traffic management purposes by the road authorities are not always accessible by private information service providers. Vice versa there is no clear obligation, in cases where the private provider has detected a serious life-threatening incident, that this information be passed to the public authorities. Private service providers and in particular digital map makers often are not, or too late, informed about new traffic regulations/limitations or circulation plans, thus creating dangerous situations when using obsolete data in navigation systems.

- **Unreliable or inaccurate (dynamic) traffic and travel information (RTTI)**: traffic **information** is still given at an insufficient quality level on several road networks leading to inefficient route planning, avoidable accidents, congestion and air pollution. A particular problem is the lack of seamless traffic information on international journeys where travellers are still facing the "border effect" because road authorities in neighbouring countries do not always exchange traffic and incident data in an efficient manner. Pan-European **deployment**, common quality levels and possible harmonisation regarding operations procedures (what will be delivered?) are undermined by local initiatives and absence of Europe-wide concertation. Consumers will be confronted with the discontinuity of services they might be used to on their national or local network, and might have to face a variety of user procedures and different 'look and feel' of similar ITS services where they are provided. Multi-modal journey planners are also non-existent in many Member States, preventing the shift to more environmentally friendly transport modes for personal trips and a better interconnection between modes. Door-to-door European multi-modal journey planners are not yet operational because first national planners have to be completed and have then to be interconnected. There are institutional and organisational barriers to assembling the data from the different private and public transport operators. Special attention should be paid to disabled and elderly people as well as vulnerable road users for whom in most cases only isolated local solutions or demonstration pilots exist at present.

- **Unreliable route navigation:** there is quite good uptake of cheap navigation devices but mainly used with static road data which is sometimes unreliable due to poor collaboration between the public and private sectors in keeping digital map data up-to-date. There is also the risk of having many devices in operation in the near future with obsolete traffic and road data, as traffic regulations will change in the meantime. Several problems exist for heavy vehicles as there are no clear rules on which routes they are allowed. A Commission Recommendation[14] (2001) addressed to the Member States to define a hierarchy of roads was not sufficiently taken up. Cheap navigation devices not taking account of vehicle dimension and weight limits are sometimes used by truck and coach drivers, sometimes leading to serious

[14] 2001/551/CE COMMISSION RECOMMENDATION of 4 July 2001 on the development of a legal and business framework for participation of the private sector in deploying telematics-based Traffic and Travel Information (TTI) services in Europe.

accidents and damage to the road infrastructure. Fast take-off of navigation devices, followed by incorporation of GPS functionalities in mobile phones, will increase these problems even more.

- Complicated **Human Machine Interaction**, or inappropriate on-board use of nomadic devices (such as mobile phones and digital assistants) can create dangerous situations or distract drivers when used while driving.

- Interesting **market developments** are happening where telecom operators, digital map makers and service providers are making deals to collect real-time traffic data in order to improve the reliability of traffic information. However if traffic information is completely left in the hands of the private sector, traffic journeys will risk being optimised from an individual customer point of view instead of trying to find a collective optimum where the benefits for society are maximised. There is also the fact that the dividing line between traffic information and traffic management, the latter being the responsibility of the road authorities, is very vague. There is a risk of mismatch between messages given by in-vehicle devices and roadside signs.

- Inefficient **logistics operations, insecurity of commercial transport**: The supply side of the transport market is dominated by medium- and small-sized enterprises. While this renders the industry particularly flexible, fragmentation of the industry can make it difficult to roll out new technologies (see Fig. 2.2) because of lack of awareness and expensive non-integrated systems. Indeed, devices are sometimes too expensive because they are addressing separate applications and don't benefit from synergies between them. Commercial transport is also suffering from problems related to unavailability and/or insecurity of parking places because of the non-existence of ITS-based parking reservation and security services. Lack of information on modal choices and transport hubs hinders the creation of "green transport corridors" where goods are transported via the most environmentally friendly transport mode.

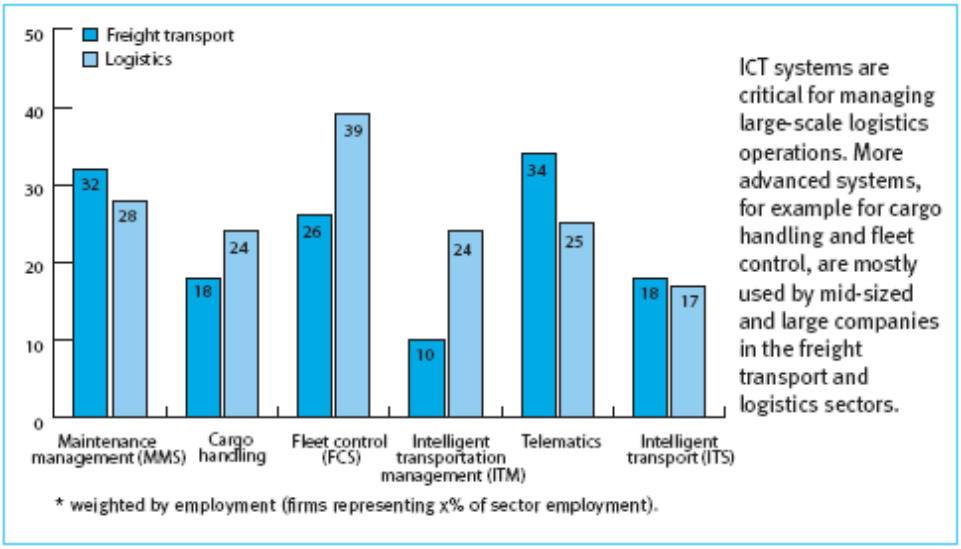



Fig. 2.3 Use of specific software systems in the transport services sectors - % of companies* using a dedicated ICT system / technology (EU-27, 2007)[15]

**Traffic safety (in-vehicle) applications and services**: *(tools dedicated to avoiding accidents or reducing their effects, and therefore non-recurrent congestion too)*

These applications relate to personal safety, but as they ideally have to be able to function in all Member States, interoperability and standardisation issues have to be tackled at EU level. The same applies to some legal aspects such as liability in case of failure, potentially leading to accidents, which are faced by all Member States and justify a common EU approach.

Typical services that are considered to be mature and that demonstrate a positive (overall) cost/benefit ratio, making them prime candidates for Europe-wide deployment, include:

- **In-vehicle active safety applications** such as collision avoidance systems can considerably improve traffic safety, but are currently (only) offered as a "comfort service" in upper segments of the market owing to concerns as to responsibility and liability: who will be liable in cases of failure or misuse by the customer; how to avoid unexpected interference of applications running in parallel; can the ITS device take over control of the vehicle in unavoidable accident situations? Low market demand keeps prices high, again reducing interest from potential customers, and possibly impairing the effectiveness of a service as well, e.g. in the case of equipped vehicles exchanging warnings on hazardous situations, where the overall impact of the application/service is strictly dependent on the number of vehicles equipped. As an overall result little progress will be made regarding core policy objectives such as road safety.

- **Intelligent Speed Management**, an in-vehicle application which triggers respect for the speed limits applicable on roads, based on digital map data, warning the driver if existing speed limits are exceeded, is recognised to be

[15] eBusiness watch 2008 (www.ebusiness-watch.org/key_reports/documents/BRO08.pdf).

very effective even in its 'basic' version (= purely informative). However uptake has been slow due to missing road data or incomplete periodic upgrade of speed limits displayed. In some countries it is very difficult to gather all data from the different administration layers (towns, regions, departments, national roads etc.) The system is applied in Sweden in all state-owned vehicles, and provided as an option in the higher end of the market — but only operational on a few parts of the road network, in some EU countries. The applications typically build on network information carried onboard and triggered by satellite positioning signals. Extensive testing in field trials including analyses of user acceptance and possible deployment schemes has been organised in various Member States, but though the car industry is slowly offering the application, deployment remains fragmented. The application and its effects are however of great importance since speeding is still a very important cause of accidents and has a clear correlation with their severity. Without Europe-wide coordination and quality control, the good functioning of any application in this field will depend on local (national) initiatives, and there is a risk that customers, increasingly relying on such support, will be confused when arriving in areas where the information is less reliable or absent.

- **Emergency call or eCall**: was initiated by the private sector (automobile industry) but relies on wider cooperation among key stakeholders for real operational use. Ongoing discussions on the overall service chain, the institutional framework (who will handle the incoming messages), the overall benefits and the related necessary investments (who will/ should pay for safety) are seriously affecting the initial timeline and resulting in postponement of operational deployment;

- **Pay as you drive**: a service that aims to link the cost of the insurance premium to be paid to the profile of the user and the journeys actually undertaken. The service is said to provide a solution for people confronted with high 'classical' insurance premiums — especially younger, inexperienced drivers if they voluntarily agree not to take the wheel during risky weekends, and accept to be checked for not infringing traffic rules (in this case: speeding). In the UK, a trial was abandoned after 18 months because of too few subscribers. Potential customers were reluctant to have a tracking device installed in their car on concerns of data privacy, even with written confirmation that the data collected were used only for checking appropriate driving. In the absence of an 'affordable' insurance contract, some drivers continued to drive uninsured.

**Other policy objectives that will benefit from a broad harmonised roll-out of ITS:**

- **(city) logistics and e-freight** (= the real-time, paperless handling of all processes related to the movement of goods): ITS include key applications aiming at minimising paperwork and unproductive repetitive processes, lowering costs and making our enterprises more effective and therefore more competitive;

- **innovation**, by stimulating cross-border knowledge transfer on effective deployment, cross-fertilisation and novel add-on services. In addition the ITS

market itself will benefit from harmonisation and standardisation efforts, while synchronised actions will lead to coordinated deployment and shortening of time to market for new services (reducing the need for venture capital);

- the expansion and improvement of the **European transport infrastructure** and the **completion of priority cross-border projects** — by providing a sound basis for appropriate and interoperable infrastructure pricing systems;

- the encouragement of a **sustainable use of resources** by strengthening synergies between environmental protection and growth — especially by promoting the internalisation of external costs, and providing the instrument required for this;

- an increase of the **budget for R&D**, in particular by private business, by providing better framework conditions for the exploitation and rapid market take-up of innovative (ITS) solutions.

## 3.2. What happens if nothing is done?

Leaving the situation unchanged would lead to a stagnation or even deterioration of the current conditions ruling the deployment of ITS, resulting in an unchanged low level of market take-up and making it hard to achieve key (transport) policy objectives and, indirectly, to contribute to objectives regarding (the tackling of) congestion, road safety and environmental nuisance.

### *3.2.1. Risk of fragmented deployment of ITS*

Instead of a coordinated approach to ITS there would be more *ad hoc* voluntary agreements (if any), fragmented legislative work in individual Member States and isolated deployment initiatives, leading to fragmented roll-out of ITS. This would endanger subsequent harmonisation, or would lead to lengthy processes for interoperability (as the European Electronic Toll Service shows).

Fragmentation on the public side would result in a slow market development for ITS, missing the opportunity to increase European industrial competitiveness and provide chances for exporting leading-edge technology solutions. Market prices would remain higher for the silo solutions. As a result customers would not be taking advantage of the potential of ITS for improved safety, comfort, cost efficiency and environmental impact.

If interurban and urban road transport systems remain badly connected this would limit the possibility to establish co-modality, given the lack of real door-to-door planning instruments, or to shift transport demand from roads to other, more energy- and environmentally-friendly modes.

### *3.2.2. Difficulty to achieve further EU transport policy objectives*

If no new policy for ITS is adopted, the above-mentioned problems will take more time to solve: development and deployment of ITS applications would remain slow and fragmented; public decision-makers would not be fully aware of the potential of ITS,

continuing to opt for 'classical solutions' (more infrastructure instead of optimising use and rebalancing the networks).

This will be **detrimental to several policies which the European Commission proposes to introduce for the greening of transport based mainly on the internalisation of external costs**. Indeed, these initiatives presuppose the existence of advanced ITS instruments such as interoperable electronic toll payment and demand management systems to tackle the worsening externalities problems. As acknowledged in the Greening of Transport package[16], the use of technologies is crucial to ensure the implementation of internalisation of external costs based on social marginal cost pricing. It will facilitate the implementation of differentiated charges according to location and time.

[16] COM(2008) 433.

### *3.2.3. Impact on main policy objectives regarding congestion (avoidance), road safety, environmental nuisance and security of the transport system*

(1) Continued road transport growth and its impacts

Forecasts for the period 2000-2020 see a growth of freight road transport of 55 % and of passenger road transport of 36 %, which is slightly above the general transport growth forecast.[17] From 2006 to 2020 a further increase of 40 million vehicles can be expected.[18]

Although the benefits of transport services are widely acknowledged, transport activities generate nuisances/costs not only to other transport users, but also to society in general, including the local population and future generations. More specifically, transport activities have an impact on time — private and professional — (congestion), on life (accidents), on health (pollution, noise), on energy use (consumption of energy will continue to increase) and on climate change (greenhouse gas emissions) among other things[19].

Over the past years, measures to reduce these nuisances — regulatory measures, awareness information campaigns, research projects and financial support (Trans-European Networks, Marco Polo) have been undertaken at EU and lower levels. Several economic instruments such as infrastructure charging, vehicle taxation, congestion charging, and fuel taxation have been implemented with various degrees of intensity and coverage. The use of ITS could enhance the efficiency of some of these instruments.

(2) Congestion

The density of traffic in Europe has increased over the past years and will remain. (See the IA on internalisation of external costs).

Many studies have shown the significance of congestion in some Member states. For England, the Eddington Transport Study (2006) predicted the waste of an extra £22 billion worth of time spent in congested traffic, which will reach 13 % of all time spent in traffic, by 2025. In the Netherlands, lost vehicle hours are predicted to double by 2020, which means an increase in congestion by 30 %.[20]

Moreover, projections show that congestion will remain a problem in many places. The map below shows the evolution of bottlenecks in EU25 in 2020.

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17 ASSESS study for the mid-term review of the EC 2001 transport White Paper, “Keep Europe moving”, 2006.

18 ProgTrans, European Transport Report 2007/2008.

19 The evolutions of these nuisances have been analysed in the impact assessment on the internalisation of external costs. SEC(2008)2208.

20 European Conference of Ministers of Transport (2007): Congestion: A global challenge; CEMT/ITF(2007)6.

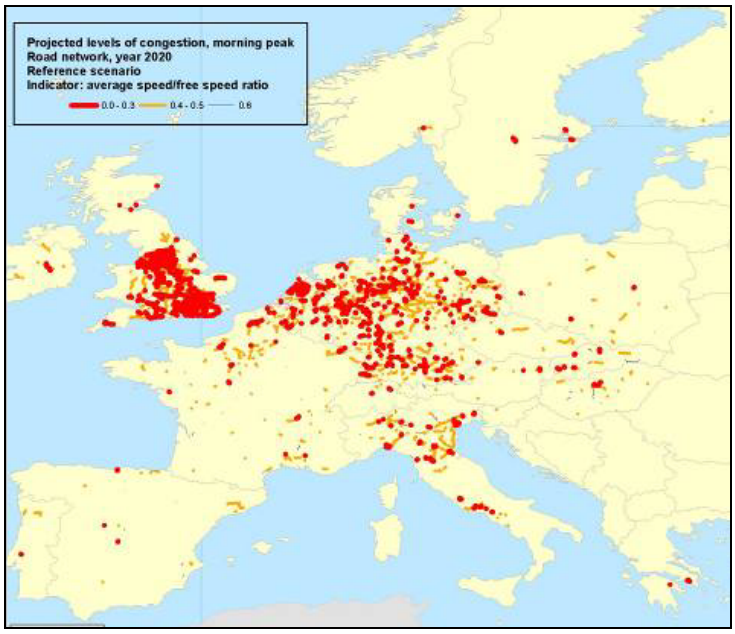


Fig. 2.4 Projected levels of road congestion (morning peak) in Europe in 2020. The congestion indicator provides the ratio between average speed and free speed. The lower the ratio becomes, the higher the congestion is. (Source: JRC/IPTS 2008; TRANSTOOLS, Impact Assessment on the internalisation of external costs.)

(3) Accidents/ Road Safety

Road fatalities will be further reduced. But at the present rate, road deaths in the European Union in 2010 are likely to stand at 32 500 which would mean that the target of 25 000 (set in the EU Road Action Programme) would not be achieved.[21]

Targets set by the Transport Policy White Paper of the European Commission of 2001 in the area of Road Safety will be missed, as insufficient use will be made of proven safety-enhancing technologies and in-vehicle applications.

(4) Air pollution and greenhouse gas emissions

If nothing is done, $CO_2$ emissions from transport overall are expected to grow a further 15 % from 2010 to 2020.[22]

Moreover, air quality in some cities and other sensitive areas does not meet the limit values set by European regulation, and has a major negative impact on human health and nature.

Urban areas are especially affected, since urban traffic generates 40 % of $CO_2$ emissions and 70 % of other pollutant emissions from vehicles.[23]

21 COM(2006)74, European Road Safety Action Programme Mid-Term Review.

22 European Environment Agency: Climate for a transport change. TERM 2007. EEA Report 1/2008.

23 European Parliament Communication 20080307 IPR 23284.

(5) Security

If no specific measures are taken, passengers will continue to suffer from lack of security on public transport, road hauliers from stolen cargo and lack of security on parking places. Insufficient attention to data security will hinder the uptake of in-vehicle active safety systems.

### 3.3. Who is affected

First and foremost all road **transport users** would suffer from more congestion and accidents. The **logistics and transport industry** and their commercial drivers will lose productivity because of a suboptimal operation of the road network. Road safety will be negatively affected by widespread and uncontrolled use of in-vehicle devices and applications: in the absence of any rules or prioritisation, drivers may be distracted by services running in parallel on separate 'on board devices'. Travellers will not be able to plan in an efficient way multi-modal journeys throughout Europe and road hauliers will be still confronted with lack of security and crime.

But also **society at large** will be affected by the negative environmental impact caused by road transport.

If prices for ITS applications, here especially for in-vehicle telematics, remain high there will be a social effect. Today these advanced safety and comfort systems can be found mainly in higher-priced cars. **Middle and lower-income classes** would not profit from any advances if applications are too expensive.

The **European industry involved in ITS** (car industry, telecommunications, information technology, map makers, etc.) will have difficulties to stay competitive on the world market.

### 3.4. EU right to act and principle of subsidiarity

Three conditions determine the EU's right to act:

*(1) The European Union can only act **within the limits of the powers given to it by the Treaties** and the objectives assigned to it (principle of conferral).*

In application of the Common Transport and the Trans-European Networks Policies (A**rticles 71(1), 80(1), 154 and 155 of the EC Treaty**) the EU has the right to act because of:

- lack of Community action in certain domains could significantly affect Member States' interests and will not lead to a straightforward concertation with commercial industry and conglomerates;
- lack of coordination between national, regional and local solutions
- national policies not producing the interoperable transport system that is needed for a European Union without borders. The integrity of the single market must be ensured so that national solutions are not developed and implemented in different ways throughout the EU.

*(2) If the problem falls under a competence shared by the Union and the Member States, the Commission needs to show that the **problem cannot be properly solved by the Member States** (subsidiarity: necessity test) and the **objectives can be better achieved by the Union** (subsidiarity: added-value test)*

The proposed policy options respect the principle of subsidiarity because they address trans-national aspects that cannot be satisfactorily regulated by Member States such as the interoperability of equipment and establishing an internal market for ITS services. First of all, the action mainly concerns a trans-national deployment to achieve European and/or harmonised cross-border services for traffic and travel information and traffic management. Secondly, if no further Union action were taken, Member States would continue to develop individual solutions, causing a fragmented technological spectrum that might endanger future harmonisation and standardisation, or would lead to lengthy processes for interoperability (as the European Electronic Toll Service shows). The further deterioration of the road traffic situation would conflict with the requirements of the Treaty (especially Art. 70 "Common Transport Policy" and Art. 154 "promoting the interconnection and interoperability of national networks"). Thirdly, action at Community level would have clear benefits by reason of effects (e.g. of common rules on liability, as well as data security and privacy) and scale (e.g. reducing the cost of ITS applications thanks to common specifications and economies of scale).

*(3) **Fundamental rights** may pose legal limits to the Union's right to take action on the problem.*

Fundamental rights will be fully respected and special attention will be paid to the protection of individual privacy in the different ITS applications, as this specifically constitutes one of the issues identified as needing to be addressed.

## 4. OBJECTIVES

### 4.1. General objective

The **general objective** of the present initiative is to create the conditions and, in particular, to put in place **the necessary mechanisms to foster the uptake of ITS services and applications for road transport and their interconnections with other modes of transport** in order to have **ITS contributing at its full potential towards the various EU policies.**

"*to ensure that our transport systems continue to meet society's economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment*".[24]

[24] Council of the European Union. June 2006. Renewed EU Sustainable Development Strategy. http://ec.europa.eu/sustainable/docs/renewed_eu_sds_en.pdf.

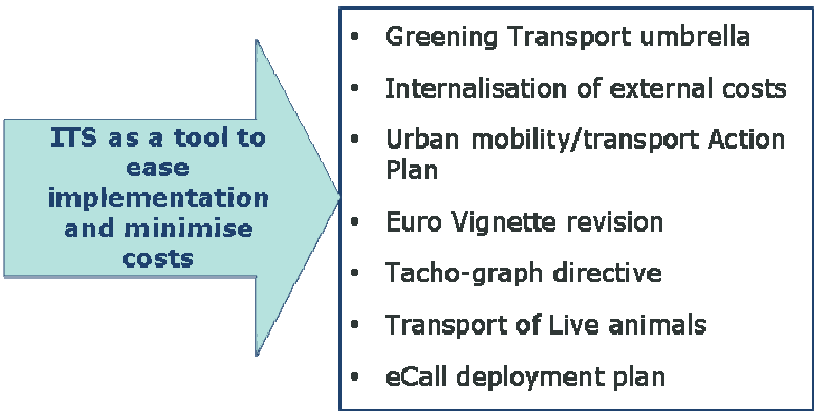


Fig. 3.1 Overview of relevant EU Transport policies or actions

- A coordinated and policy-linked deployment of **ITS for Roads will contribute to the objectives of sustainable transport, growth and jobs** mentioned in the EC White Paper on Transport Policy **and the renewed Lisbon Agenda**:

  (1) the proposal fits in with the **EU Sustainable Development Strategy** as it addresses several of the key issues identified in the 2005 review process as needing a stronger impetus.[25] The key link is the aim to make transport more sustainable (see above),

  (a) by providing instruments for effective transport demand management: extending the framework and interoperable instruments defined under the Directive on European Electronic Toll Service (EETS), in order to have it commonly applicable for all kind of roads and city access control, will facilitate cooperation among all (public or private) network operators and (local) authorities, and will enable the introduction of tailor-made schemes;

  (b) by contributing to the road safety objectives, in particular to halve the number of road deaths by 2010 (compared to 2000) through a better acceptance and wider deployment of safety-enhancing (in-vehicle) applications;

  (c) by indirectly addressing climate change and the improvement of energy efficiency, through the greening of transport and co-modality. ITS delivers the required instruments for modal choice and eco-driving, and is a key driver to energy efficiency in transport. By facilitating the optimal collection, integration and (real-time) delivery of (personalised) multimodal travel data, it allows citizens and hauliers to opt for the most energy-efficient and environmentally friendly transport mode before setting off; and once en route to opt for the less congested parts of the network and to drive at the most economic speed according to the

[25] On the review of the Sustainable Development Strategy — A platform for action (COM(2005)658 final).

actual network status and the forecast situation at their end destination. ITS also contributes to the optimisation of public transport systems and better interconnection between them, and to the enhancement of their attractiveness through the delivery of tailor-made information on possible access points, in particular where travellers enter urban areas or congested areas near their final destination.

(2) The proposed action will support several of the (microeconomic) objectives of the renewed **Lisbon Strategy for growth, jobs and competitiveness**.
Foremost it will contribute to the objective of facilitating the spread and effective use of Information and Communication Technologies (ICT) — where *"the EU has been unable to reap the full benefits of the increased production and use of ICT. This reflects the still continuing underinvestment in ICT, institutional constraints and organisational challenges to the adoption of ICT."* [26]

### 4.2. Specific objectives

**Specific objectives** related with this general objective include:

- to increase **interoperability** by standardisation of basic components, ensuring seamless access and fostering an open European ITS market based on continuity of services.

- the setting up of an **efficient concertation/cooperation mechanism between all ITS stakeholders** in order to provide a clear vision on how ITS should be deployed on a Europe-wide scale and how it should support implementation of EU policies in the field of sustainable development, competitiveness and growth and to limit or even avoid the negative effects of inappropriate deployment or use of ITS

- to **solve privacy and liability issues** related to the provision and sharing of data, and to the deployment of novel safety-enhancing applications and value-adding services

These objectives aim at improving conditions for mass market deployment all over the EU and at bringing the potential benefits of ITS services to all citizens, including vulnerable and disabled road users and elderly people, especially in the field of

- **seamless traffic management and Real-time Traffic and Travel Information (RTTI) services**, and

- **road and personal safety** — in particular by fostering a safe deployment of (autonomous) safety-enhancing applications and Advanced Driver Assistance Systems (more effective warning of imminent danger; support to drivers and vulnerable road users, faster response to accidents)

[26] Integrated Guidelines for Growth and Jobs (2008-2010) (COM(2007) 803 final).

## 5. POLICY OPTIONS

### 5.1. Policy Option A (baseline scenario): no additional new action

This policy option (no additional new action) does not consider any new proposals — such as concentrating efforts on certain existing actions or enhancing concertation in current activities in addition to what is ongoing or planned.

Today's approach is continued, consisting mainly of bottom-up research, little emphasis on connecting deployment to research results, fragmented efforts to align stakeholders' views or to concentrate their efforts and limited knowledge and awareness, in particular at decision-making level in the Public Sector.

This policy option includes financial support for research and development activities and (in a limited way) for deployment, but little coordination between the public and private sectors and among Member States. Standardisation, suffering from the absence of public authorities' representatives in the standardisation working groups, will not sufficiently stimulate Europe-wide coordinated deployment or the creation of markets. The situation likely to arise by the time horizon in question (2020) takes into account following (proposed) measures by the Commission spread over all ITS application and service areas without prioritisation:

- ongoing research as part of the 7th Framework Programme and specific calls
- continuation of standalone initiatives, focusing on well-defined applications or addressing specific issues of ITS; awareness-raising is concentrated on limited parts of the ITS spectrum, particularly addressing Advanced Driver Assistance Systems and (autonomous) in-vehicle safety applications. Existing fora include (or build on) the eSafety forum (focus on safety-enhancing in-vehicle applications and Advanced Driver Assistance Systems), the Intelligent Car Initiative (founded on support for research, harmonisation of technical solutions and creation of awareness in relation to the intelligent vehicle) and specific Committees addressing dedicated ITS services or application areas (e.g. Road Safety, the European Electronic Toll Service (EETS), etc.)
- support to fragmented deployment of ITS, e.g. with focus on the Trans-European Road Network (EasyWay project) or cities (CIVITAS), based on responses to calls for proposals: these initiatives merely build on Member States/local authorities' preferences but suffer from a rather weak global policy orientation and top-down steering, and provide few incentives for an integrated approach
- isolated and in most cases time-consuming standardisation of technology and applications
- fragmented consultation of stakeholders via fora, projects and platforms, in most cases demonstrating limited involvement, in particular of public authorities —logically hardly affecting the decision-making level.

The instruments available to the Commission's services will continue to be used *ad hoc*: financial support for research and (in a limited way) for deployment, voluntary agreements in line with the policy so far, specific standardisation mandates and (limited) regulative work where required and appropriate.

This scenario will lead to the situation described in Chapter 2 (what happens if nothing is done) and the following trends in selected application areas are expected:

- Real-time Travel & Traffic Information/ navigation devices: quite good uptake of cheap navigation devices but mainly used with static road data, and therefore often providing unreliable guidance; digital maps are hardly kept up-to-date and traffic regulations (circulation plans) are not systematically integrated. Swift introduction of mobile phones with incorporated GPS-functionalities adds to an extrapolation of the problems described. Reliability of traffic information improves when telecom operators, digital map makers and service providers join forces to incorporate information collected from travelling vehicles (= Floating Car Data), but is still no comparison with public authorities' data sources and agreed traffic policy options, with the result that journeys are optimised from an individual customer point of view. Risks of conflicting messaging from in-vehicle devices and roadside signs increase sharply

- interconnection of interurban and urban traffic management systems suffers from lack of integration of policy priorities, intensifying congestion and adding to safety problems

- innovative ITS services keep on struggling with unsatisfactorily access to data, questions of quality and continuity of service and lack of awareness. Low market take-up keeps (purchasing) costs high, even for quite mature (safety-enhancing) services which basically present a sound benefit/ cost ratio (cf. eImpact) and demonstrate a clear contribution to policy objectives, such as Intelligent Speed Adaptation[27], eCall and Pay As You Drive.

- Implementation of electronic toll /road charging schemes (devices) enjoy a strict 'add on' compliance to the EETS Directive (European Electronic Toll Service) but continue to demonstrate little customer-oriented design and support. Efforts by the Commission to develop a framework promoting on-board units compliant with all schemes wherever applied in the EU do not pay off sufficiently: markets remain fragmented, devices are hardly interoperable and suppliers promote proprietary solutions.

*Conclusion*:

- Though some success stories might emerge or continue, e.g. the surprisingly swift and broad introduction of personal navigation devices, initiatives in general are expected to result in a fragmented, and in most cases locally concentrated penetration of ITS services. Real-time traffic information

[27] Speed Alert: Harmonisation of in-vehicle speed management applications (EC Grant agreement, May 2004- June 2005).

services will develop but more focused on individual rather than collective benefits;

- Outstanding legal/juridical implications remain unsolved or are addressed in an isolated way, and negative impacts due to inappropriate use can hardly be avoided — cf. the widespread use of navigation devices in the absence of any framework, leading traffic to vulnerable and often non-equipped parts of the road network such as city centres, causing congestion, environmental problems and adding to unsafe situations;

- Product and service development continue to suffer from problematic access to content and lack of synchronised actions by key stakeholders — making synergies difficult to obtain and keeping prices high;

- As an overall result enterprises will remain reluctant to invest and develop, customers will hesitate to buy and ITS will not be able to demonstrate its full potential, nor support achievement of policy objectives.

### 5.2. Policy Option B: Overcoming specific problems by concentrating on enabling actions and application fields, indirectly supporting development and wider deployment of ITS services

*Description*:

Policy Option B aims at improving ITS uptake by addressing key objectives through the following **priority action areas:**

- the definition of a **functional open in-vehicle platform** allowing the re-use of crucial components (communication technologies, positioning, processing power and Human Machine Interface). Such a platform will permit synergies and reduce the cost of introducing and operating ITS services; it should also guarantee access for the public sector and applications of public interest. This action will facilitate the *integration of the vehicle into the transport system* and support the introduction of cooperative systems in the longer term, by standardising the exchange of data between the infrastructure and the vehicle, and between the vehicles themselves. It includes further support for broader take-up of (autonomous) *safety*-enhancing in-vehicle applications and will support the implementation of advanced and flexible solutions to improve *security* of transport operations (effective tracing and tracking methods for goods, reservation of secure rest areas, etc.);

- the establishment of a solid European concertation and coordination framework on ITS between Member States and industry: this concertation or **High Level Group** would constitute a forum for all representative ITS stakeholders (EC, MS, Regional and Local Authorities, industry players) tasked with providing *recommendations* on options to be taken and discussing *guidelines* relating to ITS deployment;

- the definition of a framework for optimised use of **road and traffic data** (including local traffic regulations and circulation plans) and of key issues concerning the reliability and the management of traffic and travel

information to be addressed by relevant public and private stakeholders. Key data will become available to all stakeholders in agreed or even standardised formats. The organisational framework and the rules of the game will be made clear for everybody, avoiding inappropriate use and reducing costs. Stakeholders will see the benefits of cooperation and the market will explore new opportunities for developing new services or adding value to existing ones;

- the development of a framework for the **continuity of ITS services** and related information flows at **interfaces between interurban and urban transport**, in relation to passengers and freight. This topic addresses the virtual borders between neighbouring operators and operating environments, directly supporting the seamless delivery of services. By exchanging experiences and data, and connecting equipment and control lines, operators will improve performance of their operations, lowering costs and better addressing customers needs;

- the resolution of **data security** and protection, **privacy** and **liability issues** hindering the uptake of certain advanced ITS equipment and services. These issues have been identified as being core to the current slow uptake of ITS: in the absence of clear rules and responsibilities, neither providers nor customers are willing to invest or buy. Though the whole ITS ecosystem is affected, issues relating to deployment of in-vehicle applications, and (autonomous) safety-enhancing ones in particular, need to be addressed first.

The action areas targeted under Option B are considered to constitute or affect the fundamental building blocks required for the deployment of Europe-wide ITS and to offer the maximum potential for synergies.

All five action areas are considered to be of enabling or 'horizontal' nature. Achieving progress will directly contribute to the objectives and will indirectly support development and deployment of applications as part of the priority ITS domains which were identified previously during the stakeholder consultation (see 1), as indicated in the table below:

| | | **Action Areas** | | | | |
|---|---|---|---|---|---|---|
| | | Functional open platform | High Level Group | Road & Traffic Data | Continuity of Services | Data security, privacy & liability |
| **Priority Application Domains** | Traffic Management | + | ++ | ++ | ++ | + |
| | Congestion (corridors & cities) | +/0 | +/0 | ++ | ++ | 0 |
| | Co-modality | + | + | +++ | ++ | +/0 |
| | Safety & Security (Commercial transport) | + | ++ | + | ++ | ++ |
| | Road Safety | + | ++ | ++ | ++ | ++ |
| | Travel Information (RTTI) | +++ | + | +++ | ++ | + |
| | Efficiency | ++ | 0 | ++ | + | + |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Logistic Operations | | | | | |

Option B will result in an agenda for measures addressing technical, operational and organisational bottlenecks that directly influence the business model for ITS services and applications. By tackling these bottlenecks, it is expected that the market will accelerate the development and provision of innovative and mature services, at lower production and operation costs and with higher quality. Customers will better appreciate and be convinced of the potential and added value of ITS and become less reluctant to purchase and use, allowing ITS to contribute at its full potential to the achievement of policy objectives.

Though all five areas were considered to be of equal importance, the establishment of a **reinforced framework for concertation and coordination is central, because** leading to a common vision on the deployment of ITS in Europe and resulting in synchronised actions.

*Relevance of chosen priority action areas:*

Identification and definition of these five main priority action areas took place during the consultation process (see 1 — Consultation of stakeholders), by comparing their potential effect (= the impact of tackling the dedicated topics described) on the key objectives, being interoperability, cooperation, solving liability issues and boosting the take-up of ITS in Europe. This repeated discussion did however not result in a clear hierarchy of priorities: since all five were considered to be crucial for at least one of the priority ITS application domains identified, none of them could be removed or 'delayed' without affecting the outcome of the whole process.

This analysis should be unsurprising as it is in line with previous considerations regarding the complexity of the ITS ecosystem and related value chains, and the need to establish close cooperation among stakeholders. Once the key issues identified have been solved or clarified, stakeholders will be able to act and cooperate better on individual solutions and applications. Improved consultation and top-down steering will encourage synchronised action, where Member States will decide in a concerted way what (national) investments and projects should be realised and the Commission services can concentrate on issues that need supranational, Europe-wide solutions and on setting up supportive initiatives with a wider scope. These include targeted financial support for research, tests or pilots; standardisation mandates; voluntary agreements (based on the work in the ITS High Level Group) and regulatory work where required on identified targets and global tax or incentive schemes, for example.

*Conclusion*:

Policy Option B will address horizontal issues directly and indirectly affecting the take-up of ITS, with a clear focus on concertation among all stakeholders involved. It is expected that top-down steering will be constructive and effective, resulting in synchronised actions that will allow individual ITS services to penetrate the market in a more harmonised and better-supported way than in the baseline scenario.

Option B will make optimal use of the instruments available to the Commission's services by delivering underpinned requests for standardisation and identifying and prioritising requirements for financial support and legislative work.

### 5.3. Policy Option B+: Option B extended with a comitology procedure

*Description:*

Option B+ builds on the same measures as introduced under Option B but formalises the concertation and coordination aspect by replacing the ITS High Level Group with

- an **ITS Comitology Committee,** constituted of Member States' representatives to assist the Commission in adopting specific measures in well-defined areas (corresponding to the basic enabling measures of Option B) via a comitology procedure, and

- an advisory group constituted of private sector key representatives, providing input and serving as a consultation body to the Commission.

Under Option B+ the Commission will be able to effectively steer and manage processes leading to a concerted, policy-driven Europe-wide deployment of ITS:

The Commission, assisted by the **European ITS Committee (EIC)** would

- exchange information with Member States and develop an overall vision on ITS deployment in Europe

- oversee the development of harmonised guidelines, specifications and standards for ITS and cooperative systems; the content of strategic components such as the eSafety and EasyWay vision and road maps, and the strategy for achieving continuity of European ITS Services on the Trans-European Road Network

- *within its mandate* and *when necessary* decide on specific actions in the areas of:

  the establishment and further development of technical requirements, guidelines, specifications and conditions to ensure a harmonised, interoperable and open development and deployment of ITS for Roads in an integrated and coordinated manner, in particular in the following areas:

  – The optimal use of road, traffic and travel data

  – European road traffic management, including interaction with other transport modes and with urban transport

  – Continuity of ITS services for freight and passengers, including those facilitating the interconnection of interurban and urban transport systems,

  – Road safety and security

  – The definition of an open functional platform for (in-vehicle) ITS Services

– Data security, individual data protection and liability

– The mechanisms ensuring European ITS concertation and coordination

– type-approval of ITS terminal and network equipment and software applications — where required by the relevant specifications and necessary for environmental, efficiency (and energy efficiency), safety or security reasons.

The EIC will not deal with topics addressed by other comitology committees, e.g. those responsible for EETS (the European Electronic Toll service Directive 2004/52/EC), digital tachograph (Council Regulation (EC) 2135/98) and vehicle type-approval (Directive 2007/46/EC). However, if synergy could be obtained by integrating devices or services falling under the responsibility of different committees, common meetings between them could be arranged.

Concrete legislative proposals to be decided by the Commission using the comitology procedure will however be underpinned by an additional and specific impact assessment.

In parallel with the ITS Committee an advisory group constituted of senior ITS stakeholders would be created. This forum would provide a solid framework for concertation & cooperation with industrial players, and for reflection and discussion on industrial and provider-based requirements and priorities. It should address all aspects and domains related to ITS deployment, and advise the Commission on business and technical aspects of the deployment and use of ITS in the European Community. The advisory group would bring together about twenty representatives of relevant ITS service providers, associations of users, transport and facilities operators, manufacturing industry, social partners and professional associations.

*Relevance*:

In addressing the five enabling actions defined under Option B and setting up a comitology committee, the proportionality principle is fully respected:

– the priority actions result from a long filtering procedure reducing the many possible local actions to the bare minimum needed to make progress and to meet the specific objectives;

– mandating the Commission, assisted by the Committee, to decide in specific areas (where necessary) will be strictly limited to those areas that require a supra-national approach and common guidelines and specifications in order to arrive at Europe-wide seamless traffic management, information and in-vehicle safety systems and services.

*Conclusion*:

Policy Option B+ builds on the actions introduced under Option B and introduces a comitology procedure, including the constitution of a European ITS Committee to assist the Commission in dedicated areas of action. Option B+ provides the best chances for moving on rapidly, and minimises the risks of not delivering the expected results, by giving the Commission the possibility, after closely consulting all the stakeholders, to put forward proposals for legislation via comitology. Under such a scenario the Commission

will be able to make a difference *where necessary* by putting all actors under pressure to work together and to (voluntarily) agree on common approaches, synchronised actions and issues to be standardised in the short term.

# 6. ANALYSIS OF IMPACT

## 6.1. Methodological Considerations

### *6.1.1. Approach*

This impact assessment is being conducted for an Action Plan, a broad policy-defining document setting an **agenda** and highlighting **priority areas** and **key issues** to be addressed. It is therefore not possible to carry out a full analysis of the concrete measures at this stage. Concrete measures are already proposed in some cases, but will be subject to further analysis in concertation with the major stakeholders concerned. Under the proportionality principle the assessment of impacts is also quite broad and at this stage in most cases preliminary. It only partly relies on detailed quantitative data.

All options have been compared against the expected development under the reference scenario A, which represents the trend if nothing additional is done.

For the assessment of the policy options a **multi-criteria analysis** has been used, whereas effectiveness has been estimated against achievement of progress against a number of **evaluation criteria** that reflect both the direct and indirect impacts of the policy options:

(1) the **direct impacts** of any action to accelerate the deployment of ITS are addressed by the following criteria

- **enhancing interoperability** and **continuity of service**
- **strengthening concertation and cooperation among stakeholders**
- **removing uncertainties regarding privacy and liability** and defining the responsibilities of the actors involved

(2) the **indirect economic, social and environmental impacts** resulting from a faster and higher level of harmonised ITS deployment are related to support in achieving the following (transport) policy objectives:

- the economic impact: *reduction of congestion on roads, competitiveness (of industry, cost of ITS applications, innovation), consumers (prices, choices, services, protection of privacy and personal data and economic growth*;
- the social impact: *road safety, employment and security*;
- the environmental impact: *climate change, air quality and noise, energy efficiency and targets related to co-modality (passenger and freight, modal split, interconnections).*

Additionally a general cost assessment with regard to the impact on the EC budget and the consistency of the impacts (trade-offs) has been used.

The **time perspective** under each option and indicator is considered to be from short to medium-term (up to 2020). Longer-term impacts (beyond 2020) typically result from increasing awareness, the application of new technologies, the establishment of greater market penetration and/or a change in the mindset of consumers and decision-makers.

It has to be noted that this impact assessment does not attempt to assess the overall impacts of a better take-up of any of the very different ITS applications concerned. The present exercise is rather an attempt to show the **impact of possible EU measures to influence the coordinated delivery mechanism for ITS deployment**, which will then in a second step bring about the benefits ascribed to a wider deployment of ITS.

Therefore, an important additional criterion is the **timescale**, which influences the time at which positive impacts can be achieved.

The assessment is basically a qualitative assessment. All criteria have been rated on a five-point Likert **scale**: positive (+ +), slightly positive (+), neutral (o), slightly negative (–) and negative (– –). The assessment was based on results from previous EU-financed research and deployment projects, stakeholder interviews, desk research and support from external consultants (see 0.1).

A full cost-benefit assessment is not possible at this stage. This proposal mainly concerns the selection of priority areas to be addressed and different process alternatives and delivery mechanisms to foster enhanced cooperation. The concrete measures to influence deployment and the precise use of dedicated EU instruments will only be defined in a later stage. Only then can the associated costs be indicated in more detail. Consequently, a cost-benefit-analysis will be included in the subsequent impact assessments required for the concrete actions to be decided. The support of the private sector via the planned advisory forum will be useful in this respect.[28]

Globally, studies and handbooks[29] from Europe and North America show a clear cost-benefit ratio in favour of many ITS applications. A recent example is the eImpact[30] research project which assessed the impacts of intelligent vehicle safety systems. Their cost-benefit analysis shows that the majority of the twelve applications investigated are profitable from society's point of view with benefit-to-cost ratios from 1.6 to 4.

### *6.1.2. Use of TRANSTOOLS simulations*

The transport model TRANSTOOLS has been used to generate additional, quantitative input for estimating the effects of implementing the various policy options. TRANSTOOLS is a European transport network model covering passenger transport and freight, as well as intermodal transport. The selection of model features is based on policy needs addressed by the European Commission services. The instrument combines various modules including economic indicators (e.g. GDP, economic growth, car ownership, etc.) and transport-related parameters (modal split, route assignment, etc.) in order to simulate the quantitative impact of specific measures over time. The model is

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28 DG TREN plans to commission a research project to develop an assessment toolkit for ITS including a cost-benefit analysis. It is expected to start in early 2009.

29 World Road Association (PIARC) (2004) ITS Handbook, 2nd ed.; US Department of Transportation (2005): Intelligent Transportation Systems Benefits, Costs and Lessons Learned.

30 www.eimpact.eu > Presentations of the final conference 26 June 2008.

able to simulate the evolution of transport and economic development related indicators according to various scenarios, and was proposed as an indirect addition to the overall assessment of policy options in this report.

TRANSTOOLS is not qualified to assess the direct relationship between the actions proposed and the rate of deployment of ITS, which is the general objective of the ITS Action Plan. But it can be used to estimate the impact of this uptake on the transport system as a whole and on progress in achieving relevant policy objectives related to transport efficiency, safety and environmental impact.

As part of the current exercise, TRANSTOOLS simulations have been used to assess the indirect impacts on policy objectives of Option B, by comparing its expected outcome against the 'baseline evolution', the estimated evolution under the baseline scenario (Option A)

Having been introduced at a very early phase of the exercise, TRANSTOOLS simulations were run to assess the scenarios proposed by JRC, namely 'clean & efficient', 'safe & secure' and 'mobility & logistics'. A fourth, combined scenario integrates the measurement of these three scenarios. The main assumptions include lower accident rates due to further penetration of advanced safety systems (resulting from a previous JRC GALILEO study), electronic charging for trucks in most countries, urban pricing in major European capitals and lower loading times and costs (by 2 %) in ports and logistics centres. It is the scenario which most closely resembles Option B. It is however worth mentioning that all the TRANSTOOLS simulations build on specific assumptions of broader deployment of ITS and ITS-related initiatives — which, as highlighted above, does not seem to be happening with market forces alone. (cf. JRC summary report[31])

### *6.1.3. Uncertainty surrounding the impact analysis*

ITS are enabling technologies whose deployment is subject to a variety of variables (factors), e.g. maturity of technology, market acceptance or willingness to invest and to buy, and is dependent on actions being implemented in a coordinated way by various independent stakeholders. The progress of these processes is difficult to predict.

The effect of the instruments proposed in the context of this initiative, basically financial support, legislation, standardisation and support for voluntary agreements, are also difficult to assess.

The overall result of the present analysis based on qualitative expectations, where possible supplemented by quantitative elements resulting from recent market analysis, forecasts and simulations, must however be approached with a certain degree of uncertainty.

All benefits of ITS, such as reduced congestions, lower fuel consumption/costs, better reliability or improved safety enhance the attractiveness of driving. This might result in higher road transport demand both for passenger and freight (induced traffic). An increase in transport activity (pkm/vkm) would counter a part of the benefits of ITS.

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[31] JRC report on TRANSTOOLS simulations of ITS Action Plan, 3rd draft (04.06.08).

## 6.2. Impact of Policy Option A — No additional new actions (baseline scenario)

Sections 2.2 and 4.1 have described in detail the risks and general trends if nothing is done: take-up of ITS services and applications will in general remain low and in the case of in-vehicle applications, probably limited to top-class (vehicle) brands and types, and the customers who can afford these; society will hardly perceive efficiency gains in traffic management operations and road safety will hardly improve owing to an insufficient penetration rate of personal safety devices and services.

### *6.2.1. Direct impacts*

Under policy Option A, the set objectives are hardly approached:

(a) interoperability and continuity of services:

- operational deployment of ITS services is still hindered by limited and difficult access to the necessary traffic and travel data, especially across borders and different modes, and unsolved legal and liability requirements

- pan-European deployment, common quality levels and possible harmonisation regarding operations procedures (what will be delivered?) are undermined by local initiatives and the absence of Europe-wide concertation. As a result consumers are confronted with discontinuities in services they might be used to on their national or local network, and they might have to face a variety of user procedures and different 'look and feel' of similar ITS services, if they are provided at all

(b) concertation and coordination:

- markets continue to suffer from a lack of vision and concertation among key stakeholders, so there will less likelihood of concerted and synchronised actions, synergies and multiplier effects — or of related cuts in costs and risks

- concertation and cooperation among stakeholders will remain mostly underdeveloped; lack of knowledge and understanding — especially at the level of public sector entities — will hamper EU-wide deployment of ITS for roads as an alternative to building more transport infrastructure. ITS deployment needs solid investment decisions for both public and private funding. In the absence of a clear vision of the future of the European Transport policy and the role of ITS in this, uncertainties regarding the exploitation and market prospects for ITS will be kept alive whereas initial deployment led by the public sector — considered to be a major trigger for private sector initiatives and developments — will remain fragmented and not conducive to multiplier effects.

(c) privacy and liability issues:

- liability issues and use of personal data differ according to the service provider, operator and Member State where the service is provided. As such

consumers will be sceptical about the added value of ITS applications and remain reluctant to buy or invest in them themselves.

*6.2.2. Indirect impacts*

Unsuccessful market take-up of ITS will make it difficult to achieve policy objectives, including:

(a) *Road safety*: low penetration of safety-enhancing applications and life-saving services will result in continued unacceptably high levels of road fatalities in the EU as a whole, generating high costs for society (medical, police intervention, material damage, etc.)

| |
|---|
| In 2004, Germany alone estimated that road accidents created socio-economic costs of nearly €31 billion (half of them for personal injuries, half for property damage).[32] |

(b) the *Greening of transport*, focussing on an enhanced shift to more energy-efficient and environmentally-friendly passenger and freight transport modes, eco-driving, a reduction in the need for transport resulting from optimal loading of vehicles and more effective route choice. These goals are endangered and congestion will continue to grow on major (road) transport axes and in conurbation areas (interurban/urban interfaces); journey times will increase and become even less reliable, affecting all users of the road transport system.

Other effects of Option A following from TRANSTOOLS simulations indicate:

- road traffic congestion, expressed as congested vs total driving time, to increase from 24.3 % (2007) to 24.9 % (2012) and 28.6 % in 2020 for EU-27;
- external costs of accidents (road, rail and inland waterways combined) to increase from €128.6 billion (2007) to €144.3 billion in 2020;
- fuel consumption (Mtoe) and emission of $CO_2$ (Mio tonnes) to increase by 15 % in 2020 (EU-25);
- **total external costs** including congestion, accidents, noise, air pollution and climate costs as defined by the External Costs Handbook (published by DG TREN in 2008)[33] to evolve from €161.8 billion in 2007 to €193.3 billion by 2020.

### 6.3. Impact of policy Option B: Overcoming specific problems by concentrating on enabling actions and application fields, indirectly supporting development and wider deployment of ITS services

Policy Option B is based on a reinforced framework for concertation and coordination, and focuses on 'horizontal' enabling actions:

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[32] Bundesanstalt für Straßenwesen (BASt), BASt-Info 2/2006.

[33] CE Delft et al. (2007): Handbook on estimation of external cost in the transport sector; available under http://ec.europa.eu/transport/costs/handbook/index_en.htm.

- Definition of an open functional platform for (in-vehicle) ITS Services
- Cooperation among stakeholders
- Access to road and traffic data, optimisation of data exchange, rules of the game
- Continuity of services across borders and modes
- Data security, privacy and liability issues

The problems and bottlenecks addressed under Option B have been identified as directly affecting the key objectives and therefore as core to the overall slow uptake of ITS. By tackling these 'horizontally' way, that is, by approaching similar problems encountered in various application domains in a coordinated manner, actions can be set up in the most efficient and probably most effective way, limiting the use of resources at the EC level and for the whole ITS community.

The key message is that we must seek a multiplier effect with the instruments available to the Commission's services and obtain synergies; central to this option are the establishment of a modular approach to ITS deployment based on an **interoperable on-board telematics platform with open functionalities** and the creation of a **High Level Group** covering all aspects of ITS deployment:

*6.3.1. Direct impacts:*

The horizontal actions address key issues relating to the deployment, provision and uptake of ITS services; however they do not address the specific objectives one by one. The following analyses will clarify what each action covers and how they will contribute to the set objectives:

(1) Definition of an **open functional platform** for (in-vehicle) ITS Services:

The establishment of a modular approach to ITS deployment, including an interoperable telematics on-board platform with open functionalities and conceived for plug-in integration of nomadic devices will enhance interoperability and provide new opportunities, synergies and cost reductions.

(a) Need for an interoperable, modular approach:

During the last 10-15 years the telematics market has offered a still growing amount of in-vehicle telematics applications and services, in most cases presented as 'standalone' applications. These applications typically make use of selected location positioning or communication methods, often rely on proprietary data protocols and transmission interfaces and present a variety of Human Machine Interactions (HMI). Although this development started in commercial vehicles (fleet management and e-freight systems), the market for devices with navigation or traveller support functionalities has expanded rapidly.

This action focuses on a universal platform with open functionalities, equipped with a safe interface (command functions, screen) and offering an easy plug-in and connection for mobile devices.

This modular concept will include positioning, communication, processing and possibly identification capabilities; the re-use of functional components and installed equipment will lead to major savings for suppliers, service providers and customers.

The market alone cannot be expected to deliver fast and coordinated integration of devices with these functionalities without EU cooperation and legislation.

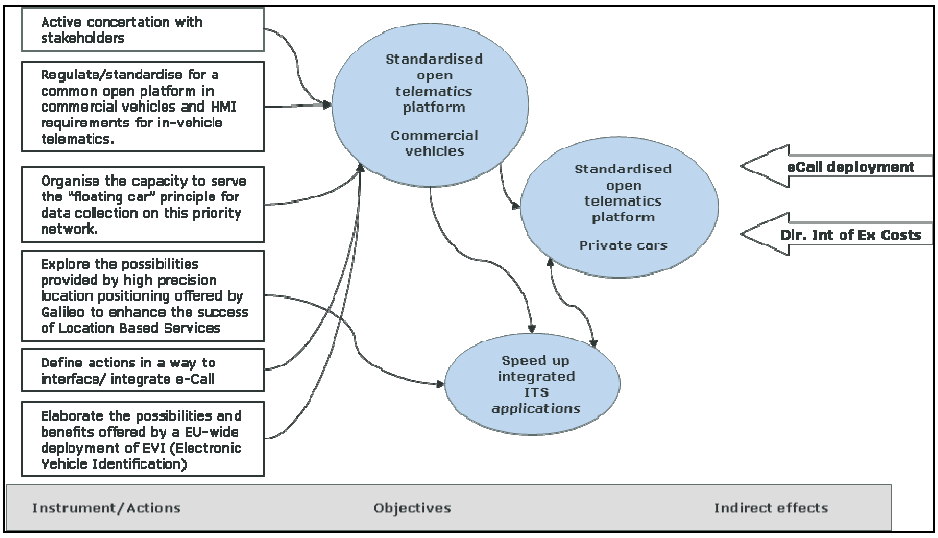



Fig 5.2: Relationship between actions and objectives (open platform)

Specific targets under this action therefore include:

– the development of standardised functionalities related to an in-vehicle platform and its interoperability and interconnection with the infrastructure, requiring functional *characteristics* to be defined and the functional *design* of existing applications and services to be taken into consideration

– measures to ensure the connectivity of nomadic devices in a safe way

– solutions for vehicle-specific requirements, e.g. a vehicle identification tag to be used for certain environmental charges or internalisation of costs linked to the vehicle, in order to exclude risks of fraud.

The platform could initially be introduced in commercial vehicles and might help later to speed up integration of ITS applications in passenger cars as well.

(b) Who will benefit?

Parallel to a generally accessible front-end device, an integrated service chain will be set up distinguishing service provision, service delivery and management of operational requirements. The concept and pilot deployment have been developed and tested in research projects (GST[34] — General System for Telematics), which addressed security and privacy issues as well. While the embedded kernel permits technically sound and safe deployment and connection to the vehicle (in order to integrate and process data from existing sensors), mobile devices can be plugged in to guarantee seamless service

[34] GST — General System for Telematics, 6FP Integrated Project developing an open and standardised end-to-end architecture for automotive telematics services.

provision through the on-board Human Machine Interaction and therefore reduce inappropriate and unsafe continued use of these.

By standardising and guaranteeing access for all parties involved — be it developers, providers, customers or public sector entities, basic costs can be reduced and competition can be enhanced:

- Developers and service providers will be able to build on existing in-vehicle components and data, lowering the cost of deployment and improving quality of the service. Continuous upgrading of services and data will be remotely processed. By having access to all equipped users they will be able to compete effectively on the basis of quality and price, to provide tailor-made services better responding to users' needs

- Customers will be able to freely select their service provider, no longer being tied to the installer (owner) of the in-vehicle device. Prices of devices and services will go down while service deployment and upgrades will be provided remotely, no longer requiring time-wasting appointments in service stations. Europe-wide seamless delivery of services is within reach, and single invoicing system will be the next logical step.

As reported in the eImpact study, a reduction of the cost of individual safety-enhancing in-vehicle applications (ISA, LDW, ACC, etc., all in the €100-250 range) thanks to synergies and re-use of components, together with better data provision and answers to liability questions, are all crucial to speed up acceptance and deployment.

- Public sector entities with access to the platform will be able to address equipped users, leveraging the effectiveness of the services provided (warning, routing advice) and allowing improvement and user-based approaches.

(c) Longer-term perspective

In the longer term this initiative will support the development of cooperative systems, building on standardised data exchange between vehicles and 'communication portals' along the roadside.

Such applications would allow faster warnings of ambient driving conditions and unexpected queues and cut costs for road operators by reducing the need for roadside-based equipment.

*Conclusion:* The direct impact of this action on key objectives can be estimated as follows:

| | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|
| Functional open ITS platform | ++ | + | 0/+ |

(2) Enhancing concertation and cooperation by setting up a **High Level Group**:

Deployment of ITS calls for effective cooperation between public and private stakeholders, with synchronised investments; the industrial and public sector's perspectives should however be distinguished:

- the **industry** is well aware of research results and potential market opportunities, but struggles with a non-obvious business case and reluctant consumers, and in some cases with issues related to protection of intellectual property, required sharing of knowledge and unsolved liability issues

- the **public sector** is not (or not sufficiently) aware of the potential of ITS to help achieve policy objectives, lacks knowledge, especially at senior level, and is not driven by the need to realise economies of scale or create synergies: in case of need, solutions are simply bought.

Feedback and analyses have demonstrated that the lack of knowledge is most significant at the level of Member States and their national and regional/ local authorities. Any measure in this field must therefore be directed particularly at the public sector, which is suffering from current initiatives being fragmented, inconsistent across Member States and unevenly matched with the various policy aims and applications.

Setting up stronger concertation is enabling: it will for example support the implementation of EU transport policies and allow other actions to become more successful.

The installation of an ITS High Level Group (ITS HLG) with representatives from all sectors, including the public sector involved, would help provide a clear vision of the future of European transport policy and the role of ITS in this. A commonly agreed road map for Europe-wide deployment would reduce current uncertainties regarding the exploitation and market prospects for ITS and will clarify and support a leading role for public sector investments. Targeted investments by the public sector are considered to be a major driving force for private sector initiatives and developments, especially where piggy-backing would enhance synergies and deliver cost reductions.

The role of the High Level Group would be

- to exchange information, best practices and cost/benefit details on ITS deployment

- to establish a general vision for ITS, and of the roles of all stakeholders

- to discuss issues hampering industry-led deployment of ITS services

- to discuss social challenges and how they can be addressed by ITS, or by revising current deployment strategies

- to discuss the joint (pilot) projects and initial investments required for long-term growth in ITS deployment

- to produce recommendations for standardisation requirements and funding..

Installing the HLG will boost the public sector's awareness and knowledge, hopefully leading to greater involvement in ITS deployment schemes. Typical measures to be considered in this field include: training and dissemination, especially to authorities and decision-makers; support for consensus building at both technical and policy-oriented levels and development of a toolkit for the assessment of ITS investments.

In addition a European database of costs and benefits of ITS early deployment projects and the establishment of an ITS infrastructure assessment procedure, as a precondition for EU (or even national) funding for building or operating (cf. ERTMS funding in TEN-T), can be envisaged.

However, since the HLG would have an advisory role vis-à-vis the EC, it is not clear if the initiative will bring together the real key players, especially from industry — what would be their interest?

Another question will relate to the mechanisms for selecting the participants, especially on the public sector side (which Member States' representatives would be most appropriate, how to deal with the other Member States)

In cases where concerted and strong action is required from the public sector, it is doubtful whether the recommendations from the HLG can be processed swiftly without further concertation among all EU members, or whether a 'soft' approach will ultimately deliver what is required.

Earlier Commission attempts to improve the uptake of ITS by 'soft' measures have failed e.g.:

- the Commission Recommendation of 2001 inviting Member States to establish harmonising requirements for traffic and travel information at national, regional and local level and to produce a categorisation of roads. This action was intended to provide a basis for allocating traffic to the most appropriate road segments, and to encourage potential synergies that should result from closer cooperation with the private sector in specific application areas. As the recommendation was not sufficiently followed, map makers were never informed about general or local traffic strategies and as a consequence many issues identified in 2001 are still open today, and have become worse since then (see 2 and 4.2) as navigation devices have become more common.

- the voluntary ITS High Level Group composed of representatives from national transport and industry ministries, which turned out to be most helpful for exchanging views but failed when it came to agreeing on clear actions to be taken or on common specifications to be adopted.

*Conclusion*: The direct impact on key objectives can be estimated as follows:

| | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Establishment of a HLG | +/- (*) | + | 0/+ (*) |

(*) the fact that stakeholders will discuss ITS-related issues will enhance understanding, and might indirectly support achievement of interoperability and the solving of privacy / liability issues.

(3) Enhancing cooperation, defining responsibilities by the establishment of a framework for **optimised collection, exchange and integration of *road and traffic data***, addressing the core of most of ITS services

Better coordination between the public authorities at all levels is a prerequisite to enable seamless traffic management and traffic information, leading to better-informed drivers, who will be able to avoid congestion and accidents.

A better integration of available content and databases will extend the functionalities of existing services and should improve their level of quality (accuracy, coverage, completeness, etc.); to complement improved access to compiled data, there should be procedures for faster upgrading of digital maps that serve as a basis for in-vehicle applications, and mechanisms to add real-time information. For example, speed information applications adjusted dynamically by integrating real-time information on traffic and road conditions (slippery roads, identified obstacles and traffic queues ahead) will be much more efficient and effective.

*Conclusion:* The direct impact of this action on key objectives can be estimated as follows:

| | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|
| Framework for road and traffic data | + | + (**) | 0/+ (*) |

(*) the fact that stakeholders will discuss ITS-related issues will enhance understanding, and might indirectly support solving of privacy / liability issues.

(**) being a prerequisite for this action

(4) Ensuring **continuity of services** *across borders and modes*

Extension of services to interfacing networks, e.g. urban/ interurban road networks or across complementary transport modes will enhance co-modality and foster the greening of freight corridors. A major prerequisite for appropriate ITS instruments providing seamless support to travellers and hauliers is real-time access to data, and agreed formats for data exchange and data integration.

*Conclusion:* The direct impact of this action on key objectives can be estimated as follows:

| | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Continuity of services | + | 0/+ (**) | 0 |

(**) being a prerequisite for this action

(5) Addressing **privacy and liability issues** linked to ITS services

This concerns especially the following ITS-related items:

- the use of shared data: who is the owner, how can the data be used/ not used; what happens if data provided cause nuisances, even accidents?
- deployment of safety-enhancing (in-vehicle) applications: risk of inappropriate use, what happens in case of failure? The action also deals with ownership of services, and aspects of security and privacy of data (exchange of data being the core of ITS).

Typical ITS applications that will benefit from solving these issues include Lane Departure Warning, Collision Avoidance and Emergency Braking Systems. Broad market take-up will lead to a drastic reduction in the number of accidents.

*Conclusion:* The direct impact of this action on key objectives can be estimated as follows:

| | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|
| Addressing privacy and liability issues | 0 | 0/+ (**) | + |

(**) being a prerequisite for achieving this action

***Overall conclusion*** *on the direct impact of the actions under Option B:*

| | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|
| **Option B** | ++ | + | + |

(**) being a prerequisite for achieving this action

*6.3.2. Indirect impact*

The impact of the 5 priority actions on achieving (transport) policy objectives is expected to be as follows:

(a) Road safety

Road safety will benefit in multiple ways:

- less risk of driver inattention: concentrating applications on a single platform with a unique, certified interface (HMI) will ensure safe control/delivery of services and in future allow services to be prioritised as a function of driving conditions (e.g. temporary inactivation of navigation assistance in critical driving circumstances)

> According to a landmark research report released by the National Highway Traffic Safety Administration (NHTSA) and the Virginia Tech Transportation Institute (VTTI), driver inattention is a leading factor in most crashes and near-crashes. Nearly 80 % of crashes and 65 % of near-crashes involved some form of driver inattention within three seconds before the event. Primary causes of driver inattention are distracting activities, such as mobile phone use, and drowsiness.

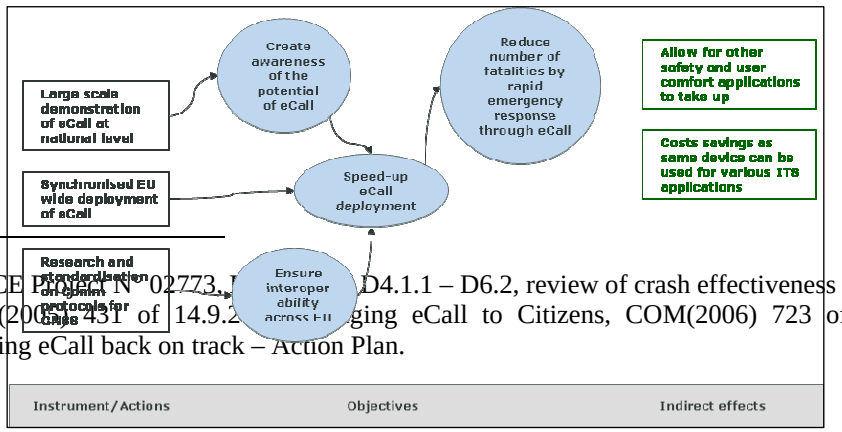
- safer traffic due to a reduction of drivers' workload, especially in the commercial transport sector

- (autonomous) safety-enhancing applications will penetrate the market more rapidly

> According to the TRACE project[35] several studies indicate the great potential of ITS to enhance safety (and environment): McKeever (1998) estimated that 26 % of fatal and 30 % of injury crashes could be prevented by a general deployment of in-vehicle, infrastructure-based or cooperative ITS systems in the US, while an OECD (2003) report conservatively predicted a reduction of almost 40 % for both categories combined. Examples of autonomous in-vehicle systems to be considered include Electronic Stability Control (ESC), Automatic Crash Avoidance (ACA), Lane Departure Warning (LDW) systems, alcohol locks and eCall (emergency call).

Take-up of safety-enhancing applications will certainly improve if there are synergies, lower costs or 'package deals': while it is not always clear if customers would be willing to pay for separate safety applications, they are more likely to consider buying combined comfort/ safety-enhancing applications (e.g. intelligent speed adaptation combined with information on black spots).

One such service that would definitely profit from a 'package introduction' is eCall[36], a safety-enhancing service proposed by the industry and the subject of a Commission communication — but still struggling with mixed interest from key stakeholders and doubts on the overall value chain:




35 TRACE PROJECT N° 02773, [illegible] D4.1.1 – D6.2, review of crash effectiveness of ITS.

36 COM(2003) 431 of 14.9.2[illegible]ging eCall to Citizens, COM(2006) 723 of 23.11.2006: Bringing eCall back on track – Action Plan.

Fig 5.3 eCall

eCall aims at reducing the number of fatalities by accelerating and supporting post-crash (medical) assistance; under the current eSafety initiative deployment of eCall is based on a voluntary scheme, expected to result in a 70 % deployment rate in new cars by 2020 (see Fig. 5.4).

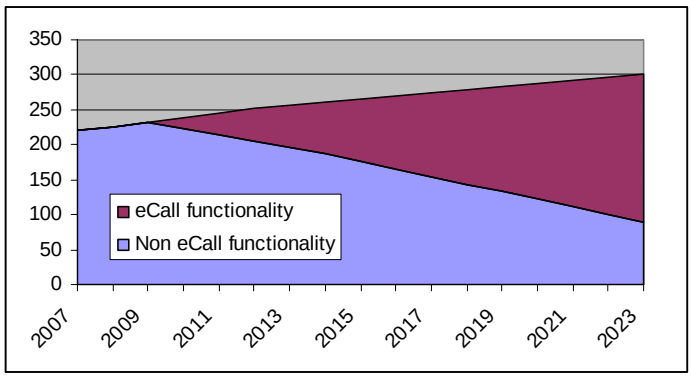



Fig. 5.4: Estimated evolution of eCall in Europe — in Mio of new cars (Source: e-Safety)

If eCall were to be deployed on 100 % of vehicles, it is expected to trigger a decrease in fatalities by 5 to 15 % across EU-27 by 2020 (2400-7477 persons), and a reduction in severe injuries by 10 to 15 % (30 000-45 000; low impact vs. high impact case). Though eCall presents a cost-benefit ratio between 1.3 and 8.5 according to a SEiSS study, it is not clear that implementation targets will be achieved. Add-on deployment on an open telematics platform drastically reduces costs and increases eCall's attractiveness; therefore such an approach should considerably speed up the implementation rate of eCall.

(b) More effective traffic management, urban mobility and co-modality for passengers:

Traffic management strategies will be more easily extended to interfacing networks, e.g. urban/ interurban road networks, across complementary transport modes, in order to enhance co-modality. Appropriate ITS instruments building on real-time data exchange will be extended across networks and modes to provide seamless support to travellers (and hauliers); consistency of messaging, thanks to optimal sharing of data and enhanced cooperation, and a set of agreed minimum rules to be respected by all players will avoid confusion and reduce unnecessary kilometres driven, reducing emissions and fuel consumption.

Dynamic information and personalised routing support and guidance will result in enhanced interaction between individual and collective transport modes, including public transport for passengers, while connections to rail and inland waterways for freight and city logistics are optimised. Road users will benefit from predictable journey times, less congestion and smoother traffic conditions resulting from dynamic speed harmonisation and 'green waves' into the city centres

As a result traffic demand will be better balanced, use of existing infrastructure will be optimised and the negative impact of the transport system as a whole will be reduced. Public sector investments will be optimised.

(c) Better use of information, better RTTI:

The actions will foster better use of information, including those related to the collection of data at the level of the vehicle (free-flow conditions, incidents, meteorological circumstances) and provide mechanisms for displaying (possibly personalised) messages inside the vehicle. As a result new services will emerge, e.g. dynamic parking guidance and en-route reservation for public transport, while user needs and customer satisfaction can be better addressed

More reliable real-time travel and traffic information (RTTI) will enhance efficient and flexible route planning, allowing time savings and minimising nuisance on sensitive parts of the road network, by reducing the need for transport.

| |
|---|
| US studies show up to 25 % reduction in travel time/congestion when implementing adequate navigation strategies based on correct and timely road status information. |

(d) Efficiency of transport logistics:

A widespread application of typical ITS-linked e-freight measures is expected to result in time savings of 10 % and financial savings of 8 %, while productivity rates should increase by 3-10 % and freight logistics costs would decrease by 2-3 %[37].

(e) Implementation of other (transport) policy objectives:

Synergies will be obtained at all levels, reducing costs for both providers and subscribers and allowing easy implementation of public sector applications and policy-led provisions relating to: respect for social regulations (resting/driving times), the transport of live animals, the internalisation of external costs, requirements for dangerous goods monitoring where necessary, electronic fee collection, the next generation of digital tachographs and eCall.

GNSS applications driven by standard incorporation of Galileo enabling functionalities will emerge and trigger a new generation of location-based services and related applications.

(f) The extension of the European Electronic Toll Service (EETS) and the combination/ integration of functionalities:

Actions will be focussed on ensuring the interoperability of infrastructure and in-vehicle equipment, extending EETS to cities, access control issues, facilitating the implementation of demand management strategies and the internalisation of external costs strategies. Deployment of applications building on the high-precision positioning offered by Galileo

[37] COM(2007) 607 Freight Transport Logistics Action Plan.

(g) Efficiency gains, competitiveness:

An open, interoperable platform would facilitate add-on services to e.g. fleet management systems, contributing to the effectiveness of daily transport-linked operations, making our enterprises more competitive and indirectly enlarging the ITS market, enhancing competition (internal market)

Priority from the infrastructure side will be given to the Trans-European Road network and the main hubs (ports, airports, and railway freight yards); a swift market take-up of interoperable in-vehicle platforms will however reduce the need for roadside-based investments and will leverage the functionalities of services and operations by road authorities and operators.

Additional input was obtained from **TRANSTOOLS** simulations (Scenario 4 — Combined measures):

- road congestion would decrease by about 2.5 % and accident costs by 7.2 %;
- fuel consumption ( decrease of up to 4.1 %) and exhaust emissions would also benefit;
- enhanced cooperation and synergies would result in an additional reduction of -1.1 % of overall external costs .

The overall appreciation of the indirect impacts of **policy Option B** compared to Option A is shown in the following table:

| | **Economy** | | | | **Society** | | | **Environment** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Impacts on … | Congestion Reduction | Competitiveness | Consumers | Growth | Road Safety | Employment | Security | Climate Change | Air Quality Noise | Energy Efficiency |
| **Option B**: ITS Action Plan with emphasis on enabling actions, synergies and coordination | + | + | + | + | + | + | + | + | + | + |

*Risk:* relying on a voluntary High Level Group for achieving Europe-wide harmonisation of services and synchronised deployment in all Member States does however present a clear risk of being unable to control the separate processes or to implement the required strategies.

### 6.4. Impact of policy Option B+: Option B extended with a comitology procedure

The B+ policy option builds on the actions envisaged under Option B, but replaces the High Level Group by a **an ITS Committee constituted by Member States' delegates**

and an **advisory group** bringing together senior key representatives from all industrial sectors.

The rationale behind this is that the High Level Group envisaged under policy Option B, building on voluntary participation, might not result in a more policy-driven approach towards ITS, nor will it guarantee a better involvement of the public sector in the deployment of ITS.

*6.4.1. Direct impacts:*

Under policy Option B+ Member States' delegates would be invited to discuss among peers the issues that are considered relevant and, among other things, to decide on priorities for Europe-wide deployment of ITS, on harmonisation of services and minimum requirements for these (voluntary approach) and on priorities for legislative work, standardisation and possibly EC funding.

The main gain would come from a better concertation among Member States, leading to faster decision-making procedures and shorter times for processing legislative work, for example.

Additional added value is expected in the area of awareness-raising and possible 'soft' measures (voluntary agreements, joint set-up of demonstration and trial projects, etc.)

Dedicated application domains where the Committee (EIC) would be active were listed in 4.3 above, and address topics including:

(1) The optimal use of road, traffic and travel data (framework, and the collection and provision of traffic plans)

Some projects already completed or in hand have yielded valuable input on data required for effective traffic management operations, information services, deployment of typical Advanced Driver Assistance Systems (navigation, Speed Alert, Lane Keeping Systems) and autonomous (in-vehicle) safety enhancing applications, e.g.

- Speed Alert analysed all elements relative to the deployment of intelligent vehicle adaptation and provided recommendations how to have it implemented throughout Europe

- Rosatte[38] is expected to provide a framework for the collection, processing and integration of road data at all administrative levels, and to establish a procedure for accelerating the incorporation of such data in digital maps

The Committee (EIC) would however be able to discuss the findings of the projects and agree on a general road map for having these services operational and implemented throughout Europe.

[38] ROSATTE (7FP) addresses a common ROad Safety ATTributes Exchange infrastructure in Europe, which should facilitate access to accurate and up-to-date road data required for advanced ITS applications, including their integration in digital maps.

In line with this action, the EIC could address a minimum set of data, the information to be disseminated for free by all service providers, and principles for coherence of messages, as discussed at a European summit organised under the German presidency[39]: especially data affecting safety-linked situations (road status, unexpected queues/ obstacles) and the need for a general agreement on the information to be disseminated as widely as possible under all circumstances.

The Committee should discuss the modalities of such an agreement in order to have it detailed and endorsed on a voluntary basis by all Member States

(2) Continuity of ITS services for freight and passengers, including those facilitating the interconnection of interurban and urban transport systems, as e.g. required for cross-border multi-modal travel planners

A number of projects (eMotion[40], iTravel[41], etc.) explore the most effective approaches to foster real cross-mode multimodality and to realise the idea of the always-connected traveller.

The Committee could examine how the outcome of these projects can be extrapolated to deployment projects, and how deployment throughout Europe can be fostered.

(3) Mechanisms to ensure European ITS concertation and coordination, leading to consistent, harmonised (and prioritised) deployment of services throughout Europe

EasyWay, an ITS for Roads deployment project supported by the EC, is preparing specifications and minimum requirements for a number of selected key services to be deployed in a harmonised way throughout Europe. The consortium is struggling in the absence of an appropriate body to endorse these and a mechanism to have the specifications incorporated into the national deployment schemes

The Committee proposed, bringing together delegates from all Member States, would provide an excellent institute to fulfil this task and ensure correct incorporation (as minimum requirements) in national deployment guidelines.

In line with this task the EIC should discuss:

- common principles for the assessment and C/B analyses of ITS deployment, and the indicators to be used to allow comparison of impact, or

- priorities for Field Operation Tests and large-scale trials where major public investments are required.

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39 Communication from the Government of the Federal Republic of Germany to the European Commission of 27 June 2007 (eSafety Conference in Berlin, 5-6 June 2007).

40 eMotion (FP6, RTD): analyses of the organisational, legal, economic and technical framework of a Europe-wide multimodal traffic information service, including proof of concept.

41 i-Travel (FP7, RTD): research project aiming at realising the always-connected traveller.

The EIC would also be mandated to process part of the legislative work as defined in the terms of the mandate to the Committee.

As for the effectiveness of procedures and administrative costs, the EIC would allow a shortening and simplification of the legislative process for new actions related to ITS, and for the amendment of existing ones. Several ITS applications having an impact on congestion, safety and the environment will be introduced earlier than in the other policy options, leading to quicker savings on travel times, accidents and emissions.

Industry would benefit from the clear policy and vision which will be defined by the Committee and could piggy-back on the mandatory introduction of specific ITS measures of public interest. Value-added services, for example, can introduced more easily on the back of existing equipment. Consumers would benefit from an earlier and wider availability of services related to driving safety and comfort. Economies of scale and decreasing prices would make services available for small and economy cars too.

***Overall conclusion*** *on the direct impact of actions under Option B+:*

| | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|
| **Option B+** (Option B plus comitology) | ++ | ++ | + |

*6.4.2. Indirect impacts:*

**TRANSTOOLS** turned out to be unable to predict developments under the B+ scenario.

A major impact of Option B+ would however be the avoidance of the risks linked to working with a High Level Group of mixed nature, and the opportunity to ensure and speed up the implementation of policies.

An incidental gain would be the further reduction of administrative costs thanks to a better consultation and concertation process with Member States, and better chances to raise awareness of ITS among (senior-level) delegates from the public sector.

*Conclusion*: The indirect impacts of **policy Option B+** reflecting these additional advantages are estimated as follows (compared to Option A):

| | **Economy** | | | | **Society** | | | **Environment** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Impacts on … | Congestion Reduction | Competitiveness | Consumers | Growth | Road Safety | Employment | Security | Climate Change | Air Quality Noise | Energy Efficiency |
| **Option B+**: Option B plus | ++ | ++ | + | + | ++ | + | ++ | + | + | + |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Comitology | | | | | | | | | | |

## 6.5. Administrative costs

The policy Options B and B+ are mainly concerned with the creation of the right framework conditions for coordination. For these options, the administrative costs for the European Commission are taken into account at this stage. As it is not certain if and how the concrete measures and instruments will take shape, with the assistance of the ITS Committee or High Level Group, the implementation costs are difficult to estimate. It can only be done at a later stage (cf. 5.1.1)

Administrative costs for EC intervention will relate to setting up (a framework for) more intense concertation and coordination among stakeholders; defining and managing financial support for research, real-life testing and Europe-wide deployment; defining functional requirements and organising their standardisation, conducting legislative work and monitoring progress in the various domains. These costs will be slightly higher for policy Option B+ because of the extra cost of setting up the comitology committee. However these extra costs of about €70 000/year[42], to organise 4 meetings with representatives from 27 Member States, are very low compared to the benefits to be gained thanks to reductions in congestion, accidents and pollution. Indeed, a 1 % reduction of these external costs will immediately result in savings of billions of euros, but the relevant implementation costs need to be taken into account.

Implementation costs for other parties could, for example, include (1) the required investments in roadside-based and in-vehicle equipment (setting up and operating services is considered to be part of a business process, where benefits cover all implied costs), (2) the implementation of legislative work at national level and (3) participation in concertation bodies and (4) collective planning / managing of standardisation, and deployment of services including testing/evaluation.

| **Types of costs** | *carried by* | | |
|---|---|---|---|
| | **Public** | **Industry** | **Citizens** |
| Infrastructure linked ITS | | | |
| In-vehicle linked ITS | | | |
| Coordination | | | |
| Standardisation | | | |
| Administrative | | | |

Tab. 5.2: Types of costs likely to be attributed (grey shading indicating who bears the types of costs indicated)

[42] European ITS Committee: 27 participants x € 650 = € 17.550 per meeting for the reimbursement of travel expenses; for four meetings per year the total amount equals € 70.200; advisory group: € 650 per participant per meeting, 20 participants x € 650 = € 13.000 per meeting for the reimbursement of travel expenses; for four expert meetings per year the total amount equals € 52.000.

## 7. COMPARISON OF POLICY OPTIONS

To summarise, the short-listed policy options are:

- **Option A**: no additional new action taken, as the baseline scenario against which the other options have been assessed
- **Option B:** concentration on enabling actions and coordination
- **Option B+:** Option B extended with a comitology procedure (establishing a European ITS Committee)

The present impact assessment should point out which actions are most effective, and the following tables give an overview on how the options have scored according to the evaluation criteria (compared to Option A).

### *7.1.1. Direct impacts*

| Impacts on… | **Interoperability** | **Cooperation** | **Privacy & liability** |
|---|---|---|---|
| **Option A** | | | |
| **Option B** | ++ | + | + |
| **Option B+** | ++ | ++ | + |

Tab. 6.1: Comparison of policy options against evaluation criteria (direct impact on objectives)

Under Option A, non-existent progress in domains related to interoperability (and synergies, leading to cost reductions) and to privacy and liability issues is very likely. As for concertation and cooperation among stakeholders, it is currently happening through existing fora, but remains fragmented and misses the critical mass to trigger change and evolution. Under these circumstances, it is expected that ITS will remain in its current position: an instrument with high potential but unable to support achievement of policy objectives because penetration and take-up are too marginal.

Option B and B+, with much better scores on all three criteria, present a serious improvement over Option A, with Option B+ scoring even higher on concertation and fostering cooperation.

Under Option B+ the Commission will be able to effectively steer and manage the complex processes related to a policy-driven deployment of ITS; it would be assisted by a dedicated European ITS Committee, constituted by delegates from all Member States, and a separate advisory group bringing together (high-level) representatives from all industrial sectors. The Commission will have the possibility, whenever necessary, to realise progress in dedicated (enabling) areas of content directly affecting ITS deployment.

*7.1.2. Indirect impacts:*

| | Economy | | | | Society | | | Environment | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Impacts on … | Congestion Reduction | Competitiveness | Consumers | Growth | Road Safety | Employment | Security | Climate Change | Air Quality Noise | Energy Efficiency |
| **Option A** | | | | | | | | | | |
| **Option B** | + | + | + | + | + | + | + | + | + | + |
| **Option B+** | ++ | ++ | + | + | ++ | + | ++ | + | + | + |

Tab. 6.2: Comparison of policy options against evaluation criteria (impacts on achievement of policies)

First of all, the analysis confirms that for both Options B and B+ EU action can have an added value contributing to most of the policy objectives. Compared to a baseline scenario of no additional new actions, both policy options will deliver a positive overall impact.

No weighting is applied, but the transport-related criteria of reduced congestion, higher road safety and less impact of road transport on the environment (greener transport) are considered important.

The main difference between B and B+ is the replacement of a High Level Group by a European ITS Committee assisting the Commission through the comitology procedure. The main advantage of Option B+ is a faster and more harmonised deployment of ITS services. The positive impacts anticipated on congestion, road safety and emissions will thus be reached earlier. That is why this option is more effective: Option B+ will save more lives and more time otherwise spent in congestion, and reduce $CO_2$ emissions most.

*7.1.3. Conclusion*

Overall, **Option B+ can be regarded as the preferred option**, because it will result in better impacts than the other options, in particular regarding cooperation and the potential to speed up agreements on particular issues hampering ITS deployment and to bring about harmonised deployment of ITS throughout Europe.

The proposed legal instrument to set up this framework for Europe-wide deployment of ITS, including the European ITS Committee would be a Directive. A Directive is the appropriate instrument, as the obligations imposed to the Member States recognise the different levels of ITS use and deployment, allowing them to concentrate on their priorities for implementing, while at the same time leaving the power and responsibility to the Commission to define, with the European ITS Committee, the technical details in support of the implementation of the Directive. A regulation would be too prescriptive, considering that many of the required actions and the level of deployment of ITS vary from country to country. Only a Directive will enable Member States sufficiently to adjust the framework established according to their individual needs.

## 8. MONITORING AND EVALUATION

In the course of this impact assessment a series of actions have been evaluated which should create better conditions for a faster take-up and deployment of ITS for roads and as such enable a stronger contribution by intelligent transport systems to the overall goals of efficiency, safety and a cleaner environment.

These actions are of an enabling and cross-cutting nature. They do not influence the general objective or most of the specific objectives directly. For monitoring activities this means that only the outputs with regard to the operational objectives can be assessed easily. The impacts on the specific and general objectives are indirect, so that in some cases it will be difficult to separate them out from other influences in the field. But it is important to stress that a prime goal of the Action Plan is to achieve positive results from ITS deployment *faster* and create the conditions to achieve them at all.

The following table gives an indication of possible indicators of progress towards meeting the objectives. Monitoring will be required not only to assess whether the measures are on track but also to review the evolution of the global context and to determine whether additional measures might be required.

It is proposed that a progress report be made by 2012 and that this report should also provide the opportunity to propose possible further actions.

| General objectives | Indicators |
|---|---|
| (Quicker) Take-up of ITS for roads | ▪ Deployment and level of services for ICT infrastructure, traveller information, traffic management and freight and logistics services<br>▪ Penetration rate of ITS applications in new/existing vehicles (market shares)<br>▪ Number of national and local demand management and access control schemes introduced<br>▪ Number of new service providers in the ITS market |
| Achievement of interoperability regarding applications and services; synergies to be obtained | ▪ Definition of a functional open platform for (in vehicle) deployment of ITS<br>▪ Measures to achieve/ ensure connectivity of nomadic devices in a safe way<br>▪ Solutions for vehicle-specific requirements, e.g. vehicle identification |

| Specific objectives | Indicators |
|---|---|
| Setting up of an efficient concertation/cooperation mechanism between all ITS stakeholders in order to provide a clear vision on how ITS should be deployed on a Europe-wide scale and how it should support implementation of EU policies | ▪ Production of a vision document<br>▪ Coordination mechanism in place<br>▪ Detailed strategies for tackling main barriers |
| To solve privacy and liability issues | ▪ Definition of a general framework describing service ownership, risks and responsibilities of providers and customers<br>▪ Establishment of a code of practice relative to the sharing and re use of data linked to deployment of ITS |
| Improved quality of seamless traffic management and real-time Traffic and Travel Information (RTTI) services | ▪ Ratio of average speed to free speed<br>▪ Change in journey time and average speed during peak hours<br>▪ Number of multi-modal journey planners<br>▪ Availability of multi-modal and/or real-time information<br>▪ Total logistics costs to shippers<br>▪ Modal split for passenger and freight transport<br>▪ Energy savings and emissions avoided<br>▪ Greenhouse gas emissions (fuel consumption)<br>▪ *Indicators on air pollution*[43]<br>▪ *Harmonised noise indicators*[44] |
| Improvements in road and personal safety | ▪ Market share of cars equipped with safety systems<br>▪ Number of (road) traffic accidents<br>▪ Number of road fatalities and injured |

[43] Directive 2004/461/EC specifies the air quality monitoring and reporting in the Member States.

[44] Directive 2002/49/EC on Environmental Noise requires authorities to draw up noise maps using harmonised indicators.