Europe: Motorway concessionaire companies committed to intelligent mobility

Since 1995 and for the coming years, sustainable mobility is at the heart of EU and national policies. It is also a daily reality for the French motorway operators who, because of their public service mission, must meet safety performance and fluidity objectives for all of their clients, in all circumstances.

To effectively and efficiently address the issues of road safety, reduce congestion and mitigate the impact on the environment, while taking into account today’s financial constraints, the European Commission supports technological innovation and the deployment of Intelligent Transport Systems (ITS) on the Trans-European Transport Network (TEN-T) through study and development programmes. As regards road transport, TEN-T should cover 90,000 km of motorways and high quality roads by 2020.

From experimentation to large-scale deployment, from collaboration to cross-border cooperation, the French motorway operators have occupied and still occupy an important place alongside other European operators, public and private, in ITS deployment projects. After an initial involvement in the TEMPO program (2001-2006) and then EasyWay (2007-2012), the motorway companies are now involved in two strategic projects: MedTIS and Arc Atlantique (2013-2018).

It is worth remembering that without European projects such as Arts, Centrico, Serti…, most of the ITS services deployed by the motorway companies (cross-border TMP, monitoring the transport of hazardous goods in tunnels, travel time information, speed limit regulation, etc.) could not have been developed in a coordinated manner: they are the only platform allowing different road operators to act in a structured framework to build effective partnerships at the regional, national and European levels.

A need of European framework

The European Commission has decided to continue to support the deployment of ITS by extending the EasyWay programme through several calls for proposals. In addition, at the end of 2013, the EU adopted new rules to develop the transport infrastructure for the period 2014-2020, with two regulations. Firstly, the TEN-T sets up 9 ‘central’ multimodal corridors, covering at least 3 Member States, 2 cross-border sections and 3 modes of transport. By 2050, these « Core network corridors » will be complemented by a broader secondary network covering all of Europe. Moreover, the « Connecting Europe Facility (CEF) » must ensure the co-financing of this TEN-T in the amount of 26 billion euros.

In this context, the French motorway operators, with other Member States, have proposed two corridor projects: one deployed on the Mediterranean arc, the other on the Atlantic coast. Complying with the TEN-T’s « Core network corridors », both take into account the objectives of the EC, with an emphasis on the implementation – for the project MedTIS I and II (2013-2018) – of high-level traveller information services along the Mediterranean, from Italy to Portugal, and for the Arc Atlantique I and II project (2013-2017), of an optimized traffic management system from Ireland to Portugal.

From Italy to Portugal, a high-level and continuous traveller information

From Venice to Lisbon, the MedTIS corridor stretches for 6,800 km of motorways supporting very diverse traffic (significant daily traffic, seasonal peaks, dense and growing heavy goods traffic…). It has two critical sections: the crossing of the Pyrenees and the Alps.

MedTIS, which deals with the coordinated deployment of traffic information services along the Mediterranean corridor, pursues a dual objective. In normal situation, it aims to provide travellers with continuous and high-quality information on travel times (« advanced » service). In abnormal
situation, it aims to strengthen user safety through tailored quality information and alerts (« improved » service).

It must also ensure interoperability and continuity of cross-border service among the 22 public and private motorway operators from the 4 Member States (Italy, France, Spain, Portugal), improve the management of freight traffic and traffic in peak periods, and contribute to the harmonisation of VMS display.

Among the 60 projects that are part of MedTIS I, the French motorway operators (APRR, ASF, ATMB, ESCOTA and SFTRF) propose to provide:
- continuity of travel time service on the France-Italy and France-Spain cross-border sections;
- continuity of real-time traveller information between adjacent networks;
- upgrading of traffic management centres and client information platforms;
- upgrading of dynamic signing of upstream black spots.

From Ireland to Portugal, an optimised traffic management system

The Arc Atlantique corridor connects the major economic nodes in Ireland, the United Kingdom, the Netherlands, Belgium, France, Spain and in Portugal, representing more than 15,000 km of motorway network. It is characterised by two maritime crossings and a single access across the Pyrenees.

The project focuses on the deployment of traffic management systems and traveller information services to reduce, on sensitive sections, both exceptional and recurring congestion problems (seasonal traffic, weather conditions, incidents, etc.). In its phase I, the project aims to deploy ITS systems for monitoring and detection purposes (5,500 km), for managing traffic lanes (150 km) and traffic in suburban areas (300 km), for freight management (350 km), as well as traffic management measures based on information devices such as VMS (1,500 km). All these measures are proven and have shown their effectiveness for optimising the capacity of congested networks and improving safety. The Arc Atlantique also aims to improve information platforms and central traffic management systems, with specifically the implementation of the DATEX II standard for data exchange.

In this corridor, the companies involved (APRR, ASF, Cofroute, Sanef and in phase II, Atlandes) propose projects such as:
- the implementation of road user alert and warning on critical spots;
- the deployment of Intelligent Truck Parking;
- the upgrade of collaborative platforms to collect and broadcast mobility data;
- and, among other possibilities, the deployment of ghost vehicle detection systems.

MedTIS and Arc Atlantique in figures

Arc Atlantique and MedTIS, European projects that involve public and private partners, are coordinated at the French level by MEDDE/DIT and ASFA. They represent an important work for all the partners and major investments in the field of ITS. This was made possible thanks to the leverage effect generated by the European support on these two projects:
By the end of 2018, the impact on these two European corridors, in addition improved safety, will be significant:

- 16,400 km of network upgraded to high-level traffic management services, including 2,700 km on the national road network;
- 14,300 km of network upgraded to the highest level of service regarding traveller information, including 2,000 km on the national road network;
- 5% reduction of loss hours for road users during congestion on strategic bottlenecks of the network;
- 5% reduction CO₂ emissions on strategic bottlenecks of the network.

EasyWay

From 2007 to 2012, the EasyWay programme (phases I and II) established itself as a unique platform for the harmonised deployment of ITS on the TEN-T. The motorway operators have taken an important place alongside the Member States and more than 150 European public and private operators.

A total of 1 bn euro has been invested by European motorway operators in this context since 2007 for traffic management and traveller information services. It also includes freight and logistics, and the harmonisation of data collection and exchange equipment.

Promoting a better use of existing networks, EasyWay, now integrated in the EW Global Programme (2007-2020), has set targets for 2020: a 25% reduction of congestion and of the number of road accident fatalities, and a 10% reduction in GHG emissions.

EasyWay has also produced a number of Deployment Guidelines, adopted in 2012 by all the Member States involved in the project, to ensure that ITS services are harmonised and continuous across the Trans-European Network. MedTIS and Arc Atlantique rely on these practical tools for defining levels of service common to all partners.

Examples of ITS deployment: French motorway operators on the cutting edge

Dynamic speed limit

Speed limit regulation make it possible to adjust speed limits in real time to 110, 90 or 70 km/h depending on the density of traffic. Today, this system is a reference in traffic management for network optimisation. Experimented on the A7 from 2004, it has now been successfully deployed on 600 km of the Vinci Autoroutes network (of which 485 km on the A7), especially during peak summer traffic periods.

This system also covers 60 km of the SANEF/SAPN network (planned extension to 85 km), including on the A13 in the Greater Paris region, between Mantes and Poissy. Nearly half of the congestion on the A13 is concentrated on this suburban section of 25 km, with up to more than 120,000 vehicles per day. The APRR group, which has deployed the system over 100 km of its network, plans to expand it to 400 km.

The results are very positive: 30% reduction of accidents, 25-30% of congestion and therefore polluting emissions, 85% satisfied motorists. The budget is balanced after one year of operation.

« In France, speed limit regulation covers around 760 km of concession motorways and extensions are planned for stretches experiencing recurring congestion. »
Broadcasting travel time information
More than 4,700 km of the concessionary network are now covered by travel time service. This information, which allows people to arrange their trips and adapt their itinerary in case of incidents, meets a strong expectation in terms of comfort and safety.

The calculation of the travel time, implemented since the beginning of the 2000s on the ASF network, is commonly based on electromagnetic loops measurements. A new calculation system, deployed from 2012 on the A1, the A2 and now on the A4, is based on Bluetooth sensors. These sensors enabled mutualisation with other existing equipment or any equipment already installed with energy power. They are deployed every 10 km on the roadside and capture the Media Address Control (MAC) of the vehicles. The travel time is calculated from the aggregation of the information of each vehicle or connected device (mobile phone, tablets...) with this MAC address. Thus accurate travel time information is displayed through VMS, radio broadcasting and the Internet.

Cross-border interoperable services
Cross-border traffic management procedures have also proven to be very effective. At the Franco-Spanish border, between Perpignan and Barcelona, the section linking the A9 managed by ASF and the AP-7 managed by ACESA is one of the first large-scale cross-border sections operated in a coordinated way. This 10 km cross-border section (Le Perthus - La Jonquera) is characterised by heavy summer traffic, a slope at 5% and sometimes extreme weather conditions generating a high rate of accidents. This has led the French and Spanish motorway operators to coordinate their actions.

Since 2009, they have been deploying a range of ITS solutions to improve traffic monitoring (exchange protocol for real-time monitoring, integrated control systems management, real-time video data exchange, etc.) and the coordination of cross-border traffic with winter management traffic measures (traffic restrictions and storage for HGVs...) and coordinated temporary signage.

A European platform for ITS
The European platform for ITS - the EIP Project - brings together 29 European partners (authorities, public and private road operators, technical agencies, etc.). Having a role of innovation, it aims to:

- monitor the application of the EasyWay Deployment Guidelines in the corridors, adapt them, disseminate them, and ensure the exchange of best practices and experience feedback;
- extend the harmonisation of ITS in growing fields such as cooperative systems and autonomous driving, in VMS technology, and also continuing to update DATEX II;
- pilot feasibility studies;
- assess the impact of the corridor projects at the European level and the socio-economic benefits of the ITS.

The momentum generated by European cooperation must be maintained and encouraged
The French motorway operators have been implementing mature and innovative ITS services for more than 20 years. Today, they reaffirm their ambition to continue their deployment to provide a relevant and sustainable response to the environmental issues we are facing today and to the changes in traffic, in particular heavy goods vehicles.

They consider that the European cooperation framework represents a unique opportunity to ensure harmonised and concrete results for the benefit of all travellers.