

**National Action Plan
on Intelligent Transport Systems (ITS)**

April 2013

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1 INTRODUCTION: THE CHALLENGES OF GLOBAL MOBILITY

Transport is central to the sustainability of any country's economic and social development. An efficient transport system makes it possible to create and strengthen markets and therefore acts as an essential tool for promoting and supporting a country's economy. A system that is not very efficient or inefficient, on the other hand, leads to a risk of reducing production capacities and limiting potential for economic growth.

In recent years, we have seen a radical structural change in transport demand models. Within passenger transport, in particular, the traditional 'single-trip' model where the journey starts and ends at home has been replaced by a 'multiple trip' approach, when a typical journey is made up of a linked set of transfers. For freight transport, the changeover from a 'stock' economy to a 'flow' economy, the relocation of production settlements in the area, the expansion of markets and the spread of logistics have brought a change in the spatial and behavioural organisation of the demand for transport. The consequence is an increase in congestion – with negative impacts on the environment, quality of life and safety – and very high costs for the community.

According to United Nations data¹, the current world scenario may be summarised as follows:

- ✓ the world's population is growing continually with more than 7 billion inhabitants in 2011, of which 51% live in metropolitan areas;
- ✓ there are currently 19 cities with more than 10 million inhabitants;
- ✓ the transport sector produces more than 25% of world CO₂ emissions and road transport in particular is responsible for 16% of global CO₂;
- ✓ in 2009, more than 1.5 million deaths and 50 million injuries caused by road accidents were recorded throughout the world;
- ✓ transport network inefficiencies account for a global cost of US\$1-2 trillion annually;
- ✓ it is estimated that congestion accounts for some 1% of GDP in developed economies and 2-5% in developing economies.

¹UNECE (United Nations Economic Commission for Europe) 'Intelligent Transport Systems (ITS) for sustainable mobility', Geneva, February 2012

In the medium- and long-term, predicted trends indicate that globalisation and population growth will give rise to an increase in demand for transport that will exceed the current capacities of transport systems. In particular:

- ✓ the world socio-economic development model will be increasingly urban-centric: by 2050, more than 60% of the world's population will live in cities, urban centres will produce more than 80% of GDP and the rate of motorisation will boom with an increase of between 250 and 375%;
- ✓ partly as a result of shifts in the axes of economic and political power (75% of growth in GDP will be in emerging countries in 2015), forecasts suggest that global passengers x km will triple and freight traffic will be four times higher than at present by 2050;
- ✓ by 2030, 27 cities in the world will exceed 10 million inhabitants compared to the current figure of 19.

With specific regard to Europe², European Commission data show that 75% of the population lives in metropolitan areas even today and cities are responsible for 70% of energy consumption and greenhouse gas emissions.

The above data reveal the mobility-related challenges that must be faced if the forecast growth is to be made sustainable. This cannot be achieved solely by increasing the number of infrastructures. Instead we must adopt a different strategic approach whereby transport is seen as a fully integrated system where information, management and control operate in harmony with the aim of optimising the management of logistics infrastructures and platforms. This will enable traffic flows to be reorganised to restore balance between the different transport modes and encourage greater use of more sustainable transport methods.

Intelligent Transport Systems (ITS) are acknowledged to constitute a smart tool that is more effective for managing mobility than other methods.

²European Commission White Paper 'Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system', 2011

Experience in operating the urban and rural systems implemented throughout the world to date³ has made it possible to evaluate the tangible benefits offered by ITS. The reported results of experiments carried out in various countries, both in the US and Europe, with different applications are as follows:

- ✓ approximately 20% reduction in journey times;
- ✓ 5 –10% increase in network capacity;
- ✓ 10 –15% decrease in the number of accidents;
- ✓ 15% decrease in congestion;
- ✓ 10% reduction in polluting emissions;
- ✓ 12% reduction in energy consumption.

These benefits have been achieved despite investments that are relatively low and in any case much less than those required to build new infrastructures. During a phase of clear growth contraction, ITS solutions therefore allow many mobility problems to be tackled effectively at low cost.

Numerous countries throughout the world (United States, Japan, South Korea and Australia) have sponsored massive investment programmes in ITS over the past 20 years, particularly for traffic management and high-tech vehicle systems.

With regard to Europe, the Commission highlighted the role of ITS as a fundamental tool for achieving the goal of a fully integrated transport network both in its 2001 White Paper '*European transport policy for 2010: time to decide*' and in its 2011 White Paper '*Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system*'. The ITS Action Plan of December 2008 and Directive 2010/40/EU of 7 July 2010 are two milestones on the way to creating favourable conditions for the full and harmonious development of ITS in EU countries.

³European Commission, 2011 White paper and eSafety Forum

2 ITS: THE EUROPEAN CONTEXT

Financial support given by the European Commission to research and development projects within the various Framework Programmes and projects within the TEMPO Programme, for the period 2000/2006, and the EasyWay Programme, from 2007 to 2013, made a decisive contribution to the development of ITS in EU countries and the creation of European know-how in this sector.

The cornerstones for defining a European policy on ITS are the 2001 White Paper '*European transport policy for 2010: time to decide*', the mid-term review of the White Paper '*Keep Europe moving - Sustainable mobility for our continent*', and the White Paper '*Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system*' of 2011, as well as the ITS Action Plan of December 2008 and Directive 2010/40/EU of 7 July 2010, which is briefly outlined below.

For the sake of completeness, the following papers should also be mentioned as they play a strategic role in the development of ITS in Europe: the 2007 Green Paper '*Towards a new culture for urban mobility*', the 2007 Freight Transport Logistics Action Plan, the 2008 Communication on '*ICTSs for Energy Efficiency*', the 2009 Action Plan on Urban Mobility, the 2010 Action Plan on Global Navigation Satellite Systems (GNSS), as well as Commission Regulation (EU) No 1266/2009 of 16 December 2009 adapting for the tenth time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport (digital tachograph), which is applicable to heavy transport in particular.

2.1 The 2001 and 2011 White Papers on Transport

In the White Paper '*European transport policy for 2010: time to decide*', and in the subsequent mid-term review '*Keep Europe moving - Sustainable mobility for our continent*' published in 2006, the European Commission stated that the primary goal for European transport policy in 2010 was to guarantee every citizen and all freight the possibility of travelling in a safe, efficient and environmentally-sustainable manner, using all available forms of transport. The Commission stated that this goal could be achieved through certain priority lines of action, including:

- ✓ optimum use of the potentials of existing transport systems and infrastructure through advanced management and control systems;
- ✓ promotion of intermodal freight and passenger transport;
- ✓ revitalisation of the railways and of maritime and river transport;
- ✓ adoption of new technologies for vehicular and infrastructural road safety with the aim of achieving the ambitious goal of halving deaths on the road by 2010;
- ✓ the development and deployment of electronic ticketing systems;
- ✓ reduction in pollution, including through the use of innovative mobility management technologies.

In the new 2011 White Paper ‘*Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system*’ the European Commission also stresses that technological innovation can allow a faster and less expensive transition toward a more efficient and sustainable European transport system. In particular, the White Paper highlights the essential role of ITS in improving the efficiency and environment impact of the European transport network in the medium-long term through the use of better traffic information and management systems with a view to a multimodal approach for both passenger and freight transport. The White Paper therefore considers ITS – together with SESAR for air transport, ERTMS for rail transport, SafeSeaNet and RIS for transport by the waterways – to be one of the fundamental strategic tools for ensuring economic and environmental sustainability and the competitiveness of European transport in the scenario to 2050.

2.2 *Action Plan for the Deployment of Intelligent Transport Systems in Europe and Directive 2010/40/EU*

In Communication 886 of 16 December 2008, the European Commission published its **Action Plan for the Deployment of Intelligent Transport Systems in Europe (ITS Action Plan)** with the aim of promoting the development of interoperable and harmonised ITSs.

The aim of the ITS Action Plan is to establish regulatory, organisational, technological and financial conditions intended to promote the changeover from a stage of limited and fragmented application of ITS to coordinated deployment on an extensive scale throughout Europe. This will have the result of fully realising the benefits that ITS can potentially offer to improving the safety

and quality of life of European citizens, including economic and employment benefits within specific sectors of industrial production and applied research. Such action will also bring considerable advantages with regard to internal and external transport cost-cutting and thus ultimately the competitiveness of the European transport system.

The premise of the Commission ITS Action Plan is therefore to *'accelerate and coordinate the deployment of Intelligent Transport Systems (ITS) in road transport, including interfaces with other transport modes'*, in a totally multimodal perspective of the European transport system with the aim of making Europe able to take on the great challenges of global mobility.

The ITS Action Plan draws on and systematically incorporates a set of initiatives previously introduced by the European Commission, namely the 2008 Greening Transport Package, the 2007 i2010 initiative on Intelligent Cars, the eSafety Action, the eFreight initiative, the Seventh Framework Programme for technological research and development, the eCall programme, European Technology Platforms and their strategic research agendas, the 2005 CARS21 initiative as well as the EasyWay programme concerning the implementation of ITS technologies on the TERN (Trans-European Road Network).

The ITS Action Plan outlines six priority areas for action. A set of specific actions and a clear timetable are identified for each area. The priority areas are as follows:

- I. Optimal use of road, traffic and travel data
- II. Continuity of traffic and freight management ITS services on European transport corridors and in conurbations
- III. Road safety and security
- IV. Integration of the vehicle into the transport infrastructure
- V. Data security and protection, and liability issues
- VI. European ITS cooperation and coordination

Plan documents prepared after the ITS Action Plan, such as the Action Plan on Global Navigation Satellite Systems, implement areas of action established by the ITS Action Plan.

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

The aim of the Directive is to establish a framework in support of the coordinated and coherent deployment and use of Intelligent Transport Systems (ITS) within the Union, in particular across the borders between the Member States, and sets out the general conditions necessary for that purpose. Directive 2010/40/EU is therefore the legal instrument that gives substance to the actions laid down in the ITS Action Plan and ensures their inclusion in the political agendas of Member States.

Drawing on the ITS Action Plan, the Directive identifies **four priority areas** for ITS:

- I. optimal use of road, traffic and travel data
- II. continuity of traffic and freight management ITS services
- III. ITS road safety and security applications
- IV. linking the vehicle with the transport infrastructure.

Within the four priority areas, the following constitute **priority actions** for the development and use of specifications and standards:

- a) the provision of EU-wide multimodal travel information services;
- b) the provision of EU-wide real-time traffic information services;
- c) data and procedures for the provision, where possible, of road safety related minimum universal traffic information, free of charge to users;
- d) the harmonised provision for an interoperable EU-wide eCall;
- e) the provision of information services for safe and secure parking places for trucks and commercial vehicles;
- f) the provision of reservation services for safe and secure parking places for trucks and commercial vehicles.

On 15 February 2011, the European Commission also published a [Decision concerning the adoption of the Working Programme on the implementation of Directive 2010/40/EU](#) to provide a detailed description and a timeline for the activities regarding the specifications related to the six Priority Actions between 2011 and 2015 as well as the activities the Commission must perform in the same period.

Italy transposed Directive 2010/40/EU on ITS through Decree-Law No 179 of 18 October 2012, converted, with amendments, from Law No 221 of 17 December 2012, ‘Further urgent measures for the growth of the country’, under Article 8 – ‘Transport system innovation measures’.

The Italian Government was also delegated by Parliament to adopt Ministerial Decree of 1 February 2013 concerning ‘Deployment of intelligent transport systems (ITS) in Italy’, which constitutes the methodological and operational basis of the current National Action Plan.

3 THE NATIONAL CONTEXT

3.1 *Mobility in Italy*

Italy is one of the European countries with the highest density of internal traffic. This is distributed unevenly throughout a transport network that includes 168 ports, a rail network covering 20 392 km, a road network (state, regional, provincial and municipal roads) covering approximately 254 686 km, a 6 668 km motorway network (of which 5 724.4 km are toll roads) and 45 airports certified by ENAC [Italian civil aviation authority]⁴.

In 2010 the volume of passenger-km for journeys with origin and destination within Italy and using national carriers ⁵ was 915 663 million passenger-km, indicating a strong mobility system, a sure sign of productive vitality and vigorous exchange, but also – as emphasised by the kilometre results – one that is at the brink of saturation. This situation, in itself worrying, is also burdened by a heavy modal imbalance: 91.86% of journeys take place by road, while the remaining 8.14% are divided between railways/trams/metros/funicular railways/cableways (5.98%), air (1.72%) and waterways (0.44%) respectively.

Also in 2010, total freight traffic with origin and destination within Italy and using national carriers for journeys over 50 km accounted for 216 787 million tonnes-km/year, with 61.93% of the demand focussed on roads while the remainder was distributed between railways/oil pipelines (13.02%) and waterways (24.58%). The percentage of freight transport by air was, however, completely insignificant (0.47%). The figure for rail traffic and oil pipelines includes a proportion of international traffic carried out within Italy.

Current traffic data for Italy therefore confirm the absolute domination of road transport, despite the fact that the infrastructure cannot yet fully cope with the demand, with negative knock-on effects in terms of heavy congestion, environmental pollution and safety. Moreover, the demand for road transport is affected by significant regional imbalances, as traffic flows are essentially concentrated on a few critical arteries and hubs around major metropolitan and industrial areas of the country.

⁴National Infrastructure and Transport Report 2010-2011

⁵National Infrastructure and Transport Report 2010-2011

The problem of traffic is particularly serious in urban areas since these house more than 60% of the population and account for more than 70% of production activities and 70% of vehicular traffic. The abandonment of large cities, especially in the last two decades, by many members of the public has also brought about an increase in the practice of commuting to work sites located in cities, resulting in growing pressure on access routes to urban centres.

Another critical issue is the vulnerability of the system to exceptional events, particularly weather events.

An awareness of these critical factors is essential if we are to plan sustainable development of mobility and logistics, which is bound to involve more efficient use of the existing road infrastructure and of rail and maritime transport. For freight transport in particular, optimum integrated management of port, rail and road networks will make it possible to take full advantage of the great opportunities offered by Italy's geographical position in relation to the world transport flows that transit through or are bound for Europe and the Mediterranean.

In terms of road safety, the trend in the number of accidents, deaths and injuries in the period 1997 – 2009 has been falling since 2001 due essentially to safer vehicles (features include improved passive safety systems as well as introduction of ABS and ESP devices on vehicles). A fundamental role has also been played by the entry into force of a new regulatory approach with the introduction of penalty points on driving licences as well as the implementation of innovative tools to prevent improper driving behaviour, such as remote control of average speed (Tutor system). This has allowed more stringent controls and a great reduction in the death rate. This result was partly achieved as a result of the systematic and structured approach developed through the adoption and implementation of the **National Road Safety Plan (PNSS)** approved in 2002. The New National Safety Plan, currently being finalised and due for publication in 2013, also demonstrates Government interest in the topic of road safety.

According to the 2010-2011 National Transport Report, 4 090 deaths, 302 735 injuries and 211 404 accidents took place in 2010, with reductions of 42.36%, 18.9% and 19.65% respectively compared to 2001. Even though the road traffic accident rate is falling, the absolute values nevertheless remain among the highest among European countries, with very worrying social and economic impacts. One exception is the rate of accidents on the

motorway network managed under concession, where the EU goal of halving the number of deaths due to accidents has been achieved one year ahead of time.

According to the '*Studio di valutazione dei Costi Sociali dell'incidentalità stradale, Anno 2010*' [*Study to evaluate the social costs of road traffic accidents, 2010*] published by the Ministry of Infrastructure and Transport, the social costs of road accidents amounted to EUR 21 billion in 2010, equal to approximately 1.5% of the GDP value for the same year, provided by the Ministry of Economy and Finance Treasury Department.

With regard to national transport policy, the latest Framework Document approved by Parliament was the **Transport and Logistics General Plan – PGTL**, published by the Ministry of Infrastructure and Transport by means of Presidential Decree of 14 March 2001. The fundamental stated aims of the Plan are to reduce transport congestion, delays, inefficiencies and the impact of transport on pollution, rebalance the distribution of freight and passenger volumes between different transport methods and improve road safety.

The PGTL considers ITS deployment to be one of the key measures for the implementation of the sustainable mobility goals that underpin the Plan. In the PGTL, ITSs are considered a crucial tool for the integration of mobility systems and services since such Systems make it possible to achieve an overview of the entire transport network.

In 2007, the Ministry of Infrastructure and Transport subsequently published **Mobility Plan Guidelines**, which reaffirmed the PGTL's goals of improving transport efficiency and safety. The Guidelines were revised in 2010 to place greater emphasis on goals of 'co-modality', innovation, road safety, environmental sustainability, logistics, motorways of the sea and development of trans-European networks. The Guidelines also state that ITS must play an essential role in achieving the goals of transport efficiency, safety and sustainability that underpin the development of the national mobility system because ITSs are a key tool for achieving integration between transport methods and networks within Italy and on major international routes, particularly within Europe and the nearby Mediterranean.

Because ITSs are based on an interface between IT and telecommunications systems, they allow the formation of an integrated transport system within which traffic flows are distributed in a balanced manner between the various modes, for greater efficiency, productivity and, above all, transport safety.

3.2 *ITS in Italy: current situation*

In line with other European countries, the Ministry of Infrastructure and Transport has decided that Italy should adopt a ‘systems’ approach to address the ongoing challenges of rising demand for mobility, within which information, management and control work in harmony to optimise the use of infrastructures, vehicles and logistic platforms from a multimodal perspective.

The ITS sector has actually been active in Italy since the 1980s but really took off during the following decade, mirroring growth in the other major industrialised countries. The State, local government, agencies, research institutes, Italian universities and public and private network operators have taken part in all European Commission Research and Development Framework Programmes, with significant results.

Traffic management and mobility ITSs are operating in many Italian cities, including Rome, Turin, Milan, Florence, Bologna, Genoa, Perugia, Naples, Brescia and Salerno. Almost 50% of Local Public Transport Agencies are also equipped with fleet localisation and monitoring systems designed to improve the service provided⁶. A survey recently carried out as part of the Elisa Programme Infocity Project funded by the Ministry of Regional Affairs⁷ showed that a high percentage of the Local Authorities involved have adopted a mobility plan that includes a section devoted to ITS. They also have interventions in the pipeline (completed or planned for the next three years) concerning ITS applications for traffic and infrastructure management, local public transport management, user information, road pricing, electronic ticketing and tariff integration, freight transport management and road safety. With particular regard to activities planned for the next five to 10 years, local authorities will prioritise investments in user information, traffic management and monitoring, freight transport management and electronic ticketing.

⁶Source ASSTRA

At regional level, under the terms of an agreement drawn up in May 2007 by the Joint Conference between the government, the regions, the autonomous provinces, ANCI [national association of Italian municipalities], UPI [Union of Italian provinces] and UNCEM National Union of Mountain Municipalities, Communities and Authorities, many regions have drawn up their own Regional Infomobility Plans, in other words a programming and guideline document concerning actions aimed at the development and sustainability of innovative processes applied to public and private mobility systems.

Numerous projects have been sponsored at various sites along strategic freight transport corridors with the aim of promoting the development of intermodality and integrated logistics. Within the integrated logistics sector, one of the main national initiatives financed by the Ministry of Infrastructure and Transport is the UIRNET project, a telematic platform set up with the aim of improving the efficiency and safety of the entire Italian logistics system, offering considerable benefits to individual users and the system as a whole. The platform will offer a comprehensive set of services and actions concerning information on mobility, information on interoperability as well as special services for managing hazardous freight transport.

Other initiatives worthy of mention include ITS projects funded under the 2000-2006 and 2007-2012 Transport NOP (National Operating Programme) that have been partly completed or are currently being implemented within Objective 1 Regions (Basilicata, Calabria, Campania, Apulia, Sardinia and Sicily), ITS projects sponsored as part of the Elisa Programme and financed by the Ministry of Regional Affairs as well as projects financed under the Industria 2015 Sustainable Mobility Programme.

In the motorway field, the toll motorway sector has represented and still represents a natural area for the testing and application of innovative systems and technologies in Italy. The toll network was in fact set up with the intention of guaranteeing efficient links between Italian areas of great economic and social importance that are characterised by significant traffic flows. This led to a need to deploy advanced systems for managing and monitoring the road infrastructure, information to users and toll collection. Italian toll motorways thus began to test and use intelligent traffic management systems more than two decades ago and have

⁷Elisa - Infocity Project, 'Indagine sull'infomobilità: I Sistemi di Trasporto Intelligenti (ITS) negli Enti Pubblici del Programma Elisa' [infomobility survey: Intelligent Transport Systems (ITS) in public authorities subscribing to the Elisa Programme], November 2012]

therefore accrued significant experience in both the organisation and management of advanced ITS services. Every year they invest substantial resources in technical and technological implementation and maintenance actions to guarantee the motorway network high levels of safety and quality. In particular, the Telepass automatic toll payment system is an Italian benchmark that has also been adopted in other European countries to the credit of Italian industry.

Furthermore, in March 2003 the Ministry of Infrastructure and Transport published Version 1 of ARchitettura Telematica Italiana per il Sistema dei Trasporti (ARTIST) [Italian telematic architecture for the transport system]. The aim of ARTIST is to establish the reference guidelines that are required to ensure the various ITS applications are compatible, integratable and interoperable with one another. The ARTIST architecture has been designed to ensure effective consistency with the European KAREN architecture to ensure that the schemes offered by ARTIST are interoperable with products developed within Europe.

3.3 Legislative framework for the development and adoption of ITS in Italy

The main technical and legal driving force behind the development and adoption of ITS in Italy is **Decree-Law No 179 of 18 October 2012 ‘Further urgent measures for growth of the country’**, also known as Development Decree Bis, converted, with amendments, from Law No 211 of 17 December 2012.

Article 8 of this Decree-Law ‘*Measures for the innovation of transport systems*’, transposes European Directive 2010/40/EU on ‘Framework for the deployment of Intelligent Transport Systems (ITS) in the field of road transport and for interfaces with other transport modes’ and stresses two fundamental topics:

- ✓ the first is the need to promote the adoption of interoperable electronic ticketing systems at national level, laying down a 90-day deadline for issuing the technical rules necessary for public transport companies with the aim of promoting the gradual phasing in of interoperable electronic ticketing while respecting existing solutions;
- ✓ the second concerns a need by owning bodies and operators of infrastructures, parking and service areas and intermodal hubs to set up a database providing information on

the infrastructures and services for which they are responsible, that must be kept constantly updated. Article 8 above also establishes a deadline of 60 days from the entry into force of the Decree conversion law for defining requirements for the deployment, planning and implementation of ITS. The aim of this is to ensure the availability of free basic information and the updating of infrastructure and traffic data information as well as actions to promote national development in a coordinated and integrated manner that is consistent with policies and activities present at Italian and EU level.

Article 8 also lays down specific requirements relating to the implementation of Directive 2010/65/EU of 20 October 2010 in terms of submitting reports on ships arriving in and leaving Member State ports, which must take place using the SafeSeaNet system, the European Union system for the exchange of maritime data, or using the PMIS - Port Management Information System, an information system for the administrative management of port activities.

Ministerial decree of 1 February 2013, published in Italian Official Gazette No 72 of 26 March 2013 completes the national legislative framework on ITS system development.

3.4 Requirements and actions for the deployment of ITS

In order to ensure maximum deployment of ITS, the requirements and principles obeyed in the design and implementation of such systems must be as follows:

- a) to make an effective and specific contribution to resolving the main transport problems, particularly on the road, such as traffic congestion, polluting emissions, energy efficiency of carriers and safety of road users;
- b) to ensure intermodality and interoperability, partly through the use of appropriate certification procedures, with the aim of ensuring that the underlying commercial systems and processes have the ability to share information and data;
- c) to promote equality of access to ITS applications and services by vulnerable road users without hindrance or discrimination;

- d) to offer proportional levels of service quality and deployment, taking into account specific local, regional and national situations;
- e) to support more effective use of existing national infrastructures and networks, taking into account the different characteristics of transport networks, particularly traffic volume dimensions and road weather conditions;
- f) to guarantee retrospective compatibility of solutions adopted, ensuring that ITS systems are able to operate with existing systems and share common purposes, without hindering the development of new technologies;
- g) to ensure the quality of synchronisation and positioning, using satellite navigation services incorporating technologies that offer equivalent levels of accuracy in shaded areas for the purposes of applications and services;
- h) to respect the consistency, compatibility and interoperability of national ITS services in relation to those guaranteed at EU level;
- i) to speed up the development of ITS and the ITS market, within a climate of market openness;
- j) to be cost efficient, optimising the ratio between costs and methods used to achieve objectives.

Together with these criteria and with the aim of achieving efficiency, streamlining and economy of use of ITS, the national authorities undertake to promote the following lines of action:

- a) set up a national telematic platform that can be accessed by users, partly with a view to implementing training activities aimed at the creation of jobs within ITS design, management and maintenance;
- b) draw up and use benchmark models and technical standards for the design of ITS, with the aim of achieving interoperability and consistency between national ITSs and similar systems at EU level;
- c) introduce a model for classifying roads, partly based on the ITS technologies and services present (for example: sensors, TV cameras, variable message signs, real-time

information on traffic and weather, emergency and road safety management systems, automatic toll payment and hazardous freight tracking);

- d) use on-board vehicle technologies in order to facilitate V2V (vehicle-vehicle) and V2I (vehicle-infrastructure) communication;
- e) set up a knowledge base of the benefits obtained by various users from the use of ITS applications;
- f) integrate platforms associated with freight transport, with particular attention to the interfaces between different transport modes, in order to avoid overlaps and conflicts between systems and promote system interoperability;
- g) use the satellite system EGNOS (European Geostationary Navigation Overlay Service) and GALILEO for satellite navigation services supporting passenger and freight transport in line with the Action Plan on Global Navigation Satellite Systems (GNSS) drawn up by the European Commission in June 2010;
- h) develop the system for the transmission of emergency calls from vehicles (e-call).

Ministerial Decree of 1 February 2013 also set up a technical guidance and coordination committee for ITS initiatives known as ComITS with the aim of guaranteeing coordination and integration within Italy.

ComITS is chaired by the Head of the Ministry of Infrastructure and Transport's Department for transport, navigation and IT and statistical systems. It is made up of the Directors of the Directorates General for road traffic, for road safety, for road transport and for intermodality, for IT, statistics and communication systems, for territorial development, planning and international projects and for Ministry of Infrastructure and Transport road infrastructures as well as one representative of the Ministry of the Interior and one of the Ministry of Education, Universities and Research. The aim of the ComITS is to ensure the consistency of all new projects of national importance that involve the use of public funding with the priority actions identified above and their interoperability. ComITS will express a binding opinion on the compatibility of the proposed projects with the national ITS architecture and offer appropriate suggestions for the purposes of ensuring this compatibility. ComITS must also monitor for duplication of efforts and consequent wasting of resources.

4 NATIONAL ITS ACTION PLAN: IDENTIFICATION OF PRIORITIES TO 2017

4.1 Priority area 1 – Optimal use of road, traffic and travel data

Priority area 1 concerns the availability, accessibility and accuracy of multimodal mobility information services in real-time. According to the European Commission⁸, this information must be validated and made available to all service suppliers under equal conditions with the aim of supporting safe and orderly traffic management. ‘Universal traffic information’ associated with road safety, which must be provided free of charge to all users, is of particular importance.

Ministerial Decree of 1 February 2013 defines the obligatory functional elements that constitute necessary conditions for the development of ITS systems, ensuring qualities of timeliness, consistency, quality and transparency. The purpose of the standard is to guarantee ITS service users and suppliers access to reliable and regularly updated information on traffic and mobility as well as the exchange of information between centres responsible for traffic information and control at central and local level.

The priority actions identified to achieve the above goal are as follows:

Priority Action 1: Databases on traffic and mobility information

The Ministerial Decree states that owning bodies and operators of infrastructures, parking and service areas and intermodal hubs must possess a database providing information on the infrastructures and services for which they are responsible, which must be kept constantly updated.

With the aim of ensuring the availability of free basic information, the law also requires that the Ministry of Infrastructure and Transport – Department for transport, navigation and IT and statistical systems, Directorate General for road safety – should make the following

⁸European Commission DG MOVE, ‘Intelligent Transport Systems in Action: Action Plan and Legal Framework for the Deployment of Intelligent Transport Systems (ITS) in Europe’, 2011.

information available on the Internet through the CCISS [road safety information coordination centre]:

1. a Data Dictionary of traffic events contained in the DATEX communication protocol;
2. a complete and updated database of locations for the IEC N63106 RDS (Radio Data System) – TMC (Traffic Message Channel) standard – or other models for the geo-referencing of traffic information produced by the adoption of new standards that can be used free of charge. The CCISS is responsible for maintaining the database and for certifying it every six months on the basis of information provided by road-owning bodies and concessionaires;
3. CCISS real-time traffic data on the entire road infrastructure network of national interest. After drawing up a user agreement with the CCISS, anyone can obtain this information with the aim of guaranteeing maximum deployment of notifications free of charge for citizens.

Priority Action 2: setting up of a Public Index of information on infrastructures and traffic

In order to allow access to information on infrastructures and traffic from sources other than the CCISS, the above Decree establishes a Public Index of information on infrastructures and traffic (IPIT) at no charge to public finances. This is held by the Ministry of Infrastructure and Transport and published on the CCISS website. It contains addresses (URLs) that can be used to obtain all public and private information relating to maps, infrastructures, traffic and the regular operation of the road system.

The bodies managing transport infrastructures and services are responsible for the accuracy and truthfulness of the information present in databases they control, for maintaining their data collection systems and for the continuity of the data production and deployment process. Data quality is guaranteed by the data producers, who arrange to define and disclose the quality standard levels for the information and the data made available and for the recording network maintenance activities in accordance with the technical and procedural standards in force in accordance with provisions for quality assurance laid down by EU and national legislation.

The existence of a quality assurance system – organised with special sections that describe procedures for data recording, access criteria and quality standards offered – designed to allow the bodies responsible for regular auditing to establish compliance with stated quality standards, constitutes a necessary preliminary condition for access to public funding. This is provided by the Regions under the Regional Plans for Infomobility (PRIM) in accordance with the Agreement between Government, Regions and Local Autonomies of 31 May 2007, or any other legislative or financial instrument specifically set up for the deployment of ITS technologies.

The Ministerial Decree also governs the method and frequency of information updates relating to maps, infrastructures, traffic and the regular operation of the road system, with the aim of ensuring consistency with effective conditions at the time of the update.

If the road-owning authorities or concessionaires are not in possession of appropriate instruments for obtaining the above information, they are bound to obtain a minimum set of data necessary from the owners of the said information; the unit cost of data use must be publicly disclosed. Data may be obtained from entities owning recording technology and holding a collection permit issued by the CCISS Management in accordance with procedures to be defined by a provision issued by the Head of the Department for transport, navigation and IT and statistical systems of the Ministry of Infrastructure and Transport.

This permit is not required by Ministry of Infrastructure and Transport departments, by road owning authorities and concessionaires and by police authorities.

Priority Action 3: Publication and deployment of certified information: new services

The publication and deployment, by any means, of data obtained from the Public Index of Information on Infrastructures and Traffic (IPIT), in other words data whose collection has been authorised under the terms of this paragraph, shall be free of charge.

In accordance with a provision issued by the Head of the Department for transport, navigation and IT and statistical systems of the Ministry of infrastructure and transport, to be adopted within 180 days of the date of entry into force of Ministerial Decree of 1 February 2013, the update methods, times and frequencies, the reference standards and the acquisition and publication formats of all infrastructure and traffic information shall be defined as well as the methods and conditions for continuous monitoring of the effectiveness of information and the efficacy of the data collection procedure.

4.2 *Priority area 2 – Continuity of traffic and freight management ITS services*

Priority area 2 covers topics relating to the achievement of conditions for the safety, efficiency, continuity and interoperability of ITS systems for traffic and transport management as well as those necessary to stimulate intermodality and co-modality in European transport corridors and in conurbations. A transport system that ensures continuity of ITS services allows optimum use of existing capacities, promotes co-modality and improves urban and rural freight transport, to the benefit of environmental sustainability and energy efficiency.

The objective to be achieved is the possibility of obtaining an **integrated multimodal mobility service for passengers and freight** that makes it possible to plan and manage journeys in an informed and personalised manner without breaks from the point of origin to the point of destination, using all available modes in an efficient and safe manner.

The development of integrated mobility services for both passengers and freight is necessarily based on the availability of, access to and systematic deployment of data and information, which therefore constitutes the enabling element of such services, on the management and organisation of these data into **open and interoperable integrated platforms**, and on transport service ticketing and integrated payment systems. The various operators that collect and process mobility information must communicate with the said platforms for this purpose.

The priority actions identified to achieve the above goal are as follows:

Priority Action 1: to promote the setting up within logistics hubs of logistics platforms that are integrated and/or interoperable with the National Logistics Platform UIRNet

The setting up, within logistics hubs, of telematic platforms that are harmonised and consistent with the PLN -National Logistics Platform UIRNet, for the exchange of data, information and documents between operators shall be encouraged with the aim of improving, simplifying and speeding up all operational and administrative processes within the complex intermodal transport cycle (road, rail and maritime).

Within the sphere of implementation of this priority action, it will be necessary to promote an extensive information and training campaign for actual telematic platform users with the aim

of facilitating their use and promoting the development of open ITS systems that are interoperable with one another and with the UIRNet NLP.

Priority Action 2: to promote the use of ITS for the multimodal management of transport and logistics, in accordance with open and interoperable platforms

Within the area of this particular priority action, Italy intends to promote the introduction of ITS systems devoted to freight logistics and transport, stepping up and stimulating transport intermodality and co-modality at both national and international level through the use of recognised Europe-wide transport corridors. The ITS systems must be interoperable and standardised. The essential reference must be the UIRNet national logistics platform for road transport.

The continuity and interoperability of ITS services at the interchange hubs (ports, interports, stations and airports) between the road network and other modes must also be guaranteed in terms of:

- ✓ issue of basic information (traffic situation near logistics hubs, available handling areas);
- ✓ streamlining of administrative procedures, particularly in the area of freight customs clearance checks, which may partly be achieved by setting up a customs one-stop-shop;
- ✓ traffic easing within intermodal areas with the aim of avoiding time wasted due to congestion and reducing environmental impact;
- ✓ minimisation of goods waiting and storage times;
- ✓ linking of different stakeholders (hauliers, logistics operators, infrastructure managers) by means of the national telematic platform for the management of information related to freight transport and the associated electronic documents;
- ✓ tracking and tracing of vehicles and loads for the transport of hazardous freight, using radio systems (RFID) and automatic location systems (GPS/EGNOS and in the future, Galileo);

- ✓ use of technologies for recording information on vehicle and load status;
- ✓ introduction and combining of ITS technologies for pairing vehicle tracking with freight tracking;
- ✓ use of open and interoperable ITS standards and architectures to ensure efficient data exchange between entities involved in the urban/rural sphere and the creation of added value services.

Due to the specific features of logistics within the Italian system, special attention will be devoted to the deployment of ITS systems for city logistics. Such systems shall be able, among other things, to:

- ✓ automatically identify the Euro emission category of freight transport vehicles in real time;
- ✓ accredit the vehicles and track them within restricted access areas;
- ✓ manage booking and control the occupation of freight loading/unloading areas;
- ✓ monitor the filling level of freight transport vehicles.

Priority Action 3: to promote the use of ITS for the management of passenger mobility from a multimodal perspective (considering local public transport, private vehicles, alternative transport vehicles) in accordance with open and interoperable platforms.

Within this priority action, Italy intends to adopt measures to promote the use of high-tech systems for the management of passenger mobility by making available **integrated multimodal passenger mobility services** that incorporate and include ITS systems for local public transport fleets, for tracking people's own vehicles and Personal Mobility Assistance systems for managing pedestrian routes or alternative vehicles with the aim of planning and managing journeys in an informed and personalised manner without breaks from the point of origin to the point of destination.

The actions will promote intermodal urban and rural mobility models focusing on people and not vehicles, through the expansion and integration of individual and collective transport modes with the use of alternative environmentally sustainable vehicles.

Priority Action 4: to guarantee the continuity of services on the national network and along borders

Europe-wide interfacing of national passenger and freight traffic control systems will be encouraged in order to ensure the continuity of management and information services along the entire national network and along the borders. In order to achieve this aim, European initiatives intended to establish cross-border cooperation with Member States will be supported, regulating and managing the interaction of entities involved, with the aim of promoting supranational coordination of control centres and the continuity of ITS services for freight and passenger transport management within European corridors and the various transport modes.

Furthermore, with the strategic aim of resolving interoperability and service continuity problems relating to traffic management and user information, it will be essential to regulate procedural aspects that determine interaction between the different entities involved. The aim will also be to allow the use of a single geographical representation system, ideally based on open CD map data.

Priority Action 5: to promote the adoption of integrated and interoperable electronic ticketing for the payment of local public transport services

The aim of this action is to promote the adoption of integrated electronic ticketing for the payment of local public transport services and for private mobility at both regional and national level. The application of integrated payment systems must allow users to use the various transport services (at local, regional and national level) using interoperable media for shared travel, parking and taxi documents.

To achieve this objective, it is necessary to use standards that allow combined use of the same ticket for several functions associated with urban mobility as well as to guarantee maximum integration with other payment and sales systems at regional and national level.

The standards must guarantee the possibility of using proximity and neighbourhood wireless and mobile technologies built into mobile phones and credit/debit cards, etc.

Priority Action 6: to promote the use of ITS in local public transport

With the aim of adopting an approach consistent with this priority action, local authorities will be encouraged to set up databases for the management of regulated fleets (for example: tourist coaches, urban logistics vehicles, passenger transport) and authorised vehicles that access restricted traffic areas, with particular reference to the vehicle accreditation processes.

The rationalisation and development of local public transport services will also be promoted through:

- ✓ implementation or expansion of fleet monitoring and location systems;
- ✓ service and shift planning and management;
- ✓ use of multimodal travel planning systems;
- ✓ the deployment of lanes reserved for local public transport equipped with appropriate control systems with the aim of discouraging their use by unauthorised vehicles;
- ✓ deployment of traffic light priority systems at crossings with traffic lights with the aim of reducing travel times and improving line management;
- ✓ use of user information system at stops that can also be accessed by means of website and smartphone applications that are able to provide information on waiting times, routes, stops and timetables;
- ✓ deployment of integrated traffic and mobility management and control platforms in metropolitan areas as well as demand management systems (restricted traffic areas, car parks).

The drawing up of tendering procedures by public transport companies for setting up ITS systems and services must be as standard and consistent as possible with open and interoperable architectures, drawn up in accordance with a benchmark model to be prepared on the basis of agreed guidelines. The contract notices must also contain a specific requirement for the evaluation of service performance parameters before and after the action with the aim of quantifying the benefits that the ITS system can generate. This information will make it possible to specifically measure the return on investments in economic terms but also in social terms.

Priority Action 7: enabling conditions for smart mobility in urban and rural areas

Italy will adopt the approach of promoting the setting up, by local authorities, of conditions enabling smart mobility in towns and cities, through the development of policies intended to incentivise:

- ✓ zero emission sustainable electric mobility;
- ✓ the adoption of sustainable mobility systems such as car sharing, bike sharing and carpooling;
- ✓ the implementation of sustainable urban logistics services.

In particular, local administrations must be able to offer on-line services that can be easily accessed namely:

- ✓ services for the effective optimisation (and possible reduction) of journeys (including journeys for work) (e.g. real-time traffic information; trip planning services);
- ✓ services for the booking and management of flexible and customisable low environmental impact passenger and freight transport (car and bike sharing, transport on demand, city logistics);
- ✓ information, booking and payment services available through more effective and widespread communication channels;
- ✓ quality mass transport services with metropolitan coverage;
- ✓ services for efficient and sustainable private transport.

To enable the above functions and services, effective coordination action will be required that makes it possible to guide local administrations toward more effective control and monitoring of regional rural mobility and access to individual urban/metropolitan areas, the deployment of integrated traffic and mobility management and control platforms in metropolitan areas as

well as the large-scale implementation of effective demand management systems (restricted traffic areas, road pricing, enforcement, car parks).

Priority area 3 – ITS road safety and security applications

Priority area 3 concerns transport safety and security ITS applications with particular attention to the eCall service, vehicle tracking for insurance purposes (black boxes) as well as the development and deployment of vehicle-centred solutions for the purposes of preventive safety (drive assist systems, monitoring of driving conditions and driving style).

Within this priority area, the problems in deployment of ITS services and solutions are mainly connected with organisational problems, such as a hotline for emergency calls and the implementation of eCall services at national level, as well as the identification of clear business models.

The priority actions identified to achieve the above goal are as follows:

Priority Action 1: Development of the national eCall system

eCall is the Europe-wide vehicle emergency call service that automatically makes an emergency call to the nearest PSAP (Public Safety Answering Point) recovery centre in the event of a serious accident, identified by the eCall device inside the vehicle. The call may also be activated manually by means of an appropriate button.

The activation of an eCall involves the immediate dispatch of an emergency message containing a Minimum Set of Data (MSD) including key information on the incident, namely the time, place and direction. In addition to automatic data transmission, a voice link will nevertheless also be established between the vehicle and the rescue centre. Information supplied by the MSD is decoded in the PSAP and displayed on the screen of the PSAP operator, who is able to hear what is happening in the vehicle and speak to the vehicle occupants if possible. This helps the operator to understand which emergency services must be sent to the place of the accident (ambulance, fire brigade, police) and quickly report the alarm and all information relating to the required service.

The PSAP operator can also immediately inform the traffic management centres so that the other road users can quickly be made aware and secondary accidents prevented or limited.

Italy is preparing for the implementation of the Pan European eCall service in 2015, involving public administration stakeholders (responsible for public emergency services), mobile phone operators and vehicle manufacturers.

For this purpose, Ministerial Decree of 1 February 2013 establishes an appropriate Institutional Board made up of representatives of the Ministry of the Interior, Infrastructures and Transport and of Regional Affairs for the analysis and coordination of the various topics.

Italy is also taking part in the European HeERO (Harmonised eCall European Pilot) project under the national coordination of the Prime Minister's Office.

In Italy, implementation of the eCall service requires:

- ✓ activation of the NUE112 emergency number throughout Italy;
- ✓ extension of the infrastructure made available for the NUE112 service with the additional functions necessary for eCall, in line with relevant European guidelines.

The following are also considered necessary:

- ✓ definition of procedures associated with the management and maintenance of eCall devices that are harmonised at European level;
- ✓ coordination between the stakeholders involved and operating procedures present in the eCall process;
- ✓ encouragement for aftermarket installation of on-board solutions, one of the aims being to ensure faster deployment of the in-service fleet and to maximise the efficacy of the financial investment necessary for the implementation of the first-level PSAP infrastructure and the associated networking.

Priority Action 2: to set up a telematic archive of motor vehicles and trailers that are not covered by third-party insurance

Article 31(2) of Decree Law No 1 of 24 January 2012, converted, with amendments, from Law No 27 of 24 March 2012 concerning: 'Urgent provisions for competition, infrastructure development and competitiveness', ordered the setting up within the Ministry of Infrastructures and Transport, Department for transport, navigation and IT and statistical

systems, Directorate General for road traffic, of a telematic archive of motor vehicles and trailers registered in Italy that are not covered by third-party insurance as required by Article 122 of Legislative Decree No 209 of 7 September 2005.

The archive is supplied by insurance companies authorised to perform this activity in Italy, which send the necessary data on-line at the time when each third party liability insurance contract for motor vehicles and trailers registered in Italy is taken out, suspended and reactivated.

The transmitted information includes identification data on the vehicle (license plate, make and type, presence of installed telematic box, telematic box provider), on the policyholder (name, surname, date of birth and tax code), and on the period (start date, end date) for which the vehicle is covered by the third-party liability insurance.

Priority Action 3: Deployment of ITS systems for the management and monitoring of hazardous freight

This priority action promotes measures for the adoption of instruments for the monitoring of vehicles and hazardous goods for greater safety during transport stages. These instruments will be based on pre-existing ITS instruments for transport monitoring, but will also include further instruments and characteristics, with the aim of introducing:

- ✓ the planning of travel itineraries that involve minimum risk in terms of the probability of road accidents occurring;
- ✓ the setting up of appropriate coded information processes to the traffic control centres/mobility offices of multimodal infrastructure managers and local administrations involved in the various transport stages (transit, destination);
- ✓ the setting up of system development analysis instruments in the event of accidents, and decision-making support tools.

Priority Action 4: Use of on-board devices that record vehicle activities (black box) for the extension of ITS services

Article 32 of Decree Law 1/12 ('development decree'), converted to Law 27/12, states that the policyholder may consent to the installation of electronic mechanisms that record vehicle activity (black boxes) in obligatory insurance policies covering third-party vehicle traffic liability.

The said Article 32 also states that the identification of the devices and their technological standards as well as methods of data collection, management and use, including for the purposes of ensuring full portability of the devices if the policyholder transfers from one company to another, should be laid down in appropriate measures issued by the competent government departments and by IVASS [Institution for the supervision of insurance] (formerly ISVAP [Institute for the supervision of private insurance and collective interest]).

The aim of the standard and of the competent administrations is to mitigate the effects of the phenomenon of insurance fraud on the size of premiums paid by policyholders. This will bring significant savings for the public as well as set up an overall regulatory system that is open to innovation and competition, compliant with privacy laws and able to allow the interoperability and scalability of solutions to accommodate new and different ITS applications and services.

To ensure that the above objectives are achieved, the new black boxes are therefore guaranteed to contain a dedicated two-way wireless communication device for communication with other on-board devices. Definition of a device portability model has been acknowledged as 'crucial' to the success of the entire regulatory action within the above area.

This action will also promote initiatives that will bring benefits to consumers using the above devices in terms of services provided and lower costs, with particular reference to initiatives that involve making collected data available and encouraging innovation and competition.

Priority Action 5: Promoting the deployment of enforcement systems

The aim of this priority action is to promote the use of ITS technologies with the aim of reinforcing and deploying instruments for preventing and establishing highway code infringements.

For this purpose, it would be advisable to encourage the launch in the user market of enforcement systems effective over the entire urban and rural road network to improve the level of road safety and promote greater innovation, particularly with regard to measuring average and instantaneous speed on fast roads. Such systems must be used in such a way that they help drivers respect speed limits.

The innovation, marketing and use of ITS systems for sanctioning incorrect actions in the urban environment that are particularly dangerous to vulnerable users (pedestrians, cyclists) will be promoted, such as systems for sanctioning drivers who drive through red traffic lights and for monitoring pedestrian crossings.

The use of enforcement ITS systems must in any case be supported by a system for recognising the points on the road network where incorrect behaviour is concentrated in order to maximise the benefits.

Priority Action 6: Development of security services in local public transport and in transport hubs

The aim of this priority action is to activate initiatives intended to improve transport security, where it is a priority to promote the large-scale adoption and deployment of:

- ✓ CCTV systems for the monitoring of interchange and parking areas (stations, ports, airports, intermodal centres, service stations, metro platforms, transport stops and car parks), vehicles (buses, trams, metros and trains) and the use of systems for transmitting alarms to the exchange from on board the vehicle by means of emergency buttons and/or hands-free systems and associated links with police systems;
- ✓ technologies for the control of access to restricted areas, that in particular allow identification of staff operating in the most critical areas;

- ✓ image processing systems for the identification of suspect situations that constitute a fundamental support for control centre operators.

The adoption of shared lines for procedures and methods of rapid access to collected data will also be promoted to allow police forces to carry out quick interventions and checks.

Priority Action 7: Promotion of advanced on-board systems

The aim of this priority action is to promote initiatives in the field of preventive safety applied to vehicle on-board equipment. In particular, the research, development, innovation, improvement and marketing of technologies devoted to the protection and preventive safety of motorists will be promoted as well as system add-ons that are able to offer a unique, interoperable and open system for the control and processing of data and events. The integration of such systems with V2V (Vehicle to Vehicle) and V2I (Vehicle to Infrastructure), with the e-Call system and with black boxes on board vehicles will be encouraged.

4.3 Priority Area 4 – Linking the vehicle with the transport infrastructure

Priority area 4 concerns the development of vehicle communications and their progressive integration with transport infrastructures (road infrastructures, service centres), as a stand-alone operational sphere and also to enable other priority areas.

Vehicle to Vehicle (V2V), Vehicle to Infrastructure (V2I) and Infrastructure to Infrastructure (I2I) represent enabling technologies for the development of innovative applications aimed at the development of a sustainable mobility model.

The priority actions identified to achieve the above goal are as follows:

Priority Action 1: Monitoring the status of the infrastructure and of safe parking areas for freight transport

The deployment of systems for monitoring the status of the road infrastructure will be promoted with the aim of optimising maintenance operations and adopting appropriate and timely measures designed to improve infrastructure usability under safe conditions.

Measures will also be adopted to improve conditions of access to paid parking areas for freight transport, partly by implementing parking area information and booking services that use ITS solutions, including mobile and on-board devices with communication and location functions.

Priority Action 2: Checking compliance with safety requirements in the haulage sector and vehicle speed

The use of ITS applications intended to improve systems for monitoring compliance with minimum safety requirements in the haulage sector and also for monitoring the average and instantaneous speed of vehicles on the road throughout the urban and rural road network will be promoted.

Priority Action 3: Technical specifications and standardisation for the link between vehicles (V2V) and between vehicles and infrastructure (V2I) for cooperative driving

With the aim of promoting the deployment of vehicle to vehicle and vehicle to infrastructure data exchange systems, partly to achieve an improvement in traffic safety parameters under adverse weather conditions and promote cooperative driving, measures will be adopted to introduce the following associated initiatives:

- ✓ the identification of ICT solutions that enable real-time vehicle to vehicle and vehicle to infrastructure communication (roadside and central);
- ✓ the implementation of technical specifications applicable to the support required to operate the telematic link between vehicles and infrastructure;
- ✓ the implementation of technical specifications relating to standard and interoperable message formats;

- ✓ access procedures for the exchange of vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) data and information.
- ✓ the implementation of testing and checking procedures that are laboratory-based and also set up in the field under actual conditions;
- ✓ the integration of V2I systems with on-board equipment, preventive safety systems and black boxes.

Priority Action 4: Monitoring the status of the road infrastructure under adverse weather conditions and for maintenance purposes

This priority action promotes the research, development, innovation, marketing and adoption of automatic instruments that are distributed throughout the area but offer centralised data-processing facilities and are sufficiently densely saturated to monitor local weather conditions and also make it possible to identify the road surface status and visibility status in real-time, offering risk indices based on data reports and not only on spot data.

The integration and representation of data processed using such systems with meteorological models and with the geographical representation systems that are already extensively encouraged in transport control systems will be promoted.

The introduction of complementary signs that can be immediately used by drivers by means of visual signals or V2I and V2V information exchange will also be promoted.

5 IMPLEMENTATION TIMETABLE

The actions submitted in this draft Plan are due to be implemented within the five-year period 2013 – 2017.

Although all the actions indicated within each priority area constitute objectives of certain interest that Italy eventually intends to pursue, full implementation is in the pipeline only for some of these and their nationwide deployment is still partial and fragmentary in some cases.

Because other priority actions will necessarily require further stages of coordination and examination, a date for full implementation and achievement of the associated objectives cannot yet be set.

A forecast target achievement date is therefore given below for priority actions where the implementation pathway has already been defined or can be defined. It does not currently seem realistic to define a reliable timeframe for completion of the other priority actions – even though these are important actions whose development will be given the greatest consideration. The ‘target date’ box in the following table is therefore completed with the acronym TBD (to be defined) in such cases, on the understanding that this deadline must be met before the deadline set at EU level (August 2017).

Moreover, under the terms of Article 17 of the ITS Directive 2010/40/EU, Italy must report to the European Commission by 2014 on progress achieved in the deployment of national projects concerning priority areas as laid down in this Action Plan. This occasion will therefore offer an opportunity to update the ‘target dates’ for the above actions with reliable data.

Priority area 1 ‘Optimal use of road, traffic and travel data’

Priority Action	Target date
PA 1: databases on traffic and travel information	2015
PA 2: setting up of a Public Index of information on infrastructures and traffic	2015

PA 3: publication and deployment of certified information: new services	2015
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Priority area 2 ‘Continuity of traffic and freight management ITS services’

Priority Action	Target date
PA1: promote the setting up within logistics hubs of logistics platforms that are integrated and/or interoperable with the National Logistics Platform UIRNet	2014
PA 2: promote the use of ITS for the multimodal management of transport and logistics, in accordance with open and interoperable platforms. Automatic identification of freight vehicle emission category in the urban environment	TBD
PA 3: promote the use of ITS for the management of passenger mobility from a multimodal perspective (in other words, considering local public transport, private vehicles, alternative transport vehicles) in accordance with open and interoperable platforms.	TBD
PA 4: guarantee the continuity of services on the national network and along borders	2015
PA 5: promote the adoption of integrated and interoperable electronic ticketing for the payment of local public transport services	TBD
PA 6: promote the use of ITS in local public transport	TBD
PA 7: enabling conditions for smart mobility in urban and rural areas	TBD

Priority area 3 ‘ITS road safety and security applications’

Priority Action	Target date
PA 1: development of the national eCall system	2015
PA 2: setting up of a telematic archive of motor vehicles and trailers that are not covered by third-party insurance	2013
PA 3: deployment of ITS systems for the management and monitoring of hazardous freight	TBD
PA 4: use of on-board devices that record vehicle activities (black box) for the extension of ITS services	2015
PA 5: promote the deployment of enforcement systems	TBD
PA 6: development of security services in local public transport and in transport hubs	TBD
PA 7: promotion of advanced on-board systems	TBD

Priority area 4 ‘Linking the vehicle with the transport infrastructure’

Priority Action	Target date
PA 1: monitoring the status of the infrastructure and of safe parking areas for freight transport	TBD
PA 2: checking compliance with safety requirements in the haulage sector and vehicle speed	TBD
PA 3: technical specifications and standardisation for a vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) link for cooperative driving	TBD
PA 4: monitoring the status of the road infrastructure under adverse weather conditions and for maintenance purposes	TBD

6 IMPLEMENTATION TOOLS AND EXPECTED BENEFITS FOR ITALY

Because ITS could constitute a real opportunity for Italy, a set of operational tools must be defined to facilitate the practical implementation of the priority actions laid down. The goal of maximising the social and economic benefits offered by ITS while stimulating the growth of a competitive market for services based on ITS systems and a national industry in the sector that is genuinely competitive on international markets requires the provision of sufficient resources.

National legislation has nevertheless ordered that activities for the deployment of ITS systems and services and the adoption of the relevant measures must be carried out within the scope of the human, financial and instrumental resources available under current law. In other words, no new or greater charges must stem from the implementation of the provisions laid down in the above Ministerial Decree of 1 February 2013.

It should be emphasised in this context that the use of ITS can generate direct and indirect savings that could be reinvested in the sector. Setting up ComITS, for example, and making this body responsible for coordinating the various ITS-related initiatives, could effectively help prevent any duplication of expenditure and ensure the optimal use of available resources.

Implementation of the proposed priority actions is strongly dependent upon the definition of a set of strategic incentives to facilitate practical implementation of the measures described. One example of an effective way to provide incentives for the adoption of ITS systems could be to use appropriate tools to reward companies that can demonstrate they have achieved pre-set goals for improving service levels and reducing polluting emissions.

ANNEX A: SOME EXAMPLES OF NATIONAL BEST PRACTICE

Brief descriptions are given below of some cases of best practice within Italy sponsored by public authorities that are in the pipeline and/or planned for the next five years, with reference to priority action areas 1, 2 and 3.

Priority area 1 (Optimal use of road, traffic and travel data)

The CCISS
Objective The CCISS - Road Safety Information Coordination Centre - is the public utility service for traffic and road information on the national road network.
Description, characteristics and functions The CCISS - Road Safety Information Coordination Centre - was set up at the time of the 1990 Football World Cup, with the aim of: <ul style="list-style-type: none">✓ collecting, processing and selecting information on traffic and the road system;✓ circulating information to help keep traffic safe and flowing smoothly;✓ drawing up and implementing road safety campaigns. The CCISS is coordinated by the Ministry of Infrastructure and Transport. Activities are carried out by the ‘Viaggiare Informati’ [travel information] Operating Centre, which currently consists of the Ministry of the Interior - Traffic Police, Carabinieri Corps, RAI - Radiotelevisione italiana S.p.A., ANAS [Italian Roads and Motorways National Agency], ACI [Italian Automobile Club], AISCAT [Italian Association of Toll Motorways and Tunnel Operators] , Autostrade per l’Italia and Infoblu. The CCISS collects information on road events and also broadcasts it via: <ul style="list-style-type: none">➤ TV programmes, the Internet and satellite➤ teletext➤ radio programmes➤ RDS-TMC (digital channel superimposed on FM radio broadcasts)➤ web➤ Call-Centre, with freephone number 1518 active 24 hours a day➤ satellite navigation systems by means of RDS-TMC➤ smart phone through the iCCISS app, developed by the Ministry of Infrastructure and

<p>Transport Department for Land Transport that allows information on traffic and the road system managed by the CCISS operating centre to be used at all times and particularly during journeys.</p> <p>The CCISS is equipped with a Datex data exchange system that it uses to communicate with Italian road system operators and with other European Union countries.</p>
<p>Stakeholders involved</p> <p>Ministry of the Interior - Traffic Police, Carabinieri Corps, RAI - Radiotelevisione italiana S.p.A., ANAS, ACI, AISCAT, Autostrade per l'Italia and Infoblu.</p>
<p>Resources used</p> <p>Public funds</p>

<p>TELEPASS</p>
<p>Objective</p> <p>Telepass is an electronic toll collection system that has been in use on the Italian motorway network since 1990. It constitutes the first European application of a nationwide electronic toll system. Nowadays, more than 8 million devices are in service on-board vehicles driven on the motorways, representing approximately 40% of the European market.</p>
<p>Description, characteristics and functions</p> <ul style="list-style-type: none"> ➤ Telepass is compliant with standards laid down by the European Directive on electronic road toll systems for the implementation of the EETS (European Electronic Toll Service), which aim to allow the interoperability of systems in service within Europe in accordance with a 'one box / one contract' approach. ➤ Because the Telepass system is so widespread, it can be used for numerous applications other than toll collection: for example, control of access to city RTZs (restricted traffic zones), car park payment, payment for access to restricted mobility areas (road charging / congestion charging) and other payments associated with vehicle mobility. ➤ Telepass, which is based on DRSC (Dedicated Short Range Communication) microwave technology, can also be used in on-board devices with satellite technology to provide integrated services for payment, vehicle tracking, fleet management, infomobility and access control.
<p>Stakeholders involved</p> <p>Autostrade Tech, Autostrade per l'Italia, other motorway concessionaires, Ministry of</p>

Priority Area 2 (Continuity of traffic and freight management ITS services)

Biglietto Integrato Piemonte– BIP

Objective

In 2007, the region of Piedmont introduced the ‘Biglietto Integrato Piemonte’ [Piedmont integrated ticket](BIP) with the aim of reviving the local passenger transport system, improving accessibility, management and promotion, enhancing the infomobility system and certifying the quantity and quality of service provision.

The aim of the project is to allow the public in the region to meet their mobility needs by using the entire regional and local public transport (LPT) system effectively and easily, mixing and matching the various existing transport modes without differentiation: rail services, metro services, urban and rural bus services, lake services, car sharing and bike sharing.

Description, characteristics and functions

The project is jointly funded by the region of Piedmont up to a maximum of 60% for the purchase of technology and involves the implementation of:

- a regional electronic ticketing system based on contactless microchip smartcard technology;
- a system for monitoring public transport vehicles;
- a CCTV system on board vehicles

The project involves a three-level structure, user network (validation, sale and top-up), company control centres (typically concentrated within the provincial catchment area), a regional service centre (instrumental in backing the region of Piedmont for governance of the BIP system and management of dealings with local authorities, users and the public, LPT agencies and companies and any other stakeholder involved in this area).

The main features of the project are as follows:

- a single smart card for all companies in the region of Piedmont;
- ticketing systems concentrated at catchment area level (organised by pricing system or province);
- a ‘transport credit’ can be loaded on the same smartcard and used as a pay-as-you-go travel unit on all buses and trains in the region. It can be topped up through the sales network;

- definition of an integrated pricing system at regional level.

Stakeholders involved

More than 100 transport companies as well as the region of Piedmont and the current eight Piedmontese provinces.

Resources used

Estimated cost of the entire regional system, approximately EUR 50 million.

Region of Piedmont funding covers 60% of total investment (EUR 27 million). The remaining portion is covered by local public transport companies.

UIRNet

Objective

The main aim of UIRNet is the setting up of the National Logistics platform, the telematic system of reference for the management of the national logistics network. Its aim is to allow interconnection of modal interchange hubs (ports, interports, freight centres and logistics platforms) to improve the efficiency and safety of logistics in Italy, as determined by Ministerial Decree No 18T of 20 June 2005 and reinforced by Laws No 27 of 24 March 2012, Article 61a ('Cresci Italia [Grow Italy]' Law and No 135 of 7 August 2012, Article 23 ('Spending Review' Law)

Description, characteristics and functions

UIRNet is a body governed by public law that operates as the single implementing entity of the Ministry of Infrastructure and Transport (MIT). Its partners are the main stakeholders in the Italian logistics system and leading national industrial players.

The National Logistics Platform is currently at a pilot stage and is intended to provide system services to all operators. It will develop into a platform for interconnection, regulating the associated data and processes. The aim is that it will become the reference framework for the national logistics network, through integrated management of information on freight traffic. The main stakeholders in the sector (ports, interports and haulage operators) will go online through the platform. By exchanging data in real time they will be able to plan, optimise and optimally book loading/unloading missions, physical flow management and slots for haulage operators to load/unload freight at hubs.

To achieve this, the National Logistics Platform is equipped with a robust, open, interoperable

and scalable infrastructure and is able to offer some innovative system services:

- a control tower service that provides real-time information on vehicles arriving at a point (logistics hub, point of interest) and displays the associated documentation;
- an interactive mission service that makes it possible to plan and manage missions, calculate arrival time and manage the relevant documentation, with real-time information on traffic status and service operability;
- a booking service that allows anyone offering a resource/service to make it available to the community as a whole, managing the relevant bookings;
- a freight taxi service that offers a service for automatically matching transport supply and demand, taking into account current and future haulage operator positions and missions.

Pilot testing of certain services has already started, including <<Arrival warning>> for haulage operators who operate through the Voltri hub and the <<infotraffic>> service allowing users to receive sensitive information on disruptive traffic events within an area of 5 to 50 Km. The agreed goal of the pilot project was to involve 5000 vehicles by the end of 2012. Testing was subsequently to be rolled out to other services, involving additional hubs and at least 20 000 vehicles by the end of 2013, after which deadline the platform will operate under steady-state conditions.

Stakeholders involved

Stakeholders involved in the UIRNet Megacommunity are the Institutions, logistics and haulage operators, the various sector associations, private companies and infrastructure managers.

Resources used

The MIT allocated a budget of EUR 27 million for the stage of implementing and testing the national logistics platform, subject to joint funding of EUR 8 295 million, which UIRNet has already obtained, partly in the form of equity from its partners and partly as a loan granted by the Cassa Depositi e Prestiti [deposits and loans fund].

In 2012, additional funds were also allocated to the project, firstly EUR 3 million through the ‘Cresci Italia’ Law, specifically allocated for improving road haulage operating conditions and inclusion of the ports in the pilot project and then an additional EUR 2 million under the ‘Spending Review’ Law with the aim of ensuring that road haulage activities are also efficient with regard to hazardous freight transport.

Priority area 3 (ITS road safety and security applications)

TUTOR

Objective

Deployment of road safety systems

Description, characteristics and functions

- Tutor is a system that was conceived, developed and implemented by the Autostrade per l'Italia group and type-approved by the Directorate General for Road Safety of the Ministry of Infrastructure and Transport. It is used to record vehicle instantaneous/average speed and for the consequent issuing of penalties by the traffic police, if necessary
- The Tutor system is based on portals installed on the infrastructure (at the beginning and end of the monitored section if activated to measure average speed)
- When an infringement has been identified and validated by a police officer, Tutor consults the national vehicle archive kept by the Ministry of Infrastructure and Transport to collect data on the holder of the logbook, completes and prints a report and forwards data for the offender notification procedure electronically
- Unlike conventional systems, Tutor is able to operate even under adverse weather conditions
- Since the first few months, adoption of the system has brought about a significant reduction in average speed (-15%) and instantaneous speed (-25%), achieving a sharp reduction in accident and personal injury rates: mortality rate -51%, rate of accidents with injuries -27%, accident rate -19%

Stakeholders involved

Autostrade Tech, Autostrade per 'Italia, other motorway concessionaires, Ministry of Infrastructure and Transport, Ministry of the Interior, local government

Expected developments

Technological development and optimisation of the system for use in non-motorway environments (city centres, rural roads, link roads) with high accident rates

HeERO

Objective

The HeERO (Harmonised eCall European Pilot Project) is jointly funded by the European Commission. The purpose of the project is to validate EU standards established for eCall and set up active and operational installations that can stimulate the deployment of the eCall system in each Member State, partly for the purposes of checking effective system interoperability.

Description, characteristics and functions

The aim of the HeERO project is to analyse and evaluate all problems that may arise in implementation of the eCall system throughout the entire service chain, including interoperability.

Italy is one of the project test sites. The Italian pilot project is conducted in the Varese area and the results of the tests carried out will be used to define the overall service ICT architecture for the deployment of PSAPs (Public Safety Access Points) able to manage the eCall system within Italy, to plan the NUE 112 infrastructure, to update mobile networks and to create a better road emergency management system.

Another aim of the Italian test site is to test additional eCall services as well as the eCall chain and also to communicate with a simulated RTTI (Real Time Traffic Information) centre.

Lastly, the results of tests carried out will be made available to all the stakeholders involved in the process of planning and implementing the eCall system throughout Italy.

The HeERO project started in January 2011 and will conclude on 31 December 2013.

Stakeholders involved

The Italian pilot project is coordinated by the Prime Minister's Office. Project partners include the Fiat Research Centre, Magneti Marelli, ACI, Telecom Italia and the Lombardy region emergency first aid agency (AREU)

Resources used

The project is jointly financed by the European Commission as part of the Competitiveness and Innovation Framework Programme (CIP ICT-PSP)

DRIVE IN²

Objective

The project Drive IN² DRIVER (Monitoring: Technologies, Methodologies and IN-vehicle INnovative systems for safe and eco-compatible driving) is a Research and Competitiveness National Operating Programme (NOP) research project, 2007-13 programming period. Its aim is to define procedures, technologies and high-tech systems relating to driver-vehicle interactions for the prevention of road accidents and for the reduction of polluting emissions. The focus of the programme is to monitor drivers and their behaviour at the wheel by observing vehicle variables and driver behavioural variables. In this way, anomalies can be identified and action taken to restore them to within limits of environmental sustainability and accident risk prevention.

The project started in July 2011 and will be completed by the end of June 2014.

Description, characteristics and functions

The project's strength and fundamental quality is its multidisciplinary approach, since it involves the following actions:

- driver analysis from a psychological viewpoint by means of cognitive and behavioural measurements in order to identify variables with an impact on the levels and quality of alertness functions when driving;
- design of sensors and/or techniques for vehicle on-board monitoring of mental and physical driving conditions (e.g. pressure, temperature, level of glucose etc., drowsiness) in real time and when driving and/or monitoring of any alcohol and narcotics intake;
- application of data fusion & data mining methods for a combined analysis of vehicle variables;
- monitoring of drivers' driving styles with the aim of analysing and modulating maximum vehicle efficiency in real-time.

This innovation is intended to identify systems that initially obtain an in-depth knowledge of driver status, specific vehicle driving style and the choice of road routes. This information can then be managed for predictive purposes, with the aim of promoting interaction between driver and vehicle with a view to warning and prevention. The purpose is to keep the driver informed during the journey by managing relevant feedback and appropriate vehicle on-board messages.

Stakeholders involved

Fiat Group Automobiles S.p.A., C.R.F S.C.p.A, Università Federico II, Università di Salerno,

CNR – Istituto Motori, Università Suor Orsola Benincasa, Università di Catanzaro, Medic4All S.p.A., TSEM Research S.r.l., Megaris S.r.l.

Resources used

The planned financial investment is approximately EUR 12 million to be paid out of NOP Research and Competitiveness funds.

ANNEX B: CLASSIFICATION OF ITS APPLICATION ENVIRONMENTS

The classification of ITS application environments and their mapping over priority areas considers the following application environments, taking into account the established international classification:

- TMS (Traffic Monitoring System)
- NMS (Network Monitoring System)
- AVM (Automatic Vehicle Monitoring) and AVL (Automatic Vehicle Location)
- ATIS (Advanced Traveller Information System)
- ATMS (Advanced Traffic Management System) and cooperative ATMSs
- ATDM (Advanced Travel Demand Management System)
- ADAS (Advanced Driver Assistance System) and Cooperative-ADAS
- ATFLS (Advanced Freight Transport and Logistics System)
- ECS (Emergency Call System)
- Other ITS solutions and applications

The following definitions are given for each of the above categories:

- The purpose of TMS is to estimate network traffic and flow conditions in road sections using statistical data, real-time data from observation technologies/infrastructure-side measurements, from vehicles, etc. These provide raw data for many other ITS applications.
- NMS monitors road infrastructure conditions and their status in terms of how safely and efficiently they can be used by vehicles. The main information used is obtained from roadside devices (roadside approach). Examples include monitoring of tunnel traffic conditions, weather conditions on road sections, the presence of snow or ice and the amount of antifreeze available in solution on the road surface, foggy conditions, etc. The long-term aim is to achieve self-aware networks. The effects are measurable in terms of reductions in infrastructure maintenance and management costs but also of traffic control and management (ATMS). Network monitoring also has an impact in terms of information transmitted to travellers (ATIS). NMS is a preparatory step for most ITS applications and is particularly important for priority area 3 and 4 solutions, specifically for I2V and V2I applications.
- The aim of AVM (and AVL, which is generally a component of AVM systems) is to track and monitor vehicle status and/or kinematics with the aim of controlling and monitoring entire fleets (an application typical of the freight and public transport sector, where they may also serve the purpose of controlling operational quality and compliance with service contracts). AVM may also contribute to the monitoring of traffic networks and flows (floating car data approach). Solutions based on black boxes for insurance services are one specific use of AVM systems. AVM systems involve the use of telematic devices based on location (satellite) and communication (V2I) technologies.
- ATIS covers dynamic user information solutions. This category includes navigation applications, where not based on static maps. ATIS systems are systems that influence

user travel choices, with immediate impacts at transport network level (e.g.: choice of route, propagation of flows between branches of a network, etc.). ATIS applications are unlikely to occur without a TMS; AVM may also be a useful aid.

- ATMS covers network control applications in urban areas and motorway systems. More generally, such systems typically have direct effects on flow propagation and only indirect effects on travel choices. For example, they have an impact on vehicle traffic flow and on choice of route only as a knock-on effect of traffic flow. ATMS applications are typical control applications (of networks). ATMS may be directed at user/vehicle categories and/or particular targets. Purely as an example, such applications may tend to ease propagation in the rescue and emergency vehicle flow. ATMS applications that are based on vehicle to vehicle or vehicle to infrastructure (V2X) communication are termed co-operative ATMS.
- ATDM systems result from bringing conventional demand control policies (TDM – Travel Demand Management) into line with ITS, namely policies for access pricing and control, parking pricing and restriction, park-and-ride, etc.). The effects of ATDM systems on transport systems mainly concern mobility choices, for example in terms of journey origin/destination matrices (modal choice, choice of destination, choice of travelling time, effects on overall mobility level, etc.). Due to technological and application affinities, this category also includes more general solutions for taxation and electronic ticketing, with reference to the motorway, rural, urban and passenger transport field.
- ADAS are driver assistance systems with impacts on driving choices for individual vehicles (driving behaviour) or sets of vehicles. They generally focus on safety (active and preventive) and driver comfort. ADAS systems (source eSafetyAware) improve road safety by reducing the number of accidents and have an immediate indirect effect on vehicle flow conditions. They can also have a significant impact on the performance of transport system components (e.g. road capacity). Cooperative ADAS is based on vehicle to infrastructure (V2I) or vehicle to vehicle (V2V) communications. In general, the option of V2X communications makes it possible to improve conventional ADAS solutions. They also make it possible to develop new

‘cooperative’ safety solutions and solutions within the applicational sphere of ATIS and, to an even greater extent, ATMS.

- ATFLSs are ITSs applied to the world of logistics. They include various application environments, ranging from the safety of hazardous freight (based to a large extent on the presence of AVM/AVL solutions) to the optimisation of terminals and urban distribution logistics. The technological management of co-modality, intermodal corridors and interports and other intermodal terminals falls into this category.
- ECS solutions are a specific type of dedicated AVM/AVL solution for European eCall system management. This topic is represented independently depending on the relevance it is given by EU obligations to implement such solutions.
- Other ITS technologies, solutions and applications cover solutions that do not fall into the above categories, which apply telecommunication, electronic and IT technologies to transport system engineering with the aim of implementing cognitive and/or decision-making technological intelligence to such systems, which are characterised by a marked ability to adapt dynamically to changes in system status.

The ITS solutions fulfil priority areas of the Directive in accordance with the following mapping table.

Solutions/Areas	Area 1	Area 2	Area 3	Area 4
TMS	X	X		X
NMS	X	X	X	X
AVM/AVL			X	
ATIS	X			X
ATMS and cooperative ATMS		X		X
ATDM		X		
ADAS and cooperative ADAS			X	X
ATFLS		X		

ECS			X	
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