ITS Action Plan for the Roads

A framework for the coordinated evolution of existing and the accelerated introduction of new Intelligent Transport Systems in Germany over the period to 2020

Developed in collaboration with:
Intelligent transport systems: an important contribution to managing the traffic of the future

Mobility allows all of us to enjoy a high degree of freedom and quality of life. At the same time, mobility is the basis for economic success. Ensuring comprehensive mobility requires considerable efforts. This applies to enhancing the efficiency of transport as well as to the necessity to realize a maximum degree of safety for all road users. And all this has to be achieved against the background of transport needs that continue to grow dynamically.

For this, we need feasible solutions, especially for the road mode. A substantial contribution to managing the traffic volume will have to come from stepping up the deployment of intelligent transport systems (ITS), not least to make optimum use of existing road capacities and to thus enhance the efficiency of transport. In the interests of providing all road users with comprehensive information, which can also enhance the efficiency of transport, it is of central importance to make the best possible use of all available public and private data sources relevant to transport. Moreover, in the future, it will be essential to organize a comprehensive traffic management system that does not stop at national borders.

Since mobility is, by its very nature, international, the European Commission, acting on an initiative by the EU Member States, has published an action plan on the coordinated Europe-wide deployment of intelligent transport systems. The corresponding ITS Directive for a European regulatory framework was adopted by the European Parliament and the Council in July 2010. The Federal Ministry of Transport, Building and Urban Development actively participated in the development of this Directive.

As the Informal Council of Transport Ministers in Nicosia on 16 and 17 July 2012 confirmed, the transport ministers of the European Union agree that the deployment of intelligent transport systems should be accelerated in the interests of all road users. I am convinced that we can only cope with the growing traffic volume if we make smart use of the latest innovative technology. As the Federal Minister of Transport, it is of great importance to me to actively support and advance this process. For Germany, we have therefore developed a national action plan for intelligent systems in road transport, the “ITS Action Plan for the Roads”. We have thereby established a clear road map for the evolution of existing as well as for the speedy nationwide deployment of new effective systems. Together with the Federal Government, federal states, local authorities, industry and trade associations, we have defined various fields of action, created action plans that are to be updated continually, and we have assigned clear responsibilities. Industry, in particular, is an indispensable partner in this process. It is thus closely involved in all decision-making processes where technical and economic issues are addressed.

My thanks go to all parties involved who have actively contributed to the development of the national ITS Action Plan for the Roads in the national ITS Advisory Council and who have indicated their willingness to participate in shaping the further process. Because only if all stakeholders cooperate closely will we succeed in providing a crucial impetus at the European level as well. I hope that the further activities of the ITS Advisory Council will continue to advance the use of technological innovations, thereby ensuring more efficiency and more safety on German and European roads.

Dr Peter Ramsauer, Member of the German Bundestag
Federal Minister of Transport, Building and Urban Development
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Introduction

The present document, the national ITS Action Plan, has been prepared by an Advisory Council for Intelligent Transport Systems (ITS Advisory Council), with the Federal Ministry of Transport, Building and Urban Development acting as the lead agency. The ITS Advisory Council ensures that all stakeholders are involved. It comprises representatives from:

- the Federal Government;
- the federal states;
- local authorities;
- the electrical industry;
- the automotive industry;
- the information and communications technology industry;
- ITS organizations;
- broadcasting corporations;
- standardization bodies;
- the scientific and research community;
- regulatory authorities;
- user associations.

The national ITS Action Plan for road transport starts with a review and status analysis regarding the transport policy objectives in the ITS sector in Germany. On this basis, and taking the requirements of the European ITS Directive into account, an ITS strategy and priority action areas for the future are derived. Within the individual action areas, packages of concrete measures are defined, bodies responsible for their implementation are appointed, milestones are established and a timetable is drawn up.
Objectives and Scope

The national Action Plan entitled “Intelligent Transport Systems in Germany” is designed to define the approach to be adopted for the coordinated evolution of existing and the accelerated deployment of new intelligent transport systems – or ITS for short – to enhance road safety, improve the efficiency of transport and reduce the negative environmental impact of transport. Currently, the focus is on private road transport and its interfaces with other modes.

Intelligent Transport Systems (ITS) are applications that use information and communications technologies (ICT) to capture, transmit, process and exchange traffic-related data and information. Here, the word “intelligent” refers to information and intelligence that has been obtained by collecting and analyzing data and that enables its users to make safer and more efficient use of the transport system.

ITS include all stakeholders (organizations and road users), including their technical systems, and the interfaces with other transport modes.

Figure 1 illustrates the scope, taking traffic information and traffic management services as an example. Here, the process chain, ranging from the detection of incidents relevant to the flow of traffic right through to the road user’s reaction, shows the multiplicity of stakeholders and technical systems. Likewise, it illustrates the importance of the interfaces that are used for communications between stakeholders and technical systems and that are absolutely essential for successful interaction between all the components of an ITS.

Figure 1: Simplified overview of intelligent transport systems that assist drivers/riders in road traffic, based on the process chain.
Motivation for an ITS Action Plan in Germany

Intelligent transport systems have been an integral component of transport strategies in Germany for years. An overview of the existing ITS can be found in the August 2011 report entitled “Status and Framework for Intelligent Transport Systems (ITS) in Germany”, which was submitted in accordance with Article 17(1) of Directive 2010/40/EU.

However, lessons learned from the operation of ITS so far and current scientific and technological developments show that the potential inherent in ITS has not been finally exhausted. Thus, upgrading the functionalities of existing ITS will significantly enhance their effectiveness.

In addition, the target-driven coordination of existing ITS development trajectories, plus the optimized operation of the systems and greater cooperation between all the stakeholders, are likely to produce further improvements in road safety, efficiency and environmental performance.

Alongside public road operators, private sector providers of ITS applications and services are also increasingly playing a major role in adaptive traffic control and the provision of information and recommendations on the live traffic situation on German roads.

Against this background, it is imperative that all stakeholders coordinate the approach to be adopted in the future deployment of innovative ITS. To this end, the purpose of this Action Plan is to coordinate the evolution of existing and accelerate the deployment of new ITS in Germany. The national Action Plan should be viewed as an overarching framework for comparable activities on telematics visions and ITS measures at the level of the federal states and local authorities.

The challenge of future mobility trends

The traffic forecast of the 2003 Federal Transport Infrastructure Plan predicted huge rises in freight moved in the long-distance transport of goods and in passenger kilometres travelled in Germany for the period from 1997 to 2015. The results of the most recent forecast of nationwide transport interconnectivity for the period from 2004 to 2025 now indicate, for the extended planning horizon of 2025, an increase of as much as 84 % in tonne kilometres in long-distance road haulage, from 367 to 676 billion. In this process, the roads’ share of freight moved will rise from today’s figure of 70 % to just under 75 %, whereas the railways’ and inland waterways’ shares will fall. In short distance road-haulage, freight lifted and freight moved will rise much more slowly – by 3 % and 11 % respectively. Short-distance road haulage’s share of total tonne kilometres is below 5 % today and will have fallen to 3 % by 2025.

A long-term forecast looking ahead to 2050 also confirms this development. Total tonne kilometres will more or less have doubled by then, and the roads will continue to bear the brunt of freight traffic in the long run, too.

In 2004, passenger kilometres (pkm) travelled on the roads reached a figure of 887 billion, and this figure will rise annually by around 6.5 billion pkm over the period to 2025. This means that by 2025 the total figure will have risen by 16 % to 1,030 billion pkm. The roads’ share of passenger kilometres travelled will fall slightly from 81 % to 79 %, thanks primarily to the high levels of growth in the aviation sector.

In the future, the long-term trends in passenger transport in Germany will increasingly be influenced by different demographic and economic developments in individual regions. On the whole, the decline in the population will not result in a reduction in the passenger car fleet, and
an ageing society will use the car more than previous generations. It is true that, in Germany as a whole, there will be a slight drop in the volume of traffic across all modes of transport over the period to 2050 and the growth in vehicle mileage will slow down somewhat. However, averaged across Germany, private motorized transport will remain the dominant mode of transport beyond 2050 despite demographic change.

In regions with a high level of growth, it is likely that passenger kilometres travelled will rise by over 25% if there are favourable economic developments and settlement patterns. However, in the future there will also be regions in Germany where, because of unfavourable structural, demographic or economic developments, the volume of road passenger traffic could fall by just under one third. In these regions, which are predominantly rural areas characterized by early industrialization with different levels of economic development and mostly in peripheral locations, it is important, perhaps more than anywhere else, to make a contribution to positive regional development by providing appropriate road infrastructure.

The road traffic volume trends that have been identified pose great challenges to transport policymakers in their endeavours to preserve safe, secure, sustainable and affordable mobility. There is a limit to how much transport infrastructure can be constructed or upgraded. ITS make it possible to make more efficient use of existing transport infrastructure. By controlling traffic, ITS can also help to reduce pollution (especially CO2 emissions). It is thus essential that the deployment of ITS be stepped up in the future. Only the combination of resource-conserving upgrades, appropriate structural maintenance and the deployment of ITS will be able to safeguard mobility in Germany in the long run.

The contribution of ITS to transport policy objectives

The Federal Ministry of Transport, Building and Urban Development has developed a new national Road Safety Programme, which it published in November 2011. One of the main objectives in the 2011 Road Safety Programme is to reflect the changed environment and new challenges in road traffic. Demographic change is one of these challenges, and new technological developments are constantly changing the environment.

The programme identifies measures in three action areas – “human factors”, “infrastructure” and “automotive engineering”. Taken together, they act as a guide for the Federal Government’s road safety activities in the years ahead. From the European objective of halving the number of road fatalities within the EU by 2020, the quantitative target of 40% fewer fatalities was derived for the 2011 German Road Safety Programme. This figure takes into account the fact that the current situation varies from one country to the next. ITS will be instrumental in achieving this target by helping to prevent accidents or mitigate their consequences.
It is essential that total gridlock be prevented, but simply building new roads is nowhere near sufficient. One of the keys to optimizing traffic is the creation of seamless linkages between the individual modes of transport. City centres, railway stations or airports – they are all increasingly becoming intermodal hubs at which people can choose the most suitable means of transport, depending on their destination, the traffic situation and the weather. They can get off their plane or train and have no difficulty continuing their journey by hire car, underground, bus or electric bicycle. To enable this change of mode, we need intelligent communications and navigation solutions that provide us with reliable and up-to-date information on traffic conditions on the road network, timetables and means of transport plus all other relevant data.

One key to reducing levels of noise and pollution is the use of alternative drivetrains. For this reason, the Federal Ministry of Transport, Building and Urban Development has joined forces with the industry in Germany with the aim of making Germany a lead provider of and a lead market for electric mobility. Electric mobility can deploy its strengths especially well over short distances. However, it is all too easy to overlook the importance of intelligent navigation technology for electric cars that are fit for everyday use. It is, for instance, indispensable if drivers want to ensure in good time that they get a place at the charging point.

And we can look even further into the future. In connection with the transformation of Germany’s energy supply, it is becoming increasingly apparent just how flexible and independent decentralized systems are compared with large plants. To consolidate these spheres, intelligent technologies are needed to establish a closely meshed web of transport, energy and data network infrastructure.

In tomorrow’s transport system, vehicles will communicate with one another and with the infrastructure. Accurate and reliable positioning and navigation are absolutely essential to this. Satellite navigation has already developed into a key technology. In the future, it will become indispensable to the viability of intelligent transport infrastructure. Europe is developing autonomous civil satellite navigation systems – Galileo and EGNOS – so that people can rely on the signals at all times.

One of the crucial factors determining the uptake of such developments is always their benefit to individuals. Innovative solutions will not be successful unless they are genuinely of use to people. For this reason, forward-looking policies focus on the intelligent organization of mobility and living conditions in which people take centre stage.
Safeguarding industrial competitiveness

When it comes to innovations for ensuring mobility, it is German companies, more than any others, who come up with outstanding ideas and products. Time and again they find new links between high technology and mobility. Germany is among the leading nations in the field of transport telematics, and industry and government want to join forces and do everything they can to maintain this status.

Transport technology must evolve, to a greater extent than in the past, into an export for the Federal Republic of Germany. In the past, the corresponding markets were dominated by domestic companies. However, the technological developments in the field of ITS will result in players that operate in Europe as well as worldwide offering their products on national markets. The ongoing standardization activities by CEN/ISO and ETSI also support this development. At the current stage, the domestic markets will make a crucial contribution to the development of technology and the establishment of necessary export credentials. The German industry must not start lagging behind other countries.

Innovative transport technologies make a significant contribution towards ensuring the mobility of people and goods in Germany – one of the world’s leading economic powerhouses. They are thus also an important factor when companies decide to locate in Germany because of its cutting-edge technology and its attractiveness as a place to do business. A smart combination with the electrification of mobility will enhance this visibility even further.

The development of ITS in the infrastructure sphere will, in the future, be closely linked to corresponding in-vehicle systems. Alongside the electrification of the drivetrain, interconnection is the great issue that will dominate the automotive engineering sector in the future. Here, new opportunities are emerging, and the infrastructure managers and their component suppliers must be proactive in shaping them. It is thus imperative that the competitiveness of Germany, as a location for business and industry, be preserved and evolved in the field of cooperative ITS as well. This is to be done by jointly creating the appropriate regulatory and technical frameworks, by participating in international standardization activities and by launching pilot applications. Here, too, upgrading the national systems will play a crucial role as a driver of innovations and in the establishment of export credentials.

Changes in the organizational environment

In the discussions surrounding ITS, it is often the case that the focus is exclusively on technical issues. However, a forward-looking ITS strategy that can meet expectations in both a national and European context must also take organizational, legal and economic aspects into account. ITS must be seen as something that is much more extensive, as a transnational/overarching basic consensus on a system of values and rules that is upheld by all stakeholders and that serves as a basis for the design of future ITS and services based on them.

The development of such a basic ITS consensus that is acceptable to everyone is a difficult process in Germany. This is due primarily to the different competences, responsibilities and frameworks in the federal system and, consequently, also the different priorities established when approaching the objective.

At the European level, the Commission’s efforts are very much focused on reforming the established perception of transport/traffic by using the term “mobility” and, by this means, developing key elements of a basic European perception of ITS. This attention is currently focused on ITS services. The intention is that these mobility services should deliver European added value by means of cross-border applications.
The rapid development of ICT also reveals a new and sustainable potential for wealth creation in the transport sector. The consequence is that entrepreneurially minded players are developing ITS business models parts of which focus on areas of responsibility that so far have had to be covered exclusively by the public sector.

The traditional perception of roles – with the public sector as operator and private sector players as providers of ITS – must be evolved in order to deliver sustainable and economically successful wealth creation. New ITS roles have emerged and are still emerging, and existing roles have to be reconsidered. In a forward-looking perception of roles, new, workable forms of cooperation have to be developed, and one of the conditions must be that players cannot shirk their responsibility to pursue the objective of a „basic ITS consensus“.

The discussions that took place prior to the preparation of the ITS Action Plan showed that ITS services in the road context are candidates with great potential for wealth creation. Against this background, all solutions that qualify as ITS, i.e. technical products or services, must in principle satisfy the requirement that they can also described as a value-added chain or a value-added network. From this, it must be apparent what collaborative relationships exist between the stakeholders or roles and how this generates benefit/added value. This also means that, in the ITS context, there have to be binding rules governing the way in which business models, roles and processes are dealt with, for the purpose of ensuring that statements (expenditure, benefits, added value) are plausible.

New trends in the technological environment

Information and communications technology

The development of general ICT is currently dominating the ITS environment. The multiplicity of options based on this has also reached the transport sector and is the main driver of innovation. Improvements in mobility through accurate positioning (GPS, Galileo, ...), mobile communications and the possibilities of ubiquitous information processing, combined with the objective of ensuring that travellers can be provided with information and directions at all times and in all places, mean that there is a huge potential for wealth creation to be harnessed.

Mobile communications have now reached a level where, with relatively little effort, services can be delivered that would have been considered utopian only a few years ago. Mobile communications comprise cellular communications and Wi-Fi data communications. Modern mobile communications technology provides very far-reaching support to the accessibility of mobile terminal equipment.

For most purposes, smartphones, with their multiplicity of communications and presentation options, represent the basic equipment for the use of ITS services by the end user. Via “apps” with the associated user interface, users, in the role of client, not only satisfy their individual information requirements for their mobility. They also voluntarily become providers of information on their own mobility patterns.

Cooperative value-added networks (car-to-car, car-to-infrastructure) are currently still in the trial phase, with the main aim of driver assistance. One of the major challenges is to genuinely exploit, in its entirety, the potential inherent in the public sector ITS infrastructure that has evolved over the years, in the interests of cooperative ITS value-
added chains. The hitherto closed transport technology systems are to be opened to web-based technologies. This is the only way that it will be possible to offer services for the mobile terminal equipment (smartphones) that is now present on a large scale and, above all, to include the increasingly interconnected vehicles in an overall system. This will require a national ITS architecture that permits interaction between existing systems, which are predominantly of a national character, and newly emerging services (mobile internet, car-to-X). Here, taking international standards into account will be crucial for future-proofing.

In the future, hybrid approaches will be pursued in data communications. This is the only way that it will be possible to respond flexibly to local conditions and requirements. This trend is already apparent today in adjacent fields of ICT and is to be transferred accordingly to ITS.

The security of data communications is also a sensitive area in ITS solutions, and special attention needs to be paid to it. Interaction between the players requires technical and substantive certification procedures. This is especially true when ITS are not only employed to provide driver information but also interact with the assistance systems that are becoming increasingly widespread. In addition, the interests of general data protection and the informational self-determination of ITS users always have to be taken into account.

In the future, standardization will not be confined to interfaces, but will also cover service functionalities, unless this has an unacceptable impact on competition. This is necessary not only with regard to a harmonized display of information to the traveller/road user. Standard functions facilitate software production and open up new opportunities for technical operations (software as a service – SaaS, cloud). This will also enable small and medium-sized organizations to benefit from the deployment of ITS.

Spread of navigation devices and their impact on route selection

Today, navigation devices are part of the mobile population’s everyday life. At the beginning of 2012, around 24 million devices were in operation, most of them (around 80 %) as nomadic devices, also known as personal navigation assistants (PNAs). Around one fifth of the devices are OEM devices permanently installed in vehicles. There is no robust evidence regarding the number of mobile telephones (smartphones) used as a navigation device. The proportion of navigation devices that are able to analyze traffic information for dynamic route planning is probably around 65 percent. Usually, the information is delivered using the Traffic Message Channel (TMC), which is transmitted into vehicles together with FM radio broadcasts. The dissemination of traffic information data via the Internet is less common.

In day-to-day operations, navigation devices are mostly used as an “electronic map”. The navigation device has become an assistant that motorists take for granted, especially when driving in unfamiliar areas. Because there are usually insufficient sources available in city centres, traffic information plays a barely perceptible role for motorists driving there. In addition, city centre traffic situations cannot usually be displayed in the required quality because of a sparse network of TMC locators.
Medium and long-distance journeys on the primary road network are a different story. Here, Germany has excellent infrastructure, which permits the high-quality display of traffic situations. Thus, many road users use their navigation device on motorways and rural roads – including for dynamic route planning.

In fact, the intensive use of such devices can also result in problematic situations. If, for instance, sustained traffic disruption results in many owners of navigation devices leaving the motorway before they had originally intended to, this often results in serious traffic disruption on the non-primary route network.

However, road users do not always unquestioningly accept the “alternative route” recommended by the device. As “responsible motorists”, road users assess the information available to them from different sources and draw conclusions that are most strongly influenced by their personal experience.

It can thus be assumed that customers are still not totally impressed by the quality of dynamic route planning. However, their confidence in dynamic navigation is likely to grow when, in the future, more data are available and more sophisticated transmission technology (TPEG1 rather than TMC) finds its way into services and devices. This technology provides greater possibilities for location referencing, which will make it possible to transmit more detailed information, including in city centres. This would be interesting above all for the emerging sphere of electric mobility, for which small-scale information on charging stations and the traffic situation is crucial, given that the range of electric vehicles is still limited.

The bandwidth of the TMC transmission path is usually not sufficient for the transmission of high-quality traffic information. Thus, a digital output path is required if complex information is to be transmitted into vehicles.

There are currently two distribution channels in Germany. First there is mobile telephony, which provides a link that can also be used bidirectionally, and second there is a broadcast medium, which has been available since the launch of radio broadcasts in the “DAB+” digital radio standard. Both channels are suitable for the dissemination of traffic data in the TPEG format.

One feature that distinguishes the two distribution channels is the cost model. For the dissemination of data by mobile telephony, charges are normally incurred which, depending on the business model, have to be paid by the vehicle manufacturer, the manufacturer of the navigation device or the end customer.

On the other hand, the digital radio transmission channel can be used by the receiver without additional costs (costs are covered by the radio licence fee). In principle, therefore, all contents can be received and analyzed simultaneously by all navigation devices. However, there is currently still a problem regarding geographical coverage. The level of coverage for mobile reception is currently around 70 to 75 percent of the territory of the Federal Republic of Germany. The installation of new transmitters is progressing rapidly, but it is still too early to make any reliable prediction as to when digital radio will be provided on, for instance, 95 % of German territory or all trunk roads.

1 TPEG stands for Transport Protocol Experts Group – an international standard for the transmission of language-independent and multimodal traffic and travel information
Interconnection between the ITS operators and their systems

The linchpin for unlocking the potential benefits of ITS is appropriate ITS information logistics, i.e. the organization, control, provision and optimization of information flows. Thus, cross-organizational value-added chains in the ITS context have to be seen as process chains in which the handling of information is of paramount importance.

Great potential for wealth creation will result if ITS players and their ITS services can be interconnected across organizations for the benefit of road users and travellers. Examples of this include:

- the interconnection of several road operators (strategy management that cuts across responsibilities);
- the interconnection of collective traffic management systems with individual navigation services;
- multimodal travel chains (interfaces between different modes of transport).

Cross-organizational vertical or horizontal value-added chains are closely linked with business models based on business processes and ultimately on technically supported work flows. Here, the need for interaction and an exchange of information becomes obvious.

If ITS services are to be addressed conceptually, it is advisable to start by describing the strategic importance, for instance European added value (vision/strategy). In addition, it must be determined who is to be involved in the generation of services and thus in the creation of added value and how these stakeholders rate the strategic importance (processes). At the same time, it must be identified what information contributes to the creation of added value (information structures) and whether, and if so how, this information can be generated (IT services and infrastructure).

Interconnecting several ITS services will produce an ITS value-added network and it will become clear what web of relationships is required for this purpose. “Cooperation” is thus of great importance for ITS and can ultimately be described as information logistics. Against this background, all solutions that qualify as ITS, i.e. technical products or services, must in principle satisfy the requirement that they can also be described as a value-added chain or a value-added network. From this, it must be apparent how the cooperation between stakeholders is organized and how this generates benefit/added value. The way in which business models, roles and processes are dealt with in the ITS context is crucial, for the purposes of ensuring that statements (expenditure, benefits, added value) are plausible.
ITS in the international context

On 7 July 2010, the European Parliament adopted Directive 2010/40/EU on ITS, which Member States have to transpose into national law within 18 months. According to this Directive, the European Commission will, within the next seven years, adopt functional, technical, organizational or service provisions for ITS (the so-called specifications) in order to ensure the compatibility, interoperability and continuity of ITS solutions across Europe.

Because the development status of ITS currently varies greatly in the individual countries of Europe, it is imperative that the German side exert a constructive influence on the European process and contribute national experience, available standards, existing solutions and future national requirements and objectives in a coordinated manner.

Against this background, the Federal Ministry of Transport, Building and Urban Development has seized the initiative and established for Germany this Action Plan for ITS in road transport, in which agreement is reached among all stakeholders on the national priorities and objectives regarding the operation and evolution of ITS and the approach to be adopted in implementing the objectives in Germany.

Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport

Other international activities

In addition to the European Commission’s measures in connection with the ITS Directive, there are other international activities that are related to the German ITS Action Plan. There follows a brief description of these activities.

EasyWay

EasyWay is an EU-funded project for the creation of Europe-wide ITS systems and services on the TEN-T road corridors and their interfaces with urban areas and other modes of transport. The main strength of EasyWay is that it provides a unique platform that brings together ministries, road traffic authorities and road operators from all over Europe and promotes close cooperation, thereby facilitating the exchange of experience and the development of common guidelines.

EasyWay organizes the process of creating and maintaining the technical bases for the European standard DATEX II (CEN/TS 16157), which is the basis for interoperable interfaces for the interconnection of traffic management and traffic information systems. In addition, EasyWay harmonizes variable message signs throughout Europe. Both activities are closely linked to the work of the corresponding standardization organizations.

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ERTICO

ERTICO-ITS Europe is a public-law partnership initiative with 101 partners who cover sectors for the development and deployment of ITS: ministries, authorities, motoring organizations, vehicle manufacturers, component suppliers, service providers, infrastructure managers, research institutes, etc. ERTICO-ITS Europe supports, for instance, the management of national ITS organizations and TISA.

The overarching objective of ERTICO-ITS Europe is the creation of sustainable mobility through the use of ITS. Priority action areas include:
- the provision of safety-related road and real-time traffic data;
- the deployment of EU-wide eCall;
- the roll-out of cooperative driver assistance systems, including automated driving;
- safe and secure interaction between driver, vehicle and infrastructure;
- optimum use of traffic and travel data for EU-wide multimodal travel and traffic information;
- creation of an EU-wide platform for cooperative ITS services;
- roll-out of information and reservation services for safe and secure HGV parking areas;
- energy-efficient, cooperative fleet management and freight transport.

ERTICO-ITS Europe supports its partners in conducting effective cooperation to evolve and roll out ITS services. In particular, ERTICO-ITS Europe stages European and international congresses on the topic of ITS in order to bring policymakers, experts and members of the public together and raise their awareness. In addition, ERTICO-ITS Europe organizes tests of the interoperability of ITS and also intends to offer a certification framework for these systems in the future.

Standardization of ITS

ITS are standardized by a large number of standards developing organizations (SDOs), whose activities are interlinked by mutual ties or agreements. The activities of the European Committee for Standardization, the European Telecommunications Standards Institute and the International Organization for Standardization are significant for Europe and are supported by the European Commission through the granting of standardization mandates. The work programme of the European SDOs is thus directly related to directives and white papers of the European Commission, for instance to the priority action areas referred to in Directive 2010/40/EU or to the White Paper entitled “Modernizing ICT Standardization in the EU: the Way Forward”.

At national level, the international activities are actively supported by Joint Committee 717 (Road Transport Telematics) of the German Institute for Standardization and German Commission for Electrical, Electronic and Information Technologies, although the purpose is not the independent creation of standards at national level. Rather, Joint Committee 717 works towards ensuring that the standards created at European level are such that there are no obstacles to these standards being used for national purposes. To safeguard German interests, the results of the ITS Action Plan should inform European standardization insofar as they are technical or functional specifications.

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3 CEN Technical Committee 278 “Road Transport and Traffic Telematics”
4 ETSI Technical Committee “ITS”
5 ISO Technical Committee 204 “ITS”
TISA - Traveller Information Services Association
TISA was created in December 2007 as a not-for-profit organization with worldwide scope under Belgian law and took over the activities from the former TMC Forum, the TPEG Forum and the German Mobile.Info project. Its objective is the proactive implementation of traffic and travel information services and products based on tried-and-tested standards, primarily RDS-TMC and TPEG. TISA provides an international framework for the coordinated development of future traffic information standards and services.

Membership of TISA is open to all public and private sector organizations. TISA has over 100 members worldwide, covering the entire value chain of traffic and travel information services.

In connection with the ITS Directive, TISA is heavily involved in the specifications on safety-related traffic information and traffic and travel information services.

Urban ITS Expert Group
In 2010, the European Commission established the Expert Group on ITS for urban areas, comprising representatives from local authorities and their most important partners, to encourage the deployment of ITS in the urban environment. This group of experts develops recommendations on three urban ITS core application fields (multimodal travel information, traffic management and urban logistics, smart ticketing) and identifies shortcomings in European ITS standardization with regard to the interests of urban areas. The mandate for the group will end in December 2012. Its findings will form the basis for further activities by the European Commission in the field of urban ITS.

UNECE - United Nations Economic Commission for Europe
Since the first Round Table on ITS in 2004, issues relating to ITS have also been the subject of discussions in various UNECE working parties. A draft strategy paper, which was the subject of a web-based public consultation in 2011, provided the basis for the UNECE publication entitled “Intelligent Transport Systems for sustainable mobility”, which was presented to the public for the first time at the ITS kick-off event in Geneva on 28 February 2012. This document contains, inter alia, the UNECE Road Map on ITS, which describes ongoing or planned UNECE activities and initiatives in the ITS sector (for instance the development of a harmonized methodology for the cost-benefit assessment of ITS).
National strategy

The previous sections described how important ITS are for ensuring future mobility. A major component of the present ITS Action Plan is an overarching national ITS vision that formulates a clearly structured, long-term policy objective with regard to the cross-modal deployment of ITS. What is especially important here is that the interests of all stakeholders and users be safeguarded. Focusing on road transport establishes the link to the scope of the ITS Action Plan for the Roads.

Overarching ITS vision

Importance of ITS

I. Mobility performs a key function in our society. It is a prerequisite of employment, prosperity and personal freedom. The basis for ensuring today’s and tomorrow’s mobility is a forward-looking transport policy which, while guaranteeing a high level of safety, meets mobility and transport needs and, in doing so, takes into account the requirements of climate change mitigation, environmental protection and noise abatement.

II. Intelligent transport systems make a significant contribution towards achieving and preserving efficient, environmentally sound, safe and secure mobility for all citizens. A major component of a sustainable transport policy must therefore always be the promotion of innovative transport technologies.

III. A cross-modal approach encompassing all types of transport is the objective on which the development of new and evolution of existing mobility components are to be focused in order to constantly move closer to the aforementioned goals. In this context, the compatibility of transport and the environment is a major challenge. In the freight transport sector, ITS applications are to result in better use being made of infrastructure and transport capacity and in better integration of the different modes, so that the railways and waterways can also deploy their full potential. As far as private transport is concerned, modern information and communications systems will produce better linkages between the different modes and more flexibility. This will encourage people to use non-motorized forms of transport, vehicles with alternative drivetrains and public transport.

IV. The comprehensive deployment of ITS in rural areas requires the fleshing-out of the conceptual basis and is to be achieved with the involvement of all areas of responsibility.

V. It is to be ensured that road users can access traffic information and ITS services. The public sector will ensure that basic traffic information that has a direct impact on road safety is provided at no additional cost to road users.

VI. The German technological leadership in the ITS sector is to set an example of best practice in the deployment of ITS in Europe.

VII. As early as the design stage of any ITS application, care must be taken to ensure data protection, informational self-determination and maximum safeguarding of the anonymity of users. The principle of “data austerity” is to be complied with.

VIII. Intelligent transport systems must not impose inappropriate constraints on any person’s right to enjoy mobility.

Role of the public and private sectors

IX. The responsibilities of the public and private sectors in the transport sector must be clearly defined and structured. In particular, it must be ensured that the public sector can perform all the functions for ensuring mobility as a public service.

X. In this context, the task of the public sector (Federal Government, federal states and local authorities) is to guarantee future-proof and high-performing transport networks that facilitate a safe, secure and efficient flow of traffic.

XI. The public sector must ensure non-discriminatory competition and enable businesses to plan with certainty.

XII. The private and public sectors will inform each other at an early stage of planned developments and projects, in order to jointly facilitate the roll-out of new technologies.
XIII. Individual traffic information services can significantly improve the quality of mobility and road safety. The public sector will support the development of individual services and systems by creating a framework wherever this is necessary.

XIV. The information and recommendations given by private sector service providers must not run counter to public interests and thus to the optimization of the overall transport system.

XV. Research and development in the sphere of ITS are to be actively promoted.

XVI. The development of German ITS standards and their consideration in the development of European and international standards is to be promoted. The development of European and international standards is to be actively supported to ensure that German interests are considered at international level at an early stage.

XVII. Standards will be developed with the participation of ITS operators and manufacturers. In addition, the public sector may intervene in a facilitating capacity or to speed things up.

XVIII. A statutory framework for Intelligent Transport Systems is to be established insofar as this is necessary for the implementation of ITS with the aim of improving road safety and the efficiency of traffic.

XIX. Ensuring transnational interoperability within the framework of an overall European perception – adopted by the EU – of the deployment of Intelligent Transport Systems will be actively progressed.

ITS strategy for road transport

XX. In the road transport sector, the great potential inherent in Intelligent Transport Systems is to be exploited to improve the safety, security, efficiency and environmental performance of transport.

XXI. The Federal Government, federal states and local authorities will operate collective traffic management systems and will coordinate their activities to enhance the safety, security and environmental sustainability of road transport and to support high-quality mobility.

XXII. One of the main areas on which the public sector will focus will be the implementation and promotion of Intelligent Transport Systems to optimize capacity on busy sections of road (intelligent traffic management, e.g. hard shoulder running at peak periods, access roads to exhibition grounds). However, Intelligent Transport Systems will definitely not be a substitute for upgrading transport infrastructure as a whole.

XXIII. Improving road safety in Germany remains a key concern. To this end, the Federal Ministry of Transport, Building and Urban Development will evolve and expand the successful Road Safety Programme.

XXIV. The deployment of state-of-the-art automotive engineering and road safety technology is a promising approach for further enhancing road safety and is being vigorously pursued by the automotive industry. In close cooperation and consultation with the industry, the public sector will create the framework required for further progress to be made here.

XXV. The public sector and private sector service providers will cooperate to unlock synergies of collective and individual services and, in particular, to ensure their consistency.

XXVI. Private and public sector players will coordinate their activities for the successful deployment of cooperative transport systems and agree on a joint course of action.
# Tasks and Responsibilities

<table>
<thead>
<tr>
<th>Task</th>
<th>Responsibilities</th>
<th>Key players in Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a regulatory framework</td>
<td>Establishment of a regulatory framework, adoption of guidelines for the implementation and operation of telematics systems</td>
<td>Federal Ministry of Transport, Building and Urban Development</td>
</tr>
<tr>
<td>Finance roadside ITS infrastructure</td>
<td>Financing of the necessary technical roadside infrastructure, e.g. detection, indicator systems, etc. (authorities responsible for road construction and maintenance)</td>
<td>Federal Government, federal states, local authorities</td>
</tr>
<tr>
<td>Planning roadside ITS</td>
<td>Planning of telematics installations on the road network in the area of responsibility on the basis of local circumstances, such as accident rates and traffic volume</td>
<td>Federal states, local authorities</td>
</tr>
<tr>
<td>Operate roadside ITS (traffic management systems)</td>
<td>Construction and operation of the telematics installations (collective traffic management) on the road network in the area of responsibility, including the collection of traffic-related data</td>
<td>Federal states, local authorities</td>
</tr>
<tr>
<td>Implement the regulatory framework under the German Road Traffic Regulations</td>
<td>Issuance of traffic orders for the operation of collective Intelligent Transport Systems</td>
<td>Federal states, local authorities</td>
</tr>
<tr>
<td>Manufacture the equipment</td>
<td>Development and provision of the equipment required for the operation of ITS, e.g. roadside telematics infrastructure, navigation devices Participation in the development of appropriate specifications and standards</td>
<td>Electrical industry</td>
</tr>
<tr>
<td>Manufacture the vehicles</td>
<td>(Development and) integration of the in-vehicle equipment required for the operation of ITS Participation in the development of appropriate specifications and standards</td>
<td>Automotive industry</td>
</tr>
<tr>
<td>Collect information on traffic conditions</td>
<td>Construction and operation of traffic detection equipment Production or procurement of vehicle-generated information on traffic conditions</td>
<td>Federal states, local authorities, private sector service providers</td>
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<tr>
<td>Provide information</td>
<td>Development and operation of information services in the sphere of ITS (e.g. private sector traffic information and navigation services, public sector information services, traffic information broadcast on the public service channel) Participation in the development of appropriate specifications and standards</td>
<td>Federal Government Federal states Local authorities Broadcasting corporations Private sector service providers Automotive industry Public transport authorities, local transport organizations and operators</td>
</tr>
<tr>
<td>Task</td>
<td>Responsibilities</td>
<td>Key players in Germany</td>
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<tr>
<td>Transmit information</td>
<td>Development and operation of communications services for the sphere of ITS (e.g. mobile telephony services) Participation in the development of appropriate specifications and standards</td>
<td>Communications network operators Broadcasting corporations</td>
</tr>
<tr>
<td>Operate traffic information service (as a public mandate)</td>
<td>Provision of basic traffic information (safety-related) Participation in the development of appropriate specifications and standards</td>
<td>Public service broadcasting corporations</td>
</tr>
<tr>
<td>Consolidate and refine information (business-to-business)</td>
<td>Consolidation and dissemination of traffic information (not an end-customer service) Participation in the development of appropriate specifications and standards</td>
<td>Federal state reporting centres of the traffic warning service Private sector service providers</td>
</tr>
<tr>
<td>Develop standards</td>
<td>Organization of the development of the necessary standards, with the participation of experts from the companies and institutions concerned</td>
<td>Standardization bodies</td>
</tr>
<tr>
<td>Promote ITS technology (research funding)</td>
<td>Research funding to promote technology</td>
<td>Federal Ministry of Economics and Technology, Federal Ministry of Education and Research</td>
</tr>
<tr>
<td>Allocate radio frequencies</td>
<td>Making frequency bands available for use in the transport sector</td>
<td>Federal Network Agency</td>
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ITS Measures

The following measures were drawn up in cooperation with the ITS Advisory Council, which was established by the Federal Ministry of Transport, Building and Urban Development. All the relevant stakeholders from the ITS sector (Federal Government, federal states, local authorities, industry, trade associations and universities) are represented on this expert body. The Advisory Council’s main task is to provide expert support to the preparation (and subsequently the updating) of the national ITS Action Plan and, in particular, to contribute its expertise to the measures. After consultation with the parties involved, each measure was allocated a lead institution responsible for supervising and implementing the measure.

Priority action areas to 2020

The priority action areas of the national ITS Action Plan (Figure 2) are derived from a consideration of the status analysis of the past few years and from the priorities set out in the European ITS Directive.

Figure 2: Action areas in the ITS Action Plan for the Roads
Action area 1:

Optimum use of road, traffic and travel data
Measures that improve the accessibility of data relevant to road transport and the quality of these data are consolidated under this heading. Data from both public and private sector sources are addressed.

Action area 2:

Continuity of the ITS services in the fields of traffic management and traffic information
Here, those activities that allow the implementation of ITS services across responsibilities are consolidated. To this end, the different system approaches are to be consolidated to form a framework architecture with defined interfaces.

Action area 3:

ITS applications to enhance the efficiency of transport, road safety and security, and environmental sustainability
This action area describes the specific measures to implement ITS applications.
Action area 1: Optimum use of road, traffic and travel data

1.1 Guide to the area-wide capture of traffic-related data and incidents
This measure will involve developing a guide that will lay the foundations for capturing dynamic traffic data on an area-wide basis that cuts across responsibilities and takes all data capture options into account or for obtaining these data from third parties. The purpose of the guide will be to assist the decision-makers at the competent public road operators in selecting the technology or procurement strategy for traffic-related data and to support investment decisions for the detection or procurement of data.

1.2 Establishment of a quality management system for the capture and processing of data for ITS services
There is as yet no comprehensive approach for a quality management system that covers all the steps in the ITS data processing chain, nor is a comprehensive review of the contents of the data captured and the information generated (as a basis for ITS) conducted.

Different technical standards and developments of existing and new ITS result in an extensive stock of complex ITS networks, which are to be addressed in an integrated quality management strategy. The “Guide to the area-wide capture of traffic-related data and incidents” (measure 1.1) will stipulate the data quality requirements. The measure described here will develop the practical steps that are necessary for ensuring that these quality requirements are met.

1.3 Establishment of a mobility data marketplace
The mobility data marketplace (MDM) will make available traffic data collected locally by various parties via a web-based portal with standardized interfaces. This portal will allow service providers (individual mobility services) and public road operators (collective adaptive traffic management), for instance, to provide, search for and subscribe to dynamic traffic-related data. The exchange of data between the partners will be via standardized interfaces. In this way, data consumers will be able to subscribe to and obtain types of data that are of interest to them via the MDM without having to perform a protracted search and enter into a process of time-consuming bilateral coordination with the data providers.

The MDM will implement priority action (b) of the ITS Directive, namely the provision of real-time traffic information services.

1.4 Procedure to optimize the accessibility of map-related road data for ITS
Up-to-date and exhaustive road infrastructure data are an important basis for ITS. The capture and maintenance of these data and, above all, the provision of them for ITS are to be such that all the relevant information is available in the necessary standardized data structures and in the necessary quality and that it can be made available via clearly defined and standardized exchange processes that are as simple as possible. In addition to meeting the technical requirements, this measure is designed to create the organizational and regulatory frameworks for non-discriminatory access to road data.
1.5 Safety-related traffic information with no additional charge to the end user

New technologies for capturing safety-related incidents and transmitting the reports promise to further enhance safety. Most of these innovations can only be implemented in collaboration with the private sector. The challenge of the future will be how to shape cooperation between public and private sector players in this field.

A new EU framework and requirements call for the revision of existing national rules and regulations. Thus, for instance, the European requirements must be taken into account when revising the Framework Guidelines for Traffic Information Services. German involvement in TISA, CEDR, EasyWay and European Commission groups of experts will ensure that the German requirements are reflected in the European rules and regulations. This measure will thus implement priority action (c) of the ITS Directive.
Action area 2: Continuity of the ITS services in the fields of traffic management and traffic information

2.1 Development of an overarching intermodal ITS vision
The national ITS vision formulates a clearly structured, overarching, long-term political vision with regard to the deployment of ITS, which takes into account the interests of the players and users and describes the objectives and benefits. When drawing up the ITS Action Plan, the Federal Ministry of Transport, Building and Urban Development, together with the ITS Advisory Council, formulated a strategy for the deployment of ITS. This strategy contains the major guiding principles for positioning in the field of transport telematics. Within this measure, this strategy will be evolved and coordinated with the stakeholders, taking other existing ITS visions into account.

2.2 Development of an ITS framework architecture for the roads
The ITS framework architecture will supply the implementation framework for the delivery of the ITS strategy/vision. The ITS framework architecture will establish basic specifications for terms, standards, mechanisms and technologies that are required to ensure the interoperability of the applications and components that operate at different levels and communicate in a distributed environment. However, the ITS framework architecture will also define the regulatory principle, the processes and the organizational forms in its scope of application. This measure will involve developing the ITS framework architecture for road transport for Germany, including the interfaces with other transport modes, on the basis of work carried out so far and taking the recent developments at European level into account.

2.3 Development of an ITS reference architecture for traffic management that cuts across responsibilities
One of the major objectives here is the creation of a universally accepted perception of traffic management as a prerequisite of ITS traffic management services that cut across responsibilities and are seamless for the road user. Closely linked to this is the facilitation of the development and deployment of ITS services that cut across responsibilities. This will be achieved by developing an appropriate ITS reference architecture with functional, organizational and technical requirements specifications for the harmonization of cooperation and collaboration between state-owned road operators and service providers and for the interoperability of their technical systems.
2.4 Development of an ITS reference architecture for public transport

The development of a functionally effective and economically operable framework architecture for ITS systems within this measure will provide those responsible for public transport and those responsible for intermodal transport with the basis for a coordinated and synchronized implementation of ITS and their operations. The recommendations will take into account not only the EU framework but also, in particular, the regional differences in existing ITS and future developments in the fields of technology and operational management. The recommendations will identify migration paths for the establishment, interlinking, integration and permanent and stable operation of ITS.

The objectives of the ITS framework architecture in public transport are the articulation of functional/technical recommendations on reference systems and the organizational, funding and regulatory/anti-trust frameworks that have to be taken into account in the public transport environment. In particular, the focus will be on the interfaces between public and private transport, i.e. intermodal transport.

2.5 Definition of strategic transport corridors

Transport infrastructure that is of key importance to the network as a whole will be defined as strategic transport corridors. For these corridors, ITS services and systems should be established that are standardized to the greatest extent possible and harmonized along the corridors. In this way, it will be possible to reduce traffic disruption and better ensure mobility on strategically important transport arteries.

The definition of a strategic network, including the elaboration of the necessary methodology, will take the form of a guide. The guide, which will initially be developed for the road operators of the federal states, is to be designed such that it can later be expanded to cover the interests of local authority road operators.

2.6 Evolution of road works site management

Road users tend to regard road works as a nuisance. However, they are absolutely essential if the structural fabric is to be maintained and the infrastructure improved, especially since the total need for structural maintenance is continuing to rise. It is thus necessary to organize even better and automate the process of planning road works sites and to optimize it taking account of the impact on traffic and the economic efficiency of the road works.

The assessment of road works sites lasting more than eight days by the Federal Ministry of Transport, Building and Urban Development as part
of the scheduling of works will be evolved and take the form of comprehensive monitoring. The basis for this will be the development of a standardized assessment method for the impact of road works sites on traffic, which will take place as part of this measure.

2.7 Harmonization of individual and collective traffic information and adaptive traffic control

The establishment of an approach, agreed between the operators of collective adaptive traffic control systems and the providers of individual navigation services, to the provision of information to road users is a prerequisite for consistent and optimally effective traffic information and route recommendations. This measure is designed to lay the basis for an appropriate agreement on collaboration between public sector road operators and private sector service providers. The objective is to develop a collaborative model. The findings will inform the revision of the Framework Guidelines for Traffic Information Services.

2.8 Functional ITS provisions as a basis for the integration of innovative system elements into investment planning

In the future, new types of ITS components will have to be integrated into the overall ITS system. However, there is as yet no overarching framework provision (as a functional provision) in which objectives, thresholds and parameters are established that permit scope for action for innovations. For instance, an agency responsible for construction and maintenance could define a specific impact for its strategic network and accept all requests for the funding of measures that demonstrably meet this requirement, regardless of the constraints imposed by the current implementation provisions. To this end, it is imperative that the methods for determining the effectiveness of ITS measures be evolved. Implementing provisions governing the various options, the purpose of which is to harmonize delivery of the systems, would then be adopted as secondary provisions to the new functional framework provision. Uniform quality requirements (functional performance requirements) will have to be developed and introduced. This will also involve a continuous review of the impact of the implemented measure.
Action area 3: ITS applications to enhance the efficiency of transport, road safety and security, and environmental sustainability

3.1 Project Plan for Road Transport Telematics
The Project Plan for Road Transport Telematics contains over 130 specific ITS measures that are to be progressively implemented over the period to 2015. For this purpose, federal government funding totalling 50 million euros a year will be available to the highway authorities of the federal states over the next few years. Adaptive traffic control systems will be installed on federal motorways. This will make it possible to make better use of the transport infrastructure, to avoid traffic disruption and to considerably shorten journey times. At the same time, the number of road accidents will be significantly reduced.

The Project Plan for Road Transport Telematics includes investment in the following telematics systems:
- active traffic management systems;
- congestion warning systems;
- strategic traffic management systems;
- ramp metering systems;
- junction management systems;
- variable lane use;
- temporary hard shoulder running;
- traffic control centres;
- traffic data capture.

3.2 Devising and trialling cooperative systems
 Cooperative systems exhibit additional potential for making the flow of traffic safer, more efficient and more environmentally sustainable for road users and their environment. Cooperative systems are based on the possibility of vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-infrastructure communications. The data and information acquired in this way are transmitted directly into vehicles, thereby enabling motorists to drive more safely, more efficiently and in a more environmentally friendly manner. There is to be an exchange of information between the players based on open communications standards, which will create a common, up-to-the-minute knowledge base that can be interpreted and used by future driver information and assistance systems. The objective of this measure is to explore the feasibility of introducing cooperative systems and to develop the bases for a decision on their deployment. The aim is to be able to decide whether the introduction of cooperative systems is possible and how a deployment scenario could be fleshed out.

3.3 Introduction of eCall
eCall is a vehicle-based automatic emergency call system with the help of which the time elapsing between an accident and the emergency services arriving at the scene is to be reduced by the automatic triggering of an emergency call and the quality of the accident notification is to be improved by a positioning component and the additional transmission of data that are important for the optimum control of the emergency service chain. The interoperability of the system throughout the European Union will be ensured by the use of the single European emergency call number 112 and the set of data standardized throughout Europe (minimum set of data – MSD). In addition to emergency calls being made automatically by in-vehicle sensors in the event of a
serious accident, they can also be made manually by
the vehicle occupants.
The objective of this measure is the implementation
of the European eCall system throughout Germany
with the parallel use of equivalent systems (TPS
eCall).

3.4 Telematics-controlled HGV parking as part of
the information services for safe and secure
parking areas for heavy goods vehicles and other
commercial vehicles
Heavy goods vehicle (HGV) parking has to be both
safe and secure. In the years ahead, the authorities
in Germany will give priority to improving the
parking situation for HGVs. This measure will thus
focus on the provision of information for safe and
secure parking areas for heavy goods vehicles and
other commercial vehicles (priority action (e) from
EU Directive 2010/40/EU). To this end, functional
detection requirements will first be formulated. In
addition, the requirements of the users (accuracy,
reliability, information channels) will have to be
determined. Afterwards, the rest areas on motorway
sections where there is great demand for HGV
parking are to be equipped with telematics systems
in the medium term, and the data acquired in this
way are to be made available via the mobility data
marketplace (MDM) for use on the Internet and in
navigation devices. The private truckstops located
alongside the motorway are to be encouraged to
participate, as are data consumers as users of the
data.

Further action required

There follow brief descriptions of measures for which
a need for further action has been identified but for the
implementation of which it has not yet been possible to
create all the necessary conditions. However, the intention
is to start the actual implementation of these measures as
soon as possible.

Establishment of a technology database
A database will be established in which available
technologies are described in a structured manner and also
assessed in terms of possible deployment areas within ITS
applications. When ITS projects are being planned, this
database will provide a quick overview of which available
technologies can be deployed and what advantages and
disadvantages the deployment of certain technologies may
entail.

Development of an intermodal ITS framework
architecture
Alongside the framework architecture for the roads,
compatible frameworks for other modes of transport (for
instance public transport) should be developed in parallel
and from an intermodal perspective, in keeping with the
overarching vision. The framework architecture for the
roads is to be merged with the framework architectures
for other modes to form an intermodal framework
architecture in order to exploit the possibilities of seamless
ITS applications and ITS services to the maximum extent
possible.

Development of further reference architectures
An ITS reference architecture will flesh out, for a specific
technical, organizational or spatial domain, the domain-
specific approaches derived from the ITS framework
architecture and progress them towards implementation.
Conceptual features (semantic features) will be mapped
onto specific architectures. The reference architecture
will be the basis for the specification and development of
specific products.
In the interests of a structured evolution of existing ITS, the
following additional ITS reference architectures are to be
created:
• adaptive traffic control systems outside built-up areas;
• adaptive traffic control systems within built-up areas;
• traffic information;
• cooperative systems.
In addition, it should be considered whether reference
architectures are appropriate and necessary in other ITS
fields.

Creation of skills and advanced training schemes
To support the sustainable planning and use of ITS, a
coordinated range of advanced training schemes is to be
created in the field of implementation, use and quality
control of ITS applications and measures. Another area
where action is required is the compilation and
implementation of a range of skills and advanced training schemes.

Optimization of collective road transport telematics
Beyond the aforementioned areas where action is required, there should be further optimization of collective road transport telematics, because there is still a great need for research here and it is likely that there will be significant scope for optimization. This should be done both within and outside built-up areas.

Multi-criteria traffic control
New possibilities of data acquisition, evaluation and linkage in traffic control will make it possible to include additional parameters to the ones familiar hitherto, in order to support efficient traffic management. Thus, a universally valid, transferable method of multi-criteria traffic control is to be developed and showcased.

ITS applications for the movement of abnormally large or heavy loads
This measure will constitute an in-depth study with a comparative assessment and a look ahead to alternative approaches to and steps in the delivery of ITS applications for movements of abnormally large or heavy loads in the overall European context. The following fields will be addressed:
- information portals on provisions governing authorization;
- electronic authorization procedures;
- route planning and route specification including real-time network condition data;
- freight tracking.

The options for extending the German VEMGAS project will be studied and described.

Performance monitoring and reporting
The national ITS Advisory Council at the Federal Ministry of Transport, Building and Urban Development will address the progress made in implementing the measures during its meetings. Meetings of the ITS Advisory Council are held twice a year (spring and autumn). At the spring meetings (with the exception of spring 2013), the bodies with lead responsibility for the individual measures will report to the ITS Advisory Council on the status of implementation of any given measure. The reports will be submitted to the Federal Ministry of Transport, Building and Urban Development in a timely manner to enable it to prepare the meetings of the ITS Advisory Council. The Federal Ministry of Transport, Building and Urban Development will coordinate the reporting activities and will develop a standardized procedure for this purpose. The report to the European Commission required by Directive 2010/40/EU will be submitted on the basis of national reporting, with the first report being submitted on the basis of the reporting at the spring 2014 meeting of the ITS Advisory Council.

If targets are not achieved, the bodies responsible are to report on the reasons for non-implementation and any remedial action taken.
Prospects and evolution of the ITS Action Plan in Germany

The plan is to be continuously updated and augmented by new measures. To this end, the Federal Ministry of Transport, Building and Urban Development will develop a procedure with the help of which suggestions for innovative measures are to be solicited from, for instance, industry, the federal states, trade associations and research establishments. The suggestions are to be appraised and prioritized at the meetings of the ITS Advisory Council.
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IVS-Aktionsplan ‘Straße‘

Koordinierte Weiterentwicklung bestehender und beschleunigter Einführung neuer Intelligenter Verkehrssysteme in Deutschland bis 2020