Deliverable D3.1.0: Complete consolidated report on the status of current ITS deployment in SEE

WOLFGANG KERNSTOCK, MIHAI NICLESCU
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PROJECT INFORMATION

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EoI Reference number: SEE/D/0099/3.2/X
Programme: South East Europe Transnational Cooperation Programme
Starting date: September 28th, 2012
Duration: 24 months
Web site: www.seeits.eu

PROJECT PARTNERS

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Abstract: This report presents the current status of ITS systems and services deployment in Greece, Austria, Hungary, Bulgaria, Romania, Slovenia, Italy, Albania and Croatia.
EXECUTIVE SUMMARY

The objectives of WP 3 are to critically compare the applied (in SEE) practice for ITS deployment with the European best practices and policy initiatives for achieving interoperable ITS implementation. The gap of regional/national ITS architectures with the EU ITS framework will be documented and communicated to stakeholders of the domain with the main emphasis on the added value of the integrated traffic management.

This report documents the results of activity 3.1 - Status of current ITS deployment in SEE countries. The main objectives of this activity were to collect, present and analyse the existing or currently under implementation ITS systems and services available in the South East Europe Countries, specifically Greece, Austria, Hungary, Bulgaria, Romania, Slovenia, Italy, Albania and Croatia.

The structure of the report is based on the template prepared by ITS Romania, which was subsequently agreed by all partners involved in Work Package 3. The information it contains is compiled based on the filled-in templates submitted by all partners involved in activity 3.1.

This report is the consolidated report of the 9 individual country reports (AL, AT, BG, HR, GR, HU, IT, RO and SI) on the “Status of current ITS deployment in SEE countries”. It is accompanied by a brief consolidated report on the status of current ITS deployment in SEE countries and 9 individual country reports.
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<td>Advanced Driver Assistance Systems</td>
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<td>ADTM</td>
<td>Athens Dynamic Traffic Map</td>
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<td>ARI-ACT</td>
<td>Information Society for the Quality of Life in the Region of Attica</td>
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<td>ATMC</td>
<td>Athens Traffic Management Centre</td>
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<td>AVMS</td>
<td>Access Variable Message Signs</td>
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<td>BOT</td>
<td>Build–Operate–Transfer</td>
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<tr>
<td>BRT corridor</td>
<td>Bus Rapid Transit corridor</td>
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<tr>
<td>B2B</td>
<td>Business-to-business</td>
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<td>CAA</td>
<td>Civil Aviation Authority (Albania)</td>
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<td>CAD</td>
<td>Computer-aided design</td>
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<td>CCTV</td>
<td>Closed-circuit television</td>
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<td>CEF</td>
<td>Connecting Europe Facility</td>
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<td>Centre for Research and Technology Hellas – Hellenic Institute of Transport</td>
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<td>CIP</td>
<td>Competitiveness and Innovation framework programme</td>
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<td>DARS d.d.</td>
<td>Motorway Company in the Republic of Slovenia</td>
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<td>DATEX</td>
<td>The standard for the exchange of traffic related data</td>
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<td>DCM</td>
<td>Decision of Council of Ministers</td>
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<td>DEM</td>
<td>Digital Earth Model</td>
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<td>DRSC</td>
<td>Slovenian Roads Agency</td>
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<td>DTMF</td>
<td>Dual Tone Multiple Frequencies</td>
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<td>EC</td>
<td>European Commission</td>
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<td>EDI</td>
<td>Electronic data interchange</td>
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<td>EEA</td>
<td>European Economic Area</td>
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<td>ETC</td>
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<td>Fare Collection System</td>
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<td>Fault Management System</td>
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<td>FRAME Architecture</td>
<td>European Intelligent Transport System (ITS) Framework Architecture</td>
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<td>geoRSS</td>
<td>An emerging standard for encoding location as part of a Web feed</td>
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<td>Graphics Interchange Format</td>
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<td>GPRS</td>
<td>General packet radio service</td>
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<td>Global Positioning System</td>
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<td>GSM</td>
<td>Global System for Mobile Communications</td>
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<td>GUI</td>
<td>Graphic User Interface</td>
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<td>Intelligent Energy Europe</td>
</tr>
<tr>
<td>IGA</td>
<td>Interface Gateway Application</td>
</tr>
<tr>
<td>IP</td>
<td>Infomobility Platform</td>
</tr>
<tr>
<td>IPPT</td>
<td>Integrated Public Passenger Transport</td>
</tr>
<tr>
<td>IS</td>
<td>Information Society</td>
</tr>
<tr>
<td>ISDN</td>
<td>Integrated Services Digital Network</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transport Systems</td>
</tr>
<tr>
<td>IVIS</td>
<td>In-vehicle Information Systems</td>
</tr>
<tr>
<td>IVR</td>
<td>Interactive Voice Response</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>KTEL</td>
<td>Organization of Suburban Public Transport (Greece)</td>
</tr>
<tr>
<td>LCS</td>
<td>Lane Control Signs</td>
</tr>
<tr>
<td>METE</td>
<td>Ministry of Economy, Trade and Energy (Albania)</td>
</tr>
<tr>
<td>MoI</td>
<td>Ministry of Interior (Bulgaria)</td>
</tr>
<tr>
<td>MPWT</td>
<td>Ministry of Public Works and Transport (Albania)</td>
</tr>
<tr>
<td>MRDPW</td>
<td>Ministry of Regional Development and Public Works (Bulgaria)</td>
</tr>
<tr>
<td>MS</td>
<td>Mobility Supervisor</td>
</tr>
<tr>
<td>MTITC</td>
<td>Ministry of Transport, Information Technology and Communications (Bulgaria)</td>
</tr>
<tr>
<td>MVMS</td>
<td>Mainline Variable Message Signs</td>
</tr>
<tr>
<td>MzIP</td>
<td>Ministry of Infrastructure and Spatial Planning of the Republic of Slovenia</td>
</tr>
<tr>
<td>NATA</td>
<td>National Air Traffic Agency (Albania)</td>
</tr>
<tr>
<td>NCUP</td>
<td>Slovenian National Traffic Management Centre</td>
</tr>
<tr>
<td>NMS</td>
<td>Network Management System</td>
</tr>
<tr>
<td>NRN</td>
<td>National Road Network (Bulgaria)</td>
</tr>
<tr>
<td>NSRF</td>
<td>National Strategic Reference Framework</td>
</tr>
<tr>
<td>OASTH</td>
<td>Organization of Urban Transportation of Thessaloniki (Greece)</td>
</tr>
<tr>
<td>OHVD</td>
<td>Over High Vehicle Detectors</td>
</tr>
<tr>
<td>OPRD</td>
<td>The Operational Programme Regional Development</td>
</tr>
<tr>
<td>OPT 2007-2013</td>
<td>The Operational Programme on Transport 2007-2013</td>
</tr>
<tr>
<td>OSE</td>
<td>Hellenic Railways Organization</td>
</tr>
<tr>
<td>PC</td>
<td>Personal Computer</td>
</tr>
<tr>
<td>PDA</td>
<td>Personal Digital Assistant</td>
</tr>
<tr>
<td>PIC</td>
<td>Slovenian Traffic Information Centre for Public Roads</td>
</tr>
<tr>
<td>PLC</td>
<td>Programmable Logic Controller</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
<tr>
<td>PROMET</td>
<td>PROject for the Management of European Traffic</td>
</tr>
<tr>
<td>PSAP</td>
<td>Public Safety Answering Point</td>
</tr>
<tr>
<td>PSP</td>
<td>Policy Support Programme</td>
</tr>
<tr>
<td>PT</td>
<td>Public Transport</td>
</tr>
<tr>
<td>RDS-TMC</td>
<td>Radio Data System Traffic Message Channel</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>RIA</td>
<td>Road Infrastructure Agency (Bulgaria)</td>
</tr>
<tr>
<td>RNC</td>
<td>Regional traffic control centre in Slovenia</td>
</tr>
<tr>
<td>RNCMNR</td>
<td>Romanian National Company of Motorways and National Roads</td>
</tr>
<tr>
<td>RSS</td>
<td>Rich Site Summary</td>
</tr>
<tr>
<td>RWIS</td>
<td>Road Weather Information Systems</td>
</tr>
<tr>
<td>SEE</td>
<td>South East Europe</td>
</tr>
<tr>
<td>S-ITS</td>
<td>Slovenian ITS Association</td>
</tr>
<tr>
<td>SITSA-C</td>
<td>Slovenian ITS architecture for road transport</td>
</tr>
<tr>
<td>SMPF</td>
<td>The Specialized Municipal Privatization Fund (Bulgaria)</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Message Service</td>
</tr>
<tr>
<td>SUT</td>
<td>Sustainable Urban Transport</td>
</tr>
<tr>
<td>ŠŽ</td>
<td>Slovenian Railways</td>
</tr>
<tr>
<td>TCS</td>
<td>Traffic Control System</td>
</tr>
<tr>
<td>TEN-T</td>
<td>Trans European Transport Networks</td>
</tr>
<tr>
<td>TERN</td>
<td>Trans-European Road Network</td>
</tr>
<tr>
<td>THEPTA</td>
<td>Thessaloniki’s Integrated Transport Authority (Greece)</td>
</tr>
<tr>
<td>TINA</td>
<td>Pan-European Corridors</td>
</tr>
<tr>
<td>TMC</td>
<td>Traffic Management Centre</td>
</tr>
<tr>
<td>TMP</td>
<td>Traffic management plan</td>
</tr>
<tr>
<td>TMS</td>
<td>Traffic Management Software</td>
</tr>
<tr>
<td>TN</td>
<td>Telecommunications Network</td>
</tr>
<tr>
<td>TOCC</td>
<td>Tirana Operational Control Centre</td>
</tr>
<tr>
<td>TPTT</td>
<td>Tirana Public Transportation Terminal</td>
</tr>
<tr>
<td>TRAINOSE</td>
<td>The Greek provider of railway transports in regional, suburban, national and international level</td>
</tr>
<tr>
<td>T-UTC</td>
<td>Tirana Urban Traffic Control Management System</td>
</tr>
<tr>
<td>VAT</td>
<td>Value-added Tax</td>
</tr>
<tr>
<td>VHF</td>
<td>Very high frequency</td>
</tr>
<tr>
<td>VMS</td>
<td>Video Message Signboard</td>
</tr>
<tr>
<td>VSLS</td>
<td>Variable Speed Limit Signs</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
</tr>
<tr>
<td>WEB</td>
<td>World Wide Web</td>
</tr>
<tr>
<td>WFS</td>
<td>Web Feature Service</td>
</tr>
<tr>
<td>WIM</td>
<td>Weigh in motion</td>
</tr>
<tr>
<td>WMS</td>
<td>Web Map Service</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

The main objectives of this activity were to collect, present and analyse the existing or currently under implementation ITS systems and services available in the South East Europe Countries, specifically Albania, Austria, Bulgaria, Croatia, Greece, Hungary, Italy, Romania and Slovenia.

The reporting follows the 6 Priority Areas that have been identified within the EC 2010 ITS Action Plan, namely:

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

This link with the ITS Action Plan was chosen to be in line with the initial objectives and focus of the SEE-ITS project. This approach also ensures a coverage of the four Priority Areas of the ITS Directive since they have a direct correspondence with the respective Areas of the Action Plan.

The report also addresses information about main actors involved in ITS development, deployment and operations, the major obstacles towards ITS implementation, funding schemes, key strengths, and a short outline of the legislative framework, in the SEE area.

This document is structured in 5 distinct chapters.

This first chapter is focused on presenting the available funding schemes, at national and European level, that can be used to deploy ITS. These were selected based on the expertise of each partner.

The second chapter presents the data sources from which the information was gathered and explains the methodology used to compile the report.

The third chapter comprises two main parts. The first describes the specific issues regarding the implementation of ITS for each of the 9 partner countries. In detail, information about the current status of ITS deployment, the strengths and weaknesses, the current legislative framework and the relevant actors/stakeholders of each country is provided. The second is a summary of finalised and on-going ITS implementations, grouped in Priority Areas and countries.
Chapter 4 summarizes the conclusions regarding ITS implementation in the SEE countries, emphasizing the common elements as well as individual country particularities.

Finally, chapter 5 contains an extended list of relevant contacts of entities related to ITS in each partner county.

1.1. General information

This report is built on data collected from 9 European countries. Together, they provide an interesting and diverse pool of information as they represent a complete range in terms of EU membership. On one hand, there is a non-EU country – Albania, 7 EU member states and 1 EU candidate country - Croatia. On the other hand, among the member states the picture is also diverse: Greece and Italy are founding states, then Austria was the earliest to join in the first expansion, followed by Hungary and Slovenia; finally, Romania and Bulgaria are the youngest EU members.

Based on the collected information, it can be said that the overall picture regarding ITS in the SEE area is quite mixed. In terms of implementation, it ranges from only a few initiatives (like for example in Albania or Bulgaria) to numerous systems and services (like for example in Austria, Greece or Hungary). In terms of policy, countries like Austria or Greece already have National ITS Plans, while others do not have any national strategies related to ITS, nor to the transport field in general. Also, there are some EU member states that have not yet transposed the EU ITS Directive in their national legislation.

Despite the differences, it is clear that all countries share a common interest and motivation to implement ITS in line with the EU Directive and Action Plan. This holds true also for Albania and Croatia, which are not EU member states.

1.2. National funding schemes used in the area of ITS in Austria

1.2.1. IV2S - Intelligente Verkehrssysteme und Services (2002-2006)

The strategy programme “Intelligente Verkehrssysteme und Services” (IV2S, Intelligent Transport Systems and Services) was the national programme to fund research and development of mobility technologies under the responsibility of the Austrian Ministry of Transport, Innovation and Technology from 2002 to 2006.

One objective of this strategy programme was to improve the competitiveness of the Austrian transportation sector by fostering technological innovations and also to achieve ecological and social improvements of the transport system by developing and deploying new technologies. Another objective was the national networking of Austrian traffic research and
development by stimulating R&D cooperation. In the medium run, a stronger connection to the European Research Area was aspired.

Under the umbrella of this strategy programme three programmes were conducted since 2002:

- **I2 Intelligente Infrastruktur – Traffic telematics and Intelligent Transport Systems**
  
  I2 - Intelligente Infrastruktur (I2 – Intelligent Infrastructure) is the Austrian research funding programme to support national companies in developing and testing integral telematics applications for the transportation sector.

- **A3 Austrian Advanced Automotive Technology**
  
  The programme A3 was conceived for cooperative research projects between industrial, university and non-university research. It aims for the development of innovative approaches and actual technological leaps in the Austrian automotive industry.

- **ISB Innovatives System Bahn**
  
  The impulse programme ISB – “Innovatives System Bahn” (Innovative System Rail) pursues the encouragement of cooperative and pre-competitive research and development of innovative rail technologies and services.

<table>
<thead>
<tr>
<th>Table 1: IV2S funding capacity 2002-2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A3</strong></td>
</tr>
<tr>
<td>Funded projects</td>
</tr>
<tr>
<td>86</td>
</tr>
</tbody>
</table>

1.2.2. **IV2Splus (2007-2012)**

The Austrian strategy programme IV2Splus for the funding of research and development of mobility and traffic technologies continues the successful previous programme IV2S, extends certain crucial aspects and redefines contentual focusses.

The strategic alignment of IV2Splus is mission-oriented since it addresses central societal challenges within the transportation sector. This should encourage a sustainable restructuring in the areas of traffic and mobility in Austria and at the same time secure and foster the innovation capacity and competitiveness of Austrian companies and service providers.

The strategy programme IV2Splus consists of four programme lines, where A3plus and I2V represent the main lines in terms of thematic impulse programmes. Ways2go and IMPULS are additional programme lines that should incorporate mid- and long-term technological and social trends.

**A3plus: Alternative Antriebssysteme und Treibstoffe (Alternative propulsion systems and fuels)**
Note: A3plus is not an ITS- programme line, yet it is part of IV2Splus and is mentioned for this reason.

The Austrian impulse programme A3plus aims to shape future traffic more energy-efficient and more environmentally friendly by fostering research and development within the scope of innovative propulsion systems and alternative fuels. Landmark key innovations should initiate technology leaps that enable completely new propulsion concepts for surface transport with fuel-consumption and emission figures unmatched so far.

I2V: Intermodalität und Interoperabilität von Verkehrssystemen (Intermodality and interoperability of transport systems)

This is the Austrian impulse programme to foster cooperative research and development projects within the field of intermodality and interoperability of transport systems.

The goal is to raise the efficiency of transportation as a whole by improving the seamless interaction of different transport carriers, the increased inclusion of more sustainable transport carriers and a more efficient utilisation of available infrastructure. New technologies and innovative solutions will be developed and tested for both freight and passenger traffic.

ways2go: Technologien für sich wandelnde Mobilitätsbedürfnisse (Technologies for changing mobility demands)

This is an Austrian funding programme line for research projects with the aim to develop sustainable mobility solutions in the context of future social challenges. It follows a long-term anticipatory research approach involving awareness-raising activities to bring about system innovations.

IMPULS: Grundlagenforschung für Innovationen im Verkehr (Basic research for transport innovations)

This is an Austrian initiative to foster basic research for transport innovations. The goal is to quickly extrapolate scientific and technological insights and solution approaches from various disciplines for the transportation sector.

<table>
<thead>
<tr>
<th>Year</th>
<th>A3 Funded projects</th>
<th>A3 Funding capacity</th>
<th>ISB Funded projects</th>
<th>ISB Funding capacity</th>
<th>I2 Funded projects</th>
<th>I2 Funding capacity</th>
<th>TOTAL Funded projects</th>
<th>TOTAL Funding capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>17</td>
<td>€ 4,5 m.</td>
<td>23</td>
<td>€ 5,2 m.</td>
<td>-</td>
<td>-</td>
<td>40</td>
<td>€ 9,7 m.</td>
</tr>
<tr>
<td>2008</td>
<td>9</td>
<td>€ 6,8 m.</td>
<td>27</td>
<td>€ 5,8 m.</td>
<td>36</td>
<td>€ 5,3 m.</td>
<td>82</td>
<td>€ 17,9 m.</td>
</tr>
</tbody>
</table>
1.2.3. **Klima- und Energiefonds (KLI.EN, Climate and Energy Funds)**

The Climate and Energy Funds were initiated in 2007 by the Austrian government to support the implementation of its climate strategy – on a short-, mid- and long-term basis – and is owned by the Republic of Austria, represented by the Ministries of Transport, Innovation and Technology and of Agriculture, Forestry, Environment and Water Management. The strategies of the Austrian government for the areas research and technology, climate protection and energy provide the most important fundamentals that find expression in the programmes of the Climate and Energy Funds. Important cornerstones of all measures are sustainability and efficiency. Superior objective is to lower national greenhouse gas emissions as fast and sustainably as possible.

**Table 3**: KLI.EN Funding capacity 2009-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (€)</th>
<th>ITS-related (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>121 m.</td>
<td>9 m.</td>
</tr>
<tr>
<td>2010</td>
<td>150 m.</td>
<td>8 m.</td>
</tr>
<tr>
<td>2011</td>
<td>147,38 m.</td>
<td>9 m.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>418,38 m.</td>
<td>26 m.</td>
</tr>
</tbody>
</table>

1.3. **European funding schemes used in the area of ITS in Austria**

1.3.1. **EU-Framework Programme**

According to the Treaty of Lisbon, knowledge is one of the key elements to make Europe the most dynamic and competitive knowledge-based economic region of the world. For this reason, the ‘triangle of knowledge’ – research, education and innovation – is a crucial factor to reach the Lisbon goals. Numerous initiatives and support measures are conducted on European Level to facilitate knowledge.

The Framework Programme (FP) focusses on EU initiatives related to research, that play a central role in the aspiration for growth, competitiveness and jobs. Thus it is an important buttress for the European Research Area. It is the biggest transnational research programme throughout the world.
The 7th Framework Programme comprises a period of seven years (2007 - 2013) and a total budget of 54 Billion Euros (of which 4 Bn. are dedicated to EURATOM). A budget of 4.1 Bn. Euros of the 7th Framework Programme is dedicated to fund research and development as well as for accompanying support measures in the field of transportation.

1.3.2. TEN TEMPO Programme (2001-2006)
From 2001 to 2006 the European Commission financially supported ITS implementations in the course of the TEN TEMPO programme in the following areas:

- Road monitoring infrastructure
- European network of traffic centres
- Traffic management and control
- Traffic information services

To force the Europe-wide exchange of experiences and thus achieve a harmonisation in implementation, seven Euro-regional projects (ARTS, CENTRICO, CONNECT, CORVETTE, SERTI, STREETWISE, VIKING) were initiated, that comprise 20 EU member states. These projects invested about 1,1 Bn. Euros into implementations of ITS. The EC supported these activities with a funding capacity of roughly 200 m. Euros.

The TEMPO programme was completed with the conclusion of the EC’s budget 2001 - 2006.

Table 4 : TEMPO Programme - Budget AT

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TEMPO complete programme</td>
<td>€ 1,100 m.</td>
<td>€ 200 m.</td>
</tr>
<tr>
<td>(EU 20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONNECT</td>
<td>€ 125 m.</td>
<td>€ 20 m.</td>
</tr>
<tr>
<td>(AT, DE, IT, SK, SI, HU, CZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CORVETTE</td>
<td>€ 230 m.</td>
<td>€ 28 m.</td>
</tr>
<tr>
<td>(AT, DE, IT, CH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>€ 98,21 m.</td>
<td>€ 15,12 m.</td>
</tr>
</tbody>
</table>

1.3.3. TEN-T Finance scheme for ITS Implementations on the TEN-T road network (EasyWay 2007-2013)
Considering the excellent results of the previous programme TEMPO and the high expectations towards ITS, the partner countries of Euro-regional projects decided to develop a follow-up programme for the period of 2007 to 2013. In this way the EC shall be convinced to encourage and fund the deployment of ITS further on. The proposal to continue Euro-regional projects under the name EasyWay was jointly submitted by 27 member states to the EC on the 20th July 2007. This programme shall contribute considerably to reach the goals of the White Paper and to consequently achieve sustainable mobility:
- Reduction of traffic jams by up to 25%,
- Increase of road safety by up to 25%,
- Reduction of the CO₂ emissions by up to 10%.

On the one hand, the compatibility of the systems and services will be ensured by synchronising with neighbour countries. On the other hand, this transnational data exchange increases the efficiency of the systems and thus brings the vision of pan-European ITS solutions one step closer. This guarantees that transacted investments are future-proof and additional short-range adoptions will generally not be necessary.

The setup of the EasyWay services is based on the EasyWay Deployment Guidelines. These are considered as an important tool for harmonising transnational ITS services since all member states (including Austria) agreed upon using them as a foundation for the deployment of ITS services within the framework of EasyWay. Especially for a small country like Austria, this is of high importance since the complete benefit of ITS for both users and operators can only be utilised through transboundary services.

Apart from the EasyWay Deployment Guidelines, the information exchange taking place in expert boards is considered another important element since this is an important basis for technical standardisations. One example is the data exchange standard DATEX which represents an essential foundation for the interoperability of ITS services. Similar developments are expected from Austria especially from the expert group dealing with Cooperative Systems, in which the Austrian partner ASFINAG took the leadership.

Important elements of the EasyWay programme:
The focus is on the implementation of European ITS services to enable barrier-free travelling for road users (on both administrative and technical level).

Along with implementation, standardised evaluation is a fixed component of the EasyWay programme. The results represent the basis for an intensive exchange of experiences among the project partners. This exchange should enable both EasyWay partners and interested countries (e.g. membership aspirants) to efficiently employ their resources.

<table>
<thead>
<tr>
<th>Table 5 : EasyWay Phase I - Budget AT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>EasyWay complete programme</td>
</tr>
<tr>
<td>(EU-22)</td>
</tr>
<tr>
<td>EasyWay CONNECT</td>
</tr>
<tr>
<td>(AT,DE, IT, SK, SI, HU, CZ)</td>
</tr>
<tr>
<td>EasyWay CORVETTE</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Austria</td>
</tr>
</tbody>
</table>

* Co-financing amounts to 20% over all activities (incl. Expert Groups, European Studies)

1.4. National funding schemes used in the area of ITS in Bulgaria

National funding in Bulgaria is limited. One of the national sources financing the implementation of ITS projects is The Specialized Municipal Privatization Fund. Resources in the fund come from the privatization of municipal companies, separate parts of the property of the companies with more than 50 per cent municipal shareholding, municipal non-residential property used for business purposes, and stipulated damages for unfulfilled obligations on privatization contracts.

Road safety fund is another national funding source is newly created legal entity that is governed by the Minister of Interior. The goal of the fund is to financially support projects improving road safety. ITS fall into this category as a contributor to reducing fatalities and accidents. Financial means for the fund are raised from traffic violations and as this goes back to the road users (also offenders) under the form of a road with improved safety, this is viewed as a more socially acceptable and fair form of use of funds collected through payment of tickets.

1.5. European funding schemes used in the area of ITS in Bulgaria

ITS projects are funded mainly by the Structural and the Cohesion funds of the European Union. The European funding mechanisms for ITS development in Bulgaria are listed below.

The operational programme “Transport” 2007-2013 is one of seven operational programmes in Bulgaria funded by the above mentioned EU funds. The main objective of this programme is to develop the railway, road and waterway infrastructure, as well as to stimulate multimodal transport, in accordance with the EU transport policy and the established requirements for development of TEN-T network.

The Operational Programme “Regional Development 2007-2013” has been developed in line with the European Union as defined in the Strategic Guidelines on Cohesion for 2007-2013 and set in the National Strategic Reference Framework of Bulgaria. It is also consistent with the National Reform Programme, created in line with the renewed Lisbon strategy in response to the Integrated Guidelines for Growth and Jobs. In this broader context, any action provided for under the OPRD will include the Community’s priorities in favor of sustainable development by strengthening growth, competitiveness and employment, social inclusion and protection of environmental quality. Within this programme several...
projects are to be implemented: “Implementation of system for automated collection of traffic data on Bulgarian road network”, as well as “Sustainable urban transport” – implemented in 7 major cities.

- **The Information and Communication Technology Policy Support Programme (ICT PSP)** – part of Competitiveness and Innovation framework programme (CIP). Under this programme the HeERO2 project is partially funded by the European Commission. Bulgaria participates in the second phase, which will prepare, carry-out and coordinate 112 eCall pre-deployment pilot, taking into account the approved standards.

- **The Southeast Europe Transnational Cooperation Programme**

- **INTERREG IV C Programme** - The funded project called “Efficient utilization of the information systems during traffic management and support of the urban public transport in the extra-urban regions” takes part in this programme, through Sofia municipality.

- **Loans** from European Bank for Reconstruction and Development.

### 1.6. National/European funding schemes used in the area of ITS in Greece

The main European funding mechanisms for ITS development in Greece are (or have been) the following:

- **The 3rd Community Support Framework** implemented during the 2000-2006 period and, particularly for the ITS development, the Operational Program “Information Society”. The ITS implementation lies, specifically, upon measures 2.8 (“Intelligent Transport”) and 2.4 (“Regional Geographic Information Systems and Innovative Actions”) of the Information Society Program (Information Society - the official Greek Portal for I.S.).

- **The Cohesion Funds.** The part-financed projects for the 2000 – 2006 period related to environment and trans-European transport infrastructures were funded under the INTERREGIII Community Initiative, which has been replaced by the South East Europe Program that covers 13 transnational cooperation programs active in the 2007 - 2013 programming period (South East Europe Transnational Cooperation Programme).


- **The 7th Framework Programme of the European Commission (FP7: CORDIS).**
• The European Economic Area (EEA) (Structure and Organization: European External Action Service).


• The Intelligent Energy Europe programme (IEE) of the 2007-2013 period (Getting funds: Intelligent Energy Europe).

An important boost for the ITS development not only in Greece but Europe-wide also has been given through the integration of ITS projects to the Trans-European Transport Networks (TEN-T). The European Commission has established specific rules for the financial support for the implementation of TEN-T guidelines. The TEN-T projects are financially supported by national government, European Community Funds (Cohesion Funds, TEN-T budget, ERDF), loans from international financial institutions (i.e. the European Investment Bank) and private funding.

In the context of supporting the European transport corridors during the 2014-2020 horizon, the Commission adopted a plan which will fund € 50 billion worth of investment to improve, inter alia, Europe's transport, networks. The Connecting Europe Facility (CEF) is one of the key initiatives proposed by the Commission that will finance projects which fill the missing links in Europe's energy, transport and digital backbone and remove bottlenecks. The Horizon 2020 ("EU Framework Programme for Research and Innovation") is another financial instrument of the European Commission for the period 2014 to 2020 (What is Horizon 2020: Research & Innovation, Horizon 2020).

Further to the abovementioned, the Public Private Partnership (PPP) initiatives in Greece have offered new funding opportunities for major ITS related projects in Greece (i.e. the Attica Tollway ITS systems).

1.7. National/European funding schemes used in the area of ITS in Hungary

After Hungary’s entrance to the European Union, both EU and national funds were used.

The most important funding schemes originating from the EU are:

• Cohesion Funds (2004-2006;2007-2013),
• European Regional Development Funds
• TEN-T: programme CONNECT, EasyWay I & II, DATRAM, IRIS I & II, FAB, ERTMS

There are also some other funding sources such as FP (Framework Programme) 6 & 7, which are important especially from the research and development point of view.
1.8. National funding schemes used in the area of ITS in Italy

In the last ten years different funding programs were launched in Italy:
- Elisa Program (2007-2012)
- Smart Cities and communities (2012 – to be defined)

The Elisa Programme ended in the 2012, as the Industry 2015 programme (due to lack of funds, also for the payment of already financed projects).

The Transport PON is going to be finalized in this year (2013), and at the moment, there are no future calls for proposals.

The Smart Cities and Communities Programme has been launched by the Ministry of Innovation, Research and University (MIUR) in the 2012. At the moment, the official “end” of the programme is not known, due to the ongoing economic recession and uncertainty about the availability of funds.

Both the Transport PON and Smart Cities and Communities Programme are co-financed by the European Commission (European Regional Development Fund - ERDF).

Concerning funding schemes in Italy, it is important to say that one of the main objectives of the national ITS action plan is to create a national fund in order to finance ITS implementation. Moreover, the plan aims to set a system for financing and award ITS best practices.

The table below summarizes the funds which have financed project on ITS in Italy until 2009.

<table>
<thead>
<tr>
<th>Funds</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional operating Programmes (PON)</td>
<td>12</td>
<td>3.82 %</td>
</tr>
<tr>
<td>National operating Programmes (POR)</td>
<td>29</td>
<td>9.24 %</td>
</tr>
<tr>
<td>EC programmes</td>
<td>139</td>
<td>44.27 %</td>
</tr>
<tr>
<td>Local funds (Provinces, Municipalities)</td>
<td>35</td>
<td>11.15 %</td>
</tr>
<tr>
<td>Private funding or other sources</td>
<td>47</td>
<td>14.97 %</td>
</tr>
<tr>
<td>Other Regional Funds</td>
<td>21</td>
<td>6.69 %</td>
</tr>
<tr>
<td>Other National Funds</td>
<td>31</td>
<td>9.87 %</td>
</tr>
</tbody>
</table>

Table 6: Funds for the financing of ITS projects in Italy (until 2009)
Transport PON (National Operating Programme) - 2000-2006 and 2007-2013

Many ITS projects have been developed or are in finalization in Objective 1 Regions or Convergence objective Regions. According to the definition of the European Commission: “Objective 1 Regions: promote the development and structural adjustment of regions that are lagging (Basilicata, Calabria, Campania, Puglia, Sardinia and Sicily)”.

Convergence objective (formerly Objective 1): this objective covers regions whose GDP per capita is below 75% of the EU average and aims at accelerating their economic development (Basilicata, Calabria, Campania, Puglia and Sicily).

Projects have been funded under the 2000-2006 (objective 1) and 2007-2013 Transport PON (Convergence objective).

The Networks and Mobility PON allocates 2.749 million euro (ERDF - 1.374 Mil. € and national fund 1.374 Mil. €) in order to develop projects on railways, hubs, ports, airports, roads, intelligent transport systems and business support logistics.

Action 1.3 of the PON is totally dedicated to financing ITS projects. The total co-financing is about 20 Mil. €. The table below shows the list of projects included in the action 1.3 of the PON.

**Table 7: Project financed by the Transport PON 2007-2013**

<table>
<thead>
<tr>
<th>Project</th>
<th>Fin. budget</th>
<th>Beneficiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>UIRNET – Regional Platforms for intermodality and integrated logistics – Basic IT Module</td>
<td>3 Mil. €</td>
<td>UIRNet SpA</td>
</tr>
<tr>
<td>Integrated Telematic Platform for management and control of dangerous goods</td>
<td>2 Mil. €</td>
<td>MT DIG SISC</td>
</tr>
<tr>
<td>Realization of a Regional CONTROL Unit for transport of dangerous goods, able to track and trace transport fleets.</td>
<td>5 Mil. €</td>
<td>Puglia Region</td>
</tr>
<tr>
<td>Port Logistic and Security System</td>
<td>3,5 Mil. €</td>
<td>Port A. of Salerno</td>
</tr>
<tr>
<td>Integrated system for Urban Logistics in the city of Messina</td>
<td>2,7 Mil. €</td>
<td>Mun. of Messina</td>
</tr>
<tr>
<td>ULISSE II – Unified Logistic Infrastructure for Safety and Security of Campania Region</td>
<td>3,6 Mil. €</td>
<td>Campania Region</td>
</tr>
</tbody>
</table>

Summary:

**Objective:** Achieving a public transport system, consistent with the objectives of the European Community, such as to support local sustainable development through a more balanced distribution of traffic between the different modes (favour of the most efficient in economic terms, social and environmental)
**Funding source:** National fund + European Regional Development Fund  
**Budget:** 20.6 Mil. € and 2.75 Bil. €

**ELISA Programme (2007-2012)**  
The Elisa Programme, promoted by the Ministry of Regional Affairs, has financed 6 ITS projects between 2007 and 2009 (one call per year) for a total co-financed budget of 13.5 Mil. € during the three year time period.

The programme is based on Article 1, paragraph 893, of the 2007 Finance Act, which established the "Fund for investment support for innovation in local government", whose management is attributed to the Presidency of the Council of Ministers - Department for Regional Affairs (the Department) and in particular to the structure of the PORE (Project Opportunities for Regions in Europe) with an annual budget of 15 million euro for 2007, 2008 and 2009.

In the ELISA programme, the Department has implemented a funding scheme, for projects of innovation and development of Local Authorities in many areas, through the technical assistance of Invitalia SpA. These areas include the integrated management of logistics and traffic information in the public and private transport, the management of digital services for local bodies, the integration and development of information systems for labor and tools for measuring the quality of services provided by local authorities.

The aim of the program is to promote and direct innovative design, starting from the needs and initiatives proposed by local authorities gathered in large aggregations.

**Summary:**  
**Objective:** Promote and direct innovative design starting from the needs and initiatives proposed by local authorities gathered in large aggregations.  
**Funding source:** The 2007 Finance Act, which established the Fund for investment support for innovation in local government (Department for Regional Affairs)  
**Budget:** 15 Mil. €/year for 2007, 2008 and 2009

**SMART CITIES**

**Objective:** Smart mobility, Smart health, Smart education, Cloud computing technologies for smart government, Smart culture, e-tourism, Renewable energy, e-smart grid, Energy Efficiency, e-low carbon technologies, Smart mobility, e-last-mile logistic, Sustainable natural resources (waste, water, urban biodiversity)  
**Funding source:** NOP-T + European Regional Development Fund  
**Budget:** about 126 Mil. € (first call, southern Italy regions) + about 655 Mil. € (second call, all regions)

**INDUSTRIA 2015**
**Objective:** Initiative to boost the competitiveness of the Italian economy of the future. It sets out the strategies, tools and targets for development based on: 1) a concept of industry extended to new supply chains that integrate manufacturing, advanced services and new technologies; 2) an analysis of the economic and production scenarios facing our country in the medium to long term (2015).

**Funding source:** The 2007 Finance Act (Department for Economic Development)

**Budget:** 64.5 Mil. € (related to “Energy effectiveness”, “Made in Italy” and “Sustainable mobility”)

### 1.9. European funding schemes used in the area of ITS in Italy

The projects elaborated in Italy under the initiative of the European Commission are about 45% of the total projects concerning ITS that have been finalized in Italy until 2009. The commitment to present request for funding support to the European Commission has been continuing until now. A more detailed summary with the list of the main European funding schemes for ITS deployment in Italy used in the past (or still active) is presented below.

**Table 8: European Funding schemes used in Italy for ITS**

<table>
<thead>
<tr>
<th>EU funding Scheme</th>
<th>Note</th>
</tr>
</thead>
</table>
| 7th Framework programme (FP7: CORDIS)                  | Among the FP7 initiatives, special role was played by GALILEO and EGNOSS that brought European GNSS one step closer to reality. Some of the project closed are SCUTUM and MENTORE. Interesting initiatives, ongoing are:  
  - COMPASS (optimised CO-Modal PASsenger transport for reducing Carbon emissions),  
  - i-Tour (Intelligent transport system for for optimized Urban Trips). |
| DG Enterprise and Industry call                         | Direct call of the EU, interesting the EGNOS2road (EGNOS2road: EGNOS services and Galileo Authentication for road) project.                                                                      |
| European Regional Development Funds and IPA Adriatic Cross-border Cooperation | Italian applicants have been active in several ERDF funding initiatives especially in the period 2007 - 2013, e.g.: SEE, INTERREG IVC, Italy – France or Italy – Slovenia or Italy – France initiatives. These some of the main reference frameworks. For example under the umbrella of INTERREG IVC we’re aware of many experienced closed or ongoing for technology applied to the public local transport. E.g. POSSE, POLITE projects |
The Intelligent Energy Europe programme (IEE) of the 2007-2013 period (Getting funds: Intelligent Energy Europe).

| TEN-T Finance scheme for ITS Implementations on the TEN-T road net. | Several implemented project are under the monitoring activities of the TEN-T Executive Agency and the best 10 are going to be awarded. Example are border-crossing initiatives as SETI and CORVETTE projects. |
| TEN TEMPO Programme (2001-2006) | Many projects with the purpose to realize and improve the quality of service of mobility and ensure the interoperability of these services in regions of linkage between the European countries, also for the improvement of road safety. The projects were launched in 1996, and are currently funded by the Programme TEMPO MIP (Multiannual Indicative Programme) 2001-2006. |

1.10. National funding schemes used in the area of ITS in Romania

There are three major national funding schemes which can be used for the development of ITS:

- State budget
- Specific research programmes of certain Ministries
- The National Research Programme

The state budget finances major investments and infrastructure projects which are managed through the National Roads Company. These allocations come from general budgetary resources and are not the same as the budget reserved for co-financing EU funded projects.

The specific research programmes of Ministries can be used for the development of analysis, studies and strategies as well as pilot implementations. Even though the Ministry of Transport does not have such a programme, the one supported by the Ministry of Communications has
priorities in the field of ITS. For example, in 2008 ITS Romania was involved together with other partners in a project that elaborated the national requirements for the implementation of eCall.

The National Research Programme finances projects based on specific calls and thematic priorities. The projects are mostly research-focused however they can also include pilot implementations. In the 2013 Calls for Proposals the following thematic priorities are related to ITS:

- Increasing transport safety and security
- Systems and technologies for intermodal transport
- Traffic management and monitoring systems

1.11. European funding schemes used in the area of ITS in Romania

The most important European funds used in Romania for financing ITS projects are the Cohesion and Structural funds through the Operational Transport Programme.

Another source is the Instrument for Pre-Accession (ISPA) and the National Company for Motorways (RNCMNR) has a dedicated Agency for the management of projects financed by ISPA.

There are also some projects that have received funding from the European Investment Bank.

Some of the most recent and most important projects at national level were funded from TEN-T as part of the EasyWay I and II projects where RNCMNR has participated as partner.

A particular case is the project HeRO, financed through the Competiveness and Innovation Programme. In the project, 6 national partners are involved, including RNCMNR. The main result is the establishment of the national support infrastructure for the implementation of the eCall service. The architecture of the national implementation contains an interface between the 112 infrastructure (where the eCall is received and managed) and the Management Centre of RNCMNR so it receives data about incidents and it can quickly intervene to restore traffic conditions.

1.12. National/European funding schemes used in the area of ITS in Slovenia

On the national level, state budget and revenues from tolls, road closures, overweight load transports and from telecommunications are used as funding sources for the Slovenian ITS deployment. On the other hand, there is only one PPP introduced for real-time traffic and travel information delivery on the state level. In this case the national radio station Radio Slovenia International (Radio Si) is media for RDS-TMC, the private company TrafficNav ltd. is
the information provider and Traffic Information Centre for Public Roads (PIC) is the main source.

There were spendings done also by municipalities in the area of ITS, especially the City of Ljubljana. Mainly revenues as a result of public services are used for the development of ITS (eg. parking). On the municipality level it is for the first time in year 2012 that PPP is introduced in the case of urban traffic management system in the city of Maribor.

Weak economic growth and uncertainty in the financial markets were characteristics of the Slovenian economic environment in last three years. Management staff with ITS stakeholders is changing from year to year and there is a need that they understand ITS and its benefits. At the moment only the “National reform programme 2012 – 2013” force the completing of the modernisation of the railway network, promote an integrated public passenger transport and increasing the competitive advantages of the Port of Koper. In these cases ITS systems and services are involved in these projects that have lasting.

In 2011 Slovenia finished the “National motorway construction programme (NPIA)”. This programme reserved also some funds for Traffic control system on Slovenian motorways.

The most important funding schemes come from the EU:
- European Regional Development Fund
- TEN-T: programme TEMPO, project PROMET and
- EasyWay programme, phases I and II;
- European Investment Bank loans.

There are also some others such as FP (Framework Programme) 6 & 7, which are important especially from the research and development viewpoint.

1.13. National funding schemes used in the area of ITS in Albania

The deployment of ITS in Albania for road transport is in its initial steps. As presented in the following chapters, there are only a few examples of utilized ITS in Albania in relation to road transport.

Albania is willing to play its role on the initiatives launched by European Commission regarding the integration in regional and pan-European networks in conformity with the European strategic documents for road network infrastructure, which should contribute in the establishment of unique economic framework, within state territory and in perspective in regional and pan-European level. Being part of important corridors and multimodal transport nodes in Europe, Albania is searching for the European support toward financing schemes for deployment and implementation of ITS in the country and especially in the city of Tirana. The
establishment of a fluid road transportation network, will make the increase of the volume of goods, the mobility of people and access to the services and markets for Albania possible, and will contribute in the economic growth of the country.

Until today, Albania has not yet been included in European funding mechanisms for the deployment of ITS.

There are a few examples of how ITS are beginning to be deployed and implemented for road transport. The financing for such initiatives is carried out locally.

Below are some projects on the deployment of ITS in Albania, financed locally by Government or by private companies:

**Project name: Implementation of Digital Tachograph in Albania** – This project is financed by the Ministry of Public Works and Transport.

**Project name: Tirana Urban Traffic Control Management System (T-UTC)** which includes the ITS deployment in the city of Tirana, is financed by Municipality of Tirana.

**Project name: Online fleet management system for the urban buses in Tirana** – It is a project financed by one of Urban Bus Operator in Tirana, private company.

The deployment of ITS in other transport modes, like air and maritime transport is considerable anyway. Here are important projects on ITS deployment and automation based on European and International standards:

**Air Transport Services**

**Project name: Modernization of Albania Air Traffic Management**

The most significant example on ITS deployment and implementation in Albania is in the Air Transport Services. The Ministry of Public Works and Transport (MPWT), Ministry of Economy, Trade and Energy (METE), the National Air Traffic Agency (NATA) and Civil Aviation Authority (CAA), went through a long and successful project of Modernization of Air Traffic Management.

This project was wholly financed by NATA, through air traffic revenues and by means of a loan issued by Exim Bank of America, involving all the above stakeholders.

**Coastal, Maritime Surveillance**

**Project name: Albania Coastal Surveillance**

This project was undertaken by Ministry of Defence, for the surveillance and monitoring of Albania coastal line. This project was successful too. Thanks to this system, all Albanian coast is monitored in real time, 24/7 hours/days. This project was financed by Ministry of Defence, through Government budget.
1.14. National funding schemes used in the area of ITS in Croatia

Croatia is not an EU member state and was not involved in any significant European funding scheme during highway development. This is especially true when it comes to ITS implementation. Apart from ITS implementation, Croatia has not been significantly involved in European ITS research and development programmes. Several projects have started only recently:

- Intelligent Cooperative Sensing for improved traffic Efficiency – ICSI (7th Framework Programme, Croatia is a partner).

- Harmonised eCall European Pilot – HeERO (The Information and Communication Technologies Policy Support Programme)

This has led to the fact that Croatia has not been included by harmonisation programmes or ITS implementation plans. After Croatian accession to the EU (on July 1, 2013), ITS implementation will become a major challenge for Croatia and the EU, especially because of the significance of Croatia in terms of European road corridors.
2. **Data Sources and Methodology Used**

The report was compiled based on the information provided by the responsible project partners from each of the 9 targeted countries. They gathered the data from various sources based on their expertise and network of contacts. All the collected data were examined in terms of their accuracy (only data from trustworthy sources were used), their relevance to the SEE-ITS research activities and their coverage regarding the six Priority Areas that are specified within the EC ITS Action Plan.

In order to collect information, the following methods were used:

- desk research
- interviews, discussions and consultations with major private and public stakeholders

In most countries National ITS Association provided support by sharing their knowledge and facilitating connections with stakeholders.

The starting point for data collection was the report submitted by each Member State in August 2011 in fulfilment of the obligations of the ITS Directive. Additional main data sources used were the following:

- Current national legislation on transport and in particular road transport
- National ITS/Transport Plans
- Deliverables of national and European projects related to ITS
- Official websites of ITS companies (related products and reports)
- Official websites of public transport companies (annual reports, announcements, provided services, etc.).
3. **Implementation Status**

3.1. **Specific issues regarding the implementation of ITS in Austria**

Travel information services based upon ITS have so far been deployed by only a few transport services, infrastructure operators and private companies within and for their respective field. Consequently there are sectoral supplies which only concentrate on single areas and means of transport and are not interconnected. There are for example Scotty by the Austrian Federal Railway company ÖBB, ASFINAG Roadpilot, qando by Viennese Public Transport provider Wiener Linien and VOR (East Austrian Public Transport Association), the traffic information centre of the Austrian broadcaster Ö3 or the traffic information service of the Austrian automobile association ÖAMTC. In terms of individual transport, private suppliers of navigation tools and services have established on the market. The quality of road and traffic data represents an important factor for the acceptance of ITS services and thus for the success of taken measures. Consequently it is necessary to guarantee and continually improve the quality of all existing and newly developed ITS services.

The Austrian ITS law was adopted on 31st March 2013 and creates a framework for the support of a coordinated and coherent implementation and utilisation of ITS and sets the necessary conditions. It is applicable for the implementation of ITS in road transport and their interfaces to other modes of transport. With this law, Austria adopts the EU ITS Directive. In addition to the definitions laid down in the EU ITS Directive, the Austrian ITS law defines the “Graph Integration Platform” (Graphenintegrationsplattform, GIP), an intermodal Austria-wide traffic graph. AustriaTech is the institution responsible for monitoring ITS deployment both nationally and internationally and also for reporting to the Austrian Minister for Transport, Innovation and Technology. The Austrian ITS Action Plan was presented in 2011 and is regarded as a constantly evolving document. Furthermore there is an Austrian comprehensive traffic plan, a dedicated implementation plan for electromobility and an Austrian Traffic Safety Programme 2011 - 2020.

The most important stakeholders involved in the ITS implementation process are:

**AustriaTech:**
- Supporting technological strengthening of the Austrian traffic industry and domestic technology providers
- Research on strategic level (future studies) with respect to technologically relevant topics (Think Tank)
- Developing innovation strategies to implement ITS in Austria
- Realisation of technologies
• Contributing to the realisation of EU directives and international standards in Austria

**Austrian Ministry for Transport, Innovation and Technology (BMVIT):**

- Transport policies
- Road, rail, shipping, aviation
- Traffic accident research
- Commercial passenger and freight transport
- Setting of priorities in national research programmes with a council for research and technological development

**ASFINAG**

ASFINAG operates, maintains and monitors the motorways and expressways. This includes route management, winter services, pruning and clipping as well as the cleaning of tunnels, roads and rest areas. The second pillar is the planning and building of primary sections of road. Within the scope of a coordinate building programme with the owner, ASFINAG annually invests in building new roads and expanding the road network. The third task area of ASFINAG is the collection of tolls: car toll (toll sticker), HGV toll (GO-Box) and the special tolls.

**Ö3**

The Austrian radio station Ö3 provides traffic information via traffic announcements and TMCPlus.

The Austrian graph integration platform GIP.at and GIP.gv.at shall contribute to close crucial gaps in the acquisition of traffic data, especially for the lower level road network. Real-time data shall increasingly be used for public transport and consequently another important step towards intermodal real-time traffic information shall be taken. Central element for the provision of traffic information will be the fusion of information and traffic data from different sources (including user generated content). In this matter, the Austrian motorway operator ASFINAG is developing the so-called “Verkehrsdatenplattform” (traffic data platform) right now. For the next five years, the focus will be on adding data of lower level and urban infrastructures of all means of transport to the existing traffic information system. By separating the processing from the presentation of the data, future investments and further development of the content platform (Verkehrsdatenplattform) will keep the service platform (“PVIS”) up to date.

There is a strong commitment of all stakeholders in Austria regarding the implementation of ITS applications and services. According to an extrapolation within a study conducted by Brimatech the Austrian ITS industry generates an annual turnover of 2.2 Billion Euros. In Austria there are well-established funding and research programmes, internationally acknowledged companies with a high level of technological know-how, a well-developed transport system as well as a powerful energy system featuring 70% of renewable energies in the electricity mix. The Austrian federation works together with the states to harmonise and simplify the current fare system in order to shape public transport in Austria even more
attractive, transparent and simple. Yet there are differing political interests. Depending on their electorate and regional presence, each party variably sympathises with each mode of transport. Additionally, up to now ITS have been regarded primarily as a synonym for industry-driven technological innovation of telematics components (vehicles, infrastructure, devices) in the field of transport. It has been omitted to deal with political and administrative issues coequally to technological development on national and European level.

A basic requirement towards an Intelligent Transport System is a harmonised data exchange between Austrian infrastructure operators. To facilitate this exchange, measures to create a consistent organisational and legal framework are taken on national level. In this way the necessary premises for Austrian infrastructure operators to ensure a harmonised and comprehensive exchange of ITS-relevant data shall be created. In this matter it is very important to sufficiently define and analyse quality requirements for the data exchanged as well as rights and duties of all stakeholders involved.

The most important basis for successful interoperability and compatibility between cities and regions is a cooperative organisational and management structure that covers states, countries and operators and is initiated by public authorities. Only in this way it is possible to integrate a maximum number of partners from administration, transport services and infrastructure operators and the data they have to offer.

So the objective is to provide all traffic participants with real-time traffic information services. In the next five years there will be improvements all over the information chain (incident detection, processing and customer information) by quality assurance measures, which is expected to increase the general efficiency. Thus processing times will shorten and users will receive information faster. This will not only improve infrastructural utilisation, but will also contribute to a distinct increase of efficiency, safety and environmental friendliness.

3.2. Specific issues regarding the implementation of ITS in Bulgaria

The transposition of the Directive 2010/40/EU was performed in the end of January 2013. The Law on Road Transport is the law defining the responsibility for coordinated and coherent deployment and use of Intelligent Transport Systems in the Republic of Bulgaria. It obliges the Minister of Transport, Information Technology and Communications to coordinate activities in the deployment and use of Intelligent Transport Systems in the field of road transport and for interfaces with other transport modes. To support the performance of the Minister of Transport and Communications, a Council on Intelligent Transport Systems is to be constituted in an advisory capacity. This Council has not been constituted yet and does not function so far.

In 2010, a Strategy for development of the transport system of the republic of Bulgaria 2020 was accepted. Another important document was the adoption of the National Strategy for
the improvement of road safety in the Republic of Bulgaria 2011 – 2020; however there is no separate strategy for ITS deployment yet.

Major issues are:

**Lack of ITS infrastructure on all National roads and highways**

One of the major problems in regard to the deployment of ITS systems in Bulgaria, is the lack of supporting infrastructure practically on all non-urban roads. The majority of the infrastructure has been planned and built 20 years ago. ITS, being a new technology, has not yet been taken into account at all. A considerable portion of the road construction in the past 20 years has been refurbishing of already existing roads. There is significant building of new roads only in the last 7-8 years and the majority of them are also based on older projects. Technically viewed, there is no main power supply and no wire based communication options. For the communication part, there are some available substitutions – using the 3G GSM of the mobile operators is the main and mostly available option. It is worth mentioning that Bulgaria is a country with a mountain terrain and 3G is not always available especially in the high mountain passes – 2G (GPRS) has to be used there. This constrain limits significantly the number of ITS applications that can be supported over these communication links. These speed of transfer might be appropriate for some low bandwidth applications like sensors for weather conditions or traffic, but insufficient for high demanding applications like video surveillance, live traffic monitoring etc.. Supplying the equipment with power is a much bigger problem – the lack of main power supply leaves solar panels as the only available option. This might be enough for some low power sensors, but will not be sufficient for more power demanding technology like cameras, radars etc..

The infrastructural problems are directly inherited from the administrative and legal level. ITS infrastructure is not planned as a part of the construction project even when it comes to future roads segments.

**Lack of information system for road users and maintainers**

Traffic data collection in Bulgaria can be divided in two major categories: urban and non-urban roads. In the cities, there is some data regarding the travel time from one destination to another and the average speed of the traffic flow. The vehicles of public transport are equipped with GPS for positioning and communication modules for transmitting their current location to the central management of the public transport. Based on this data, conclusions for the traffic situation can be drawn.

On the non-urban roads, there are about 117 counting point of the Road Infrastructure Agency. Very few of them have old and non-functioning counting equipment. Counting is done manually on annual basis. This produces small volume of traffic data and it is unreliable. The value of this data and whether it is suitable for developing models and planning infrastructure is questionable. The Road Infrastructure Agency is aware of this problem and currently there are several tenders planned for installing traffic counting systems. In contrast to road planners and maintainers, road end users have practically no information about the
traffic conditions, except occasional radio reports. This reduces their ability to avoid congestions by using different routes. Bulgaria has a mountain terrain with high mountain passes, which are often closed due to bad meteorological conditions during the winter (mainly severe snowfall). Users are not informed about the road condition and they must rely on occasional radio reports, which contain information only about some major roads. This situation is the same when it comes to informing the public about dangers and obstacles on the road.

**Lack of integrated traffic management system**

There are no automated or even partially automated telematics systems for traffic management. Management of everyday regular traffic and of specific traffic incidents is conducted via traditional methods and mainly by human presence and intervention on the network (traffic and police officers). Usually police officers manually manage the traffic in intersections in peak hours (e.g. lane switching to balance commuter traffic in different directions, and manually reroute traffic due to an accident. There are no systems with VMS (Variable Message Signs) and no live traffic monitoring, which significantly increase the reaction time to traffic events, accidents inclusive.

**Lack of integrated electronic GIS system for analysis**

Currently, there is no operational electronic GIS system for analysis of road accidents and locations with high accident rates and potentially dangerous locations. The accident protocols are delivered in electronic form with very low level of automation. All these conditions hinder the further statistical processing and analysis of the collected data into an information system. In September 2011, the Ministry of Regional Development and Public Works has ratified EC 2008/96 EC regarding road audit. It should be carried not only on new roads, prior to acceptance for use, but also on already existing roads and it should be done proactively, when there is indication of higher accident rate. In this case the existence of a good system for analysis is imperative.

**Poor institutional data exchange**

The available data is not shared and used optimally between different authorities. Quite often, different state institutions – e.g. road maintainers, infrastructure planners and enforcement authorities would collect their own data, sometimes duplicating each other and would not share it or when they do, the procedure is complicated, not automated and requires administrative work. In many cases, traffic data is available, but it is viewed as “internal information” for the particular institution and thus it is not circulated or made accessible for road users.

**Low level of automation in traffic law enforcement and violation processing systems**

Currently big part of the violation processing done by the Ministry of Interior (MoI) is manually intensive. This includes also the data transfer part from the enforcement devices on the road to the office. The consequence is very low collection (payment) rate for traffic offences, which leads to minimising the preventive effect of enforcement and increasing the accident rate. The traffic police is aware of this problem and currently a new back-office
system is being developed, which will drastically increase the level of automation and ticket collection rate. It will support the processing of a wide variety of offences, originating from different sources like enforcement cameras, radars, police officers, parking violations etc.

**Lack of coordination between the institutions responsible for ITS**

The ITS deployment in Bulgaria is a responsibility of the Ministry of Transport, Information Technology and Communication. The responsible Ministry for highway administration is another authority - the Ministry of Regional Development and Public Works with the Road Infrastructure Agency which is responsible only for the non-urban roads. In the cities the responsibility lies on the municipalities and there are also centres for traffic mobility. Traffic police is separately dealing with the enforcement part of it.

### 3.3. Specific issues regarding the implementation of ITS in Greece

There are several factors that drive the ITS policy making and implementation in Greece. The geographical position and morphology, the current transport network (a relative sparse road and railway network, more than 140 passenger and freight ports, 45 airports), but also the deep economic recession that the country faces over the last years, create a rather complex context that influences ITS deployment.

Greece has already implemented a number of large ITS projects, mainly in the field of road transport and in large cities of Greece (Athens and Thessaloniki). Greece's main strengths regarding the ITS deployment rest upon its scientific human potential, its scientific experience and know-how coming from ITS related European projects (i.e. Intelligent Urban Mobility Management System of Thessaloniki, EASYTRIP, VIAJEO, etc.), but also from private initiatives that bestir themselves in the ITS research and development, as well as the active involvement of representatives of Greek ITS related bodies in European ITS organizations (i.e. ERTICO, ITS Nationals).

Nonetheless, the current ITS deployment in Greece is generally hindered by:

- restrictions on the financing;
- high investment costs that are demanded in combination with the uncertainty when the depreciation timeframe and the return on investment is concerned;
- existing weaknesses in the public administration structures;
- long time period from tendering to implementation;
- lack of a structured policy and national ITS priority framework that causes a fragmented and limited, geographically, ITS deployment.

As already mentioned, today Greece presents a number of large ITS projects that, nonetheless, mainly focus on major urban areas of Athens and Thessaloniki or major motorways, while a lack of such projects in other urban and rural areas is observed.
Therefore, as also highlighted in the ITS Action Plan for Intelligent Transport in Greece (Ministry of Development, ITS Action Plan for Intelligent Transport in Greece, 2012), the specific issues that need to be addressed for the deployment of ITS at national level include the following aspects:

- The need to support rural ITS deployment, since the majority of ITS applications and projects are concentrated on the two large urban agglomerations Athens and Thessaloniki;
- The need to promote interoperability and coordination among implemented ITS systems;
- Promote collaboration between public (central and regional authorities) and private bodies and clearly define roles and responsibilities among the involved players;
- Improve administrative structures and personnel in order to raise bureaucratic obstacles;
- Provide incentives to the private sector aiming to invest more on ITS innovation;
- Better cooperation between research community and private initiatives

3.4. Specific issues regarding the implementation of ITS in Hungary

The most characteristic examples of ITS applications in Hungary today are the traffic management of motorways, the traffic control systems of motorways, the electronic fee collection (road toll), the route guidance/ navigation.

Intelligent Transport Systems and services in the road sector are diverse and generally there are a lot of stakeholders, such as network operators, network providers, content providers and of course road users (drivers, public transport users, pedestrians etc.).

It will be extremely important in the future for local authorities – mainly in larger cities – to address the field of Intelligent Transport Systems and services, defining deployments that support the implementation of their objectives in order to ensure local mobility.

In 2007, the “Coherent Strategy for Transport Development (EKFS)” was published and dealt with the field of Intelligent Transport Systems and services as a horizontal matter besides the improvement of road safety reduce of environmental impacts and improvement of energy efficiency of transport.

In 2009, the “Strategy for national development of Intelligent Transport Systems and services” was completed as a draft paper and it mainly focused on systems and services related to road transport.

On the national road network, taking the current situation into account, analysing European and national trends in accordance with strategic EU and national documents in the field of Intelligent Transport Systems and services the following most important deployment areas and priorities can be set out:
• deployment of ITS in modern road operation – traffic management;
• traffic control and information systems of the motorway network;
• traffic control centres;
• multimodal traffic information: real-time information systems;
• electronic fee collection;
• coherent electronic payment system of passenger transport (e-ticketing);
• ITS deployment of freight/logistics;
• E-Safety systems supporting road safety;
• integrated EU-wide e-Call service.

The wording of the document was formed after comprehensive debate and consultation with full consensus of the stakeholders. It is highlighted that this strategy was the first to reflect on ITS applications of the road sub-sector with a comprehensive and coherent framework.

It is urgently needed to develop the national “ITS strategy” as soon as possible (not only for the road sector but also for other sectors). The “Action Plan” should relate to the recorded priorities of the strategy in accordance with the strategic main objectives and operative goals, indicating the priorities.

A number of other tasks are linked to the Intelligent Transport Systems that have important roles at planning, implementing and operating any kind of Intelligent Transport Systems and services. These are horizontal matters which are summarized as follows:
• establishing of a system architecture: coherent framework to link and identify the way of cooperation of certain independent systems/services
• evaluation of Intelligent Transport Systems /services
• standardisation issues of intelligent transport systems and services

The Ministry of National Development fulfils its reporting notification in accordance with the paragraph 17 (deadline: 27 August 2011) of ‘ITS Directive’ as in the structure below:
• implemented ITS elements on the TEN-T network and related to the TEN-T network (related to the priority areas of the ITS Directive) from governmental and/or EU sources;
• planned implementation of ITS elements on the TEN-T network and related to the TEN-T network (related to the priority areas) from governmental and/or EU sources;
• implemented ITS projects of cities/capital (related importance to the national TEN-T network)
• interfaces with other modes of transport/sub-sections (related importance to the national TEN-T network);
• private investments with significant effects on ITS deployment (implementation of TMC place-codes, TMC services)
The form proposed by ERTICO – ITS Europe ‘Public Authority Platform’ will be used for reporting.

It was crucial for Hungary to join euro-regional projects in 2004 immediately after the enlargement of the European Union.

The advantages of participation in CONNECT Euro-regional project and EasyWay project for Hungarian partners were as follows:

- In the case of projects selected for implementation the necessary and specified, by special local requirements, ITS developments/deployment on the motorway network could have been set up.
- The elaboration of studies based on regional cooperation and using cross-border ITS solutions and the implementation of projects launched by considering these studies made and will make it possible to operate interoperable systems/services on the national road network.
- The work was implemented in European context, cooperating with fellow partner countries and supported and approved by the EU Committee.
- The financial support of the EU makes it possible to implement the necessary development and deployment to achieve higher service level on the Hungarian motorway network.

The completed developments during CONNECT project (between 2005 and 2009) and in EasyWay Phase I (between 2008-2009) are outstanding because in the previous years there had not been any comprehensive, strategy-implemented development apart from those included in the projects, but only isolated, non-compatible/non-interoperable solutions were implemented in certain sections and in different times on the motorway and main road network.

Taking these reasons into consideration, in the content of the Hungarian report, the implemented or currently being implemented investments within Euro-regional CONNECT and EasyWay projects are strongly highlighted.

At the fields of special importance that are suitable for ITS Directive at single activities and projects, the processes/steps of development are presented as well. That is the reason why the outcomes achieved / the (sub) projects implemented are indicated separately. This method emphasizes the importance of European cooperation and EU-funds in ITS developments/implementations of the recent years.

3.5. Specific issues regarding the implementation of ITS in Italy

ITS in Italy are a sector operating since the eighties, even if it had a relevant development starting from the nineties, in parallel with the growth of the industry in other major industrialized countries.
ITS for the management of traffic and mobility are active in many Italian cities under the responsibility and control of public authorities (Rome, Turin, Milan, Genoa, Naples, Florence). Besides that, more than 50% of the Transport Agencies for Local Transport are equipped with localization and monitoring systems of fleet, in order to improve the services offered. A survey recently conducted within the project Infocity (Elisa Programme) on local authorities who participated in the program Elisa, showed that: a high percentage of the local authorities concerned, adopted a mobility plan that includes a section devoted to ITS. Moreover ITS applications for traffic management and infrastructure for the management of local public transport, for information users, for the road pricing, for electronic ticketing and integration tariff, for the management of transport goods and for road safety, are either completed or planned for the next three years work. In particular, as regards the activities envisaged in a horizon of time between the next 5 and 10 years, the areas where the local authorities focus priority investments will be those of information to users, management and monitoring of traffic, freight management and electronic ticketing.

Concerning the automotive sector, considerable efforts have been done for the development of tools and solutions in order to increase safety, mobility efficiency and consumption reduction. For example: advanced systems to navigation systems that provide tips for a more eco-oriented driving or reducing consumption, systems of tracking / monitoring traffic that enable fleet management services and insurance services, ADAS (Advanced Driver Assistance Systems) aimed to increase the level of safety of vehicles, including heavy vehicles. There are numerous projects initiated in various locations placed on strategic corridors of freight transport in order to promote the development of intermodal and integrated logistics. The UIRNet project is also noteworthy: a telematics platform designed to improve the efficiency and safety of the entire Italian logistics system, bringing considerable benefits both for individual users and the system as a whole.

In Italy, the toll motorway network has represented a natural environment for testing and applying innovative systems and technologies. In particular, the Telepass system for automatic payment of tolls is an Italian excellence, which is also used in other European countries, to the benefit of the domestic industry.

Some critical aspects concerning the implementation of ITS in Italy can be identified:

- lack of general Guidelines for standard development of open and interoperable systems
- lack of clear and certain rules
- pilot projects are not always part of large-scale applications
- still missing a national research program
- still missing a national fund for financing ITS
- restriction on financing

Some measures concerning ITS are included in article 8 of the law “Further urgent measures for the growth of the nation” (18 October 2012, n.179). This law has been defined by the Ministry Council in order to counteract the economic crisis.
In particular, two aspects are considered relevant by the article:

- interoperable electronic ticketing (technical rules for public transport agencies will be adopted during the 90 days after the publication)
- database of information on infrastructures and services collected by the infrastructure managers, owners of the transport and logistics nodes (freight villages, ports, …) and parking areas. Design, realisation and diffusion requirements will be adopted during the 60 days after the publication.

The national ITS action plan (“Piano d’Azione ITS nazionale”) has been issued in December 2012, and identifies the national priorities until 2017. It is currently under evaluation and it is planned to be approved by the end of March 2013.

The plan goes beyond the EU priorities, for which specific actions are defined for each priority, and defines necessary actions, at general level, to support the coordinated development of ITS in Italy:

- Revision and updating of the national ITS framework
- Promote the elaboration and utilization of reference models and technical standards for the design and implementation of ITS systems
- Promote the diffusion of ITS on the national road network
- Introduce a classification of the service level for national road network, considering available ITS systems for information, management and safety
- Launch a system for measure and monitoring of the benefits of using ITS applications (database of benefits)
- Networking transport platforms
- Create the conditions for the utilization of services provided by navigation systems
- Increase the diffusion of telematics systems on vehicles.

The National ITS Action Plan of Italy defines main actions for some of the priority areas that will be specifically developed in the near future, until the 2017.

**Priority Area 1**

AP1 – Implementation of databases for traffic and travel information (objective: 2014)
AP2 – Development of reliable and certified information services (objective: 2015)

Currently, the critical aspects of this sector in Italy are mainly organizational and data related (availability of reliable and timely data sources on the whole territory). The aim is to ensure that all citizens have access to secure information, localized, real-time conditions of mobility along their journeys using the potential given by the new communication technologies (smart phones, web browsers, nomadic devices).

**Priority Area 2**

AP1 – Development of integrated multimodal ITS services for both passenger and freight transport (2014)
AP2 – Development of ITS services for multimodal logistics (2014-2015)
AP4 – Nationwide adoption of interoperable electronic ticketing (2014)
AP5 – Continuity of services along the borders (2016)
AP6 – Adoption of smart mobility policies in urban and metropolitan areas (priority for public transport, bike sharing, car sharing, electric mobility,...) (2015)

The objective to be met is the ability to provide integrated services for multimodal mobility for people and goods, making it possible to plan and manage the movement in an informed and personalized, seamless from the point of origin to destination using all the available modes in an efficient and safe.

The development of integrated mobility for both people and freight is based, necessarily, on the availability, access and set up system of data and information that are, thus, the enabler of these services, management and organization of these data in integrated platforms open, interoperable, and integrated payment systems, ticketing and transport services.

Priority Area 3
AP1 – Development of the national e-Call service (2015)
AP2 – Implementation of safe and secure parking places for trucks and comm. vehicles (2015)
AP3 – ITS for insurance companies and related serv.: black boxes and connected vehicles (2014)
AP4 – Nationwide diffusion of ITS services for security for public transport and in the transport hubs (metros, ports, stations, airports) (2015)
AP5 – Nationwide diffusion of enforcement tools for safety (2015)
AP6 – Nationwide diffusion of ITS for long distance freight transport control (2013-2014)
AP7 – ITS solutions for managing and monitoring of dangerous goods transport (2014)
AP8 – Promotion of on-board technologies (2016)

Priority Area 4
AP1 – Development of cooperative driving systems (2017)
AP2 – Monitoring of road transport infrastructures in adverse weather conditions and for the optimisation of maintenance operations (2015-2016)

The fourth priority area concerns the development of communications of the vehicle and its progressive integration with the transport infrastructure (road, service centres), not only as an operating field in its own right but also as an enabler for the other priority areas. Communications Vehicle-to-Vehicle, Vehicle-to-Infrastructure and Infrastructure-to-Infrastructure technologies are enabling the development of innovative applications, aiming at developing a model of sustainable mobility.

3.6. Specific issues regarding the implementation of ITS in Romania

In Romania, Intelligent Transport Systems are in an emerging stage of implementation. However, there are already some systems deployed, both at local urban level and on national
roads and motorways. This is the reason why almost all projects address the priority area of optimal use of road, traffic and travel data.

Another important aspect is that a decision of the National Motorways Company is in force, which states that all new motorways to be built will include intelligent infrastructure. Therefore the premises for a full-scale deployment of ITS exist.

However, it is important to note that there is no national strategy for the deployment of ITS. On the one hand, this makes it very difficult to coordinate the implementation because there are no clear objectives and targets on medium and long term. On the other hand, it is also very difficult to find and allocate financing sources for any project idea as there is no framework to fit it and correlate it with a global vision. Still, some steps in this direction have been made, of which the most important are:

- The “National Strategy for a sustainable transport system for 2007 – 2013 and 2020, 2030” adopted in 2008 mentions the implementation of ITS as a solution for the development of the transport field;
- The “National Strategy for intermodal transport 2020” adopted in 2011 proposes ITS as key technologies for the implementation of intermodal platforms and services for intermodal freight transport services;
- Adoption of the ITS Directive (2010/40/UE) into national law by Governmental Ordinance no. 7 from January 2012.

The Ordinance not only sets up the framework for the implementation of ITS but it also creates a National Coordination Board for ITS in charge for monitoring the implementation of ITS and exchange of information and expertise among both public and private stakeholders in the field.

The Governmental Decision from 2012 which established the National Coordination Board for ITS as a consulting body of the Government.

The chair of the Coordination Board is assigned by the Ministry of Transport and the vice-chair by the Ministry of Communications. The Board includes members from various Ministries, from the Special Telecommunications Service, the Romanian Space Agency, the National Authority for Radio communications, the Romanian Standardisation Association as well as various public organisations representing cities and administrative regions. The Board can set up for itself an Inter-institutional Working Group and also a Technical Working Group. While the members of the former are only representatives of the public administration, the latter can also have members from private stakeholders and non-profit organisations.

Finally, regarding sources of financing, it can be seen that the most used one is state budget. The main reason for this is that public administrations are not well trained to comply with the requirements for developing and managing projects involving European Funds. Another reason is bureaucracy, as these kinds of projects impose the cooperation and coordination of
multiple agencies in order to be set up and monitored. Now, as the budgetary resources are getting lower, the option of concession contracts is also starting to be explored.

3.7. Specific issues regarding the implementation of ITS in Slovenia

After joining the EU, Slovenia has moved in new era of faster, more accessible road traffic. At the same time, many sophisticated ITS were installed and upgraded to ensure smooth and safe traffic flow at the increasing traffic volumes. The focus of ITS in Slovenia was therefore on motorways, but there were several successful projects also outside this scope.

In these cases we found two main strengths of ITS environment in Slovenia:

- successful deployment and implementation of ITS in Slovenia made by domestic knowledge; examples:
  - electronic toll collecting (ETC) system on motorways for personal vehicles that was in use between 1995 and 2008 when it was replaced with the toll stickers (vignette) for R1 and R2 vehicle classes. The same ETC system is now serving the heavy load vehicles
  - traffic surveillance and management systems on several high hazardous motorway sections,
  - cross border traffic data exchange
  - WIM (weigh in motion) systems
- advantageous geostrategic position within important transport corridors in Central and South East Europe (nearby important EU countries like Italy, Germany and Austria and access to West Balkan)

With the construction of new infrastructure, there appears the need of defining the role of each party involved in traffic management. At the same time, mutual agreements between each party are going to be defined. In the past Ministry of Infrastructure and Spatial planning introduced SITSA-C, Slovenian ITS architecture, which has never been adopted by other ITS stakeholders.

On the other hand, the absence of the concrete measures from the Ministry responsible for transport in last twenty years in the direction to introduce single ticketing system and coordinated timetables clearly shows that the number of public transport passengers dropped significantly, even that on the declarative level the legal basis was created. Different entities developed a number of systems for e-ticketing for the use of public transport, which, while using a single standard on the local level, but due to differences in data protocols among themselves are incompatible.

From these experiences we found many Slovenia’s weaknesses in the ITS environment:

- weak policy and no strategy regarding ITS implementation on different levels
- bottom up instead of top down development of existing ITS what caused the local commercial interests and requirements
recent ITS deployment has focused on the low level system application, resulting in the lack of interoperability

- poor knowledge use
- low share of innovative companies and low level of innovation culture
- public and private sector low investments in research and development of ITS
- education orientation primarily for scientific results without a clear contribution to the economy
- existing educational and research system makes it almost impossible for collaboration with ITS industry
- inconsistency of subvention measures by the state (inefficiency of the tax system)
- intolerance to business risk and failure, especially on the public places
- low level of networking in the home environment and the formation of strategic partnership with foreign partners
- lack of management with advanced business knowledge and experience abroad;
- predominantly focusing on traditional markets
- quantity of local suppliers

To introduce higher level of ITS understanding Slovenia should:

- Make more public discussion and presentations of specific intentions in the field of ITS
- Prepare or upgrade strategic documents such as ITS Action plan or ITS Strategy on the National, Regional and Municipality level
- Update, promote and adopt the SITSA, the framework of Slovenian ITS architecture
- Define rules and responsibilities of ITS actors in Slovenia, including tasks such as integrity, liability, etc.
- Implement more cross-border EU ITS

A national ITS action plan is in preparing phase and will be adopted in the middle or end of 2013. In this document, the vision and strategy for the period 2013 - 2018 is proposed, including rules and responsibilities of different ITS stakeholders, business model and financing of ITS in Slovenia.


In addition, the Roads Act governed by changes in the valuation of particular services and road safety evaluators in the competence of each body for action in the event of roadblocks and in making of investment documentation for projects that do not significantly affect the environment. They are also set basic questions regarding the establishment of the National Traffic Management Centre (in Slovene: NCUP). In this way, this is the beginning of operational procedures for the ITS deployment. For the implementation of the legislation Ministry for Infrastructure and Spatial Planning, Slovenian Road Agency and DARS d.d. (as
national motorway operator and concessioner) are competent. Mentioned law allows operators to perform their duties in the premises NCUP and for the implementation of the tasks of the Centre are entitled to free use of facilities.


The Public Passenger Transport Act is in preparing phase. With this act the integrated public transport will be established in Slovenia, including e-ticketing, real-time schedules for all transport modes and management of passenger transport.

### 3.8. Specific issues regarding the implementation of ITS in Albania

One of the most important changes after 1990s in Albania was the migration of population from rural areas to urban areas. Tirana, capital of Albania, has undergone in a massive new settlements. The population of Tirana in 1990 was 270,000 inhabitants and today Tirana Municipality Area has 880,000 inhabitants (including some areas which are outside Municipality of Tirana). This urban development overloads the transport and utility networks of Tirana. The lack of roads with adequate traffic capacity hinders the operation of public transport and the accessibility to many areas of the city. The occupation of the road sides is one of the major causes of traffic overload with reduced level of service and slowing traffic flows. The majority of new constructions made in Tirana during the last decade, are without car parking, and as a result, the cars are parked on the streets, creating congestion of the traffic. With the urban street conditions pedestrians are the category of road users which suffer more the present situation in terms of not sufficient road crossing facilities.

Tirana is currently facing a deep restructuring process in its urban transport system. Over the recent years neither the transport infrastructure nor the transport services have kept pace with the population growth and the boost in the number of private cars. These changes have increasingly fostered the demand for more efficient transport infrastructures, as well as integrated plans for urban development and traffic management in the city.

Albania has invested a lot in the last twenty years for the reconstruction of the existing road network and building new roads and highways throughout the country, rural and urban roads.

As result of the investments in the road transport, the interurban transport is improved, meanwhile in the cities and especially in Tirana, the traffic congestion creates unfavourable conditions for movement of cars, vehicles and people.

The reconstruction and building of new roads/highways in Albania was a priority. The ITS deployment and implementation is left rather behind because the priorities were the road
network construction. Here below are several factors which caused delays in ITS deployment in Albania:

- Lack of strategy and policy approach regarding the implementation of ITS
- Lack of appropriate ITS legislation
- Unavailability of funds

The European Commission has set up the ITS legislative framework in 2010. In this perspective Albania has the opportunity to start build up strategies based on European Union legislative framework for the ITS deployment.

Hopefully there are some advantages/strengths for the current status toward the deployment and installation of ITS in Albania:

- Albania can establish adequate framework conditions for accelerating and coordinating deployment of ITS
- Prepare an up to date legislation for the deployment of ITS
- Plan and integrate the generic ITS components on a realistic timetable
- Use the “best practices” for the design of up to date technologies to support the ITS deployment

In order to start the deployment of ITS in Albania in national level, the specific matters need to be addressed, such as:

- Provide an adequate legislation framework for deployment of ITS, laws and Government decision for this purpose, in coherence with EU legislation and ITS Action Plan Priority Areas
- Establish a strategy for the deployment of ITS in conformity with the EU Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010, EC Action Plan and other EU documents on this subject
- Create an administrative structure/department in national level which will promote, support, develop and follow up the ITS deployment
- Start projects for the deployment of ITS in cities, especially for Tirana at first place
- Promote collaboration between central and regional authorities and between public and private organizations with defined roles and responsibilities
- Support financially projects aiming the ITS deployment
- Promote the public-private partnership for the research and deployment of ITS

3.9. Specific issues regarding the implementation of ITS in Croatia

There has been no systematic approach to ITS implementation financing in road networks in Croatia thus far. A significant highway network has been built (1300 km) during the last decade and modern information and communication technologies have been implemented to mark the beginning of Croatian ITS development. Unfortunately, due to non-existent national ITS architecture, the systems were not integrated at higher instances. Therefore, there was
no unitary national scheme for funding ITS as a special system. ITS funding was a part of the total funding for highway development. The main investor was the Republic of Croatia using a World Bank and European Bank for Reconstruction and Development loans. Particular ITS projects were integrated with the development of particular highway sections. Also, there are multiple highway concessioners in Croatia which leads to differences between implemented systems and adjacent technologies.

It can be generally said that the applied ITS solutions on certain highway sections are on a high technological level. For example, the systems for incident management on highways (especially in tunnels) have received excellent grades in the existing project on tunnel safety (European Tunnel Assessment Programme). 51 tunnels were tested in 2007 and one of the tunnels on the A1 highway (“Brinje”) was determined to be the best in Europe. Croatian tunnels have been graded as very good in recent years. Application of VMS in highways is high which represents significant improvement in informing users (drivers, passengers, etc.).

The basic problem with current implementation is the lack of integration at higher instances (regional, national, EU). This leads to low levels of interoperability. Current data exchange methods are manual (e.g. protocols on exchange of information on traffic and incidents with Slovenia and Austria based on fax machines). The use of DATEX standard (information exchange between traffic management centres, traffic information centres and service providers) is not even planned for implementation.

ITS does not have a regulated status in the current Croatian legislation. In accordance with the remaining legislative obligations for Croatian accession to the EU, a supplement to the existing Highway Act is currently underway in the sense of the Directive 2010/40/EU.

3.10. Priority area: optimal use of road, traffic and travel data

3.10.1. Austria

3.10.1.1. Summary of finalised activities

**Enhancement and optimisation of RDS-TMC in Austria (TMCplus)**

Co-funded by the European Commission.

Since October 2002, the traffic information centre of ORF operates a comprehensive and freely accessible RDS-TMC service in Austria. This service is broadcasted by the stations Ö1, Ö3, FM4, and the nine regional stations (Ö2).

The data are created and coded by the traffic information centre of Ö3 and broadcasted via RDS-TMC. The editors receive accident and traffic jam messages from ASFINAG’s traffic management and information system, from the police, road maintenance depots and about
20,000 so-called Ö3vers (registered traffic jam messengers). The editors evaluate and process information before they are coded into digital traffic messages.

TMC traffic messages are located using the Austrian Location Code and the standardised ALERT-C Event Code. The Location Code comprises all motorways and main roads as well as the most important urban roads of the nine state capitals and also Dornbirn, Leoben, Schwechat, Steyr, Villach, Wels and Wr. Neustadt. All traffic messages that are educible with the LC-catalog will be encoded to a TMC-message and broadcasted in case of a delay.

By May 2008, 91% of all traffic messages broadcasted by ORF were also TMC-messages. 93% of all interurban messages can be located via Location Code. The Austrian Location Code is owned by ASFINAG and regularly maintained by ASFINAG, the Ö3 traffic information centre and ÖAMTC.

Interfacing cities (Project VEMA)
Co-funded by the European Commission.

Project objective was to define how the traffic data that are needed for the proposed dynamic and intermodal traffic management (VEMA) of the Vienna Region can jointly be administrated and utilised and summarised into a common data sharing. Complex and extensive data were available in different formats and at various locations. The planned data streams and processes as well as the roles and permissions of the involved parties should result in an overall system with mutual advantages and synergies for all VEMA-partners.

These are the Austrian Ministry of Transport, Innovation and Technology (BMVIT), the Austrian Ministry of Internal Affairs (BMI) respectively the Federal Police Headquarters of Vienna, the states of Vienna, Lower Austria and Burgenland, Austrian Federal Railways (ÖBB), ASFINAG, Wiener Linien and Verkehrsverbund Ostregion.
Objective of this traffic data share was to have a dynamic, intermodal, entire and up-to-date overview of the situation on the roads available by 2010. These data should make the comprehensive traffic and mobility management possible that was defined in the Viennese traffic master plan of 2003 (Masterplan Verkehr Wien 2003). All information that could motivate citizens to change their mobility behaviour should be made available for them.

Additionally, companies were provided with information needed to shape logistical procedures more efficient. All traffic data were located in a consistent traffic framework and the situation on the roads was depicted comprehensively and throughout the entire traffic network. The traffic overview depicted the current situation on the roads as well as short- and long-term traffic forecasts.

**Project organisation „ITS Vienna Region“**
Co-funded by the European Commission.

Verkehrsverbund Ostregion (VOR) was charged with conducting the tasks for the Vienna traffic management. For that purpose the project organisation “ITS Vienna Region” was established within VOR.

Main task of ITS Vienna Region is to develop an intermodal and dynamic traffic data pool for the Vienna Region (comprises Vienna, Lower Austria and Burgenland) as well as for traffic information service providers (TISP) and for applications offered by partners (states, ASFINAG, etc.). The foundation for this data pool is the common reference graph for ITS Vienna Region that comprises the existing graphs of Lower Austria, Vienna, ASFINAG and the public transport network (including timetables).

The decentralised basic data model is being updated regularly. Updates are generated by various traffic sensors, RDS-TMC messages and the Viennese FCD system. Thus ITS Vienna Region cooperates with Austrian Federal Railways (ÖBB), the Austrian Broadcasting Corporation (ORF), Wiener Linien, ASFINAG and the states.
The three states Vienna, Lower Austria and Burgenland heavily cooperate across the state boarders and together form the Vienna Region. The Website "AnachB.at", an innovative and free online traffic service application for Vienna, Lower Austria and Burgenland, comprising all means of transport, is an excellent example for this supraregional cooperation. The data pool is updated constantly and thus optimal routes can be calculated anytime.

3.10.1.2. Summary of ongoing activities

Verkehrsauskunft Österreich (VAO, collaborative traffic information service throughout Austria)
Co-funded by KLI.EN (programme of 2010).

Objective of VAO is to define and deploy an intermodal traffic information service (MIT, PT, bicycle and pedestrians) offered by Austrian traffic infrastructure operators (ASFINAG, states), transportation companies, traffic information providers (ÖAMTC, traffic information centre of the Austrian Broadcasting Corporation ORF), the cooperational collective of the Austrian public transport providers (Kooperationsgemeinschaft der österreichischen Verkehrsverbünde, KGÖVV) and ITS Vienna Region (the traffic telematics platform of Vienna, Lower Austria and Burgenland) throughout Austria. The project is supported by the Federal Ministry of Internal Affairs, Austro Control and ÖAR. As a “Trusted 3rd Party”, AustriaTech will ensure that all partners and stakeholders can access VAO free from discrimination.

Main objective of the next years must be to entrench VAO as a standard for as much services and partners as possible to guarantee consistent, reliable and cross-platform intermodal traffic information system throughout Austria. Specific requirements of various user groups have to be regarded in this task. In further consequence it is planned to discuss an expansion of
VAO’s services with operators and authorities of neighbouring regions. Thus it should be possible to provide border-crossing multimodal travel information in the long run.

**Graphenintegrationsplattform – GIP (Graph Integration Platform)**
Co-funded by KLI.EN (programmes of 2009, 2010).

Along with enhanced implementation of ITS services in Austria in the course of the nineties, the Austrian territorial authorities and transportation companies started to establish traffic graphs. While commercial providers could offer a consistent GIS standard from the beginning, governmental traffic graphs were developed according to the respective territorial authorities and their administration units. As development progressed, it became more and more difficult to adjust and calibrate the single graphs with each other due to different quality standards and compatibility problems. Consistent traffic graphs for the whole of Austria were only provided by commercial providers. In many fields of public administration work this has proven to be subpar since graphs could not be historicised. To achieve improvements in this matter and with reference to the lessons learned during the project ITS Vienna Region, the setup of a consistent public traffic graph for all Austria was tackled.

GIP is the link that has been missing between public authorities systems and transport infrastructure: the common "official" reference graph to which all the different systems of the administrative units can now relate and link up to. GIP covers all modes of transport (passenger car traffic, public transport, cycling, walking) and, moreover, is capable of proposing intermodal combinations. The platform is continuously updated by eGovernment processes.

Goal of GIP is to create a consistent, spatial and intermodal reference system for Austrian traffic networks. This reference system should form the basis for pioneering applications in traffic information, management and control and should also enable consistent electronic administrative procedures (e-Government) in traffic.

This consistent digital traffic graph will be updated in the course of the e-Governmental procedures. Thus traffic information and management can be conducted reliably. Additionally, safety-related services like an accident data management application can access the graph as a reference.

**ASFINAG test centre**

For a modern and innovative company like ASFINAG, technical quality management is absolutely vital since this can ensure a permanent quality level of the used telematics components as well as a stringent project execution within the company.

On the one hand, innovation cycles are shortening, thus new and immature technology is deployed in the course of many projects. On the other hand, project life spans shorten due to time-limited construction works. This gap keeps opening constantly and causes more and more problems in the projects of road operators. The risk of failure keeps growing and
causes project delays. This can be handled by testing the conformity of critical components and systems at an early stage.

Since technical systems become more and more complex, challenges occur more and more frequently during the integration of new facilities.

ASFINAG’s planning manuals specify comprehensive technical and qualitative standards for various products in detail. These specifications particularly serve to avoid interface problems at the implementation of components made by different manufacturers.

With the foundation of the ASFINAG testing centre there is now an institution available that is capable to eradicate problems when integrating new telematics solutions by testing the conformity of products beforehand.

The Know-How achieved by conformity tests is an important element that proves to be very useful prior and during the project for both creating new product specifications and product tests. Additionally, the expertise acquired by the proper utilisation of special gauges during the troubleshooting process can be drawn on in severe problem cases.

3.10.2. Bulgaria

3.10.2.1. Summary of finalized activities

Road Infrastructure Agency web services
Currently, the web page of Road Infrastructure Agency offers free of charge road maps of the Republic of Bulgaria and up-to-date information on current conditions of the National Road Network (NRN), on-going and upcoming construction and repair works, information concerning prices and points for vignettes distribution etc. Different sections offer information concerning services offered, ways to use them and relevant legislation.

Department „Situation Centre” in Road Infrastructure Agency, performs the following activities:

- supports a communication-information system for collection, processing and analysis of information concerning the condition of the National Road Network
- support of data base, connected with risks and threats of arising crisis
- continuous connection and interaction with the structures of the Ministry of Interior – Directorate general ”Security Police”, ”National Fire Safety and Protection of Population Service”, Directorate „National System 112” and other public authorities
- continuous 24-hour monitoring of the National Road Network

Project „Development of spatial model of National Road Network in geographical information system”
The implementation of the project „Development of spatial model of National Road Network in geographical information system” has been finished in June 2012.
- Convert of current geographic data from undefined (unidentified) coordinate system into WGS 84;
- Migrated graphical and attribute data from traffic databases (Roads and Sromp) and database for bridges (Scan Print) into GIS
- Developed web application for access to road and road infrastructure data
- The Web application offers access to:
  - Graphical visualization of objects from the infrastructure
  - Technical and operational characteristics

3.10.2.2. Summary of ongoing activities

**Project „Integrated system for analysis and evaluation of the traffic on highways and main roads in the Republic of Bulgaria, part of the TEN-T network”**

A project in the framework of Priority Axis 2 of Operational programme „Transport” is in preparation stage, entitled: „Integrated system for analysis and evaluation of the traffic on highways and main roads in the Republic of Bulgaria, part of the TEN-T network”.

The main activity in the framework of the project is the development of integrated subsystems for analysis and evaluation of the traffic, which would facilitate transport mobility, optimizing the use of infrastructure and vehicles. They would also enable vehicle identification, classification and tracking.

In addition to the main activity of the project, subsystems will provide collection of meteorological data.

**Project “Implementation of system for automated collection of traffic data on Bulgarian road network”**

In 2011 Road Infrastructure Agency has signed a contract for grant in the frame of Priority axis 5 „Technical assistance” of the Operational programme”Regional development”. One of the activities in the project is connected with *traffic data collection for roads class II and III*.

**Project “Geographic Information System”**

In April the Road Infrastructure Agency has applied for grant under the Operational programme „Transport” for a project for corporative Geographic Information System – GIS. The project aims to introduce geographically oriented centralized management of the infrastructural objects.

Digitalized maps and data for geo-analysis will improve the financial effectiveness, resource management and decision making related to planning and expansion of the road infrastructure. All data will be integrated into a single database and represented on electronic maps. The project is in line with the Directive 2007/2/EO establishing an Infrastructure for Spatial Information in the European Community.
GIS will be implemented with a centralized architecture and database to provide for users online access to the functions and abilities of the system.

3.10.3. Greece

3.10.3.1. Summary of finalised activities

The actions and projects that have been undertaken and implemented in Greece in Priority Area I are presented in the following table. The table also presents some overlapping with other Priority Areas. More details on each project/action are provided in Annex I of the current document.

Table 9: Finalized projects/actions in Greece for Priority Area I

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobility Centre of the Kalamaria Municipality (Thessaloniki) and development of electronic services for travellers’ information through the Internet and through the Mobility Centre</td>
<td>II</td>
</tr>
<tr>
<td>2</td>
<td>H.I.T. PORTAL - An Online Portal for Integrated Transportation Data Management and Processing</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Telematics services of the Organization of Urban Transportation of Thessaloniki (OASTH)</td>
<td>II</td>
</tr>
<tr>
<td>4</td>
<td>Thessaloniki’s Ring Road Traveller Information System</td>
<td>II and III</td>
</tr>
<tr>
<td>5</td>
<td>Intelligent Urban Mobility Management System of Thessaloniki</td>
<td>II</td>
</tr>
<tr>
<td>6</td>
<td>Urban KTEL S.A.: Integrated Telematics System for Dynamic Passenger Information and Automatic Ticketing for Urban Bus Services</td>
<td>II</td>
</tr>
<tr>
<td>7</td>
<td>Consolidated combined transport system of Attica Region (Routing Portal)</td>
<td>II</td>
</tr>
<tr>
<td>8</td>
<td>e-Trikala ITS system</td>
<td>II</td>
</tr>
<tr>
<td>9</td>
<td>“Myroute” Info-mobility services Portal</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>“Geodata” Portal</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Athens Dynamic Traffic Map for multimodal travel information services</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Train-Taxi combined booking and ticketing service of TRAINOSE</td>
<td></td>
</tr>
</tbody>
</table>

3.10.3.2. Summary of on-going activities

The actions and projects that are currently under implementation or have been included in funding mechanisms and are going to be implemented in a short/medium-term period are presented in the following table for Priority Area I. The table also presents some overlapping
projects with other Priority Areas. More details on each project/action are provided in Annex I of the current document.

### Table 10: On-going projects/actions in Greece for Priority Area I

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Integrated Intelligent Transport System with telematics passenger information services in the island of Naxos</td>
<td>II</td>
</tr>
<tr>
<td>2</td>
<td>Integrated Information System for passengers on the municipal transport and for drivers on available parking places - Municipalities of Vironas, Ilioupolis and Pefki (Athens)</td>
<td>II</td>
</tr>
<tr>
<td>3</td>
<td>GEOPortal of Egnatia Motorway</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Park-n-Ride: An integrated system for driver’s information on available parking spaces and for passengers’ multichannel information.</td>
<td>II</td>
</tr>
<tr>
<td>5</td>
<td>Intelligent parking and transport services in the Municipality of Kropia</td>
<td>II</td>
</tr>
<tr>
<td>6</td>
<td>Integrated information system for Public Transport passengers multichannel information in the islands of Rhodes and Kos, the cities of Kalamata and Xanthi and the Municipality of Kordelio-Evosmos (city of Thessaloniki)</td>
<td>II</td>
</tr>
<tr>
<td>7</td>
<td>An integrated drivers’ information system for free parking spaces within Municipality of Kalamaria (Thessaloniki)</td>
<td>II</td>
</tr>
<tr>
<td>8</td>
<td>Digital Traffic Information Services in metropolitan Municipalities of the island of Crete</td>
<td>II</td>
</tr>
<tr>
<td>9</td>
<td>Park-n-Ride: An integrated system for driver’s information on available parking spaces and for passengers’ multichannel information in the Municipality of Corinth</td>
<td>II</td>
</tr>
<tr>
<td>10</td>
<td>EasyTrip: multimodal route planning application and advanced traveller information services for smart devices</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.10.4. Hungary

**3.10.4.1. Summary of finalised activities**

### Table 11: Finalized projects/actions in Hungary for Priority Area I

<table>
<thead>
<tr>
<th>Priority area I: Optimal use of road, traffic and travel data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects / activities in this area</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>Multimodal travel information services</td>
</tr>
<tr>
<td>Project Description</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Parking control system in Budapest (pilot project)</td>
</tr>
<tr>
<td>Development of the traffic management system of Budapest, expansion its monitored area with adaptive traffic management, installation of new VMSs with special information content in favour of to foster modal shift, component I.</td>
</tr>
<tr>
<td>Municipal Public Services Co. Ltd. – FKF</td>
</tr>
<tr>
<td>Real-time travel information services</td>
</tr>
<tr>
<td>Establishment of a common data platform (“gate”) for operating multimodal intelligent transport systems and services (pilot project)</td>
</tr>
<tr>
<td>Hungarian Public Roads Company</td>
</tr>
<tr>
<td>Establishment of a data portal and insurance of professional data portal access for services according to the business model that is crated in the project</td>
</tr>
<tr>
<td>Hungarian Public Roads Company</td>
</tr>
<tr>
<td>Development of the unified data management system for transportation networks, data visualization portal development.</td>
</tr>
<tr>
<td>Coordination Centre for Transport Development</td>
</tr>
<tr>
<td>Creation of a traffic portal of the metropolitan traffic management centre and give free run of data for develop further information services (Improvement of the technical background of TMC service)</td>
</tr>
<tr>
<td>Municipal Public Services Co. Ltd. – FKF</td>
</tr>
<tr>
<td>D2.2/2-3: M0 motorway, travel-time forecasting system (implementation)</td>
</tr>
<tr>
<td>Travel time and congestion prediction service for the road-users on M0 expressway based on the real-time database from the traffic counting stations. (Implementation)</td>
</tr>
<tr>
<td>State Motorway Management Company Ltd.</td>
</tr>
<tr>
<td>AAK’s website development regarding to information services and develop a dynamic data transfer channel that can be used by road users</td>
</tr>
<tr>
<td>State Motorway Management Company Ltd.</td>
</tr>
<tr>
<td>Further development of “Műszinfo”, create external links to FIR and website of AÁK and develop other links to external host</td>
</tr>
<tr>
<td>State Motorway Management Company Ltd.</td>
</tr>
<tr>
<td>RDS TMC service</td>
</tr>
<tr>
<td>TrafficNav Ltd.</td>
</tr>
</tbody>
</table>

Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries
3.10.4.1. Summary of on-going activities

No on-going activity currently under this Priority Area.

3.10.5. Italy

3.10.5.1. Summary of finalised activities

The entities operating in Italy in regard to traffic monitoring systems are either public or private bodies that acquire, store, process and provide data on traffic, parking and vehicle fleets. They include road traffic operating bodies, traffic police authorities, road and traffic data marketing companies (data providers), companies and bodies that supply data processing models and systems (content providers), logistics and transport operators, public transport authorities. The final category of entities are the information system users themselves, as they effectively act as floating probes that identify traffic conditions in the network in order to supply the data providers.

The entities operating within the Information Systems differ only partly from the above because different entities act both as data providers and information service providers: mobility agencies, road operating bodies, traffic police authorities, producers of on-board terminals (satellite navigation systems, smart phones), telecommunication operators (mobile phones, Wi-Fi networks, Internet providers), companies providing traffic information services (information providers). The information recipients are end users in some cases and in other cases they are intermediate entities or agencies responsible for regulation and control. Road operating bodies and mobility agencies collect traffic data by means of fixed and mobile detection systems. They generally carry out an initial processing of measurements taken for statistical purposes or to provide information to the user and they are themselves information providers, at local level, by means of variable message signs (VMS), Info-points or other tools. Local public transport companies, private and public vehicle fleet operators and logistics operators also provide data on vehicles that can therefore be used indirectly after appropriate processing operations in order to obtain information on traffic status.

Police authorities do not carry out traffic measurements directly but are a useful source of information on anomalies such as accidents, road closures, etc.

The data providers collect and process data with the aim of providing information on traffic and the performance of network elements for which the monitoring system provides satisfactory coverage.

Forecasting methods represent one of the main functional requirements of regulation and information systems. Various qualitative data processing levels can in fact be defined (considering here only advanced systems for real-time measurement and digital expression of data):

a) direct and immediate communication of data recorded by location on a digital map (for example: CCISS, ANAS website, motorway network operator sites)
b) immediate application of recorded data in a form consistent with the method of representation (examples are provided by the Infoblu and Octo Telematics website and various motorway operator companies, including Autostrade per l'Italia and Autostrade dei Fiori)

c) forecasting of traffic conditions based on statistical speed estimates (for example: TomTom HD Traffic, TRAVEL TIME service of motorway operator companies)

d) forecasting of traffic conditions based on the simulation of network performances according to the way users behave when faced with unexpected congestion conditions

Information may be provided in very different ways: by Internet, via RDS/TMC radio, by text messaging, using an on-board navigation system or by means of variable message signs.

**ITS services on the motorway network**

Even though the Italian toll motorway network is managed by different companies, the management and user service provision methods are standardised over the entire network. The numbers in the following figures refer to the basic elements of the infrastructure for data collection and processing along the network. This is made up of the TV cameras, weather stations, SOS posts, data processing systems and Traffic Control Centres that provide the building blocks for information services to end users.

<table>
<thead>
<tr>
<th>Table 12: Finalized projects/actions in Italy for Priority Area I</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No</strong></td>
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<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
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<td>5</td>
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<td>6</td>
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</tbody>
</table>

3.10.5.2. Summary of on-going activities

<table>
<thead>
<tr>
<th>Table 13: On-going projects/actions in Italy for Priority Area I</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No</strong></td>
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<td>2</td>
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</tbody>
</table>
3.10.6. Romania

3.10.6.1. Summary of finalised activities

Traffic and road conditions monitoring and information system – development strategy and pilot project
Co-funded by the European Commission, the project began in 2010 with the goal of creating a system for traffic and road infrastructure monitoring along the A1 motorway. The Romanian National Company of Motorways and National Roads (RNCMNR) set out a traffic monitoring and information pilot consisting of equipment installed in 6 nodes along the A1 motorway. The data gathered is processed locally and communication is ensured between sensors, data acquisition equipment, local processing units and the monitoring centre. Since April 12th, RNCMNR established the Traffic and Road Weather Monitoring Centre in Bucharest thus completing the project in April 2011.

Extension of the Traffic and road conditions monitoring and information system from the A1 onto A2 motorway
The project’s main focus was to set up a pilot to extend onto the A2 the monitoring infrastructure created in the 2010 pilot on the A1 motorway. The project was co-financed by the European Commission and began in 2011 and was completed in the same year. Equipment for monitoring traffic, road conditions and infrastructure were installed in 3 nodes between Km 64 and Km 150 of the A2. All the equipment installed was connected to the Traffic and Road Weather Monitoring Centre in Bucharest.

Refurbishing and maintenance of the Communication and Traffic Monitoring System on the A2 motorway Bucharest - Lehiu (Km 9 + 500 –Km 64 + 020)
The project began on August 31st 2010 and was completed in 2011. It was funded from the state with the goal of refurbishing the communication and electrical power system for the
Communication and Traffic Monitoring System on the A2 motorway, Bucharest – Leheliu sector as well as maintenance for the system.

The project’s final result was a Communication and traffic Monitoring System on the A2 motorway section Bucharest – Leheliu, encompassing a great number of electronic equipment, powered by their own network of electric cables and interconnected through the optic fibre-wire network. This monitoring system is comprised of 6 variable message signs, 102 phones for emergency calls, 16 cameras, road weather stations with roadway sensors, fibre-wire network and electrical power, computers, servers, software, hardware and a Control Centre at km.19+500 where all the information from the system is gathered and monitored in real time.

Road traffic monitoring via traffic counters
The project addressed the sectors of roads characterized by similar traffic in order to install road sensors that will determine traffic intensity and characteristics via the electronic module. Work on the project started in 2000 with funds from budgetary allocations and was built for permanent use. Traffic data is extracted via laptop, transmitted to CESTRIN Bucharest (Centre for Technical Road Studies and Informatics) for processing to obtain the ADA (annual daily average) and MDA (monthly daily average). The data collected contributes to a more accurate determination of traffic characteristics, intensity, total axle tonnage, speed and number of vehicles for each class by automatic registering with traffic equipment.

Fixed and mobile installations for checking individual axle weight on freight road vehicles
Funded from budgetary allocations, the project began in 2000 and the system is currently in use. The goal was to build a fixed and mobile system for determining axle weight for freight vehicles crossing the border. As a result, one fixed installation was placed at the entry of Bechet border point and 10 mobile weight measuring installations placed on the vehicles. The database created is sent to CESTRIN at the end of each month.

Minimum ITS service requirements for Corridor IV
The study was financed from state budget with the objective of determining the reference services for the Romanian roads that are part of the TEN-T Network. During the study, an analysis was made regarding the current status of ITS systems in Romania, regulations at a European and national level, technical specifications used in on-going projects, as well as sets of ITS services recommended by EasyWay. The minimum ITS service requirements have been prepared and approved by RNCMNR on March 16th 2010. These requirements are to be used in preparing the technical specifications for motorways under construction that have an ITS component.

Passenger information in public transport vehicles using LCD monitors
The partnership publicity contract started in September 1st 2010. The project’s aim was to provide useful information to passengers and advertising messages using LCD monitors installed in 100 busses in the interest of raising the level of traveller information.
ARCHIMEDES

ARCHIMEDES is an integration project that reunited 6 European cities to approach the issues and opportunities to create a safe, lasting environment for efficient transport energy systems in urban areas.

The project was funded from Local budget and non-refundable funds from the European Commission. It began in September 2009 and was completed in September 2012 and set out to promote and introduce measure for a more lasting, cleaner and economic urban transport.

Upon its completion, in the city of Iasi, GPL equipment was installed on 30 busses, 10 minibusses were modified, 50 specialized stations and 40 audio warning systems for disabled people were installed and 11 km of bicycle track was constructed.

3.10.6.2. Summary of on-going activities

The Timisoara – Arad motorway construction

The project is state financed and began in December 2008 with the goal of implementing ITS systems every 2 km on the new Timisoara – Arad motorway. The aim is to install a set of sensors and controllers for data acquisition and processing, as well as communication interfaces for establishing a link and synchronize with the central data base. The result will be the improvement of traffic flow, an increase in traffic capacity to prevent congestion and reducing by 60% the number of serious accidents and deaths.

The Timisoara Lugoj motorway construction Km 44+500 – Km 54+000

Co-funded from the state budget, the project is due to end in April 2013. As part of the construction project, Intelligent Transport Systems will be installed every 2 km. The ITS system is still in the design stage. Surveillance systems, CONC concentration points, IFRA security system, SOS emergency telephone system, weather monitoring system, vehicle detectors and other equipment is to be installed with the purpose of improving traffic flow, increase traffic capacity and reduce number of serious accidents and deaths by 60%.

Modernization and extension of the public transport area in the Cluj Metropolitan Area

The project aims for the lasting development of the public transport system, with an impact on increasing mobility and as a result on the population’s quality of life, increasing its appeal from an operational point of view, as well as infrastructure, increasing passenger safety and improving the waiting stations and access for all categories of passenger. The project will have a duration of 20 months from the date on which the contract was signed and will have the main objective of modernizing 87 public passenger stations existing in the municipality and bringing them up to international standards.

TrafficGuide - Real-time information system for traffic conditions
The project is due to end in June 2013 and is financed by ELECTRONIC SOLUTIONS and co-financed by the European Commission. The goal is to disseminate information in real-time regarding traffic on national roads and the main arteries in Bucharest using multiple sources such as: a public website with information about traffic and a public information system using RDS-TMC at a national level.

The project is at its beginning and will have a total duration of 24 months. The technical solution and project have been established and the first acquisition procedures for the project’s implementation have started.

![TrafficGuide portal](image)

**Figure 4: TrafficGuide portal**

### 3.10.7. Slovenia

Activities for optimal road use as well as traffic and travel data have been widely implemented in the last decade and are planned also in the future, especially on the state roads.
Since 2006, all information collected on road and traffic conditions has been reported by the Traffic Information Centre for Public Roads (PIC), which operates within the Motorway Company of the Republic of Slovenia (DARS d.d.) and the Slovenian Road Agency. The traffic control system (TCS) is currently implemented on 80 kilometres of Slovenian motorways with plans to extend it to all critical road sections, 180 out of 600 kilometres of Slovenian motorway network. Until now the system controls five the most critical sections of the Slovenian motorways out of four regional traffic control centres (RNC) with full-time staff were established with all necessary infrastructure to monitor traffic situation and react in case of dangerous events by using VMSs or deploying field units. Three of the systems are part of an interregional motorway that passes over a hilly landscape with a very changeable climate, one of the systems has been built around the capital city of Ljubljana, dealing with high volumes on the city by-pass and one system is implemented in front of the Karavanke tunnel with Austria, the longest Alpine tunnel in Slovenia.

Figure 5: Typical VMSs in Slovenia (source Traffic design d.o.o.)
Kažipot - Road traffic information system was introduced by PIC and DARS d.d. It can provide accurate real-time traffic information to the public using different information channels for road network users. Due to the nature of PIC, which must at all times ensure accurate and updated traffic information, therefore Kažipot is important component. It provides a constant and stable performance, effective procedures of entering information, minimizing possibilities of incorrect entries and provides quality information to end users.

Kažipot ensures recording and processing of data used by traffic information centre operators and it is also on-line connected with other information subsystems:

- traffic incident monitoring system (accident, roadwork zones and events) with recommendations for users;
- traffic cameras images and video streaming
- traffic signs control and alerting
- traffic counters and alerting (system TrafficAgent, designed by Mikrobit d.o.o.);
- weather sensors measurements
- optimal path calculation
- asset tracking and on-board equipment state from DARS operative teams

System offer automated communication channels through WEB portals, call centre, teletext pages and radio stations. Different B2B channels such as: HTML/XML traffic reports, RSS and geoRSS feeds, RDS-TMC alerts and generic DATEX2 services are used.
3.10.7.1. Summary of finalised activities

Multimodal travel information services – A variety of travel information services is available, separately for different transport modes in Slovenian and English language. Services are not centralized and are operated by different subjects, especially for public transport. Main services are on-line and are reachable by different communication media.

Real-time travel information services - Real-time travel information services for the national road network are available. Special information for commercial vehicles is available.

Availability of road, traffic and transport services data used for digital maps - Road, traffic and transport services information for the national road network are available with coordinates and therefore suitable for further use in digital maps. A national TMC-service has been available since 2009 and is provided by TrafficNav (the Hungarian private company) and is available on national FM network of RTV Slovenia (Radio SI). The service is based on the Slovenia location table.

Road safety related traffic information provided free of charge - Road safety related traffic information provided free of charge (road safety information from road operators and user associations (e.g. AMZS – Slovenian Automobile Association and EuroRAP).

Figure 7: EuroRAP risk maps for Slovenian road network (source www.amzs.si)
3.10.7.2. Summary of on-going activities

In the future, Slovenia will implement multimodal travel information services and also continue with the activities for optimal road use, and traffic and travel data; we will provide real-time travel information for road users; we will continue to provide road, traffic and transport services information applicable for digit maps and we will provide road safety information free of charge.

The Ministry of Infrastructure and spatial planning has been working on Integrated Public Passenger Transport (IPPT) project in Slovenia since 2007. The tariff system and integrated ticketing database have been done in 2008. There is the process on for standardisation of timetables for buses and rail transport. There is a plan to establish the information web portal for travellers IPPT in the next two years, including uniform national e-ticketing system.

Slovenia is involved in many projects supporting ITS deployment on the European and National level. The largest volume of ITS activity has been realized in the field related to information and communication infrastructure through the implementation of TCS introducing new telecommunication hub of the RNC Ljubljana. This RNC together with PIC became a temporal centre for the management of the entire Slovenian part X. corridor and represent the infrastructure base for the new National Traffic Management Centre (NCUP), taking into account the new EU directive on the deployment of intelligent transport systems in the field of road transport. Legally, NCUP is framed in the Roads Act, which reorganise the existent TIC for state roads to NCUP with the new and very important function of traffic management for all public roads including public transport. Therefore, the main objective is to assure safe, optimal and smooth flow of traffic. In order to facilitate the realisation of these objectives, certain guidelines in the form of a document should be prepared, defining the assignments when various tasks are being performed. At the same time, mutual agreements between each party should be defined. NCUP includes all public road networks in Slovenia, i.e. all national roads and strategically important local roads. Organizational Traffic management concept on the national level in Slovenia is shown in Figure 8 below.
3.10.8. Albania

3.10.8.1. Summary of finalized activities

For this Priority Area in Albania, two Decisions of Council of Ministers (implying legislative/legal framework) regarding deployment of Digital Tachograph can be mentioned:

- Decision of Council of Ministers (DCM) Nr. 1243 dated 10.09.2008 “For the approval of regulation for the organization of working time of the operators of road transport, for working time of the drivers and registration equipment”
- DCM Nr.207 dated 25.02.2009 “For the approval of the regulation for the roadside and in the offices inspection, regarding the enforcement of the working time regulation for the operators who carry out road transport and working time of the drivers and the roadside and in the office inspection”

There are no other finalized projects in this Priority Area in Albania.
3.10.8.2. Summary of on-going activities

The on-going projects under the Priority Area I in Albania, are represented in the below table. The funding of such projects is already in place.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Project / Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction of Tirana Urban Traffic Control Management System (T-UTC)</td>
<td>II and III</td>
</tr>
<tr>
<td>2</td>
<td>Installation of GPS in urban busses</td>
<td>II</td>
</tr>
</tbody>
</table>

3.10.9. Croatia

3.10.9.1. Summary of finalised activities

**CIVITAS ELAN - Public transport priority and traveller information**
Co-funded by the European Commission.

The CIVITAS-ELAN Project is the result of an intensive cooperation and exchange process during which the cities of Ljubljana, Gent, Zagreb, Brno, and Porto agreed to respond in a pro-active way to the substantial mobility challenges in European cities. Activity 8.2-ZAG Public transport priority and traveller information was one of main measures in ITS area. Main results are: Increasing average speed of public transport vehicles, notably during rush hours; Improved mobility for public transport vehicles by giving them traffic light priority at intersections; Integrated LED information display panels by tram information (arrival time, delay etc.); LED displays at numerous points within the city, giving information on the availability of spaces in public parking garages; Improved mobility for all vehicles in city by creating a system of coordinated traffic lights and „intelligent crossings“ and displaying information on available places in public parking garages.

The Project was finalised in 2012.

**Croatian traffic & weather information service (Mobile application)**
Full Private funded.

Croatia Traffic & Weather application through several user modules provides information on the current weather and temperature, pressure and humidity, wind speed, etc., while the Meteorological Bureau source is responsible for all the forecasts. Among other basic information, there are modules for viewing exchange rates, important phone numbers, a module for calculating tolls, a module for parking or garage (showing vacancies), etc. Croatia
Traffic & Weather contains the so-called points of interest (more than 3000) and locations such as gas stations, banks, markets, etc.

The Project was finalised in 2010.

**SPECTRA – City of Rijeka: Integrated Urban Traffic Information System**

Funded by City of Rijeka.

SPECTRA – City of Rijeka is an umbrella urban traffic information system, which integrates all relevant traffic information, allowing the exchange of traffic parameters collected from a variety of specialized transport systems, their central processing for traffic experts and providing high-quality traffic information to all road users. It is possible to combine function modules according to specific customer requirements and build in stages traffic lights crossing. SPECTRA is an advanced system for graphical representation of actual traffic conditions in real time.

The Project was finalised in 2011.

3.10.9.2. Summary of on-going activities

**Standardization of transport data collection and analysis**

Funded by Republic of Croatia, University of Zagreb.

The project idea was initiated by the current problem of an unsatisfactory quality of data in the field of transport in Republic of Croatia. This statistical area is considered a priority by the Central Bureau of Statistics and the Eurostat for all strategic transport infrastructure projects and economic development. The quality of the present data is consistent with the methodology or meaningful data in the EU member states. Blindness, relativity and inconsistency of national data on transport is now a fundamental barrier to the future development of transport in Republic of Croatia. These are particularly the obstacles in financing from the Structural Funds and the Cohesion Fund when Republic of Croatia becomes an EU member. Intelligent Transport Systems are specially assigned for analysis and implementation.

3.11. Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations

3.11.1. Austria

3.11.1.1. Summary of finalised activities

**Maintenance Decision Support System (MDSS)**

Co-funded by the European Commission.
By realising the various installations and the provision of the related telematics services, a very complex landscape of distributed systems and services with various interfaces has been set up. In accordance, the responsibilities for the technical operation and the associated requirements reach far beyond the operational area of a conventional road operator. The simple monitoring of operational states of the systems does no longer comply with the requirements. It was necessary to set up an integrated infrastructure monitoring system for the geographically distributed telematics infrastructure and to tackle the related challenges for planned and event-driven maintenance management considering all relevant internal and external organisations.

Central requirement to the Traffic Monitoring System is to technically monitor all facilities and systems within the periphery of ASFINAG’s telematics infrastructure as well as to support all maintenance work. Additionally, it has to ensure the adherence of the defaults defined in the respective maintenance contracts of each service contractor.

The system consists of three core elements:

- **Process controlling**: Incidents of all connected facilities and systems (outdoor facilities, IT infrastructure, network problems, etc.) and also their processing status are displayed.
- **Process management**: The handling of troubleshooting processes as well as the whole planning and conducting of maintenance is supported and documented.
- **Contract management**: All contract details of the maintenance providers necessary for maintenance are allocated and processed exactly.

During the entire planning process the integrated approach was one of the main priorities. A strict orientation on the needs of the technical operation was ensured in order to end with a system being capable to meet the above mentioned requirements. Mainly the interconnection of the different geographically distributed systems, the integration of the process management into a centralised monitoring system as well as the functionality for the planning of inspections and maintenance (incl. external sub-contractors) proved to be very complex and challenging. Due to the complex maintenance-contracts with external partners an integrated maintenance-ticketing system and contract-management system was necessary to be implemented.

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**ITS activities during the UEFA EURO 2008**
Co-funded by the European Commission.

In 2008, Austria and Switzerland were the sites for the UEFA EURO 2008.

Temporary intermodal traffic control point in Salzburg and Klagenfurt
In the course of the European Football Championship 2008, traffic management was also challenged in a special way. To conduct integrated traffic management in smaller host cities as well, the integrated traffic control point of the Interevent Consortium was utilised in Salzburg and Klagenfurt. This temporary control point was able to capture and process data from various sources (GPS, sensors in buses, cameras, radar detection, occupancy rate of parking lots, etc.) with the purpose to fulfil the following tasks:

- Guidance of visitors when arriving and departing using information and communication technology suitable for the mass (Mobility Portal)
- Supporting traffic guidance with a control centre that offers an integrated picture of the current situation near the venue
- Provision of an intermodal real-time traffic data foundation that comprises traffic-relevant information from various sources (Real-time-interface control point)
- Detection of trends and critical situations, followed by recommendations for action

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*Figure 9: ASFINAG’s Maintenance Decision Support System*
Interevent’s control point has proven successful and impressively demonstrated the possible applications of Intelligent Transport Systems across different means of transport especially in urban areas.

**Intelligent mobility survey among the fans at the UEFA EURO 2008**

Along with Switzerland a combi-ticket for the use of Public Transport was issued for European Football Championship 2008. Combi-ticket means that the ticket for the stadium was also a ticket for public transport in the respective host city, but could be used in trains of ÖBB and SBB too. The combi-ticket was valid on match day until 12 pm on the following day. Objective was to achieve a high share of environmentally friendly means of transport for the arising traffic volume and thus to use the existing infrastructure efficiently.

To analyse the impact of this measure and to gain insights for future major events, BMVIT conducted a visitor survey using new communication technologies. Objective was to gather the mobility behaviour of about 5% of the visitors to obtain a credible sample. Contrary to conventional methods based on the use of pen and paper, they used standardised questionnaires that were suitable for digital processing. The results were populated into a data base via SMS right after each interview. Thus, more persons than ever before could be registered and the results could be processed and depicted much faster (real-time).

More Information about traffic-related activities during the EURO 2008 can be found at the following website:


![Figure 10: Inter-event control point during the EURO 2008](image)

3.11.1.2. Summary of on-going activities

**Safe parking areas for trucks and other commercial vehicles**

During 2010 an EasyWay pilot implementation was set up by the Austrian motorway operator ASFINAG to inform truck drivers on the occupancy of ten truck parking areas in the greater Vienna region. In coordination with the workers' chamber and the chamber of commerce it was decided to set up a first pilot implementation towards truck parking occupancy information system. A second phase of this pilot will cover the region around the city of Linz and will adopt a more automated approach for the detection.
Several studies show an imminent lack of truck parking areas across Europe. While ASFINAG proceeding a considerable investment programme to build new infrastructure, ITS is also seen as a major success factor. Via ITS the current occupancy of truck parking areas are to be communicated to the truck drivers as a basis for smart decision concerning resting.

The monitoring approach is crucial to the provision of such a service. Given the Austrian operating environments it was decided that a manual detection based on special CCTVs would be the most suitable approach for the first phase of this service. Therefore ten resting and truck parking areas (with over 680 single truck parking slots) were equipped with special CCTVs to gain an easy overview of the area. The operators at the ASFINAG traffic management centre in Vienna Inzersdorf were provided with an easy tool to set the status of the resting areas to “free” or “full”.

Information regarding the level of capacity is communicated on roadside traffic control systems or special road signs as well as through ASFINAG’s traffic information channels. This means that on the one hand the ASFINAG webcam pictures of the rest areas are accessible on the ASFINAG website and on the other hand the current level of capacity is depicted on traffic control systems. Thus dispatchers can search for free parking spaces for their drivers actively. Drivers can access the webcams via ASFINAG Road Pilot at mobile.asfinag.at.

![Figure 11: Truck parking occupancy integrated into the web-based TIS portal of ASFINAG](image)

### 3.11.2. Bulgaria

#### 3.11.2.1. Summary of finalized activities

**Fare Collection System in Sofia’s Public Transport**

The main funding source of the project is a subsidy provided by the Kingdom of Holland’s government in the amount of 2,45 Mil. €, with 2,5 Mil. € provided for the installation of the...
fare collection system and up to 200,000 € to fund the activities of the project consultant. On 09.01.2003, a Subsidy Management Contract was signed between Sofia Municipality and the European Bank for Reconstruction and Development.

The fare collection system is based on contactless smartcards. The main transport document is the top-up smartcard, while the secondary one is the ticket, issued by a vending machine in the vehicle. The fare is collected upon boarding the vehicle. All vehicles, regardless of their ownership, must be equipped with identical fare collection and validation devices.

The system was installed on 447 vehicles (trams and trolleybuses), 5 depots of Stolichen Elektrotransport EAD and 20 travel card outlets of SKGT–Sofia EOOD.

In Sofia and some of the big cities in Bulgaria, there are electronic information boards providing users of the public transport with information concerning schedules and arrival times. On traffic lights there are variable signs showing the length of the green/red phase – implemented for more congested areas.

Project „Development of Road management System” of Road Infrastructure Agency:
In 2010, the project „Development of road management system” was completed, launched in 2007 with the conclusion of agreement for funding between the International Bank for Reconstruction and Development and the Republic of Bulgaria. Within the project integrated applications for road database have been developed for the following: road database, road development and management, GIS. A system performing regular collection of data for the conditions of the National Road Network is developed.

The short-stay paid parking scheme – BLUE ZONE/GREEN ZONE
The short-stay paid parking scheme – BLUE ZONE/GREEN ZONE is being introduced in public streets, squares and car parks, owned by the Municipality after a decision of the Sofia Municipal Council and by order of the mayor of Sofia in accordance with his legal powers and the schemes adopted by the Sofia Municipal Council.

Only vehicles weighing up to 2.5 tons and minibuses or buses that seat up to 12 passengers are allowed to park in the Blue Zone.

The short-stay paid parking scheme is divided into two zones:
"BLUE ZONE":
Maximum duration of stay up to 2 hours; on weekdays from 8.00am to 7.00pm and on Saturdays from 8.00am to 2.00pm.
"GREEN ZONE":
Maximum duration of stay up to 4 hours; on weekdays from 8.00am to 7.00pm.

Vehicles may be parked in the Blue/Green Zones only in line with the instruction signs and only in the designated areas. After the permitted time has expired, the vehicle is removed by
tow truck. Parking places in the open-air parking zones for short-stay paid parking known as the Blue/Green Zone are indicated by road surface markings, and road signs and signboards on which are indicated the terms for parking. CCTV and photographic cameras may be installed to monitor the spaces.

Payment, verification and monitoring of the actual time that the vehicle has spent parked in the Zone, is implemented using a voucher bought by the driver or by sending a SMS containing the number of the vehicle license plates.

The short-stay paid parking scheme is also introduced into other major cities in the country.

3.11.2.2. Summary of on-going activities

**Preparation activities for deployment of toll collection systems charging the road use, based on travel distance**

The current model of tolling, using physical vignettes for all vehicles in the Republic of Bulgaria is to be reformed into a new differentiated electronic toll collection system, consisting of two subsystems – electronic vignette system for cars and light-duty vehicles and electronic satellite based system for heavy vehicles.

At present, the documentation for public procurement procedure for selection of consultant for the project “Consulting services regarding analysis of opportunities and options for the introduction of an integrated electronic system for providing European electronic toll service (EETS) when using the road infrastructure of the national road network in Bulgaria” has been prepared. The project is funded in the framework of Priority axis 5 „Technical assistance” of Operational Programme Transport. The duration of the planned activities is set to 36 months.

**Project “Sustainable Urban Transport” (the Ministry of Regional development and Public Works)**

Within the framework of the Operational Program ”Regional Development“ 2007 - 2013, in accordance with priority area I of the Directive Operation 1.5 is implemented - “Sustainable Urban Transport” with eligible activities related to "Development of plans for traffic management and implementation of automated management and control systems through the introduction and improvement of management and information services systems."

Specific Beneficiaries – Municipalities of the 7 major cities in Bulgaria (the capital Sofia, Plovdiv, Varna, Burgas, Russe, Pleven, Stara Zagora). The period for implementation of the projects is 36 months. The projects are as follows, described separately by municipalities:

**Sofia Municipality**

„Intelligent traffic management system”

In Sofia, the project provides the implementation of a system, giving priority to public transport at selected intersections. This will enable the operation of traffic lights to be
synchronized with the actual traffic flow, as well as operate in different modes throughout the day.

This component will be installed on 20 intersections to give priority to public transport, taking into account traffic in real time. In addition 7 intersections will be reconstructed to improve their operation.

**Plovdiv Municipality**

“Modernization and development of sustainable urban public transport in Plovdiv Municipality”

**Traffic lights and traffic lights control**

In the framework of this component, a Traffic management centre will be implemented, comprising all intersections into a controlled area range of 42 signalized intersections and 8 pedestrian crossings, all of them light traffic controlled. All intersections within the controlled range will be equipped with new controllers. On strategic points, traffic detectors and CCTV surveillance cameras will be mounted to enable monitoring at the Traffic management Centre. Using automated localization, 19 of the intersections will be enabled to give priority of the public transport.

**Varna Municipality**

“Integrated public transport in Varna Municipality”

**Priority to vehicles of urban public transport at intersections**

This component includes design, delivery and installation of equipment for the system, providing priority to urban public transport vehicles at all traffic light controlled intersections on the BRT (Bus Rapid Transit) corridor, using automated traffic lights control.

The system provides priority to the urban public transport vehicles at all 27 traffic light controlled intersections along the proposed BRT corridor.

**Burgas Municipality**

“Integrated public transport in Burgas Municipality”

**Introduction of Bus Rapid Transit, central bus station and traffic light priority system for buses**

All 16 intersections along the BRT corridor will be equipped with controllers, providing priority to the public transport. Additional 4 intersections along the route feeding the BRT will be equipped with the same controllers. Investments will reduce waiting time for the buses, help avoid congestions, predictability and shorten travel duration.

**Associated system for public transport management**

The main objective in this component is the deployment of management and control of public transport, to enhance the reliability of the services and provide users improved quality. The following elements comprise the system:
- centralized system for traffic management
- in-vehicle control systems
- integration of all modules, taking part in the control and management of the public transport

**Video surveillance System (CCTV)**

The video surveillance system will be implemented on major intersections along the BRT corridor as well as on intersections of additional lines of the public transport. This activity aims to enable additional options to manage public transport through real-time monitoring and includes the installation of 40 CCTV cameras on major intersections of public transport lines, as well as delivery and installation of central control systems enabled for integration with the system for public transport management and control.

**Ruse Municipality**

“Integrated system for public transport in Ruse Municipality”

**System for public transport management and control and electronic information boards, based on GPS**

The system for management and control of the public transport includes the following subsystems:

1. System for vehicle positioning – equipment of all vehicles with on-board computers with GPS and system for next stop visual and voice notification;
2. Central system for real-time information and traffic management;
3. Surveillance video system on intersections
4. Passenger information system
5. passenger notification for next vehicle arrival times through SMS on less used bus stations
6. public information service for possible routes and public transport lines through web-based application
7. Electronic Information Boards installation on key public transport stations

**Pleven Municipality**

“Integrated public transport in Pleven Municipality”

**Intelligent system for traffic management**

1. Equipment on intersections – controllers, traffic lights and motion detectors in real-time
2. Adaptive traffic management implementation separately for each intersection;
3. Communication link to the centre for public transport management, allowing feedback
4. Develop a web-based application for processing and analysing the data from the censors and providing the information for the public transport traffic in real time
Project „Strategy for implementation of system consisting of automated technical means for law enforcement and unified centre for violation processing” – the Ministry of the Interior

At the Ministry of Interior, a strategy has been developed for the implementation of a system consisting of automated technical means for law enforcement and unified centre for violation processing. The strategy is developed in consistence with the “National strategy for improvement of road safety in the Republic of Bulgaria for the period 2011-2020”, which requires the implementation of systems consisting of automated technical means for law enforcement and unified centre for violation processing, in order to improve traffic law enforcement. The objective is to achieve:

- Automatic identification of Bulgarian license plates – not less than 90%
- Automatic identification of license plates, registered in EU Member States or in neighbouring countries – not less than 70-75%
- Continuous operation of the system
- Implementation of automated information system “Unified National System for Automated Control”
- Activities, concerning processing of unidentified by the automated system license plates

Subsystems subject to integration are:

- “Vehicle license plates identification”
- “Identification of vehicles running red-light”
- “Speed control of vehicles and automatic registration and identification of vehicles”
- “Identification of vehicles in violation of Road”
- “Traffic conditions analysis”
- “Vehicles registration”
- “Access management and control”
- “Consolidation and integration of subsystems in real-time”
- “A System for information exchange between different databases”

Project “Efficient utilization of the information systems during traffic management and support of the urban transport in the extra-urban regions”

‘Parking and Mobility’ takes part in the INTERREG IV C Program through Sofia Municipality. The project is called “Efficient utilization of the information systems during traffic management and support of the urban public transport in the extra-urban regions”. Leading partner is the Institute for Development and Computer Technologies in Greece. The rest of the participants are:

- Other municipalities from Greece and Bulgaria
- Transport organizations from Italy and Great Britain
- Organizations from Slovenia and Romania

The main objective of the project is to manage traffic, this being one of the problems of European cities. Equipment, mainly from information and communication technologies, will be studied and tested during the project implementation.
3.11.3. Greece

3.11.3.1. Summary of finalised activities

The actions and projects that have been undertaken and implemented in Greece in Priority Area II are presented in the following table. The table also presents the overlapping with other Priority Areas. More details on each project/action are provided in Annex I of the current document.

Table 15: Finalized projects/actions in Greece for Priority Area II

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Athens Traffic Management Centre (ATMC)</td>
<td>I and III</td>
</tr>
<tr>
<td>2</td>
<td>ITS services in Egnatia National Motorway</td>
<td>I and III</td>
</tr>
<tr>
<td>3</td>
<td>Intelligent Traffic Management System in the Prefecture of Chalkidiki</td>
<td>I</td>
</tr>
<tr>
<td>4</td>
<td>Egnatia Motorway Observatory</td>
<td>I</td>
</tr>
<tr>
<td>5</td>
<td>Integrated Management Information System for Container Terminal in the Port of Thessaloniki</td>
<td>I</td>
</tr>
<tr>
<td>6</td>
<td>Telenavis NavFleet, Web Nav Fleet, Dispatcher and Traffic Information Services</td>
<td>I</td>
</tr>
</tbody>
</table>

3.11.3.2. Summary of on-going activities

The actions and projects that are currently under implementation or have been included in funding mechanisms and are going to be implemented in a short/medium-term period are presented in the following table for Priority Area II. The table also presents some overlapping with other Priority Areas. More details on each project/action are provided in Annex I of the current document.

Table 16: On-going projects/actions in Greece for Priority Area II

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
</table>

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### 3.11.4. Hungary

#### 3.11.4.1. Summary of finalised activities

**Projects/activities in this area:**
- ITS Framework architecture (HITS)
- Management of traffic along transport corridors
- Development and upgrade of traffic information and traffic management centres

#### Table 17: Finalized projects/actions in Hungary for Priority Area II

<table>
<thead>
<tr>
<th>Priority area II: Continuity of traffic and freight management ITS services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Projects / activities in this area</strong></td>
</tr>
<tr>
<td><strong>ITS Framework architecture (HITS)</strong></td>
</tr>
<tr>
<td>System Architecture Plan for the Hungarian road network, and harmonisation of national System Architectures (ITS Architectures) (workshops, dissemination)</td>
</tr>
<tr>
<td><strong>Management of traffic along transport corridors</strong></td>
</tr>
<tr>
<td>Implementation of a traffic control and information system on the M7 motorway (pilot project)</td>
</tr>
<tr>
<td>Implementation of a traffic control and information system using VMS on a selected section of the motorway network (implementation)</td>
</tr>
<tr>
<td>Project</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>Development and upgrade of traffic information and traffic management centres</td>
</tr>
<tr>
<td>Evaluation of the monitoring plan for the motorway M7, and based on the evaluation realisation of a pilot monitoring system in a selected road section, (feasibility study + pilot project)</td>
</tr>
<tr>
<td>Continuation of the development concept and migration plan of motorway TCC of Hungarian State</td>
</tr>
</tbody>
</table>

**Priority area II: Continuity of traffic and freight management ITS services**

- **Development and upgrade of traffic information and traffic management centres**
- **Evaluation of the monitoring plan for the motorway M7, and based on the evaluation realisation of a pilot monitoring system in a selected road section, (feasibility study + pilot project)**
- **Continuation of the development concept and migration plan of motorway TCC of Hungarian State**
| Motorway Management Company, (pilot project) | Company Ltd. |  
| Continuation of the development concept and migration plan of motorway TCC of Hungarian State Motorway Management Company, (implementation) | CONNECT III D2.2. /2. | State Motorway Management Company Ltd. |
| M0 motorway, enlargement of the communication systems for operation on the south-sector and integration to the AAK’s TCC, (implementation) | CONNECT III D2.2./2-1. | State Motorway Management Company Ltd. |
| M0 motorway, travel-time forecasting system, (implementation) | CONNECT III D2.2./2-3. | State Motorway Management Company Ltd. |
| Incident management on motorway sections (monitoring, automatic incident – management and prediction with data providing to the road-users), (implementation) | EW I EWI. S2.3.1. 197 060 616 HUF | State Motorway Management Company Ltd. |
| Updating/development of the Motorway TCC, involving new sections in the traffic control system in operation | EW I EWI. S4.2.1. 1 430 377 555 HUF | State Motorway Management Company Ltd. |
| Management of sensitive road segments, automatic incident detection and data providing to the road-users in a selected road section of the motorway network, (implementation) | EW II EWI. A2.1.1. 1 482 000 EUR | State Motorway Management Company Ltd. |
| Development of monitoring systems (traffic monitoring, automatic incident detection, CCTV, travel time and weather monitoring) | EW II EWI. A4.1.1. 1 070 000 EUR | State Motorway Management Company Ltd. |
| Realisation of a DATEX based communication (pilot) system – traffic data and strategy exchange and tactical cooperation between motorway TCC of Hungarian State Motorway Management Company, the TCC of Budapest, and UTINFORM | CONNECT III D2.4. /1. 15 312 710 HUF | Municipal Public Services Co. Ltd. – FKF |
| Development of the traffic management system of Budapest, extension the monitored area with adaptive traffic management, installation of new VMSs giving information with special information content in favour of to foster modal shift | EW II EWI. A2.2.2. 750 000 EUR | Municipal Public Services Co. Ltd. – FKF |
| Modelling and incident detection on the black spots of urban road sections | EW II | EWII. A4.1.2. | 1 080 000 EUR | 2012 | Municipal Public Services Co. Ltd. – FKF |
| Development of freight traffic entrance monitoring and enforcement system (pilot project) | EW II | EWII. A4.1.6. | 230 000 EUR | 2012 | Municipal Public Services Co. Ltd. – FKF |
| Further development of central traffic database | EW II | EWII. A4.1.5. | 200 000 EUR | 2012 | Hungarian Public Roads Company |
| Network organization of isolated traffic management and control devices - Further development of the national UTINFORM real-time data centre (TIC) | EW II | EWII. A4.2.1. | 1 000 000 EUR | 2012 | Hungarian Public Roads Company |

### Management of freight along transport corridors

| Establishment of a supporting system, that filter overload vehicle because of the ceasing of inner EU country borders | EW II | EWII. A3.2.1. | 1 672 800 EUR | 2011-2012 | Hungarian Public Roads Company |

**Applied standards / regulation:**

- Technical Guideline: ÚT 2-1.153: „Requirements of variable message signs for road traffic” (reason for application: Hungarian regulation)
- European System Architecture (FRAME)
- Deployment Guidelines (elaborated in EW) „Traveller information services” and „Freight and Logistics Services” (reason for application: European regulation for the interoperability)

#### 3.11.4.2. Summary of on-going activities

No on-going activity currently under this Priority Area.

#### 3.11.5. Italy

**3.11.5.1. Summary of finalized activities**

In Italy were identified four areas of intervention that refer to the priority area II:

1. **Payment system:** sector covering payment applications of various kinds associated with mobility: roads, motorways, car parks, public transport, mobility value-added services
2. **Access control systems:** this sector includes systems currently adopted in Italy for the control of access to Restricted Traffic Zones in town centres.
3. **Traffic management systems:** this sector covers information collection applications, circulation to traffic-mobility-logistics control centres, integrated management of traffic and hierarchically controlled mobility.

4. **Safety:** this sector covers applications linked to the control of safety and prevention (such as speed control, control of protected areas such as logistics centres).

### Table 18: Finalized projects/actions in Italy for Priority Area II

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TELEPASS System (All the motorway network)</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td>TELEPARK (many Italian cities)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ECOPASS Milano</td>
<td>I</td>
</tr>
<tr>
<td>4</td>
<td>UTOPIA System (SWARCO MIZAR, 10 Italian cities)</td>
<td>I</td>
</tr>
<tr>
<td>5</td>
<td>ULISSE System Unified Logistic Infrastructure for Safety &amp; Security (Regione Campania)</td>
<td>III</td>
</tr>
<tr>
<td>6</td>
<td>Integrated ticketing systems - MI MUOVO (Emilia Romagna Region)</td>
<td>I</td>
</tr>
<tr>
<td>7</td>
<td>Restricted Traffic Zones (ZTL – many Italian cities)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Rome – Integrated traffic and mobility management system</td>
<td>I</td>
</tr>
<tr>
<td>9</td>
<td>Safety Tutor</td>
<td>III</td>
</tr>
<tr>
<td>10</td>
<td>ST Turin</td>
<td>I</td>
</tr>
<tr>
<td>11</td>
<td>SIMONE project</td>
<td>I</td>
</tr>
<tr>
<td>12</td>
<td>WI-MOVE</td>
<td>I</td>
</tr>
<tr>
<td>13</td>
<td>LOG-IN-MED project</td>
<td></td>
</tr>
</tbody>
</table>

### 3.11.5.2. Summary of on-going activities

### Table 19: On-going projects/actions in Italy for Priority Area II

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UIRNet</td>
<td>I, III</td>
</tr>
<tr>
<td>2</td>
<td>Electronic ticketing systems - MI MUOVO (Emilia Romagna Region)</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>Integrated system for Urban Logistics in the city of Messina</td>
<td>I</td>
</tr>
</tbody>
</table>
3.11.6. Romania

3.11.6.1. Summary of finalised activities
There are no activities to be mentioned.

3.11.6.2. Summary of on-going activities

Traffic management and surveillance system in Galati
The project consists of the following subsystems: traffic control in 16 intersections, traffic video monitoring in those intersections (36 cameras), street signalling and communications, command centre.

The technical project is prepared and execution is to begin depending on the budget and will have a duration of 10 months with the aim to improve traffic flow and citizen safety in Galati by implementing an adaptive control management system for urban traffic and video surveillance.

Traffic management system in Ramnicu Valcea
With the aim of improving traffic flow and citizen safety in Ramnicu Valcea by implementing an adaptive urban traffic management system, the project will have duration of 10 months.

The traffic management system is based on intelligent solutions that have the capacity to continuously assess the number of vehicles and the directions in which they travel and to adapt and synchronize the control systems (traffic lights) so that as a result transit times are shortened for as much as possible.

The objective in the major targeted field for intervention “Integrated plans for urban development” is to increase the quality of life and create new work places in cities by rehabilitating the urban infrastructure and improving urban services, including social services, also by developing support structures for businesses and entrepreneurships.

Traffic management system in Bucharest and its expansion
Work on the project began in May 2007 and will continue until full coverage in Bucharest is achieved. The project is self-funded plus loans from European Bank.

The project represents a unified and integrated implementation of three open systems:
- Adaptive urban traffic control system (UTC)
- Public transport management system (PTM)
- Closed circuit surveillance system for traffic management (CCTV)
Thus far 140 intersections and 300 public transport vehicles have been modernized and integrated.

**Integrated traffic management system for Deva Municipality**
Co-funded by the European Commission the project’s main objective is to improve traffic flow and citizen safety in Deva Municipality by implementing an adaptive management control system for urban traffic. The project is approved and waiting contract signing.

### 3.11.7. Slovenia

Communication infrastructure and monitoring systems are a prerequisite for the provision of all ITS services (traffic management, control, information and incident and emergency handling) using dynamic information as input. These are the bases for continuity of traffic and freight management. Several studies are performed for optimal placement of ITS systems deployment in regard to traffic growth projections and related to traffic calming and other safety and mobility issues. The variety and quantity of installed ITS equipment forces corridor operator to develop ITS equipment database for better overview, maintenance and renewal of ITS systems. As an example of good practices in the area of organizational architecture of cooperative traffic monitoring and management we can mention project PROMET as the well done demonstration of seamless service between Slovenia and Italy. The project resulted in the integration of traffic management tactical operations across the border between Italy and Slovenia, between the operators Autovie Venete and DARS d.d. Project was finished as the demonstration with evaluation. Continuity of traffic management is established in 2008 and is upgrading according to users’ needs.

E-freight transport tracking is offered by ŠŽ (Slovenian Railways). The availability of real-time consignment/wagon tracking and monitoring allows users to track their consignments or wagons throughout their transport journey on both Slovenian as well as foreign railway networks: Austria, Italy, France, Germany, the Netherlands, Hungary and Slovakia.

The International Air Transport Association’s (IATA) e-freight standard has been implemented in Slovenia in 2010 and was led by Lufthansa, Slovenia Customs and DHL.

On the other hand, weigh in motion monitoring system (called SI-WIM) with determination of dangerous goods loads in Slovenia is introduced. The system uses instrumented existing bridges and culverts from the road network as the weighing scales for traffic analyses purpose, road and pavement design and assessment, maintenance planning, as the pre-selection for static weighing and for monitoring of overloaded vehicles trying to avoid static weighing sessions.
3.11.7.1. Summary of finalised activities

**ITS Framework architecture** – the first version of National ITS framework architecture for road transport was made and is named SITSA-C. This version still has a status of proposal and never accepted by main decision stakeholders in the field of ITS in Slovenia. Base for the Slovenian ITS framework architecture was project FRAME, therefore the conceptual design of Slovenian ITS framework is compatible with the European framework. The renewal is needed while the user need change in last five (5) years, especially in the area of subsystems Public Transport Management System and Personal Device System.

**Management of freight along transport corridors** – in the mean of “management of freight transport along transport corridors” for transit traffic in direction West-East and South-North a multimodal freight transport is well developed by private logistics operators (international port in combination with railway and/or road: the use of block trains on international journeys). Slovenia is a relative small country and due to the high costs for cargo transport for distances shorter than 200 km wider use of multimodal transportation is not foreseen. Slovenia' Customs and Taxation Services are involved and connected to several databases in conjunction with European Commission.

**Urban ITS architecture** - ITS architecture for national roads by mean of “Urban Traffic Management” was made also as a proposal, which will be used in the case of new sub centre for non-motorway roads, called CUVP (State for traffic management of non-motorway state roads), established by Slovenian Road Agency. This centre will exclude the cities of Ljubljana

![Figure 12: Weigh in motion system SiWIM (source Cestel d.o.o.)](image-url)
and Maribor, which have their own TCC on the Municipality level. Base for the Slovenian Urban ITS architecture was project FRAME, therefore the conceptual design of Slovenian framework is compatible with the European framework.

![Diagram](http://www.pti.fgg.uni-lj.si/sitsa)

**Figure 13** : Proposal of National ITS framework architecture for roads SITSA-C (source: http://www.pti.fgg.uni-lj.si/sitsa)

### 3.11.7.2. Summary of on-going activities

**Management of passenger transport across different modes** – A variety of road and public transport information is available. Integration of all information into multi-modal journey planning for the whole country is not questionable due to the small size of Slovenia, but maybe due to reduced use of long distance public transport and consequently a small number of potential users.

**Management of freight along transport corridors** - The future will introduce the deployment of freight and logistics systems and services with multi/co-modality solutions. Due to its small size, Slovenia is waiting in the first phase for common EU multi/co-modal e-Freight web portal (database) to monitor freight along transport corridors. However, the emphasis will remain on sustainable mobility through focused activities for safe, convenient and environmentally friendly road network following the principle - fair user pricing based on the pay-as-you-drive and the proportion of the pollution emitted. The main on-going and
open question is how to shift the cargo from roads to other transport modes with the existing principles.

**Tracking and tracing of freight across all modes of transport (freight transport logistics, eFreight)** - Management of freight transport along transport corridors (or transit traffic) in direction West-East and South-North a multimodal freight transport is well developed by logistics operators (international port in combination with railway and/or road operator, e.g. the use of block trains on international journeys). The use of RFID is foreseen, but can be freely changed to other technologies, used by other systems and services such as electronic toll system.

### 3.11.8. Albania

3.11.8.1. Summary of finalised activities

There are not finalized actions or projects implemented in Albania for the Priority Area II at this time.

3.11.8.2. Summary of on-going activities

There are two on-going activities related to this Priority Area for the ITS deployment:

- Implementation of Digital Tachograph in Albania. This project is financed by the Government of Albania, Ministry of Public Works and Transport and it is in the process of implementation.

- Tirana Public Transportation Terminal (TPTT) project which includes the following: Develop the TPTT into an intermodal transportation hub that integrates current and future regional and local transit modes into a comprehensive transportation system.

More details on this project are provided in Annex I of the current document.

#### Table 20: On-going projects under the Priority Area II in Albania

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Project / Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The implementation of Digital Tachograph in Albania</td>
<td>III, I</td>
</tr>
<tr>
<td>2</td>
<td>Tirana Public Transportation Terminal (TPTT)</td>
<td>IV</td>
</tr>
</tbody>
</table>

### 3.11.9. Croatia

3.11.9.1. Summary of finalised activities

**Croatian Highways Control and Information Systems**

Funded by Concessionaires of Highways.
The tunnels on freeways in Croatia were equipped with SOS niches, adequate LED Variable signalization, measurement devices, video surveillance inside the tunnel and on tunnel approaches, automatic incident detection and traffic counting and classifying equipment. The main tunnel control centres are equipped with topXview™ Complete ITS Platform software.

The main control centres contain one large video wall that enables fast overview of traffic situation in tunnels. The control centres implement full topXview™ functionality including safety procedures according to scenarios allowed by Croatian Highways. Selected projects – Tunnel Mala Kapela – first long tunnel with complete implementation of automated safety and other procedures and algorithms Tunnel Brinje – awarded the safest tunnel in Europe by EuroTAP (European Tunnel Assessment Programme) in 2007, Tunnel Veliki Gložac – judged equal best tunnel in Europe by EuroTAP (European Tunnel Assessment Programme) in 2008. The Project was finalised in 2011.

**Croatian Electronic Toll Collection Systems (ENC)**
Funded by Concessionaires of Highways.

In the 2006 HAC Ltd and ARZ Ltd introduced Electronic Toll Collection System for passenger vehicles. From the 2007 HAC Ltd introduced Electronic Toll Collection System for trucks (3. and 4. vehicle category).

In 2010 BINA Istra Ltd has introduced the possibility of paying via Electronic Toll Collection System, also.

All three systems are interoperable.

The Project was finalised in 2010.

3.11.9.2. Summary of on-going activities

**Main operations and communications Centre in Republic of Croatia**
Funded by HAC Ltd.

Many systems of traffic management by sectors’ highways were built during the construction of the highway in the Republic of Croatia. For a long time, there is a need for integrated multi-level governance. This project proposes the Main operations and communications Centre at the national level. The objectives of the main operations and communications Centre (MOCC) in Republic of Croatia are: The collection, processing, analysis and storage of data relevant to the process of road traffic on the national level; The exchange of information relevant to the process of road traffic on the interstate level; Centre services which directly or indirectly affect the process of road transport at the national level; Database, processing and exchanging data with ITS services at the national level; Database, processing and exchanging data with ITS services at international level; Main operative and communication
Centre has to be a service to all users of highways and state roads in Croatia, and its work is organized at the national level.

**Development methodology of integrated adaptive transport-logistic systems**

Funded by Ministry of Science, Education and Sport Republic of Croatia.

Efficient and effective development of integrated intelligent transport-logistics systems (ITLS) require coupling of different domains of knowledge, methods and tools which can operate with smart ITLS structures and processes in real-time. The main problem in end-to-end transport service and transport chains realization is on the interface between separated and different physical, logical and organisation systems i.e. when the transport modes or the network operator is changed. Classical analytical and numerical methods of “hard” optimization are not suitable for transport-logistics problem with real-time data collecting.

The Project was finalised in 2011.

### 3.12. Priority area: road safety and security

#### 3.12.1. Austria

3.12.1.1. Summary of finalised activities

**Construction Site Management (CMS)**

Co-funded by the European Commission.

A maximum route availability and road safety for all users are important objectives of ASFINAG. Despite the necessary maintenance work on the motorway network road users should reach their destinations as unimpeded as possible. ASFINAG’s Construction Site Management’s task thus is to ensure, that road maintenance work is planned in such a way that drivers can continue their journey without major delays. Important criteria are the length of a construction site, how many of them are there within a section at the same time and the associated loss of time. ASFINAG’s Construction Site Management also coordinates upcoming maintenance by analysing the risk for traffic jams. An alternative route is always kept free of construction sites. In the last ten years, accidents with personal damage within construction zones were reduced from 170 to 60 per year, thanks to ASFINAG’s active and constantly optimised Construction Site Management. This is clearly a trend that has to be pursued while keeping congestion related to construction works as minor as possible.

Attention was turned especially to the increased information needs of transport companies since they can check the availability of the route right before starting a haul. Additional information such as maximum width or the respective admissible total weight can be displayed dynamically.

The following information can be requested:

- Lane markings in the construction zone
• Emphasising of entrance ramp construction sites
• Highlighting concerned junctions
• Optimised printing feature
• Clearly structured search results (e.g. with more motorways selected)

The website is in full operation since 2009 and provides users with information about all construction sites registered in the Construction Site Management (BMS).

### Baustellen auf der A1 West Autobahn gefunden

<table>
<thead>
<tr>
<th>Typ</th>
<th>Verantwortung</th>
<th>Datum</th>
<th>Maßnahme</th>
<th>Spurführung</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 8,9km - 9,5km</td>
<td></td>
<td>26.07.11 bis 26.08.11</td>
<td>Brückennennstandssetzung</td>
<td>Salzburg (D)</td>
</tr>
<tr>
<td>A1 8,9km - 9,5km</td>
<td></td>
<td>19.06.11 bis 07.09.11</td>
<td>Brückennennstandssetzung</td>
<td>Wien</td>
</tr>
<tr>
<td>A1 8,9km - 9,5km</td>
<td></td>
<td>25.07.11 bis 26.08.11</td>
<td>Brückennennstandssetzung</td>
<td>Salzburg (D)</td>
</tr>
<tr>
<td>A1 Rampa auf Kin 31</td>
<td></td>
<td>16.06.11 bis 17.11.11</td>
<td>Lärmschutzmaßnahme</td>
<td>Wien</td>
</tr>
<tr>
<td>A1 31,7km - 32,7km</td>
<td></td>
<td>13.07.11 bis 24.08.11</td>
<td>Lärmschutzmaßnahme</td>
<td>Salzburg (D)</td>
</tr>
<tr>
<td>A1 99,5km - 101,5km</td>
<td></td>
<td>02.06.11 bis 15.11.11</td>
<td>Anbau von Fahrstreifen</td>
<td>Wien</td>
</tr>
<tr>
<td>A1 101,5km - 104,5km</td>
<td></td>
<td>03.06.11 bis 16.11.11</td>
<td>Anbau von Fahrstreifen</td>
<td>Salzburg (D)</td>
</tr>
</tbody>
</table>

**Figure 14:** ASFINAG’s Construction Site Information System

### Road Weather Information System

Co-funded by the European Commission.

Since 2005, ASFINAG utilises SWIS in Austria. First being merely a weather data base, ASFINAG’s webSWIS has turned into easily reachable and visually appealing supporting tool suitable for every user group and motorway maintenance authorities. Within the ASFINAG information services, SWIS is available for conventional road users in terms of weather information as well.

The Austrian civil aviation organisation Austro Control is partner for weather information and occupies employees in the field of meteorology around the clock. They review the necessary data and create the forecasts for SWIS.

### Section Control

Co-funded by the European Commission.

In terms of road safety, ASFINAG decided to survey speed limits on certain motorway sections via Section Control.
Especially on potentially dangerous road sections such as tunnels, constructions zones or country roads, speeding is a frequent cause for serious accidents. Speed limit enforcement via Section Control is much more effective and reliable than enforcement with radar devices since these are only capable of punctual speed measuring and furthermore provoke drivers to brake abruptly or change lanes and thus cause dangerous situations again.

Every vehicle is photographed as it enters the enforcement section, including its license plate and the time it enters. When exiting the enforcement section, it is photographed again and equipped with another timestamp. Based on the time difference and the length of the section, it is easy to calculate the vehicle’s average speed (minus eventual measuring tolerance). If the system detects a speeding vehicle, the respective data record is saved and forwarded to the executive forces. If no speeding is detected, the data record gets discarded immediately. Section Control is capable to differentiate between two-wheeled and four-wheeled vehicles, cars, truck and buses. Thus speed limits can be monitored depending on the vehicle category.

3.12.1.2. Summary of on-going activities

Verkehrsbereinflussungsanlagen (VBA, Traffic Control System)

Co-funded by the European Commission.

In terms of road telematics, Traffic Control Systems, consisting of gauging and displaying sections, are being installed on Austrian motorways. In this way, data about the current situation on the roads, weather, road conditions and environment (including noise and emissions) are collected. From this data pool, location-based driver information like speed limits, restrictions on overtaking and other warnings and information can be created. These are processed through complex algorithms and displayed on the Traffic Control System's displaying section. Depending on the operational area, there are Traffic Command Systems on the one hand and Traffic Control Systems on the other.

Traffic Command Systems inform about suddenly occurring events (accidents, rain or black ice) along a certain section and harmonise the general speed according to the given circumstances (traffic density, congestion, etc.). Traffic Control Systems can depict an alternative route in case of congestion, divert and thus calm traffic. Five more sections are to be equipped with the necessary facilities until 2013.

To ensure a maximum of efficiency within the field of traffic telematics, the current extension plan for Traffic Control Systems has been evaluated. The result is a new strategic alignment. Telematics will be deployed where its benefits are verifiable and where it contributes to increasing road safety and homogenise traffic.
eCall in Austria
The European emergency system eCall is expected to save up to 2,500 people’s lives after having a traffic accident every year and to reduce the severity of injuries by roughly 15%. An on-board telematics unit forwards emergency calls either to the European emergency number 112 (Pan European eCall), or to the service centre of a third-party supplier (Third Party Service eCall).

Following the eCall pilot programme of 2006, an eCall testing site was installed and evaluated in the Federal ministry of Internal Affairs (BMI) in early 2007. In June of the same year, Austria signed the so-called "Memorandum of Understanding for Realisation of Interoperable In-Vehicle eCall". Thus Austria is one of 14 member states (by December 2008), that support this EU initiative.

Since 2009, the "eCall Implementation Platform", in which Austria is represented as well, plays an important role in the implementation of eCall on European level. But eCall must not be regarded as an isolated application; in fact the increased implementation of telematics is expected to result in interconnected functionality.

In the Austrian traffic safety programme 2011 – 2020 issued by the Federal Ministry of Transport, Innovation and Technology, measures have been determined within different action fields to implement eCall.

Starting package (timeframe for starting the measures: 2011)
- Implementing eCall: Creating the necessary infrastructure on the part of the emergency services

Short-term measures (timeframe for starting the measures: 2010-2014)
- Mandatory equipment of all new trucks with eCall systems

Figure 15: Traffic control system
• Creating the necessary infrastructure at the emergency services
• Facilitating the equipment of vehicles with eCall

Mid-term measures (timeframe for starting the measures: 2015-2017)
• Securing the necessary functionalities at operations centres
• Championing the mandatory implementation of eCall on European level

Implementation of eCall in Austria is realised together with the Federal Ministry of Internal Affairs

3.12.2. Bulgaria

3.12.2.1. Summary of finalized activities
A good portion of the intersections in major cities are equipped with CCTV cameras both for surveillance and detecting red light violations, which are later processed in a control centre;

3.12.2.2. Summary of on-going activities
Traffic police has identified 174 locations with high accident rate where cameras for violation detection should be deployed until the end of 2014, according to plan. A decision of the council of Ministers assigns the organization of planning and implementation to the Minister of Interior until the end of 2013. The project includes the implementation of a **System of stationary and portable radars**. The project will be funded from the road safety fund.

**An integrated system for violation processing** is under development and testing. The system offers rich functionalities which include: management and processing of the currently available offences, by the staff of the Ministry of Interior (MoI) and integration with other systems of the Ministry of Interior. For the citizen (offenders) the functionalities include: viewing and payment of tickets through the internet, SMS and/or WAP. As an additional feature monthly payment subscription for debts is offered. When a new ticket is emitted, the offender receives a notification through SMS. The IVSP is a product of the Bulgarian system developer and integrator "Vereo".

**Harmonised eCall European Pilot - Phase 2 – HeERO 2**
For the upgrade of PSAPs, in order to be able to receive e-Call, the Directorate of National System 112 works according to the Priority area III: ITS road safety and security applications, priority action (d) the harmonized provision for an interoperable EU-wide e-Call of the Directive 2010/40/EU. The Minister of Interior has approved the technical framework and approach for this upgrade, which is described in detail in “Terms of Reference for implementation of e-Call service”.

Bulgaria has been chosen for one of the six Member states and associated countries for the extension of the project HeRO – HeRO 2. HeERO2 will prepare, carry-out and coordinate pre-deployment pilots for the Pan-European e-Call based on 112. This will be undertaken at a European level in accordance with the approved standards. The other countries
participating in the pilot extension are Belgium, Denmark, Luxemburg, Spain, and Turkey along with three additional associated Member States: Hungary, Slovenia and Ireland. Bulgarian Pilot Site is represented by 6 partners: the Ministry of Interior trough Directorate of National System 112, Bulgarian Association Intelligent Transport Systems, Enterprise Communications Group, Icom, Mtel and Technical University of Sofia. Partners will test and validate the whole e-Call chain from vehicle to PSAP’s and further to the Dispatcher’s centres of First responders, handling emergency cases.

In 2015-2016 the Directorate of National System 112 plans to work for providing the necessary capacity for the full processing of e-Call emergency calls.

3.12.3. Greece

3.12.3.1. Summary of finalised activities

The actions and projects that have been implemented in Greece in the field of ITS for road safety and security, are limited to the part of the Traffic Management Centres’ operations (in urban areas and highways) that concern road safety (identification of road accidents and provision of information to drivers). The harmonized e-Call European project that regards an emergency service in case of road accidents is currently in an implementation phase.

At an institutional level, the Inter-ministerial Committee on Road Safety, the National Road Safety Council and the National Observatory of Road Safety of the Technical Chamber of Greece are the legal bodies that deal with the national road safety policy and the improvement of the road infrastructure, vehicles and technical surveillance of road traffic conditions in order to meet high road safety specifications.

The actions and projects that have been undertaken and implemented in Greece in Priority Area III are presented in the following table. The table also presents some overlapping with other Priority Areas. More details on each project/action are provided in Annex I of the current document.

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ITS services and systems of Attica Tollway</td>
<td>I, II and IV</td>
</tr>
</tbody>
</table>

3.12.3.2. Summary of on-going activities

The actions and projects that are currently in implementation phase or have been integrated in funding mechanisms and are going to be implemented in a short/medium-term period are presented in the following table for Priority Area III. The table also presents the overlapping
with other Priority Areas. More details on each project/action are provided in Annex I of the current document.

### Table 22: On-going projects/actions in Greece for Priority Area III

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Geographical Information System of the North Aegean Region</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td>Innovative drivers’ information system for emergency road incidents and free parking places in the Municipality of Nestos</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>Harmonized e-Call European Pilot</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>An Integrated Multichannel System for the Management and Monitoring of the Conditions in the Road Networks of the Municipalities of Lamia, Domokos, Makrakomi and Stilida</td>
<td>I and II</td>
</tr>
</tbody>
</table>

3.12.4. Hungary

3.12.4.1. Summary of finalised activities

**Projects/activities in this area:**

Information services for safe and secure parking places for trucks and commercial vehicles

Safety and comfort of vulnerable road users

### Table 23: Finalized projects/actions in Hungary for Priority Area III

<table>
<thead>
<tr>
<th>Priority area III: ITS road safety and security applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Projects / activities in this area</strong></td>
</tr>
<tr>
<td><strong>Information services for safe and secure parking places for trucks and commercial vehicles</strong></td>
</tr>
<tr>
<td>Establishing of a dynamic information service, providing additional information (route-guidance, occupancy of parking areas, etc.) for the freight transport on the TEN-corridors of Hungary (Implementation)</td>
</tr>
<tr>
<td>EW I</td>
</tr>
<tr>
<td>Establishing of a static information service, providing information about parking possibilities/systems for the freight transport on the TEN-corridors of Hungary (Pilot project)</td>
</tr>
<tr>
<td>EW I</td>
</tr>
<tr>
<td>Static information collection and dissemination for freight traffic about parking systems and possibilities of the main transport corridors (TEN-T)</td>
</tr>
<tr>
<td>EW II</td>
</tr>
</tbody>
</table>
Real-time dynamic information services for freight traffic on the main transport (development of parking monitoring system, occupancy monitoring, guidance, navigation, etc.)

| EW II | EWII. A3.3.2. | 130 000 EUR | 2012 | State Motorway Management Company Ltd. |

Safety and comfort of vulnerable road users

| Supporting the pedestrian transport by navigation system/ supporting the transport of road users with restricted abilities/, connection of pedestrian and public transport (implementation) | EW I | EWI.S1.1.2./2. | 7 500 000 HUF | 2009 | Municipal Public Services Co. Ltd. – FKF |

Applied standards / regulation:

- Technical Guideline: ÚT 2-1.153: „Requirements of variable message signs for road traffic”
- (reason for application: Hungarian regulation)
- (reason for application: Hungarian regulation)
- Deployment Guidelines (elaborated in EW) „Traveller information services” and „Freight and Logistics Services” (reason for application: European regulation for the interoperability)
- W3C-WCAG 2.0 (Web accessibility standards for special needs of visually impaired computer users )

3.12.4.2. Summary of on-going activities

No on-going activity currently no on-going activity currently under this Priority Area.

3.12.5. Italy

3.12.5.1. Summary of finalised activities

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brescia – Padua motorway COMPANION system</td>
<td>I , II</td>
</tr>
<tr>
<td>2</td>
<td>POLICEMAP integrated accident detection system</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>ANAS Sicurezza nella nebbia (fog safety project)</td>
<td>I , II</td>
</tr>
<tr>
<td>4</td>
<td>SAFETUNNEL „Sicurezza in Galleria” project</td>
<td>I , II</td>
</tr>
<tr>
<td>5</td>
<td>SITI ‘Safety in Intelligent Tunnel’ project</td>
<td>I , II</td>
</tr>
</tbody>
</table>
3.12.5.2. Summary of on-going activities

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Progetto SIRSS</td>
<td>I , II</td>
</tr>
<tr>
<td>2</td>
<td>Progetto VIAMONT</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>Realization of a Regional CONTROL Unit for transport of dangerous goods, able to track and trace transport fleets</td>
<td>I , II</td>
</tr>
<tr>
<td>4</td>
<td>Harmonized e-Call European Pilot</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Private eCall emergency call</td>
<td></td>
</tr>
</tbody>
</table>

3.12.6. Romania

3.12.6.1. Summary of finalised activities

Study regarding the e-Call technology
The project studied the status of emergency 112 call and e-Call technologies at a national and European level. Based on these the overall architecture for the national e-Call system and the implementation guide were developed.

The project had 24 months duration from November 2008 until 2010.

Improving traffic flow for Craiova Municipality, from east to west, by rehabilitating the Decebal – Dacia Blvd.
The rehabilitation of the 4 main road segments consists of rehabilitation sub-activities for the roadway and sidewalks and the systemization of traffic and public transport.
Co-financed by the European Commission, the project lasted 30 months from 2008 until 2011 and had the goal of improving and developing the transport network infrastructure for Craiova Municipality and increase traffic safety.

Traffic management system for Alexandria Municipality
Beginning in August 2011 and ending in November 2011 the major objective of the project is to improve traffic flow by implementing an adaptive control and administration system for urban traffic. Apart from decongesting traffic, monitoring and centralized control will be taken in to consideration so that traffic operators can make decisions in real-time and ensure
priority for vehicles with special destinations: public transport, ambulances, fire fighters and police.

3.12.6.2. Summary of on-going activities

Traffic management system for Zalau Municipality
The project consists of constructing a traffic management system for a 3,5 km route by equipping 8 already existing signalized intersections and the signalling for 3 others with signalling systems, traffic lights and traffic machines and inductive loops, building a traffic control centre with optic fibre-wire links, implementing a traffic law enforcement system (detection of red light crossing and exceeding the speed limit) and a video surveillance system.

Co-funded by the European Commission and with a duration of 10 months, the project has the following objectives:

- Improve traffic and increase stability in the area;
- Reduce pollution by exhaust emissions;
- Increase traffic and pedestrian safety;
- Improve the quality of urban public space.

The project is in its contracting stage.

Traffic management and video surveillance in Timisoara
The main goal of the project is to improve traffic flow and citizen safety in Timisoara Municipality by implementing an adaptive control management system for urban traffic and metropolitan video surveillance.

The project will implement a traffic management system and video surveillance that will contribute to increase citizen safety and will last 12 months with funding from local and state budget.

Feasibility study, technical project and funding request have all been prepared. Documentation is being verified for the purpose of submitting it to ADR.

HeERO – Harmonised e-Call European Pilot
The project will have duration of 36 months from January 1st 2011 and is co-funded by the European Commission and will have the following objectives:

- Define operational and functional requirements necessary to implement the e-Call systems;
- Implement existing pan-European e-Call standards;
- Implement required technical and operational infrastructure;
- Identify added value services, public and/or private, that could be useful to the e-Call infrastructure;
- Develop manuals for operating the e-Call system;
3.12.7. Slovenia

On certain motorway sections in Slovenia the problem of speeding is particularly acute (such as at toll stations, before road works, where a motorway turns into a single carriageway, etc.), the Police began using a new system of stationary speed control. In order to slow the traffic in these motorway sections, thus ensuring the greater safety of motorway users, the police have obtained a system intended for stationary speed detection where there are lane closures. The purchase of this device was financed by the DARS d.d. Overall 18 stationary radars are in operation since 2007.

Slovenian police also regularly controls the traffic of goods’ vehicles on the motorway network.

The basic working area of the specialized mobile unit is traffic control, especially the control of goods vehicles, buses, taxis, school busses, delivery- and one-track vehicles. Attention is given to the weight (axle weight, total mass) and technical road worthiness of vehicles as well as psychophysical condition of drivers; special areas also include the transport of dangerous substances and escort of ad hoc transport operations. Beside this unit, patrols of police stations for countervailing measures and other inspection services are controlling the motorway cross. Police officers use various technical equipment and aids when establishing infringements of road traffic regulations:

- vehicles with an integrated video-surveillance system PROVIDA (in civil and white-blue vehicles): in-car speed measuring system for speed control and enforcement

![Figure 16: Automatic speed and dangerous good control: stationary and mobile (source: DARS d.d., Police Murska Sobota)](image-url)
• equipment for establishing road worthiness of motor and trailer vehicles - various meters (exhaust emissions, brake fluid temperature, sound level, tyre profile, road worthiness of connecting assemblies of motor and trailer vehicles) and regloscope
• equipment and programs for data check from digital and analogue tachographs
• equipment for determining the weight of motor and trailer vehicles, including a program for data processing
• stationary speedometers with associated equipment for data processing
• other technical equipment, for instance height and tape meters, digital cameras and video cameras

Methods of measurement with tolerances are defined in Slovenian legislation (Act of rules in road transport, Rules on the metrological requirements for speed meters in the road transport).

Driving through tunnels is essentially different from driving on an open road. Overtaking in single-tube tunnels is prohibited (the only single-tube tunnel on Slovenian motorways is the Karavanke tunnel). In tunnels it is also prohibited to turn, drive in reverse or stop, except in emergencies, when it is allowed to stop the vehicle in an emergency turn-off – in such case the engine must stop working immediately. When entering and exiting a tunnel, especially in bad weather, driving conditions change very quickly, so more attention is suggested.

On the other hand, Slovenia develops and promotes traffic education, issues and prepares traffic and educational publications and other materials. Slovenia also implements prevention programs, campaigns, media advertising and carries out activities and campaigns for a greater road safety. Different road safety organizations in cooperation with road operators are main actors.

![Image of tunnel and road signs]

**Figure 17:** Detection of the ghost driver on motorway ramp – test field (source: DARS d.d.)

Safety in tunnels on Slovenian motorways is technically supported by traffic surveillance from control centres (RNC) via a video system, built-in systems of automatic fire detection and reporting, and in newer tunnels also automatic detection of traffic and congestions, built-in traffic signalling and communication equipment (traffic lights, systems for emergency calls, safety lighting, etc.), emergency turn-offs in longer tunnels, in all tunnels with one-directional traffic with cross connections between the tunnel tubes. Primary the renovation of existing
tunnels was regulated by new legislation based on Directive 2004/54/EC (On minimum safety requirements for tunnels in the trans-European road network).

3.12.7.1. Summary of finalised activities

**Automatic emergency call** - emergency call system is implemented on the motorway road network and it is integrated into the existing traffic information system that ensures quick and reliable means of providing traffic information to traffic control centre and 112 regional Public Safety Answering Point. Operator can detect unexpected events and response faster. Slovenia was one of the first counties in EU that introduced number 112. Slovenia has routing calls to 112, from fixed and mobile network, arranged so that the caller gets competent regional centre with the highest reliability. Slovenia uses the “push” method of providing fixed caller location information in most alternative fixed networks. Automatic “pull” method is used as back-up. In the case of nomadic VoIP, the systems operator providing services is obliged to communicate, besides the registered subscriber’s address, a note notifying the existence of a nomad user. The system uses Cell ID/ Sector ID based localisation.

**Nomadic devices to support driving task and/or the transport operation** - Transport operators use different solutions for tracking vehicle and cargo. In public-private partnership RDS-TMC service is available.

**Safety and comfort of vulnerable road users** - In major cities infrastructure is adjusted for disabled, pedestrians and cyclists. Pavements in urban areas are designed and maintained in a way that they are suitable for people with disabilities. Main motorways are equipped with emergency lane. State roads are wide and lanes are marked.

The “WAP 112 and SMS112” call is a solution that was first introduced at Ljubljana. Through this centre all WAP 112 and SMS112 messages from the territory of Slovenia are received. This solution is mainly meant to enable 112 “calls” for deaf people. The application is available both in Slovenian and English.

**Road weather Information System (RWIS)** – DRSC and DARS d.d (road operators) have many Road Weather Stations (RWS) installed on representative road sections all over the country. All of them are using GPRS data transfer and are equipped with embedded road sensors (mostly Lufft, some Vaisala) and meteorological sensors (Campbell Scientific, OTT). Most common measurements are: road temperature (surface, 5 cm depth and 30 cm depth), thickness of water film, salt concentration, freezing point temperature, road condition, air temperature and humidity, dew point, intensity, amount and type of precipitation and visibility. Some of them also measures wind speed and direction. RWIS is the most important tool for winter maintenance that offers information on the current meteorological state of the road network (wet, ice, snow ...) and provide weather forecast for winter maintenance. RWIS is service:

- for collecting data from different weather stations and their conversion into the appropriate form for the input to the central system
• for evaluation and processing of data against different thresholds and alarm conditions, the input of data into the central database, informing the contractors about the triggered alarms
• for presentation of data via web-based application

Users can access the current weather information, weather forecasts and the archive. There are also available various types of reports, RWS metadata, data on the installed sensors, data on maintenance, etc. The application can also trigger alarms. ‘Opened’ system supports RWSs of different producers and is custom-designed.

![Figure 18: An example of RWIS data (source: DARS d.d.)](image)

3.12.7.2. Summary of on-going activities

**Automatic emergency call** – future development depends on international solutions of in-vehicle on board units. "WAP 112 and SMS112" are constantly upgraded and other functionalities such as video calls are planned in the future. For other devices (roadside infrastructure) there are some prototypes for automatic language recognition and redirection of emergency call.

**e-Call** – implementation in Public Safety Answering Points (PSAPs) is planned according to the state-of-the-art standardization. There are still problems to be solved, especially the enhancement of existing “112” service to provide cross-border enabled e-Call service (compliant with HeERO initiative). Vehicles, equipped with e-Call-compliant in-vehicle systems (GNSS unit, GSM modem) will be serviced with same quality of service in the case of emergency calls in any state that participates in HeERO project; thus providing cross-border continuation and harmonization of the service in neighbouring countries. All new vehicles in
the European Union, and also in Slovenia, after 2015, will have to be equipped with a device, which will automatically transmit an emergency call in the case of an accident. Slovenia will prepare update of legislation for the approval of new vehicles.

**Information services for safe and secure parking places for trucks and commercial vehicles** – In Slovenia infrastructure for safe and secured parking is not available. Security will be increased due to implementation of parking area video surveillance system. In the future service, for parking space availability will be provided. Base for this system will be EasyWay guidelines.

**Safety of road users with respect to their on-board HMI** – implementation depends on international solutions.

### 3.12.8. Albania

3.12.8.1. Summary of finalised activities

The finalized activity of the Priority Area III for “Road safety and security” can be considered partial legislation where elements of the ITS legislation for road safety and security are included:

- Law Nr. 8378, dated 22.07.1998 – Road Code of Republic of Albania

There are no projects that have been implemented in Albania for road safety and security.

Albania has an Inter-Ministerial Committee of Road Safety headed by Prime Minister; this Committee continuously analyses major problems and issues of the road safety and build up policies for improvement to meet the related standards on road safety.

3.12.8.2. Summary of on-going activities

One on-going project which contributes to the road safety and security is the implementation of digital tachograph, which is part also of Priority Area II shown above.

### 3.12.9. Croatia

3.12.9.1. Summary of finalised activities

There are no activities to be mentioned.

3.12.9.2. Summary of on-going activities

**Harmonised eCall European pilots project (HeERO)**
Co-funded by the European Commission.

HeERO is an international pilot project preparing the general roll-out of the EU-wide seamless eCall service. In running national and cross-border pilot projects, HeERO will prove that eCall is operational and ready for becoming a reality for all European citizens. HeERO’s consortium includes 8 EU Member States (Czech Republic, Finland, Germany, Greece, Italy, the Netherlands, Romania and Sweden) and Croatia. In cooperation with Croatia, Finland and Romania, the Russian Federation will demonstrate in cross-border trials that eCall and its ERA-GLONASS emergency call service can interplay without any friction.

**VISTA - Computer Vision Innovations for Safe Traffic**
Funded by IPA IIIc HR Component.

The action aims to unlock and strengthen the technology transfer and commercialization capacities at two partner HEIs in the field of computer vision applications for automotive industry sector in Croatia. The main objective is successful and effective transfer of academic innovations in this field towards the associated organisations from the industry. The action includes selected research and networking activities that together aim at boosting the interaction between the academia and the industry, in concordance with the objectives and priorities of the call for proposals.

### 3.13. Priority area: integration of the vehicle into the transport infrastructure

#### 3.13.1. Austria

**3.13.1.1. Summary of finalised activities**

**Cooperative Systems in Austria (COOPERS)**
Co-funded by the European Commission.

In addition to road telematics, vehicle-mounted telematics systems will essentially contribute to raising efficiency and safety on the road in the future.

Many vehicles actually feature built-in driver assistance systems that positively influence road safety in particular. Furthermore, modern vehicles have a large amount of data available in their on-board electronics, such as information about speed, acceleration, road condition and environment. When merged centrally and intelligently, position and velocity of each anonymous individual yield in reliable and valuable information for road operators since vehicles and infrastructure can exchange data and thus a picture of the current situation on the roads can be created. This information exchange (Car2Car and Car2Infrastructure) is of particular interest since it can also be used to provide drivers with individual high-quality
traffic information in real time. One of the biggest EU projects dealing with this topic is “Co-operative Systems for Intelligent Road Safety” (COOPERS).

**COOPERS overview**
Within this international project with a total budget of 17 M. €, 39 partner companies and a duration of four years, available traffic data provided by ASFINAG are processed into so-called COOPERS Service Messages at the ASFINAG traffic management centre in Vienna-Inzersdorf and then sent to a test route with a total length of 18 kilometers located on the Inntal-motorway A12 near Innsbruck. The traffic control systems on this section are equipped with CALM-IR-devices, which transmit the COOPERS Service Messages lane-specifically to passing vehicles. Properly equipped cars can receive up to ten different services per traffic control system, ranging from simple accident and congestion warnings to detailed weather information as well as travel time estimations and lane advices. In the course of the tests conducted within the COOPERS project it was observed, how drivers reacted to this kind of information and how their driving changed accordingly.

Prospectively, there are tests scheduled within the field of Cooperative Systems and the COOPERS test track with communication technologies other than IR, especially WLAN (IEEE 802.11p) and DVB. Additionally, hardware and software of the on-board-units (OBU) should be further developed and optimised, along with the constant general advancement of the services.

On the long run, there should be created a basis to comprehensively transmit traffic information directly into the vehicles. A faster and individual availability of traffic information is expected to result in increased road safety and an improved traffic flow.

![Figure 19: Cooperative Systems in Austria](image_url)

3.13.1.2. Summary of ongoing activities

**Testfeld Telematik (telematics testing field)**
The research project Testfeld Telematik was formed by a consortium of research institutions, industrial and public companies to test how cooperative services have to be designed and employed to be able to contribute to more safety, efficiency and environmentally friendly
mobility in the road network in the best possible way. Austrian telematics players have already held leading positions in several European pilot projects focusing on cooperative services, where they successfully demonstrated the technology’s technical feasibility. Testfeld Telematik builds upon the strength of these Austrian experts and, for the first time, bundles the competences of all Austrian industrial companies to work out internationally recognised answers for Europe-wide implementation and for Austria to obtain a headstart. To achieve a sustainable improvement of Austria’s competitive position, an international study team will certify the experiences gained by the consortium as well as the effects of cooperative services on road operators and cities. This will enable Austrian technology to be quickly employed by other European pioneers to successfully overcome the major challenges presented to transport policy.

The testing field essentially covers the motorway intersection A2/A23-A4-S1, which includes Austria’s busiest roads, as well as the link to public transport in the Vienna area. Test drivers in this area will be given a chance to experience and test the developed cooperative services for about one year.

Among others, the project partners contribute the following underlying systems and services to Testfeld Telematik.

- The Graphenintegrationsplattform (graph integration platform, GIP) is the first Austrian, nationwide, intermodal traffic graph for all modes of transport. Its aim is to manage traffic data digitally according to uniform rules, and keep the data updated automatically. GIP forms the basis for services such as routing or address search.
- The project Verkehrsauskunft Österreich (traffic information Austria, VAO) combines the traffic information of almost all of Austria’s transport operators to create a co-modal traffic information service.
- The real-time traffic service AnachB.at, developed by the traffic management project of the federal provinces Vienna, Lower Austria and Burgenland as well as ITS Vienna Region, offers route planners for all transport modes and a real-time snapshot of the current traffic situation at www.AnachB.at and as a mobile application. It is operated by ITS Vienna Region/VOR.
- In addition, existing, quality-assured ASFINAG processes and systems relating to traffic information and management are incorporated into the project.

Both European road operators and the automotive industry regard cooperative systems as the future information channel to the vehicle, because they are able to pass on accurate and direction-based information to the respective transport user in real time. The establishment of a telematics testing field for cooperative services aims at the mutual exchange of real-time information between vehicle and infrastructure to raise safety, efficiency and environmentally friendly mobility. Of particular importance is to make the transfer to public transport attractive and simple, which is achieved by comprehensive co-modal traffic information for all means of transport.
3.13.2. Bulgaria

At this stage there are no activities under development or on-going activities in this priority area. In case of undertaking actions in this area, they will be synchronized with and conformed to the results achieved through the programme “EASYWAY” – regional project “ITHACA”.

3.13.3. Greece

3.13.3.1. Summary of finalised activities

Little progress has been made in national level under this Priority Area. Some related actions and projects include technologies for advanced vehicle positioning and timing, electronic toll collection and systems for the provision of priority to intersections.

The national actions/projects that have been implemented for the exchange of information between vehicle and infrastructure are summarized in the following Table.

**Table 26**: Finalized projects/actions in Greece for Priority Area IV

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Priority of Athens tramway to road intersections</td>
<td>II</td>
</tr>
</tbody>
</table>

3.13.3.2. Summary of on-going activities

The national on-going actions/projects under Priority Area IV, are summarized in the following Table.

**Table 27**: On-going projects/actions in Greece for Priority Area IV

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cooperative mobility systems pilot in Thessaloniki (COMPASS4D)</td>
<td>III, I, V, VI</td>
</tr>
</tbody>
</table>

3.13.4. Hungary

There are currently no activities in this area.

3.13.5. Italy

3.13.5.1. Summary of finalised activities
Table 28: Finalized projects/actions in Italy for Priority Area IV

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Infonebbia project</td>
<td>I, II, III</td>
</tr>
</tbody>
</table>

3.13.5.2. Summary of ongoing activities

There are currently no activities in this area.

3.13.6. Romania

3.13.6.1. Summary of finalised activities

**Area information system via radio broadcasting for special, emergency situations**

The project analysed available information and sources for transmitting emergency messages in vehicles. An on-board data transmission using radio broadcasting (RDS) platform was created and tested.

Funded from the state budget, the project lasted 2 months (from September to November 2007) with the goals of establishing available information and sources for transmitting emergency messages in vehicles and analysing available radio broadcasting channels and communication networks.

The results of the testings have shown the possibility to transmit emergency messages to vehicles via RDS channel using the existing radio network, potential for transmitting traffic data using the RDS-TMC technology, applications which will be developed in the future and also the concept of a data transmission platform using RDS broadcasting channels.

3.13.6.2. Summary of on-going activities

There are no activities to be mentioned.

3.13.7. Slovenia

Design of support systems for ITS integration with vehicle transport infrastructure and systems for advanced driver assistance or an increase safety will depend on the internationally acclaimed solutions.

3.13.7.1. Summary of finalised activities

There is commercial TMC service in Slovenia using public FM broadcasts’ RDS code.
3.13.7.2. Summary of on-going activities

**Nomadic devices to support driving task and/or the transport operation** - Tracking cargo and cargo vehicles based on RFID is planned. For the future public RDS-TMC service is planned.

3.13.8. Albania

3.13.8.1. Summary of finalised activities
There is no activity or projects under this Priority Area finalized in Albania.

3.13.8.2. Summary of on-going activities
There are some initiatives from the private sector in Albania to use technologies for advanced vehicle positioning and timing. Bus Operator private company in Tirana has an on-going project for “On-line fleet management system for the urban buses” in Tirana. Details are shown on the Annex 1 of this document.

3.13.9. Croatia

3.13.9.1. Summary of finalised activities
There are no activities to be mentioned.

3.13.9.2. Summary of on-going activities

**Towards Autonomic Road Transport Support Systems (COST Action TU1102)**
The aim of this Action is to unite and align groups across Europe from computer science, engineering and transport studies into a world leading research community that will develop new ways of designing Road Transportation Support (RTS) systems based on the ideas of autonomic systems. If used as a platform on which to implement leading edge RTS technologies, such systems have the potential to deliver savings in the cost of system configuration, maintenance, and infrastructure, while potentially improving network efficiency and reducing the chances of human error. Using an autonomic approach to RTS is a novel and very ambitious idea requiring interdisciplinary community building, hence the need for COST, and a European dimension. This Action will bring together disparate strands of research into an integrated discipline, putting Europe at the leading edge of autonomic transportation system development. Additionally it will have the wider benefit of producing a transformative change within the field of autonomic systems itself that will translate to other application areas such as energy management.

**Intelligent Cooperative Sensing for improved traffic Efficiency – ISCI**
Funded by the European Commission.
The goal of the project is to define a new architecture to enable cooperative sensing in Intelligent Transportation Systems and to develop a reference end-to-end implementation.

The project results will enable advanced traffic and travel management strategies, based on reliable and real-time input data. The effectiveness of such new strategies, together with the proposed system, will be assessed in two field trials. The main objectives are:

- Design of a new architecture for M2M communication and local intelligence implementation in an ITS;
- Development of a reference implementation of the data distribution layer;
- Development of a new class of road sensors with pervasive communication capabilities;
- Adaptation of V2X and backhauling communication technologies to the proposed architecture;
- Definition of novel traffic and travel management strategies leveraging the proposed solution.

In ICSI, the pervasive sensing approach will allow network managers to monitor road traffic conditions in real time and ubiquitously. In this context it is important to note the difference between traditional ITS technologies and cooperative ITS systems. While in the first case, only the sensors in the infrastructure can collect data on the state of traffic, the vehicle collaborative technologies become an important additional source of dynamic traffic information from the information exchanged and detected using V2V and V2I. The European Union recognizes the need to encourage research efforts to join forces to enable implantation of cooperative systems in member states in the near future.

### 3.14. Priority area: data security and protection, and liability issues

#### 3.14.1. Austria

There are no activities to be mentioned.

#### 3.14.2. Bulgaria

There are no activities to be mentioned.

#### 3.14.3. Greece

3.14.3.1. Summary of finalised activities

No national actions have been undertaken under this priority area. As already mentioned, at a legislative level, the following relative Laws have been applied:

- 2472/1997 for protection of personal data;
• 3471/2006 for protection of personal data in the field of electronic communications;
• 3917/2011 for the retention of data generated or processed in connection with the provision of publicly available electronic communications or public communication networks, use of surveillance systems with the audio or video recording in public places; and
• 3448/2006 and 3613/2007 for the processing and use of data related to the road transport network and the road traffic.

3.14.3.2. Summary of on-going activities

There are no activities to be mentioned.

3.14.4. Hungary

There are no activities to be mentioned.

3.14.5. Italy

There are no activities to be mentioned.

3.14.6. Romania

There are no activities to be mentioned.

3.14.7. Slovenia

The main legal issues regarding the data, information and ITS technology supported databases in general are related to the three prevailing problem domains:

• Intellectual Property Rights and ITS technology - copyright issues on spatial data sets, topographic and thematic digital maps, ITS databases, ITS software and applications etc.;
• Privacy Protection and ITS technology - confidentiality protection in ITS databases versus enabling public access to data, personal integrity data and political sensitive data, policy for restrictive disposal and limited access to spatial data etc.,
• Liability and ITS technology - warranty and (legal) responsibility for specified data quality, liability contract problems, negligence, torts and damages, limited recovery strategies for data etc.

Different acts formally define who in principle possesses copyrights on spatial or ITS data. The consistent strategy for licensing and user oriented pricing policy of indemnities for data and services are gradually prevailing. Despite such formal orientation in practice data is, probably primary because of economic reasons, still often the subject of gratuitous and unregistered distribution.
The privacy issues in databases that are maintained by geodetic and other public services in Slovenia are formally well covered by the present legislation. General public interests, the declared publicity aspect of databases, which are supported by ITS technology, and on the other end the touchy privacy protection of individuals, should be properly balanced. The liability for spatial ITS data quality and the level of such responsibility are still technically and legally an open issue. In general, geodetic service and infrastructure operators in the country do not provide explicit guarantee about the quality of their data, and therefore also do not assume legal responsibility in the cases of detriment that is caused by insufficient data quality.

The outlined liability approach is still prevailing, but should be altered for the benefit of ITS data users, if in the near future the primary aim is to set up a massive market with ITS data, where the market value of data for their end users will be the dominant factor of success.

3.14.7.1. Summary of finalised activities

A set of laws and regulations has been carried out, which are crucial for putting into force the whole legal system and also for its consistent implementation in practice. Personal data are not used under any circumstances without consent of person, by any shared or given to a third party or institutions, except in cases provided by law. Personal data are used exclusively for the purpose of sending information to the registered users, for example AMZS – Automotive association club, with guarantee that personal data are never abused to send commercial messages or otherwise violate user privacy.

Information Commissioner Act implements into the Slovenian legal order the Directive 95/46/EC of the European Parliament and Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data from October 1995.

3.14.7.2. Summary of on-going activities

On-going activities, especially adjustments in the law and acts, depend on international solutions and cooperation.

3.14.8. Albania


There are no projects or actions finalized activities under this Priority Area in Albania. The following Laws are approved for the protection and handling of personal data in Albania:

- Law Nr.9887, dated 10.03.2008 “For Protection of Personal Data”
- Decision Nr.1 dated 04.03.2010 “For definition of detailed regulations for the protection of personal data (The Commissioner for Data Protection)
- Several “Directives to ensure protection of personal data” (The Commissioner for Data Protection)
3.14.8.2. Summary of on-going activities

There are no on-going activities under this Priority Area.

3.14.9. Croatia

3.14.9.1. Summary of finalised activities

Legal regulations in area of information and data security
Funded by the Republic of Croatia.

Legal regulations of the Republic of Croatia in area of information and data security are developed within the process of Croatia's accession to EU. Under these laws is uniquely defined the term data as a foundation and starting point that defines the information security measures and standards. The most important limiting factors in the systematic implementation of information security measures and standards are financial and human resources. Meeting the prescribed information security measures and standards for the handling of classified information that has high classification requires a considerable amount of financial resources. Also, there is a great emphasis on staff that would carry out its functions under such ITS, because it is also complex and time-consuming to implement security checking process which creates additional financial costs and may cause a time gap between planning and human involvement in implementation (lack of access to classified resources without undergoing safety testing and certification of personnel). Subsequently it can be concluded that the hypothesis "security costs" in most cases is a correct statement.

The Project was finalised 2008.

3.14.9.2. Summary of on-going activities

There are no activities to be mentioned.

3.15. Priority area: European ITS cooperation and coordination

3.15.1. Austria

3.15.1.1. Summary of finalised activities

Traffic management plans
Co-funded by the European Commission.

The main focus of intelligent traffic management is on the following:

- Optimising traffic flow
- Optimising road safety
- Improving the availability of streets
Against this background international exchange was practiced quite early within European projects and plans for traffic management were developed. These are strategies for traffic control commonly agreed upon by all concerned parties to co-ordinately manage predefined (frequently) occurring problems like construction works, congestion, traffic jams and accidents.

According to the expansion of road telematics (traffic control systems, variable message signs) it is possible to provide road users with dynamic routing advices while driving. Currently, about 19% of the ASFINAG road network is equipped with variable message signs.

The following sections are currently covered by internationally coordinated traffic management plans:

- TMP Brenner (D, A, I), alternative route: Tauern-Karawanken
- TMP Tauern-Karawanken (A, SLO, HR), alternative route: Pyhrn
- TMP Pyhrn (A, SLO, HR), alternative route: Tauern-Karawanken

In preparation:

- TMP Danube (A, HUN, SK)
- TMP (I, SLO)

3.15.1.2. Summary of ongoing activities

**Traffic telematics agency AustriaTech**

AustriaTech is a federal public service-oriented company aimed at maximising the societal deployment of new technologies in traffic and transport. The company was founded in 2005 as a wholly owned subsidiary of the Austrian Ministry of Transport, Innovation and Technology (bmvi).

AustriaTech acts as an agency for the ministry and is pursuing a long-term strategy for sustainable transport solutions. In addition, AustriaTech receives a legal mandate from the ITS law. This law is the national implementation of the European ITS Directive, and it declares that AustriaTech has the tasks of observation, documentation and harmonisation of mobility services.

As an agency, AustriaTech facilitates and carries out a common ITS strategy. As a neutral partner, the company is able to go between management, infrastructure operators and the industry, as well as functioning as an independent system.

The 30 members of staff at AustriaTech put a distinct focus on the implementation of mobility technology. AustriaTech can advise bmvi on the content of governance decisions, due to the comprehensive technological knowledge and specialised process expertise which are on hand in the company.
Addressed core topics:

- Supporting technological strengthening of the Austrian traffic industry and domestic technology providers;
- Research on strategic level (future studies) with respect to technologically relevant topics (Think Tank);
- Developing innovation strategies to implement ITS in Austria;
- Realisation of technologies.
- Contribution to the realisation of EU directives and international standards in Austria.

### 3.15.2. Bulgaria

There are no activities to be mentioned.

### 3.15.3. Greece

#### 3.15.3.1. Summary of finalised activities

This Priority Area refers to cooperative actions between ITS players all over Europe and the formulation of a common ITS agenda and methods for ITS implementation. At a national level, this is interpreted through the participation of Greek research institutes, ITS companies of public transport authorities in European projects related to ITS applications and services. An indicative list of such projects is provided in the following Table.

**Table 29**: Finalized projects/actions in Greece for Priority Area VI

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>General information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VIAJEO “International Demonstrations of Platform for Transport Planning and Travel Information”</td>
<td>The project was concluded in October 2012 and designed, demonstrated and validated an open platform that: supports transport operations, planning and a wide range of traveller information services; delivers dynamic information through integrated traffic collection and management; delivers solutions of multi-modal journey planning and provided standardized interfaces to connect a variety of entities that deal with mobility services.</td>
</tr>
<tr>
<td>2</td>
<td>InMoSion</td>
<td>The project ended in June 2009 and it developed a paratransit system to facilitate the transport needs of elderly people by taking advantage of the leaps in communication, computational, Geographic Information Systems (GIS) and Intelligent Transport Systems (ITS) technologies (cell phones, PDAs, Internet, electronic payment and traveller information systems) in order to provide an innovative transportation solution to European cities.</td>
</tr>
</tbody>
</table>
3.15.3.2. Summary of on-going activities

An indicative list of on-going European project activities, where Greece participates, is provided in the following Table.

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
<th>General information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ITHACA Euro-regional project</td>
<td>The project aims at deploying new technologies for safety and protection of the environment and promoting new services on the main sections of the Trans-European Road Network (TERN).</td>
</tr>
<tr>
<td>2</td>
<td>EASYWAY II</td>
<td>EasyWay is a project for Europe-wide ITS deployment on main TEN-T corridors driven by national road authorities and operators with associated partners including the automotive industry, telecom operators and public transport stakeholders.</td>
</tr>
</tbody>
</table>
3.15.4. Hungary

There are no activities to be mentioned.

3.15.5. Italy

3.15.5.1. Summary of finalised activities

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PREVENT project</td>
</tr>
<tr>
<td>2</td>
<td>ITHACA Euro-regional project</td>
</tr>
<tr>
<td>3</td>
<td>SAFESPOT project</td>
</tr>
</tbody>
</table>

3.15.5.2. Summary of ongoing activities

<table>
<thead>
<tr>
<th>No</th>
<th>Project/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COMPASS project</td>
</tr>
<tr>
<td>2</td>
<td>SCUTUM project (SeCUring the EU GNSS adopTion in the dangeroUs Material transport)</td>
</tr>
<tr>
<td>3</td>
<td>EASYWAY project</td>
</tr>
<tr>
<td>4</td>
<td>P3ITS project</td>
</tr>
<tr>
<td>5</td>
<td>HeERO project</td>
</tr>
<tr>
<td>6</td>
<td>iTETRIS project</td>
</tr>
<tr>
<td>7</td>
<td>CVIS3 (Cooperative Vehicle-Infrastructure System)</td>
</tr>
</tbody>
</table>

3.15.6. Romania

There are no activities to be mentioned.
3.15.7. Slovenia

As Slovenia is a small country and road incidents have an impact on neighbour countries and vice versa, plans are required to harmonize measures of traffic management systems in the cross-border corridors. The cross-border motorway is a crucial link on EU Corridor V (from Italy to Hungary via Slovenia), characterized by high traffic flows (freight and passengers) and seasonal peaks.

![Map of Slovenia](image)

**Figure 20**: Main TEN passing Slovenia (source: DARS d.d.)

3.15.7.1. Summary of finalised activities

DARS d.d. and ASFINAG as motorway operators from Slovenia and Austria had set up traffic management plan (TMP), which specified measures in the case of incidents on road corridors Munich (Germany) – Karavanke tunnel (Slovenia/Austria) – Zagreb (Croatia) and Munich (Germany) – Graz (Austria) – Maribor (Slovenia) – Zagreb (Croatia), where planned road corridor blockade for more than five hours. The same TMP is signed with HAC (Hrvatske avtoceste) in Croatia.
Project PROMET - was a project of common interest as a part of Trans-European infrastructure networks (TEN-T). The project’s results improved traffic flow and safety in the cross-border link between Italy and Slovenia. It promoted coordinated procedures for traffic management, traffic monitoring and information services to drivers. Two existing TCCs in Palmanova (Italy) and Kozina (Slovenia) are the basic nodes for the planned interventions.

This project also addressed the logical architecture of the system, considering how the Data Exchange could support new and integrated Traffic Management operations, in particular the recovery interventions in case of major traffic breakdowns (incidents). This part follows the standard methodologies defined by the European ITS Framework Architecture, and also developed in the frame of the Italian ARTIST architecture.

Therefore a translator for the specific PROMET incident is included in the Data Exchange system. The system accepted data from Italy in term of XML files via ftp, including traffic events. These XML files do not follow a standard format, but they consist of standard data according to the DATEX I model. The translator is used to convert these XML files into data following the DATEX II model. In the opposite direction, the system provides data to Italy in term of EDIFACT formatted data via ftp files. Data as mentioned are generated in two major systems and concentrated in the DATEX II node. The translator converts all the data into EDIFACT messages. Technically this was done by private company Traffic design d.o.o.

Updating of situation data: It was agreed that, when one of the events changes, a new snapshot will be sent. 'Non-active' events will not be sent; however when an operator decides to close an event, a message will be delivered automatically. The ALERT-C method is used to specify the location of an event (incident). File Transfer Protocol (FTP) is used to exchange and manipulate files and data over a TCP/IP based public network.

Figure 21: Traffic management plan Austria - Slovenia - Croatia (source: DARS d.d.)
3.15.7.2. Summary of ongoing activities

With Hungary there is no deep cooperation in information exchange but interest was recorded for mutual cooperation in the field of freight management and traffic information exchange.

Automation of data exchange between NCUP and centres in Austria, Croatia and Hungary with common strategic traffic management of motorway corridors is planned following the example of Italy.
3.15.8. Albania

Albania is willing to receive guidance and technical support from EU in this direction. A closer cooperation and coordination with EU countries who have experience in deployment and implementation of ITS, would help Albania to start this action and benefit from best practices.

3.15.8.1. Summary of finalised activities

This Priority Area has some relevance with Albania Institutions efforts to deploy the ITS systems. Institutions include the Ministry of Public Works and Transport, the Institute of Transport, municipalities, in particular Municipality of Tirana as well as urban transport private companies, ITS companies who provide related applications and services.

There is no finalized activity for this Priority Area.

3.15.8.2. Summary of on-going activities

The only one of on-going activities for Priority Area VI for the European ITS cooperation in Albania is the current project.

Table 33: On-going activities under the Priority Area VI in Albania

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Project / Action</th>
<th>Other relevant Priority Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>“Identification and documentation of the current status regarding the deployment of Intelligent Transport Systems (ITS) in Albania” in the framework of the South East Europe Transnational Cooperation Programme (SEE) 2007-2013 Project entitled “Intelligent Transport Systems in South East Europe”</td>
<td></td>
</tr>
</tbody>
</table>

3.15.9. Croatia

There are no activities to be mentioned.
4. **Conclusions**

The main objectives of this activity were to collect, present and analyse the existing or currently under implementation ITS systems and services available in the South East Europe Countries, specifically Albania, Austria, Bulgaria, Croatia, Greece, Hungary, Italy, Romania and Slovenia.

The reporting follows the 6 Priority Areas that have been identified within the EC 2010 ITS Action Plan, namely:

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

This link with the ITS Action Plan was chosen to be in line with the initial objectives and focus of the SEE-ITS project. This approach also ensures a coverage of the four Priority Areas of the ITS Directive since they have a direct correspondence with the respective Areas of the Action Plan.

The report also addressed information about main actors involved in ITS development, deployment and operations, the major obstacles towards ITS implementation, funding schemes, key strengths, and a short outline of the legislative framework in the SEE area.

Based on the research performed, it can be concluded that the deployment of ITS in the SEE area is strongly influenced by the availability of funds and the existence of an appropriate policy and legislative framework.

In this report both European and national funding schemes were analysed.

The following European funds have been identified as sources of financing for ITS deployment in the SEE area:

- The 3rd Community Support Framework (CSF) and, particularly for the ITS development, the Operational Program “Information Society” (2000-2006).
- The Cohesion Funds (CF). The part-financed projects related to environment and trans-European transport infrastructures were funded under the INTERREG III Community Initiative (2000-2006), which has been replaced by the South East Europe Program that covers 13 transnational cooperation programs (2007-2013).
• The 7th Framework Program (FP) of the European Commission (2007-2013). A budget of 4.1 Bn. Euros of the 7th Framework Program is dedicated to fund research and development as well as for accompanying support measures in the field of transportation
• The ICT Policy Support Program (ICT PSP) of The Competitiveness and Innovation framework Program (CIP) (2007-2013)
• The Intelligent Energy Europe Program (IEE) (2007-2013)
• The European Economic Area (EEA) Grants (2009-2014)
• TEN - TEMPO Program (2001-2006) and TEN-T Finance scheme (2007-2013)
• The European Investment Bank and World Bank Loans (EIB/WB Loans)
• The Operational Program “Regional Development” and “Transport” (OP) (2007-2013)

The table below summarizes the European funding mechanisms used in each country.

Table 34: European funding schemes per examined country in the SEE area

<table>
<thead>
<tr>
<th>European Funding Schemes</th>
<th>Albania</th>
<th>Austria</th>
<th>Bulgaria</th>
<th>Croatia</th>
<th>Greece</th>
<th>Hungary</th>
<th>Italy</th>
<th>Romania</th>
<th>Slovenia</th>
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<tbody>
<tr>
<td>FP</td>
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<td>TEN (TEMPO, T)</td>
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<td>ICT-PSP</td>
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<td>NSRF</td>
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<td>IEE</td>
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<tr>
<td>EIE</td>
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<tr>
<td>EEA</td>
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<tr>
<td>EIB/WB Loans</td>
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<td>OP</td>
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</tbody>
</table>

At national level the most used sources of financing for ITS implementation are national state budget funds. In some countries like Greece, Hungary, Albania and Croatia, Public Private Partnership (PPP) initiatives are also deployed as an alternative to using state budget funds. The table below summarizes the national funding mechanisms used in each country.

Table 35: Overview of national funding schemes used in the area of ITS

<table>
<thead>
<tr>
<th>Country</th>
<th>Funding schemes/programmes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>o National budget</td>
</tr>
<tr>
<td></td>
<td>o PPP</td>
</tr>
</tbody>
</table>
In terms of implementation, policy context and future priorities, our research has revealed a mixed picture both in terms of current status and priorities. We can attribute this mainly to the differences in EU membership age and experience in absorbing EU funds as those have been identified as the main sources of financing for all EU member states in the SEE area.

For instance, the deployment of ITS in Albania for road transport is in its initial steps. There are only limited utilizations of ITS in the country in relation to road transports. However, as seen by latter legislation changes towards the adoption of ITS, Albania is willing to play its role on the initiatives launched by European Commission regarding the integration in regional and pan-European networks. Being part of important corridors and multimodal transport nodes in Europe, Albania is searching for the European support toward financing schemes for deployment and implementation of ITS in the country. The establishment of a fluid road transportation network, will make possible the increase of the volume of goods, mobility of people and access to the services and markets for Albania, and will contribute in economic growth of the country.

On the contrary, the status of ITS deployment in Austria is very different. Since 2004 travel information services based on ITS have been deployed, however only by a few transport services, infrastructure operators and private companies within and for their respective field. Consequently there are sectorial supplies which only concentrate on single areas and means of transport and are not interconnected. In terms of individual transport, private suppliers of navigation tools and services have established on the market. A basic requirement towards an Intelligent Transport System is a harmonized data exchange between Austrian infrastructure operators. To facilitate this exchange, measures to create a consistent organizational and legal framework are taken on national level. In this way the necessary premises for Austrian
infrastructure operators to ensure a harmonized and comprehensive exchange of ITS-relevant data shall be created. In this matter it is very important to sufficiently define and analyse quality requirements for the data exchanged as well as rights and duties of all stakeholders involved.

The ITS status of Croatia started evolving in the ‘90s, when a group of transport and traffic scientists recognized the importance of ITS and initiated a number of research projects supported by the Ministry of Science or other public bodies and public-owned companies. In 2005, science and professional association ITS-Croatia was established and some scientific projects in the field of ITS have been initiated. There has been no systematic approach to ITS implementation financing in road networks in Croatia thus far. A significant highway network has been built (1300 km) during the last decade and modern ICT have been implemented to mark the beginning of Croatian ITS development. Particular ITS projects were integrated with the development of particular highway sections.

Greece presents a number of large ITS projects that mainly focus on the major urban areas of Athens and Thessaloniki or major motorways, while a lack of such projects in other urban and rural areas is observed.

Hungary is also a country with a large number of ITS projects. The most characteristic examples of ITS applications in Hungary today are the traffic management of motorways, traffic control systems of motorways, electronic fee collection (road toll), route guidance/navigation, but urban traffic management is also a relevant area.

Intelligent Transport Systems and services in the road sector are diverse and generally there are a lot of stakeholders, such as network operators, network providers, content providers and of course road users (drivers, public transport users, pedestrians etc.).

It will be extremely important in the future that local authorities – mainly in larger cities – address the field of Intelligent Transport Systems and services, defining deployments that support the implementation of their objectives in order to ensure local mobility.

Apart from Austria and Greece, Italy is the only other country in the SEE Area which has a National ITS Action Plan. The national ITS action plan (“Piano d’Azione ITS nazionale”) has been issued in December 2012, and identifies the national priorities until 2017. It is currently under evaluation and is planned to be approved by the end of March 2013.

The plan goes beyond the EU priorities, for which specific actions are defined for each priority, and defines necessary actions, at general level, to support the coordinated development of ITS in Italy.

In Romania, the main focus is on road transport both at national level and at the level of local municipalities. Intelligent Transport Systems are in an emerging stage of implementation. However there are already some systems deployed, both at local urban level and on national roads and motorways. This is the reason why almost all projects address the priority area optimal use of road, traffic and travel data. Another important aspect is that a decision of the National Motorways Company is in force which states that all new motorways to be built will
include intelligent infrastructure. Therefore the premises for a full-scale deployment of ITS exist.

In Bulgaria the status is similar to Romania. The focus is also mainly on road transport and building motorways with Intelligent Infrastructure. The transposition of the Directive 2010/40/EU was performed just end of January 2013. The Law on Road Transport is the law defining the responsibility for coordinated and coherent deployment and use of Intelligent Transport Systems in the Republic of Bulgaria. It obliges the Minister of Transport, Information Technology and Communications to coordinate activities in the deployment and use of Intelligent Transport Systems in the field of road transport and for interfaces with other transport modes.

In Slovenia the country has moved in a new era of faster, more accessible road traffic. At the same time many ITS were installed and upgraded to ensure smooth and safe traffic flow at the increasing traffic volumes. Several new tunnels were built, most notably Šentvid motorway tunnel (near Ljubljana). The focus of ITS in Slovenia was therefore on motorways, but there were several successful projects also outside of this scope. Finally, after the entrance of Slovenia in the Schengen area in 2007, the new Customs service information system was put into operation featuring cargo vehicle control and tracking at the border crossings.

The table below summarizes the ITS implementation status in terms of implementation, policy context and future priorities.
### Table 36: Overview of ITS implementation, policy context and future priorities

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Finalized activities</td>
<td>On-going activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albania</td>
<td>1</td>
<td>4</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>establishment of adequate framework conditions for accelerating and coordinating ITS deployment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>development of National ITS Action Plan</td>
</tr>
<tr>
<td>Austria</td>
<td>10</td>
<td>9</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>o development and implementation of impact-analyses of all three action fields (safety, efficiency and environment) of the Austrian ITS action plan</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>o integration of modern road monitoring technologies into Cooperative Systems</td>
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<td></td>
<td></td>
<td>o development and implementation of systems for recognising and processing critical driving manoeuvres</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0</td>
<td>6</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>o building of new highways and road infrastructure rehabilitation</td>
</tr>
<tr>
<td>Croatia</td>
<td>7</td>
<td>6</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td></td>
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<td></td>
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<td>o modernize traffic and freight management ITS services</td>
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<td></td>
<td></td>
<td>o construction and modernization of highways and other infrastructure</td>
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<td></td>
<td>o integration of transport infrastructure management</td>
</tr>
<tr>
<td>Greece</td>
<td>29</td>
<td>23</td>
<td>Yes</td>
<td>Yes</td>
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<td>o support rural ITS deployment</td>
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<td></td>
<td>o promote interoperability and coordination among implemented ITS systems</td>
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<td></td>
<td></td>
<td>o promote collaboration between public (central and regional authorities) and private bodies</td>
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<td></td>
<td></td>
<td>o improve administrative structures and personnel</td>
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<td></td>
<td></td>
<td>o provide incentives to the private sector</td>
</tr>
<tr>
<td>Hungary</td>
<td>41</td>
<td>0</td>
<td>No</td>
<td>No</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>o ITS deployment in municipalities</td>
</tr>
<tr>
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<td>o traffic control and traffic information systems for the motorway network</td>
</tr>
<tr>
<td>Country</td>
<td>Year</td>
<td>No</td>
<td>Yes</td>
<td>Remarks</td>
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<tr>
<td>Italy</td>
<td>30</td>
<td>18</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
|         |      |    |     | o define general Guidelines for open and interoperable systems as pillars of integrated mobility services, in the background of clear and certain rules (facilitate competition)  
|         |      |    |     | o foster cooperation between the various stakeholder, overcoming particularism  
|         |      |    |     | o participate actively and make proposal at European level  
|         |      |    |     | o exceeding the vision of blocks pilot projects, but promote large-scale applications  
|         |      |    |     | o activate a national research program  
|         |      |    |     | o activate a national fund for financing ITS  
|         |      |    |     | o share and define business models for the diffusion of ITS  
|         |      |    |     | o promote training activities on ITS in order to develop professionals |
| Romania | 12   | 15 | Yes | No     |
|         |      |    |     | o promote interoperability and coordination among implemented ITS systems and EU harmonisation  
|         |      |    |     | o development of National ITS Action Plan  
|         |      |    |     | o building of new highways and road infrastructure rehabilitation  
|         |      |    |     | o electronic fee collection |
| Slovenia| 9    | 1  | No  | No     |
|         |      |    |     | o promote interoperability and coordination among implemented ITS systems and EU harmonisation  
|         |      |    |     | o integration of the secondary road network and multi-modal solutions |
In conclusion, based on the information collected and presented in this report, it can be said that the overall picture regarding ITS in the SEE area is quite mixed.

Firstly, there is a common set of European and national funding mechanisms however to which extend every one of them is used varies from country to country. Nevertheless, it was clear that most projects were implemented using some kind of European funding.

Secondly, in terms of implementation, it ranges from only a few initiatives (like for example in Albania or Bulgaria) to numerous systems and services (like for example in Greece or Hungary). In terms of policy, countries like Austria, Greece or Italy already have National ITS Plans while others do not have any national strategies related to ITS, nor to the transport field in general. Also, there are some EU member states that have not yet transposed the EU ITS Directive in their national legislation.

However, it is important to note that all countries are willing to put in place the funding mechanisms and the policy framework that will allow them to continue the implementation of ITS. Moreover, all countries have as priority the integration and harmonization of both national applications but also with the neighbouring countries, at European level.
5. **Contacts related to ITS**

**Austria**

- Federal Ministry of Transport, Innovation and Technology
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  Department III/I4 - Mobility- and Traffic Technologies, Renngasse 5, 1010 Vienna, i4@bmvit.gv.at, +43 1 711 62 - 65 3105 – ITS Research
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  Europaplatz 3/2, 1150 Vienna, DI Hans Fiby, hans.fiby@its-viennaregion.at
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  Karlsgasse 5, 1040 Vienna, office@fsv.at
- Schieneninfrastruktur – Dienstleistungsgesellschaft mbH (SCHIG mbH)
  Lassallestraße 9b, 1020 Vienna, office@schig.com
Bulgaria

- Ministry of Transport, Information Technology and Communication
  Sofia 1000
  9, Djakon Ignatii Str.
- Ministry of Interior
  Sofia 1000
  29, Shesti Septemvri Str.
  Tel.: +35929825000 - Central Mol
- Ministry of regional development and public works
  Sofia
  17 – 19, Kiril and Metodiy str.,
  Directorate "Public Relations and International Relations"
  Section "Public Relations " - +359 2 9405 430, +359 2 988 29 54
- Urban Mobility centre
  Sofia 1202
  84, Maria Luisa blvd.
  Tel.: 070013233
- Road Infrastructure Agency
  Sofia
  3, Macedonia Blvd.
- Directorate "Communication and information"
  Tel.: +359 2 9 173408
  press@api.government.bg
Croatia

- Ministry of Maritime Affairs, Transport and Infrastructure (www.mppi.hr)
- The Ministry of Regional Development and EU Funds (www.mrrfeu.hr)
- ITS Croatia (www.its-croatia.hr)
- The Croatian Association of Toll Motorways Concessionaires (www.huka.hr)
- Croatian Motorways, LTD (www.hac.hr)
- Faculty of Traffic and Transport Sciences (www.fpz.hr)
**Greece**

- Ministry of Development, Competitiveness, Infrastructure, Transport and Networks
  Department of Foreign Affairs of the Transport sector
  Tel. 0030 210 6508000
  e-mail: yme@yme.gov.gr
  2 Anastaseos St., 10191, Papagou, Athens, Greece

- ITS Hellas
  Tel. 0030 210 6511690
  Fax: 210 6549776
  Email: secretary@its-hellas.gr
  http://www.its-hellas.gr/

- Athens Traffic Management Centre (ATMC)
  102 – 108 3rd Septemvriou St., 10434, Athens, Greece
  http://www.patt.gov.gr

The data used for the current report were provided by the following sources:

4. National Presidential Decrees and Laws as presented in section 3.1.2.
5. The following official websites of the companies/authorities that have implemented the ITS project/service:
   - Retrieved December 2012, from Mobility Centre Network of Kalamaria: www.kemdkalamarias.gr
   - Retrieved December 2012, from Organization of Urban Transportation of Thessaloniki: www.oasth.gr
• Retrieved December 2012, from Routing Portal of the Attica Region: www.atticaroute.gr
• Retrieved December 2012, from Thessaloniki’s Intelligent Urban Mobility Management System: http://www.mobithess.gr
• Retrieved December 2012, from e-Trikala ITS system: http://www.e-trikala.gr
• Retrieved December 2012, from Thessaloniki Port Authority S.A.: http://www.thpa.gr/
• Retrieved December 2012, from Telenavis Hellas S.A.: http://www.telenavis.com and one of the company’s ITS product: www.realtraffic.gr
• Retrieved December 2012, from Train-Taxi service: http://www.trainose.gr/nees-ypriesies/traino-taksi

6. Other relevant sources (i.e. articles, papers, etc.):
• Argirakos, G., Petrakis, K., Zartaloudis, I., & Tzoutzopoulou, M. The Problem of the Tram Priority in Traffic Lights (only in Greek).
• CERTH/HIT’s annual reports and project’s deliverables (VIAJEO, InMoSion, etc.).

7. Other relevant web sources:
• Retrieved December 2012, from South East Europe Transnational Cooperation Programme: http://www.southeast-europe.net/en/
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**Hungary**

- Ministry of National Development Transport Infrastructure Department  
  Mr. Lajos Szűcs, Head of Department, tel: +36 1 7956864, e-mail: lajos.szucs@nfm.gov.hu
- Municipal Public Services Co. Ltd. – FKF  
  Contactperson: Zoltán Jenovai, Director for Traffic Management jenovaiz@fkf.hu
- Hungarian Public Roads Company  
  Contactperson: Dr. András Gulyás, Technical Advisor  
  gulyas.andras@kozut.hu
- Hungarian Transport Administration:  
  Contactperson: Forrainé Hernádi Veronika, Head of Unit  
  hernadi.veronika@kkk.gov.hu
- State Motorway Management Company Ltd.  
  Contactperson: Zoltán Jákli, Technical Deputy General Director  
  jakli.zoltan@autopalya.hu
- TrafficNav Ltd.  
  Csaba Antal, Managing Director
- Hungarian Public Roads Company  
  Contactpersons: Zoltán Vályi, Deputy Head of Department  
  valyi.zoltan@kozut.hu  
  Ibolya Bali, Head of Department  
  bali.ibolya@kozut.hu
- Hungarian Public Roads Company  
  Contactperson: László Szilágyi, Head of Department  
  szilagyi.laszlo@kozut.hu
**Italy**

The national institution responsible for ITS policies is the Ministry of Infrastructure and Transport. The relevant contacts are given below:

**Department for Transport, Navigation and Information Systems and Statistics**

Directorate General for Information Systems, Statistics and Communication

**Division 1 – Application development and management**

Massimiliano Zazza – ITS systems contact  
Tel: +39 06 5908 3171  
Email: massimiliano.zazza@mit.gov.it  
Website: www.mit.gov.it

**TTS Italia** is the national association for telematics for transport and safety. Like other national ITS associations, this aims to promote ITS at national level. TTS Italia includes some 80 members and is part of the European network of national ITS associations, of which it is a founder member, sponsored by Ertico/ITS Europe.

Contacts:  
Ms Olga Landolfi, Secretary General;  
Via Flaminia 388 – 00196 Rome;  
Tel: +39 06 3227737; Fax: +39 06 3230993;  
Email: olga.landolfi@ttsitalia.it, ttsitalia@ttsitalia.it

**AISCAT – Italian Association of Motorway and Tunnel Operator Companies**

Like all category associations, since this association was set up back in 1966 it has been responsible for gathering and comparing the experiences and needs of Italian operators of toll motorways and tunnels and sharing them at working tables.

Contacts:  
Mr Andrea Manfron, Head of Technical Affairs;  
Via Po 12 – 00198 Rome  
Tel: +39.06.4827163; Fax: +39.06.4746968;  
Email: andrea.manfron@aiscat.it.
**Romania**

- Ministry of Transport  
  38 Diniuc Golescu Boulevard, Bucharest  
  bpresa5@mt.ro  

- Ministry of Communications  
  14 Libertatii Boulevard, Bucharest  
  http://www.mcsi.ro/Minister  
  relatiocupublicul@msinf.ro  

- National Company for Motorways  
  38 Diniuc Golescu Boulevard, Bucharest  
  http://www.andnet.ro/  
  presa@andnet.ro  

- National Authority for the Management of the Transport Operational Programme  
  38 Diniuc Golescu Boulevard, Bucharest  
  postransport@mt.ro  

- ITS Romania  
  38 Diniuc Golescu Boulevard, Bucharest  
  secretariat@its-romania.ro
Slovenia

- Ministry of Infrastructure and Spatial planning, Langusova 4, SI-1000 Ljubljana, Slovenia:
  - Infrastructure Directorate,
    - Boštjan Rigler, e-mail: bostjan.rigler@gov.si
    - Dean Herenda, e-mail: dean.herenda@gov.si
  - Transport Directorate,
    - Bojan Žlender, e-mail: bojan.zlender@gov.si
- Administration of the Republic of Slovenia for Civil Protection and Disaster Relief, Vojkova cesta 61, SI-1000 Ljubljana, Slovenia
  - Darko But, e-mail: urszt@urszr.si
  - Boštjan Tavčar, e-mail: bostjan.tavcar@urszr.si
- DARS d.d. (Motorway Company in the Republic of Slovenia), Ulica XIV. divizije 4, SI-3000 Celje, Slovenia
  - Ulrich Zorin, e-mail: Ulrich.zorin@dars.si
- S-ITS, Slovenian ITS Association:
  - e-mail: info@sits.si
Albania

The following sources are used to prepare the present report:

- Council of Ministers: http://www.km.gov.al
- Ministry of Innovation, Information Technology and Communications: http://www.mitik.gov.al
- Albanian Civil Aviation Authority: http://www.aac.gov.al
- Durrës Port Authority: http://www.apdurres.com.al
- Albanian Association of Urban Transport: http://www.shktq.org
- Municipality of Tirana: http://www.tirana.gov.al
- Commissioner for Protection of Personal data: http://www.kmdp.al
- Albania Association of Urban Transport: http://www.shktq.org
- Current legislation of Albania on transport and in particular road transport
- Project studies and reports of the Ministry of Public Works and Transport of Albania
- Albania National Transport Plan (Revised-ANTP2)
- Project deliverables of Institute of Transport of Albania
- Decision of Council of Ministers (DCM) Nr. 1243 dated 10.09.2008 and Nr. 207 dated 25.02.2009 on the deployment and implementation of Digital Tachograph, “For the approval of regulation for working time of the individuals which carry out road transport, for the working time of the drivers and recording equipment”
- Web sites of companies which provide the ITS equipment, solutions and services
  - Proton: http://www.proton.com.al
  - Swarco Mizar: http://www.swarco.com; development and implementation of advanced telematics systems
  - Austria Tech: http://www.austriatech.at; ITS technology deployer, traffic management implementing the appropriate technologies
  - Veolia Transportation: http://www.veoliatransportation.com; public transport solutions
  - Lecip: http://www.lecip.com; transportation technologies
  - Web sites of companies performing road transportation services in and out Albania (reports, issues, recommendations, etc.)
  - Alba Trans: http://www.albatrans.com.al; Albanian urban, interurban and international transport company
• Shega Trans: http://www.shega-trans.com; Albanian urban, interurban and international transport company

Reports on activities and projects aiming deployment of ITS (Municipality of Tirana)
6. **ANNEX I – DETAILED INFORMATION ABOUT ITS IMPLEMENTATION STATUS**

6.1. **Albania**

6.1.1. **Priority area: optimal use of road, traffic and travel data**

<table>
<thead>
<tr>
<th>Activity/project name: Tirana Urban Traffic Control Management System (T-UTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Main objectives:</strong></td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
</tr>
<tr>
<td><strong>Financing sources:</strong></td>
</tr>
<tr>
<td><strong>Stakeholders involved/Roles:</strong></td>
</tr>
<tr>
<td><strong>Technology used:</strong></td>
</tr>
<tr>
<td><strong>Status and main results:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
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<td><strong>Financing sources:</strong></td>
</tr>
<tr>
<td><strong>Stakeholders involved/Roles:</strong></td>
</tr>
<tr>
<td><strong>Technology used:</strong></td>
</tr>
<tr>
<td><strong>Status and main results:</strong></td>
</tr>
</tbody>
</table>
### Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries

| Description | Interface Gateway Application (IG)  
| Fault Management System (FMS)  
| Network Management System (NMS)  
| The specification includes:  
| removal and replacement of the existing UTC traffic light controllers  
| supply of new LED traffic lights in some junctions  
| supply of UPS in main junctions for uninterruptable power supply  
| removal and replacement of the traffic light with LED traffic lights  
| supply of the VMSs  
| supply of the CCTVs  
| supply of a new telecommunication system  

**Tirana Urban Traffic Control Management System (T-UTC) would become a focal control point for the city, not only for ordinary traffic management but also for facing critical situations where the control centre could become the crisis management point.**

### 6.1.2. Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations

**Activity/project name: Implementation of Digital Tachograph in Albania**

| Description | The implementation of Digital Tachograph in Albania  
| Main objectives | Road safety improvement by means of implementation of Digital Tachograph for transport vehicles  
| Duration | Started May 2011 and continuous  
| Financing sources | Ministry of Public Works and Transport  
| Stakeholders involved/Roles | Ministry of Public Works and Transport  
| | General Directorate of Road Transportation Services  
| | Operators, private companies involved in road transports  
| Technology used | IT, servers, data bases  
| Status and main results | The Directorate General of Road Transportation Services is entitled to implement the Digital Tachograph process and issue respective cards. This process consists of:  
| | Administrative Procedures  
| | Certification, Safety Policy  
| | Personalization of the card itself  
| | Connection with the TACHOnet  
| | The Digital Tachograph will make possible checking more efficiently: the driving times  

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The rest periods of drivers in order to improve the road safety. Here are included:

- daily/weekly/monthly working time
- rest periods for the driver, in conformity with the legislation, contributing in the increase of safety roads.

The implementation of Digital Tachograph is at its initial phase. It is already established the shop for the installation and maintenance of the Digital Tachographs; some sample cards are issued and distributed to the drivers on the “first come first served” basis. Digital Tachographs shall be under test for some period of time and after the approval, shall be applied to whole vehicle fleet which needs it to circulate in European Countries, as required by EU legislation.

**Activity/project name:** Tirana Public Transportation Terminal (TPTT)

<table>
<thead>
<tr>
<th>Description:</th>
<th>Tirana Public Transportation Terminal (TPTT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main objectives:</td>
<td>Develop the TPTT into an intermodal transportation hub that integrates current and future regional and local transit modes into a comprehensive transportation system; Promote transfers between many different transportation modes, as well as pedestrian and bicycle access, on one site in a way that is efficient, logical, and safe; Increase transit ridership; Connect local and regional transit with intercity bus and rail, including future high-speed rail; and Provide further connections to and from Mother Teresa International Airport.</td>
</tr>
<tr>
<td>Duration:</td>
<td>Start June 2012 Completion December 2016</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>BOT Concession Contract</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>Ministry of Public Works and Transport – Concession Agreement Municipality of Tirana – Management of Urban Traffic Public service and private businesses</td>
</tr>
<tr>
<td>Technology used:</td>
<td>International, Interurban, Urban Traffic Management</td>
</tr>
<tr>
<td>Status and main results:</td>
<td>Design of Bus Terminal – A tender package for BOT concession shall be prepared as deliverable by June 2013</td>
</tr>
</tbody>
</table>

**Activity/project name:** “On-line fleet management” Installation of GPS in the urban busses

| Description: | Installation of GPS in the urban buses for better managing for the |

**6.1.3. Priority area: integration of the vehicle into the transport infrastructure**
route City Centre-Porcelan

Main objectives: “On line fleet management of the buses” in the city, check the standby and operation times and manage better the buses fleet

Duration: Started September 2012

Financing sources: Operator – Private business
Name of the company: “Tirana Urban Trans” sh.a
Nr of owned buses: 50
Year of establishment: 2001
Nr. of passengers/day: 30,000
Nr. Of lines in which it offers the service: 3

Stakeholders involved/Roles:
Operator, Municipality of Tirana, public service and private businesses
Municipality issues operations licences
Operator implement the services and making efforts for better usage and management of assets, which contributes to the benefit of users

Technology used: GPS

Status and main results:
The Operator has installed in one service line City Centre – Porcelan, in ten buses the GPS. This installation is a test for Operator to check how the fleet of buses can be better managed and serve to the public and the company itself. Main results up to now are:
- On line trajectory of the buses movements
- Control of stop/operation times
- Control of efficiency

6.2. Austria

6.2.1. Priority area: optimal use of road, traffic and travel data

Activity/project name: Enhancement and optimisation of RDS-TMC in Austria (TMCplus)

Description: The traffic information centre editors of Ö3 receive accident and traffic jam messages from ASFINAG, the police, road maintenance depots and about 20,000 registered traffic jam messengers. The editors evaluate and process information before they are coded into digital traffic messages. Additionally, cooperation and information exchange between states is envisaged to optimise international routes as well.

Main objectives:
- Upgrade and optimise existing services
- Investigation of follow-up technologies

Duration: 09/2008 – 07/2009

Financing sources: Co-funded by EC (CONNECT Phase III)

Stakeholders involved/Roles: ASFINAG, ORF

Technology used:
- A Concept for a DVB-H-pilot
### Improved DVB-S

| Status and main results: | Finalised; |

#### Activity/project name: Interfacing cities (Project VEMA)

| Description: | Defining how traffic data needed for the proposed dynamic and intermodal traffic management of the Vienna Region can jointly be administrated, utilised and summarised into a common data sharing. |
| Main objectives: | Strengthen the cooperation concerning traffic management in the area of Vienna/Eastern Lower Austrian region as a base for coordinated traffic management and control measures. |
| Duration: | |
| Financing sources: | Co-funded by EC (CONNECT Phase I & II) |
| Stakeholders involved/Roles: | |
| Technology used: | |
| Status and main results: | Evolved into ITS Vienna Region |

#### Activity/project name: ITS Vienna Region

| Description: | Verkehrsverbund Ostregion (VOR, East Austrian traffic network) was charged with conducting the tasks for the Vienna traffic management. For that purpose the project organisation “ITS Vienna Region” was established within VOR |
| Main objectives: | Establishing a pool of dynamic and intermodal traffic information data for the area of Vienna, Lower Austria and Burgenland |
| Duration: | |
| Financing sources: | Co-funded by EC (CONNECT Phase I - III) |
| Stakeholders involved/Roles: | ÖBB, ORF, Wiener Linien, ASFINAG, Vienna, Lower Austria and Burgenland |
| Technology used: | |
| Status and main results: | Finalised; ITS Vienna region is now a permanent division of VOR |

#### Activity/project name: Verkehrsauskunft Österreich

| Description: | The mission of VAO is to create a collaborative information service for all of Austria with consistently high quality that covers all means of transport (cyclists, pedestrians, public transport, motor vehicles, Park&Ride). |
| Main objectives: | - More coherent supply, not only covering small sections of mobility  
- Equally high quality of all services; thus access to a collaborative database in order to prevent inconsistent recommendations is necessary |
### Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries

<table>
<thead>
<tr>
<th><strong>Duration:</strong></th>
<th>01/04/2011 – 31/03/2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financing sources:</strong></td>
<td>Co-funded by KLI.EN (Climate and Energy Funds)</td>
</tr>
</tbody>
</table>
| **Stakeholders involved/Roles:** | - ASFINAG  
- Austrian States  
- CNS GmbH  
- ÖAMTC  
- Traffic information centre of the Austrian Broadcasting Corporation ORF  
- Co-operations collective of the Austrian public transport providers (Kooperationsgemeinschaft der österreichischen Verkehrsverbünde, KGÖVV)  
- ITS Vienna Region  
- Federal Ministry of Internal Affairs (Supporter)  
- Austro Control (Supporter)  
- ÖAR (Supporter)  
- AustriaTech (Trusted 3rd Party) |

**Technology used:**

**Status and main results:** Ongoing

---

### Activity/project name: Graphenintegrationsplattform – GIP (Graph Integration Platform)

| **Description:** | GIP is the missing link between public authorities systems and transport infrastructure: the common "official" reference graph to which all administrative units can now relate and link up to. GIP covers all modes of transport and is capable of proposing intermodal combinations. The platform is continuously updated by eGovernment processes. |
| **Main objectives:** | GIP offers an overview of the entire transport infrastructure to public administration and authorities by furnishing all the essential information in a nutshell. Parallel data storage systems are therefore no longer required. |
| **Duration:** |  |
| **Financing sources:** | Co-funded by KLI.EN (Climate and Energy Funds) |
| **Stakeholders involved/Roles:** | - ASFINAG  
- Austrian States  
- BMVIT  
- ITS Vienna Region  
- ÖBB  
- Austrian Association of Cities and Towns (associated partner) |

**Technology used:**

**Status and main results:**
Activity/project name: ASFINAG test centre

**Description:** The ASFINAG test centre checks conformity of new products before they are used in specific projects and it works on standardisation of components which are used on the ASFINAG infrastructure.

**Main objectives:**
- Product specification
- Product inspection
- Increasing the quality of technical products used on ASFINAG infrastructure

**Duration:** 2005 –

**Financing sources:**

**Stakeholders involved/Roles:** ASFINAG

**Technology used:**

**Status and main results:**

6.2.2. Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations

Activity/project name: Maintenance Decision Support System (MDSS)

**Description:** By realising the various systems and services a complex landscape with various interfaces has been set up. In accordance, the responsibilities for the technical operation reach far beyond the operational area of a conventional road operator. It was necessary to set up an integrated infrastructure monitoring system comprising all relevant internal and external organisations.

**Main objectives:**
- Centralised monitoring of operating states (including all connected infrastructure)
- Visualisation of the different systems
- Historical visualisation of measurements
- Alarm feature for critical values
- Message generation in case of failure, automatic notification of contractor, supervision of execution
- Monitoring of system quality as well as contractual situation
- Maintenance-planning system, based on standardised maintenance-schedules, considering personal and technical resources
- Modular set-up

**Duration:** 01/2007 – 08/2009

**Financing sources:** Co-funded by EC (CONNECT Phase III, modification in the course of EasyWay I)

**Stakeholders involved/Roles:** ASFINAG
<table>
<thead>
<tr>
<th>Technology used:</th>
<th>Status and main results:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Finalised</td>
</tr>
</tbody>
</table>

### Activity/project name: ITS activities during the UEFA EURO 2008

**Description:** Managing and analysing inbound and outbound traffic as well as streams of visitors during the UEFA EURO 2008 in Austria and Switzerland

**Main objectives:**
- Guidance of visitors
- Supporting traffic guidance with a control centre that offers an integrated picture of the current situation near the venue
- Provision of an intermodal real-time traffic data foundation
- Detection of trends and critical situations, followed by recommendations for action
- Gather the mobility behaviour of about 5% of the visitors

**Duration:** December 2006 - October 2008

**Financing sources:** Co-funded by EC (CONNECT Phase I – III)

**Stakeholders involved/Roles:**
- BMVIT
- Austrian States
- ASFINAG
- ÖBB
- ÖAMTC
- ORF
- UEFA

**Technology used:**

<table>
<thead>
<tr>
<th>Status and main results:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalised; The results of the study constituted a main factor for the decision to expand the scope for transportation planning in Klagenfurt. The study clearly demonstrated the need for adjustments in initial concepts.</td>
</tr>
</tbody>
</table>

### Activity/project name: Safe parking spaces for trucks and other commercial vehicles

**Description:** During 2010 a pilot implementation has been set up by ASFINAG to inform truck drivers on the occupancy of 10 truck parking areas in the greater Vienna region.

**Main objectives:** Providing truck drivers and logistics company dispatchers with information about free and safe truck parking areas

**Duration:**

**Financing sources:** Co-funded by EC (EasyWay II)

**Stakeholders involved/Roles:** ASFINAG

**Technology used:** CCTV, VMS, Smartphone Apps/Mobile Web Clients

<table>
<thead>
<tr>
<th>Status and main results:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing; Improvements and enlargement</td>
</tr>
</tbody>
</table>
6.2.3. **Priority area: road safety and security**

**Activity/project name: Construction Site Management (CMS)**

| Description: | Construction measures inevitably impact the flow of traffic. In order to keep such disruption to a minimum, ASFINAG has developed clear parameters for what is tolerable for customers and these are taken into account during planning. They include the number of major construction sites on defined road sections, the maximum tolerable loss of time due to construction activities and the duration of construction activities. |
| Main objectives: | Minimising traffic obstruction caused by construction sites |
| Duration: | |
| Financing sources: | Co-funded by EC (CONNECT Phase I – III) |
| Stakeholders involved/ Roles: | ASFINAG |
| Technology used: | |
| Status and main results: | |

**Activity/project name: Road Weather Information System**

| Description: | A weather information tool for Austrian roads, accessible on the ASFINAG website |
| Main objectives: | |
| Duration: | |
| Financing sources: | Co-funded by EC (CONNECT Phase II) |
| Stakeholders involved/ Roles: | ASFINAG, Austro Control |
| Technology used: | |
| Status and main results: | Finalised; Road users can be better informed about icy conditions, fog, snow drifts etc. and the motorway operator can optimise the disposal of its service and maintenance vehicles. Furthermore knowledge generated in aviation is disseminated. |

**Activity/project name: Section Control**

| Description: | In terms of road safety, ASFINAG decided to survey speed limits on certain motorway sections via Section Control. Especially on potentially dangerous road sections speeding is a frequent cause for serious accidents. Speed limit enforcement via Section Control is much more effective and reliable than enforcement with radar devices since these are only capable of punctual speed measuring. |
| Main objectives: | |
| Duration: | |
| Financing sources: | |
| Stakeholders involved/ Roles: | |
| Technology used: | |
| Status and main results: | |
## Main objectives:
- Harmonise vehicle speeds
- Increase road safety, especially on sections with frequent accidents
- Effective and sustainable enforcement of speed limits

### Duration:
Since 2003

### Financing sources:
Co-funded by EC (CONNECT Phase III)

### Stakeholders involved/Roles:
ASFINAG

### Technology used:
Cameras with license plate recognition

### Status and main results:
Ongoing:
Section control harmonises vehicle speeds and increases traffic safety. On all sections controlled, accidents have diminished in amount and severity. Since its implementing, the average speed of cars has decreased by 10km/h and of trucks by 15 km/h.

---

### Activity/project name: Verkehrsbeeinflussungsanlagen (VBA, Traffic Control System)

#### Description:
- Harmonise traffic at heavily frequented junctions
- Enhancing infrastructure capabilities
- Comprehensive traffic data capture
- Optimal information about alternative routes
- Multilingual information
- Speed limits and lane closing in case of an incident

#### Duration:
Since 2006

#### Financing sources:
Co-funded by EC (CONNECT Phase I – III)

#### Stakeholders involved/Roles:
ASFINAG

#### Technology used:
Road and weather sensors, inductive loops

#### Status and main results:
Ongoing:
500 devices already in use on about 19% of the ASFINAG road network

---

### Activity/project name: eCall in Austria

#### Description:
All over Europe more than 40,000 people are killed in road accidents every year. Up to 2,500 of them could be saved, if help would be called in time. For Austria this would mean 50 saved people per year. With an electronic on-board unit, which transmits an automatic message to an emergency centre, this aim should be achieved within the next few years.

#### Main objectives:
Saving lives of road accident victims by improving the rescue chain

#### Duration:
06/2006 – 08/2006

#### Financing sources:
Stakeholders involved/Roles:
- AI
- BMVIT
- Dolphin Technologies
- ÖAMTC

Technology used:
GPS, vehicle sensors, GSM/SMS

Status and main results:
Finalised;

6.2.4. **Priority area: integration of the vehicle into the transport infrastructure**

Activity/project name: Cooperative Systems in Austria (COOPERS)

**Description:**
COOPERS provides vehicles and drivers with real time local situation based information and safety related traffic and infrastructure status information, distributed via dedicated Infrastructure to Vehicle Communication link (I2V)

**Main objectives:**
Defining, developing and testing new safety related services and equipment and applications using two-way-communication between road infrastructure and vehicles from a traffic management perspective.

**Duration:**
01/2006 – 02/2010

**Financing sources:**
Co-funded by EC (6th Framework Programme)

Stakeholders involved/Roles:
APPLUS, ARS, Ascom, Asfinag, AustriaTech, Autostrada del Brennero, BMW, Dornier Consulting, Efkon, Efkon Mobility, Ernst & Young, FAV, Fraunhofer Gesellschaft, GEWI, HiTec Marketing, ICI, INESC, JAST, KTH, Kybertec, Lucent Technologies, Navteq, Bayerisches Staatsministerium des Inneren, ORF, Philips, Politechnika Lodzka, PWP Systems, Seibersdorf Research, S&T, Swarco, TeamNet, Technical University of Crete, TransVer, TRG, Vienna University of Technology, Vega, VTI

**Technology used:**
GSM/UMTS, DAB, Infrared, WiMAX

**Status and main results:**
- Cooperative Systems offer drivers more accurate traffic information that relates more specifically to the local driving conditions.
- The test drivers reacted positive to the system throughout, considering it useful and easy to handle. The feedback on the improved road safety and information regarding road conditions was particularly positive.
- The reactions of test drivers to incidents were better using COOPERS than without it. This could be observed with all test drivers and not only with those who had been
very positive about the system.

Activity/project name: Testfeld Telematik (telematics testing field)

| Description: | Testing how Cooperative Systems have to be designed and employed to be able to contribute to more safety, efficiency and environmentally friendly mobility in the road network in the best possible way. |
| Main objectives: | Making traffic  
- safer  
- more efficient  
- more environmentally friendly  
- securing Austria’s spearheading market position in ITS |
| Duration: | 03/2011 – 06/2013 |
| Financing sources: | Co-funded by KLI.EN (Climate and Energy Funds) |
| Stakeholders involved/Roles: | ASFINAG, AustriaTech, Fluidtime, Kapsch TrafficCom, Siemens, Efkon, Swarco, Bayrische Medientechnik, HiTec Marketing, ITS Vienna Region, Audio Mobil, TomTom |
| Technology used: | C2C and C2I communication  
Informing users via  
- Smartphone app  
- Satnav  
- Vehicle-integrated solutions |
| Status and main results: | Ongoing |

6.2.5. Priority area: European ITS cooperation and coordination

Activity/project name: Traffic management plans

| Description: | Developing strategies for traffic control commonly agreed upon by all stakeholders to coordinate management of predefined (frequently) occurring problems like restoration works, congestion, traffic jams and accidents |
| Main objectives: |  
- Standardisation of data  
- Data exchange  
- Data processing |
| Duration: | |
| Financing sources: | Co-funded by EC (CONNECT Phase I – III) |
| Stakeholders involved/Roles: |  
- Austrian State Road Operator - ASFINAG (AT)  
- Road and Motorway Directorate (CZ)  
- Hungarian Roads Company – MK (HU)  
- Ministry of Economy and Transport – GKM (HU) |
<table>
<thead>
<tr>
<th>Technology used:</th>
<th>Variable Message Signs,</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Motorway Management Company Ltd. – ÁAK (HU)</td>
<td></td>
</tr>
<tr>
<td>SINA (IT)</td>
<td></td>
</tr>
<tr>
<td>GDDKiA with the Road and Bridge Research Institute, technical university and research institutes (PL)</td>
<td></td>
</tr>
<tr>
<td>DARS d.d. (SLO)</td>
<td></td>
</tr>
<tr>
<td>Ministry of Transport Slovenia (SLO)</td>
<td></td>
</tr>
</tbody>
</table>

**Status and main results:**

ASFINAG implemented a trend-setting national Traffic Management and Information System for the Austrian motorway network. This system is based on area wide traffic detection on the entire Austrian high level road network, three different types of Traffic Control Units and a centralised Traffic Management and Information Centre, located in Vienna-Inzersdorf as the heart of the system. In addition, Traffic Management Plans (TMPs) for the Brenner- and Tauern-corridor (western regions of Austria) were established in cooperation with Bavaria, Italy and Switzerland.

**Activity/project name:** Smartphone app „Unterwegs“

**Description:**
A smartphone app that informs users about current conditions on Austrian motorways. With “Unterwegs“, users can access nearly 400 ASFINAG webcams, contact the ASFINAG service centre and give feedback about current driving conditions.

**Main objectives:**
- Providing:
  - Real-time information on traffic conditions
  - A possibility to directly contact the ASFINAG service centre
  - A possibility for users to give feedback about traffic conditions

**Duration:**

**Financing sources:** Co-funded by EC (EasyWay II)

**Stakeholders involved/ Roles:** ASFINAG, ÖAMTC

**Technology used:** Webcams, GSM/UMTS, GPS (for optional location based services)

**Status and main results:** Ongoing;

**Activity/project name:** Intermodal route planner AnachB.at

**Description:**
Providing dynamic information about traffic conditions and an intermodal routing service for all three federal states of the Vienna Region, including a routing service for cyclists and Park&Ride information. AnachB.at is available online and for iPhone
Main objectives:  
- Permanently updated  
- For all traffic modes (also combinations of different modes)  
- With realistic travel time  
- Publicly available for free  
- For the entire Vienna Region

Duration: Since 2009

Financing sources: Co-funded by EC (EasyWay I)

Stakeholders involved/Roles: ITS Vienna Region, ASFINAG, ÖBB, Ö3, Wiener Linien, the Austrian states of Vienna, Lower Austria and Burgenland

Technology used:

Status and main results: Ongoing;

Activity/project name: Noise and pollution driven traffic management in Austria

Description: For a better control and overview about the traffic situation and surveillance of noxious and emission values, ASFINAG put Traffic Control Units into operation. This was the basis for noise- and pollution-related activities in the course of EasyWay. The tempo limits displayed on these gantries are based on continuous measurement of pollution relevant attributes.

Main objectives: Reducing the speed in the concerned areas (Brenner corridor in Tyrol and the area around Graz) and consequently emissions, pollution and noise.

Duration: Since 2004

Financing sources: Co-funded by EC (EasyWay I)

Stakeholders involved/Roles: ASFINAG

Technology used: Various sensors to capture environmental data (temperature, air humidity, rain intensity, visibility conditions, etc.) as well as road data (water coat, salt, street temperature, vehicle speeds, etc.), gantries for displaying.

Status and main results: Ongoing;

6.3. Bulgaria

6.3.1. Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations

Activity/project name: “Modernization and development of sustainable urban public transport in Plovdiv Municipality”
**Activity/project name:** “Integrated public transport in Varna Municipality”

**Description:** This project includes design, delivery and installation of equipment for system, providing priority to mass urban public transport vehicles at all traffic light controlled intersections on the BRT (Bus Rapid Transit) corridor, using automated traffic lights control.

**Main objectives:**
- provides priority of the mass urban public transport vehicles
- 27 traffic light controlled intersections coverage

**Duration:** 07.2012 г.

**Financing sources:** EFRD ==> Operational programme "Regional development"

**Stakeholders involved/Roles:** Varna Municipality

**Technology used:**

**Status and main results:** Ongoing

---

**Activity/project name:** “Integrated public transport in Burgas Municipality”

**Description:**
1. Introduction of rapid bus transport, central bus station and traffic light priority system for buses
2. Associated system for public transport management
3. Video surveillance System (CCTV)

**Main objectives:**
- 16 intersections along the BRT corridor equipped with controllers
- providing priority to the public transport
- 4 intersections along the route feeding the BRT equipped with controllers

---

**Description:** Traffic lights and traffic lights control

**Main objectives:**
- traffic management centre implementation, controlling area of 42 intersections and 8 pedestrian crossings
- traffic detectors and CCTV surveillance cameras provide monitoring
- 19 of the intersections enabled with the function to give priority to the public transport

**Duration:** 07.2012 г.

**Financing sources:** EFRD ==> Operational programme "Regional development"

**Stakeholders involved/Roles:** Plovdiv Municipality

**Technology used:**

**Status and main results:** Ongoing
- reduction of waiting time for the buses,
- avoid congestions
- Predictability and shorten travel duration.
- centralized system for traffic management;
- In-vehicle control systems;
- Integration of all modules, taking part in the control and management of the public transport
- video surveillance system on major intersections
- additional options to manage public transport
- 40 CCTV cameras on major intersections of public transport lines
- Integrated central control system

| Duration: | 07.2012г. |
| Financing sources: | EFRD ==> Operational programme "Regional development" |
| Stakeholders involved/Roles: | Burgas Municipality |
| Technology used: | |
| Status and main results: | Ongoing |

Activity/project name: “Integrated system for public transport in Ruse Municipality”

| Description: | System for public transport management and control and electronic information boards, based on GPS |
| Main objectives: | • System for vehicle positioning – equipment of all vehicles with on-board computers with GPS and system for next stop visual and voice notification;
  • Central system for real-time information and traffic management;
  • Surveillance video system on intersections;
  • Passenger information system;
  • passenger notification for next vehicle arrival times through SMS on less used bus stations;
  • public information service for possible routes and public transport lines through web-based application;
  • Electronic Information Boards installation on key public transport stations. |
| Duration: | 07.2012г. |
| Financing sources: | EFRD ==> Operational programme "Regional development" |
| Stakeholders involved/Roles: | Ruse Municipality |
| Technology used: | |
| Status and main results: | Ongoing |
Activity/project name: “Integrated public transport in Pleven Municipality”

<table>
<thead>
<tr>
<th>Description</th>
<th>Intelligent system for traffic management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main objectives:</strong></td>
<td>Equipment on intersections – controllers, traffic lights and motion detectors in real-time;</td>
</tr>
<tr>
<td></td>
<td>Adaptive traffic management implementation separately for each intersection;</td>
</tr>
<tr>
<td></td>
<td>Communication link to the centre for public transport management, allowing feedback;</td>
</tr>
<tr>
<td></td>
<td>Develop a web-based application for processing and analysing the data from the censors and providing the information for the public transport traffic in real time.</td>
</tr>
</tbody>
</table>

| Duration:                      | 07.2012 г. |
| Finishing sources:             | EFRD => Operational programme "Regional development" |
| Stakeholders involved/Roles:  | Pleven Municipality |
| Technology used:               |            |
| Status and main results:       | Ongoing |

6.3.2. **Priority area: road safety and security**

Activity/project name: “Harmonised eCall European Pilot - Phase 2” (HeERO 2)

<table>
<thead>
<tr>
<th>Description</th>
<th>HeERO2 will prepare, carry-out and coordinate pre-deployment pilots for the Pan-European eCall based on 112. This will be undertaken at a European level in accordance with the approved standards.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main objectives:</strong></td>
<td>• to prepare the necessary infrastructure to realize interoperability of &quot;eCall&quot; at European level</td>
</tr>
<tr>
<td></td>
<td>• to boost Member States investment in the PSAP infrastructure and interoperability of the service within the roadmap (end of 2014)</td>
</tr>
<tr>
<td></td>
<td>• to encourage a wider adoption across more Member States</td>
</tr>
</tbody>
</table>

| Finishing sources:             | Co-funded by EC (CIP) |
| Stakeholders involved/Roles:  | Ministry of Interior of the Republic of Bulgaria, Bulgarian Association Intelligent Transport Systems Sdruženje (ITS Bulgaria), Icom OOD, Enterprise Communications Group OOD, Technical University of Sofia, Mobitel EAD |
| Technology used:               |            |
| Status and main results:       | Ongoing |
6.4. **Croatia**

6.4.1. **Priority area: optimal use of road, traffic and travel data**

Activity/project name: CIVITAS ELAN - Public transport priority and traveller information

**Description:**

The CIVITAS-ELAN Project is the result of an intensive cooperation and exchange process during which the cities of Ljubljana, Gent, Zagreb, Brno, and Porto agreed to respond in a pro-active way to the substantial mobility challenges in European cities. Project partners developed a highly integrated work plan with several common measures and a range of other cooperation and exchange arrangements. The starting point for the CIVITAS-ELAN project was to “put citizens first”.

In responding to citizens’ needs, 68 measures are implemented within eight CIVITAS ELAN policy fields:

1. Alternative fuels and clean vehicles (15 measures)
2. Collective transport and intermodal integration (10 measures)
3. Demand management (5 measures)
4. Influencing travel behaviour (14 measures)
5. Safety, security, and health (8 measures)
6. Innovative mobility services (4 measures)
7. Energy efficient freight logistics (4 measures)
8. Transport telematics (8 measures)

8.2-ZAG Public transport priority and traveller information was one of main measure in Transport telematics field, Zagreb.

**Main objectives:**

Main objectives are:

1. To increase average speed of public transport vehicles, notably during rush hours;
2. To reach improved mobility for public transport vehicles by giving them traffic light priority at intersections
3. Integrated LED information display panels by tram information (arrival time, delay etc.)
4. LED displays at numerous points within the city, giving information on the availability of spaces in public parking garages.
5. To reach improved mobility for all vehicles in city by creating a system of coordinated traffic lights and „intelligent crossings“ and displaying information on available places in public parking...
<table>
<thead>
<tr>
<th><strong>Garages</strong></th>
</tr>
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<table>
<thead>
<tr>
<th><strong>Duration:</strong></th>
<th>2008-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financing sources:</strong></td>
<td>The European Union and National Founds</td>
</tr>
<tr>
<td><strong>Stakeholders involved/Roles:</strong></td>
<td>City of Zagreb, Faculty of Transport and Traffic Sciences</td>
</tr>
<tr>
<td><strong>Technology used:</strong></td>
<td>Traffic counting, video surveillance and remote control of route flow, regulation of illumination etc.</td>
</tr>
<tr>
<td><strong>Status and main results:</strong></td>
<td>Finalised;</td>
</tr>
</tbody>
</table>

**Main results:**

1. Improvement in tram performance – average tram operation time decreased by 6.46%; the cumulative running time of a tram decreased by 7.3%; tram operating speed increased by 6.9%; the cumulative intersection delay for trams in the whole Savska Street decreased by 17.84% and the intersection delay for trams on Deželićeva intersection was reduced by 84%. This improved flow resulted in a decrease of the average number of vehicles on all intersections in Savska Street by 1.86%. Hence, all quantifiable targets were exceeded with one exception: decrease of number of vehicles by 3% was only partially achieved.

2. LED information display panels – 40 LED information display panels were installed in the corridor.
3 – The share of very satisfied users, by the sub-criterion Are you satisfied with the availability of information on PT stops, is increased from 6.25% in 2009 to 11.44% in 2011.

4 – The number of very satisfied users, by the sub-criterion Are you satisfied with the availability of information about incidents in PT, clearly indicates the positive change (their share is increased from mere 2.67% in 2009 to almost 11% in 2011).

5 – The percentage of very satisfied users with the accuracy of PT vehicles is more than double with the share of 15.21% in 2011.

Activity/project name: Croatian traffic & weather information service (Mobile application)

Description: Croatia Traffic & Weather application through several user module provides information on the current weather and temperature, pressure and humidity, wind speed, etc. Meteorological Bureau source for forecasts. Among other basic information, there are modules for viewing exchange rates, important phone numbers, a
| Main objectives: | Accurate and reliable travel advisor  
- FREE in app messaging  
- LIVE Traffic cameras (HAK)  
- LIVE parking and garage places availability (ELMAS)  
- More than 3000 points of interest updated on daily basis (ATMs, restaurants, bars, airport locations, hospitals etc.)  
- LIVE user traffic reports |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>2008-2010</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>Private</td>
</tr>
</tbody>
</table>
| Stakeholders involved/Roles: | appsCroatia  
HAK (Croatian Car Club) |
| Technology used: | Status and main results: Finalised;  
Main results:  
- Commercial version (Version 3.7) |
| Activity/project name: Standardization of transport data collection and analysis Description: | The project idea was initiated by the current problem of an unsatisfactory quality of data in the field of transport in Republic of Croatia. This statistical area is considered a priority by the Central Bureau of Statistics and the Eurostat for all strategic transport |
The quality of the present data is consistent with the methodology or meaningful data in the EU member states. Blindness, relativity and inconsistency of national data on transport is now a fundamental barrier to the future development of transport in Republic of Croatia. This is particularly the obstacles in financing from the Structural Funds and the Cohesion Fund when Republic of Croatia becomes an EU member. Intelligent transportation system is specially assigned for analysis and implementation.

<table>
<thead>
<tr>
<th>Main objectives:</th>
<th>Establish a reliable and standardized system of transport data collection and analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>
| Financing sources: | Republic of Croatia  
                      | University of Zagreb                                                              |
| Stakeholders involved/Roles: | University of Zagreb  
                               | Faculty of Transport and Traffic Sciences  
                               | Central Bureau of Statistics                                                    |
| Technology used: | On-going                                                                          |
| Status and main results: | On-going                                                                         |

Activity/project name: SPECTRA – City of Rijeka: Integrated Urban Traffic Information System

**Description:**
SPECTRA – City of Rijeka is an umbrella urban traffic information system which integrates all relevant traffic information, allowing the exchange of traffic parameters collected from a variety of specialized transport systems, their central processing for traffic experts and providing high-quality traffic information to all road users. It is possible to combine function modules according to specific customer requirements and build in stages traffic lights crossing. Spectra is an advanced system for graphical representation of actual traffic conditions in real time.
Main objectives: The system facilitates the work of operators in the transport centre. It is based on the use of the Internet or mobile phone in real time. The system provides all the necessary information about the traffic to each participant, such as traffic congestion, free parking, road works etc.

Duration: 2007-2011

Financing sources: City of Rijeka

Stakeholders involved/Roles:

- City of Rijeka
- Rijeka Promet d.o.o.
- Autotrolej, Rijeka

Technology used:

Status and main results: Finalised

Main results:
Real-time (7/24) information availability of:
- Roads traffic load conditions,
- Incidents - congestion, delays, accidents,
- Garages and parking lots – availability,
- Video cameras to monitor traffic,
- Weather conditions,
- Other service Information.

6.4.2. Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations

Activity/project name: Croatian Highways Control and Information Systems

Description: The tunnels on freeways in Croatia were equipped with SOS niches, adequate LED Variable signalization, measurement devices, video
surveillance inside the tunnel and on tunnel approaches, automatic incident detection and traffic counting and classifying equipment. The main tunnel control centres are equipped with topXview™ Complete ITS Platform software. The main control centres contain one large video wall that enables fast overview of traffic situation in tunnels. The control centres implement full topXview™ functionality including safety procedures according to scenarios allowed by Croatian Highways. Selected projects – Tunnel Mala Kapela – first long tunnel with complete implementation of automated safety and other procedures and algorithms Tunnel Brinje- awarded the safest tunnel in Europe by EuroTAP (European Tunnel Assessment Programme) in 2007, Tunnel Veliki Gložac – judged equal best tunnel in Europe by EuroTAP (European Tunnel Assessment Programme) in 2008. Implementation of National Level Traffic Counting System providing real time all around country traffic density information to selected group of diverse users.

Main objectives: The following surveillance, control and traffic management systems is installed alongside the highway:

1. Video Surveillance Systems
   - Emergency Roadside Telephone System
   - Traffic Signalling System
   - Data Transmission System
   - Over-Height Vehicle Detection System
   - Automatic Vehicle Counter / Classifying Systems
   - Weigh in Motion – Overloaded Vehicle Detection Systems
   - Road Weather Information Systems

The following systems are usually installed in tunnels over few hundred meters long:

|---|---|---|---|---|---|---|---|---|---|---|---|

**Duration:** 2005-2011

**Financing sources:** Croatian Motorways, Ltd

**Stakeholders involved/Roles:**
- Croatian Motorways, Ltd
- Telegra Ltd.
- Dalekovod Ltd

**Technology used:**
- Traffic Control and Management Systems, including variable signalization and traffic detection/counting
- topXview™ - Complete ITS software platform
- Video Surveillance and Automatic Incident Detection Systems
- Fire Detection and Fire Alarm Systems
- Automatic Vehicle Counter / Classifying Systems
- Data Communication Network
- Road Weather Information Systems

**Status and Finalised**
main results:

1. A6 HIGHWAY, RIJEKA - ZAGREB (ARZ), SECTION KIKOVICA - OŠTROVICA - VRATA – DELNICE – KUPJAK - STARA SUŠICA

2. A4 HIGHWAY, SECTION IVANJA REKA – GORIČAN

3. A1 HIGHWAY, TUNNEL MALA KAPELA

4. A1 HIGHWAY, TUNNEL SVETI ROK

5. A5 HIGHWAY, SECTION ĐAKOVO – SREDANCI

6. A3 HIGHWAY, SECTION BREGANA - ZAGREB – LIPOVAC

7. A1 HIGHWAY, SECTION DUGOPOLJE - BISKO – ŠESTANOVAC

8. A2 HIGHWAY, SECTION ZAGREB – MACELJ

9. A3 HIGHWAY, SECTION IVANJA REKA - VELIKA KOPANICA
**Activity/project name:** Croatian Electronic Toll Collection Systems (ENC)

| **Description:** | Major operator of highway in Croatia is HAC. HAC is the leading company in Croatia when it comes to novel implementation of HETC (Highway ETC). Bilateral interoperability agreement for RFID payment media is signed between ARZ and HAC. The rest of operators are still to join the initiative. Regardless of the fact that both operators are using DSRC microwave at 5.8 GHz OBU, as standardized by the Comité Européen de Normalisation the interoperability is not guaranteed since the application level is different. |
| **Main objectives:** | Taking into account specific situation in Croatia, mixed toll collection system is used. There are four operators of tolled roads in Croatia: Hrvatske autoceste d.o.o. (HAC), Autocesta Rijeka-Zagreb d.o.o. (ARZ), Autocesta Zagreb-Macelj d.d. (AZM) and Bina-Istra, d.d. (BI). HTCS (Highway toll collection system) is different for each operator. In HAC and ARZ HETC system the application level is realized in TIS and PISTA standards. Both standards are supported in European CESARE/CARDME/PISTA standardization procedure since they are already widely use by numerous European highway operators. Data structure at the application level in different standards is not unified. Every operator can read data that other operator created, on the physical level, but it does not understand it. Interoperability is reached by signed interoperability agreements in which operators exchange data structure and data meaning. Each operator reads data on the physical level. If the data is in other operator format it is translated from the external data structure and data meaning to internal data structure and data meaning according to the interoperability Agreement. Currently, ARZ and HAC have defined set of business rules to support roaming of the ETC users. User is allowed to go if it is found on the common authorized users list. The absence of national standards with the development and implementation of toll collection systems resulted in the fact that the built-in systems with the concessionaries in the Republic of Croatia are not compatible enough. In order to increase efficiency and secure total interoperability of built-in toll collection systems, it is necessary to establish within the local, regional, and European frames, a national coordination body in order to enable achieving necessary technical and organizational structure |
necessary for future information connected with foreign concessionaries.

**Duration:** 2005.-2008.

**Financing sources:** Own Concessioners Fund

**Stakeholders involved/Roles:** HAC, ARZ

**Technology used:** DSRC microwave at 5.8 GHz OBU

**Status and main results:** Finalised

Main results:
In the 2006 HAC Ltd and ARZ Ltd introduced Electronic Toll Collection System for passenger vehicles. From the 2007 HAC Ltd introduced Electronic Toll Collection System for trucks (3. and 4. vehicle category).
In 2010 BINA Istra Ltd has introduced the possibility of paying via Electronic Toll Collection System, also.
All three systems are interoperable.

Activity/project name: Main operative and communication Centre in Republic of Croatia

**Description:** Many systems of traffic management by sectors highways were built during the building highway in the Republic of Croatia. For a long time there is a need for integrated multi-level governance. This project proposes the Main operative and communication Centre at the national level.
| Main objectives: | The objectives of Main operative and communication Centre (MOCC) in Republic of Croatia is:  
- The collection, processing, analysis and storage of data relevant to the process of road traffic on the national level;  
- The exchange of information relevant to the process of road traffic on the interstate level;  
- Centre services which directly or indirectly affect the process of road transport at the national level;  
- Database, processing and exchanging data with ITS services at the national level.  
- Database, processing and exchanging data with ITS services at international level  
- Main operative and communication Centre has to be a service to all users of highways and state roads in Croatia, and its work is organized at the national level. |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>2011-2014</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>Croatian Motorways, Ltd (HAC)</td>
</tr>
</tbody>
</table>
| Stakeholders involved/Roles: | Ministry of Maritime Affairs, Transport and Infrastructure Republic of Croatia  
Croatian Motorways, Ltd |
| Technology used: |  |
| Status and main results: | On-going |
6.4.3. **Priority area: road safety and security**

**Activity/project name:** Harmonised ecall European pilots project (HeERO)

<table>
<thead>
<tr>
<th>Description:</th>
<th>HeERO is an international pilot project preparing the general roll-out of the EU-wide seamless eCall service. In running national and cross-border pilot projects, HeERO will prove that eCall is operational and ready for becoming a reality for all European citizens. HeERO's consortium includes 8 EU Member States (Czech Republic, Finland, Germany, Greece, Italy, the Netherlands, Romania and Sweden) and Croatia. In cooperation with Croatia, Finland and Romania, the Russian Federation will demonstrate in cross-border trials that eCall and its ERA-GLONASS emergency call service can interplay without any friction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main objectives:</td>
<td>The overall objective of HeERO is to prepare the deployment in Europe of the necessary infrastructure for making the pan-European in-vehicle emergency call service &quot;eCall&quot; a reality. eCall is based on the single European Emergency number 112, and will work seamlessly across the EU and beyond.</td>
</tr>
<tr>
<td>Duration:</td>
<td>January 2011 - December 2013.</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>The European Union will provide 5 million Euro to the project's overall budget of 10 million Euro.</td>
</tr>
</tbody>
</table>
### Stakeholders involved/Roles:
The HeERO pilot includes national and international pilot projects involving Croatia, the Czech Republic, Finland, Germany, Greece, Italy, The Netherlands, Romania and Sweden. The project also includes cross-border testing activities with the Russian ERA-GLONASS system. More than 100 eCall equipped vehicles will travel within the different participating EU Member and other States as well as cross border. Other Member States and interested parties are welcome to follow HeERO’s activities. HeERO will work in close liaison with the European eCall Implementation Platform (EeIP), which is also open for new participants.

### Technology used:
eCall is an emergency call triggered either manually by vehicle occupants or automatically as soon as sensors embedded in the vehicle detect the impact of a serious accident. When activated, eCall establishes a voice connection with the relevant PSAP (Public Safety Answering Point). The PSAP is a public or private emergency call centre operating under public delegation. Using the voice line, a Minimum Set of Data (MSD) is sent to the PSAP operator. The most important single data in the set is the accurate geo-location of the accident scene. Knowing the coordinates of the crash site enables the rescue services to arrive much faster there and to treat the victims much more quickly. Time saved thus translates into lives saved and less severe injuries.

The pilot will start with a state analysis of the eCall value chain to system implementation requirements and necessary infrastructure upgrades will be on the in-vehicle system interface, the telecommunication infrastructure (specifically 112/E112 related parts) and the PSAP equipment. Based on the results of this analysis, implementation plan will be prepared for each participating country to guide implementation and testing. Similarly training manuals and emergency procedures will be prepared for the handling of eCalls.

The pilots’ trials will be run under real-life conditions and aim at testing the implemented components. The goal is to assess all systems required for the end-to-end operation of the pan-European eCall. Tests results will be evaluated and deployment enablers/barriers identified. These overall results of the pilot will be included in the final recommendations for eCall deployment in Europe and made available to interested third parties.

### Status and main results:
Ongoing;
Main results:
HeERO will deliver a set of eCall implementation recommendations, best practices and guidelines to be used by participating countries for their national development of the eCall service. These documents will be made available to all European countries interested in eCall implementation. The goal is to have the infrastructure prepared and ready for use, and all involved organizations to know what to do and how to do it, when vehicles will be equipped with EU-wide eCall functionality. Therefore the most important impact in Europe is the deployment of a sustainable and seamless eCall service across all countries. This will lead to increased road safety as eCall is one of the most promising road safety systems, such as safety belts, Antilock-Braking Systems (ABS) or Electronic Stability Control (ESC) in the past.

HeERO will implement, test and assess eCall standards defined and approved by the European Standardisation Organization namely ETSI MSG and CEN TC 278 WG 15.

Activity/project name: Development methodology of integrated adaptive transport-logistic systems

**Description:** Efficient and effective development of integrated intelligent transport-logistics systems (ITLS) require coupling of different domains of knowledge, methods and tools which can operate with smart ITLS structures and processes in real-time. The main problem in end-to-end transport service and transport chains realisation is on the interface between separated and different physical, logical and organisation systems i.e. when the transport modes or the network operator is changed. Classical analytical and
numerical methods of "hard" optimization are not suitable for transport-logistics problem with real-time data collecting.

| Main objectives: | Methodological experiences from development of air traffic control, traffic and travel management, emergency management, demonstrate need for upgrading methodological approach and tools for intelligent adaptive transport-logistics networks development. Basic change is shift away from fragmented and static observing to higher levels of cooperation and service coordination with elimination of mode changing barriers, change of operators, cross boarders etc. In the first phase of the ITS development the focus is on the ITS technology development and preliminary architecture design focused on road traffic and transport but in the future it is necessary to generate ITS knowledge and adapted methods oriented to end user service, safety and security. New concept of Incident Management System for Road Tunnels is proposed. The system was tested in real environment. |
| **Duration:** | 2007-2012 |
| **Financing sources:** | Ministry of Science, Education and Sport Republic of Croatia |
| **Stakeholders involved/Roles:** | Ministry of Science, Education and Sport Republic of Croatia  
Faculty of Transport and Traffic Sciences  
Croatian Road Industry |
| **Technology used:** | Finalised; |
| **Status and main results:** | 1. Ontology approach for ITS application  
2. The use of modern mobile telecom technologies such as Cell Broadcast system messaging in ITS application.  
3. New concept of Incident Management System for Road Tunnels |

Activity/project name: VISTA - Computer Vision Innovations for Safe Traffic

| Description: | The action aims to unlock and strengthen the technology transfer and commercialization capacities at two partner HEIs in the field of computer vision applications for automotive industry sector in Croatia. The main objective is successful and effective transfer of academic innovations in this field towards the associated organisations from the industry. The action includes selected research and networking activities that together aim at boosting the interaction between the academia and the industry, in concordance with the objectives and priorities of the call for proposals. |
### Main objectives:

**Overall objectives:**

1. Strengthening of technology transfer and commercialization capacities of partner HEIs.
2. Transfer of existing computer vision applications from HEIs to SMEs in the automotive industry sector.
3. Developing new traffic- and transport-related computer vision applications with commercial potential in collaboration with SMEs in the automotive industry sector.

**Specific objectives:**

1. Conducting specific R&D activities towards commercialization of specific innovative computer vision applications.
2. Networking of HEIs and SMEs in Croatian automotive industry sector to improve the SME access to high-tech knowledge, stimulate the commercialization of existing innovations developed at HEIs, and foster the conception of future joint R&D projects

### Duration:

2012-2015
<table>
<thead>
<tr>
<th>Financing sources:</th>
<th>IPA HR Component IIIc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>University of Zagreb Faculty of Electrical Engineering and Computing University of Zagreb Faculty of Transport and Traffic Sciences Croatian Automotive Industry</td>
</tr>
<tr>
<td>Technology used:</td>
<td></td>
</tr>
<tr>
<td>Status and main results:</td>
<td>On-going Main results:</td>
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<tr>
<td></td>
<td>Driver assistance systems for:</td>
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<tr>
<td></td>
<td>- surround view parking visualization,</td>
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<td></td>
<td>- traffic sign detection and recognition,</td>
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<td>- lane detection and recognition,</td>
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<td>- lane departure and collision warning,</td>
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<td></td>
<td>- automatic headlight detection,</td>
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<td></td>
<td>- detection of road-side vegetation for traffic infrastructure maintenance,</td>
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<td></td>
<td>- driver mental state recognition.</td>
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</table>

6.4.4. **Priority area: integration of the vehicle into the transport infrastructure**

Activity/project name: Towards Autonomic Road Transport Support Systems (COST Action TU1102)

| Description: | A current, well recognised societal problem is the frequent failure of road transportation networks, resulting from traffic incidents, system overloading and lack of optimised support systems. The aim of this Action is to unite and align groups across Europe from computer science, engineering and transport studies into a world leading research community that will develop new ways of designing Road Transportation Support (RTS) systems based on the ideas of autonomic systems. If used as a platform on which to implement leading edge RTS technologies, such systems have the potential to deliver savings in the cost of system configuration, maintenance, and infrastructure, while potentially improving network efficiency and reducing the chances of human error. Using an autonomic approach to RTS is a novel and very ambitious idea requiring interdisciplinary community building, hence the need for COST, and a European dimension. This Action will bring together disparate strands of research into an integrated discipline, putting Europe at the leading edge of autonomic transportation system development. Additionally it will have the wider benefit of producing a transformative change within the field of autonomic systems itself that will translate to other application areas such as energy management. This Action is unique in that it does not aim to advance the state of |

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the art of RTS technologies, but in the engineering of the technologies themselves using autonomic principles. In this it will not duplicate results from current or ongoing projects, but it will draw on them. This includes road transport research and development programmes at national, European and global level, such as the EU projects EasyWay, E-FRAME, EMOTION, COOPERS and the EU NoE NEARCTIS. Likewise, it will utilise results from EU projects in advanced ICT, and major collaborative efforts such as in Organic Computing and Organic Traffic Control (DFG Special Priority Programme Organic Traffic Control project: http://projects.aifb.kit.edu/effalg/otcqe/otc/index.htm). It will complement and interact with other existing European and National networks and Groups. For instance, it will complement the imminent “ERA-NET road II” programme “Mobility: Getting the most out of Intelligent Infrastructure”. This activity will inform the Action’s members of the challenges faced by National Road Administrations in embracing new techniques to get the most out of the existing road network. While this programme is aimed at improving the implementation of intelligent infrastructure technologies in a relatively evolutionary and short term way, this Action’s aims are longer term and more revolutionary in nature.

Main objectives:

1. assemble and integrate a critical mass of expertise and researchers from academia (transport studies, computer science and engineering) and stakeholders (manufacturers, consultants, suppliers, and transport authorities) with at least 50 members by the end of the Action, forming a research infrastructure within Europe on which to base collaborative research proposals and future research programmes in ARTS, and supported by sustainable community platforms such as workshop series, mail lists, professional network tools, and web sites;

2. identify and classify the specific role of autonomic systems within current applications and research areas within transportation systems, connecting up relevant industry and university research across Europe, and to disseminate to industry and user communities the impact and potential benefit of ARTS;

3. coordinate research and development in determining an understanding of the technical, legal and institutional challenges to be overcome before the full benefits of ARTS can be achieved, and forming the framework from which these problems will be solved;

4. produce a detailed assessment and quantification of the potential benefits of ARTS systems, especially related to its potential for lessening the environmental impact of road traffic while maximising the sustainable aspects of support
Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries

<table>
<thead>
<tr>
<th><strong>Duration:</strong></th>
<th>2011-2015</th>
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<tbody>
<tr>
<td><strong>Financing sources:</strong></td>
<td>HR COST</td>
</tr>
<tr>
<td><strong>Stakeholders involved/Roles:</strong></td>
<td>R&amp;D Institutes, Academia, Traffic technology consultants, Manufacturers, Service providers and suppliers, The end users include transport control centre and facilities operators, with regional traffic control managers and national and EU traffic legislators</td>
</tr>
<tr>
<td><strong>Technology used:</strong></td>
<td>Embedded software support systems such as those in transportation are now so complex that the need for a step change in the way they are engineered is apparent. In addition to aiming for conventional properties such as dependability, future systems need to be embedded with self-managing properties. Technologies and research expertise exists to underpin this step change, but are distributed throughout several disciplines. Launching the network will immediately bring attention to this issue through these disciplines, and forge a new community with the capability to meet this challenge.</td>
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<tr>
<td><strong>Status and main results:</strong></td>
<td>On-going</td>
</tr>
</tbody>
</table>

**Main results:**
The expected, tangible outcomes of the Action will be a sound foundation for ARTS technical infrastructure (common vocabularies, subject area classifications, shared technical platforms, new advanced algorithms, benchmarks etc) which will be produced through network activities such as workshops and short term scientific missions. Thus, the Action is initially aimed at scientific and technological advances, but these are seen as key to the delivery of satisfying economic and societal needs in the future.

**Activity/project name:** Intelligent Cooperative Sensing for improved traffic Efficiency - ISCI

**Description:**
The architecture of the ICT infrastructure for supporting Intelligent Transportation Systems (ITS) is purely hierarchical, with sensed data flowing from the leaves (i.e., road-side or vehicle installed sensors) to the root (i.e., the traffic management centre). The current approach does not scale adequately with the inclusion of a significant number of new elements, is not flexible in supporting an incremental growth or changes of the ITS, and exhibits latency and security issues. In ICSI we tackle all
these issues by proposing a new architecture where the intelligence for sensing and actuation is distributed over some of the elements, called gateways, which host a software platform for running ITS applications, using the local storage and computation capabilities available. Communication with the remote centre happens only for the transmission of aggregated data for long-term operations, e.g., data mining, software upgrades, and logging. The approach proposed in ICSI enables scientific and technological innovations: advanced sensing algorithms will be defined, which make use of real-time availability of data; efficient distribution of context-rich data lays the foundations for novel traffic and travel management strategies. Both directions will be studied in the project. However, research challenges are associated at all levels to the realization of the system, especially for the communication among sensors, gateways, and vehicles, which are fully addressed in the project activities. Prototypes of sensors, road-side units, and communication units suitable for the cooperative operation envisaged in ICSI will be developed and integrated into an end-to-end demonstrator, which will be used in on-field experiments for the use cases of smart urban traffic management and accident recovery in highway.

Main objectives:
The goal of the project is to define a new architecture to enable cooperative sensing in intelligent transportation systems and to develop a reference end-to-end implementation. The project results will enable advanced traffic and travel management strategies, based on reliable and real-time input data. The effectiveness of such new strategies, together with the proposed system, will be assessed in two field trials. The main objectives are:
1. Design of a new architecture for M2M communication and local intelligence implementation in an ITS
2. Development of a reference implementation of the data distribution layer
3. Development of a new class of road sensors with pervasive communication capabilities
4. Adaptation of V2X and backhauling communication technologies to the proposed architecture
5. Definition of novel traffic and travel management strategies leveraging the proposed solution

**Duration:** Nov 2012 – May 2015

**Financing sources:** VII Framework Program, European Commission

**Stakeholders involved/Roles:** Universities, R&D Institutes, Industry, SMEs

**Technology used:**

The architecture will incorporate, in a consistent way, novel techniques that decrease response to events by moving local intelligence into the RSUs, which will be able to coordinate among themselves. The RSU is an essential element in any cooperative ITS system because of its ability to provide bidirectional communication channels (V2I and I2V) between vehicles and traffic control centre, and can act simultaneously as a traffic sensor (collecting data on speed, acceleration and position of vehicles) and as an element of dynamic signalling (transmitting contextual information to vehicles). But it is important to note that the RSU is not only a communication interface between vehicles and control centre, but also incorporates intelligence services and applications, and enables the local implementation of RSU’s own traffic strategies and services cooperative ITS.

The operation of the data distribution architecture will enable the integration of a new class of road-sensors able to measure traffic-related parameters with advanced techniques (e.g., computer vision techniques) not fully exploited by existing sensors. The new sensors will be organized as a pervasive Wireless Sensor Network (WSN), based on the IEEE802.15.4 standard, thus guaranteeing a widespread measure of target parameters. From a network point of view the sensor network will be globally addressable and connected to RSU units by means of integrated IEEE802.15.4 interfaces.

**Status and main results:** On-going
6.4.5. **Priority area: data security and protection, and liability issues**

Activity/project name: Legal regulations in area of information and data security

<table>
<thead>
<tr>
<th>Description:</th>
<th>Legal regulations of the Republic of Croatia in area of information and data security are developed within the process of Croatia’s accession to EU. Under these laws is uniquely defined the term data as a foundation and starting point that defines the information security measures and standards. The most important limiting factors in the systematic implementation of information security measures and standards are financial and human resources. Meeting the prescribed information security measures and standards for the handling of classified information that has high classification requires a considerable amount of financial resources. Also, there is a great emphasis on staff that would carry out its functions under such ITS, because it is also complex and time-consuming to implement security checking process which creates additional financial costs and may cause a time gap between planning and human involvement in implementation (lack of access to classified resources without undergoing safety testing and certification of personnel). Subsequently it can be concluded that the hypothesis “security costs” in most cases is a correct statement.</th>
</tr>
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<tbody>
<tr>
<td>Main objectives:</td>
<td>These legal and normative acts are necessary for a systematic and complete implementation of information security measures and standards in complex systems such as ITS. Quality implementation of prescribed information security measures and standards within the ITS depends on segmenting ITS in the parts that coincide with areas of information security. It ensures the proper sequence framework for the implementation of information security measures and standards for a particular area, with the aim of the systematic arrangement of ITS in terms of creating compliant system.</td>
</tr>
<tr>
<td>Duration:</td>
<td>2006–2008</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>Republic of Croatia</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>Bodies of state administration, The Ministry of Maritime Affairs, Transport and Infrastructure</td>
</tr>
<tr>
<td>Technology used:</td>
<td>-</td>
</tr>
<tr>
<td>Status and main results:</td>
<td>Through this Action, first were implemented legal acts related to information security, namely the Data Secrecy Act (NN, No. 79/07) and the Information Security Act (NN, No. 79/07).</td>
</tr>
</tbody>
</table>
### 6.5. Greece

#### 6.5.1. Priority area: optimal use of road, traffic and travel data

Activity/project name: Mobility Centre of the Kalamaria Municipality (Thessaloniki) with electronic services for the provision of travellers’ information through the Internet and through the Mobility Centre

| **Description:** | The services developed under the project include:  
|                  | • Information on stops, time-schedules and itineraries of the public transport services of OASTH.  
|                  | • Information on stops, time-schedules and itineraries of the municipal public transport service of Kalamaria.  
|                  | • Information on time-schedules and itineraries for KTEL (suburban public transport).  
|                  | • Combined route guidance with means of public transport from address, public transport stop or points of interest.  
|                  | • Information on points of interest via web GIS.  
|                  | • Information on mobility impaired persons’ trips.  
|                  | • Information on ticket prices and ticket selling counters. |

| **Main objectives:** | To provide information services to the citizens of Kalamaria for their daily trips, thus promoting the share of the public transport modes and supporting sustainable mobility. |

| **Duration:** | Project development: 1-1-2009 to 30-6-2011. Service provision and updating is on-going. |

| **Financing sources:** | The Centre was developed under the project “MobiNET – Mobility Centre Network”, which was financed through the Intelligent Energy Europe programme. The project’s total budget amounts to 47,000€ + VAT. |

| **Stakeholders involved/Roles:** | Authorities: Municipality of Kalamaria, Anatoliki SA (Kalamaria’s Development Agency)  
|                                | Content providers: Thessaloniki’s Integrated Transport Authority (THETA), Organization of Public Transportation of Thessaloniki (OASTH), Hellenic Railways Organization (OSE), Organization of Suburban Public Transport (KTEL)  
|                                | Service and technology providers: Centre for Research and Technology Hellas – Hellenic Institute of Transport (CERTH-HIT) |

| **Technology used:** | ArcGIS server, CERTH-HIT routing algorithms |

| **Status and main results:** | The service is currently available for public use both online (www.kemdkalamarias.gr) and at the information kiosk of Kalamarias’ Mobility Centre. |
Activity/project name: H.I.T. PORTAL- Online Portal for Integrated Transportation Data Management and Processing

**Description:**

H.I.T. PORTAL is a web-based, user-oriented data management and service provision system that manages raw and processed data in order to offer the following services: Transport Observatory, transportation and traffic data provision, routing, advanced transportation forecasting and simulation tools, Info-mobility services, and a test bed for new products.

The transport systems included in H.I.T. PORTAL are the National Road, Rail, Maritime, Air and Multimodal Transport Systems and, the Urban Transport Systems of Thessaloniki and Athens-Attica.

The data for the national road transport system include: size and characteristics of the road network; traffic volumes and levels of services provided to the users; sum of vehicles per category; transport related companies in Greece; demand for road transport (passenger-kilometers and ton-kilometres); public transport and accidents and accident impacts. The routing service includes vehicles’, drivers’ and freight routing in urban and suburban environments, including digital network, fleet description, drivers, depots, routing and re-routing of vehicles and estimated travel times.

**Main objectives:**

HIT PORTAL has four goals:

- the creation of critical information content concerning the status of the transport system and operations of all basic transport fields in Greece,
- the dispersal of expert tools to be used by institutions and companies in the transport field,
- the regular monitoring of the national transport system and
- the support of innovation in the field of transport through the provision of state-of-the-art technological infrastructure, operational environment and data.

**Duration:**

From 01/10/2005 to 30/09/2007.

**Financing sources:**

The project was funded under the 3rd Community Support Framework and the Operational Programme “Competitiveness” with a budget of 1.275.039 Euros.

**Stakeholders involved/Roles:**

Centre for Research and Technology Hellas – Hellenic Institute of Transport (CERTH-HIT) (service and technology provider)

**Technology used:**

The H.I.T. PORTAL is installed on hi-tech hardware including Powerful Servers, Distributed Systems, Desktop and Mobile Workstations, Mobile Phones, Palmtops and GPS Receivers. Data and applications are protected with the aid of critical modern network security procedures. The equipment run under the Window and Linux operating systems, with each workstation being dedicated to a specific operational, task, using the relevant set of specialized ICT.
tools to process raw data in order to provide the users with the requested information or specific service.

The H.I.T. PORTAL uses state-of-the-art databases to store and distribute the traffic and transportation data. These databases are organized, depending on the data they manage, either by services function of by type of data and, when required, they interface with other database services such as the GIS server and the Web server.

| Status and main results: | H.I.T. PORTAL is currently available for public use under the URL: http://www.komvos-imet.gr |

Activity/project name: Telematics services for the Organization of Urban Transportation of Thessaloniki (OASTH)

Description:

The project has been implemented through the following sub-projects:

a. Telematics services for public bus tracking and optimum bus circulation management. The service is based on satellite surveillance devices which have been installed on the buses. Using the GPS and GSM technology, information such as the vehicle’s spatial coordinates, speed and global time are sent to a Traffic Operation Centre. All the data are processed by the Operation Centre database.

The collection and processing of the aforementioned data enables the:

− Estimation of the bus arrival times at bus stops
− Changes of the departure times
− Rearranging of the terminals and bus stops locations, as well as modifications of the planned bus schedules
− Addition/removal of itineraries
− Management, design and planning of various itineraries settings
− Calculation of route performance indicators

b. Telematics Passenger Information service. The service includes the display of the next stop through in-vehicle Variable Message Signs (the signs also display various custom-related information, as well as social or other messages) and the Smart Bus Stop displays at 200 bus stops that provide information (via dot-matrix boards) on the arrival time of the next three to ten buses, along with customer announcements.

Web-based passenger information services are provided through www.oasth.gr. The services include trip planning and real time information on arrivals at bus stops

c. Voice announcements in-transit and “smart bus” functions. The audio announcement system is located within the bus and announces the next stop audibly (along with the visually displayed information). The “smart bus” functions are related
to:

- Installation of on-board electronic devices that enable the bus driver to determine the beginning and end time of a particular shift. The application notifies the system administrator when a driver commences and completes his scheduled shift.
- The connection of the ticket validation machines with the telematics device on the bus. All the information and data are transferred wirelessly in real time to the system administrator.
- The connection of the ticket vending machines to the telematics device inside the bus.
- The connection of the telematics device with the on-boards passenger display screen that displays the route of the vehicle.

d. Interactive information services to passengers of the Organization of Urban Transportation of Thessaloniki. The project is related to the implementation of an Interactive Voice Response (IVR) technology that allows the passenger to interact with OASTH’s host information system via speech recognition and DTMF tones input via telephone keypad. The host system responds with pre-recorded audio for directing the user to his selections and for providing the relevant information, namely:
  - The bus arrival time on a requested bus line
  - The bus arrival time on a requested bus stop
  - The route (in terms of bus stops names) of a requested bus line
  - The bus lines that transit a requested bus stop

e. Passenger information services through the use of smart phone technologies. This project is related to the provision of information to passengers in real time through smart phone technologies. The user has access via his mobile phone into a web-site application, from where he can receive information on:
  - Bus routes, where the user can select and preview the time schedule of all bus lines.
  - “How to go where” with the shortest way, where the passenger gets exact information for the bus lines he needs to use in order to get to his destination, but also the exact travel distance.
  - Bus routes maps, where the user can graphically view in a map all the bus stops of a selected bus line.
  - Arrivals of a specific bus route in bus stops.
  - Arrivals of buses in a specific bus stop.
- Bus position in real time.
- Bus lines and stops, where the user can view a list of all available bus lines and bus stops of a specific Municipality of Thessaloniki’s agglomeration.
- Points of interest, where a list with all the points of interest per Municipality and category (health, education, sports, leisure, etc.) is provided, along with their map position.

**Main objectives:**

The main objectives of the project were:
- modernization of the Organization’s operations
- provision of information to passengers
- optimization of the provided services
- increase in the use of Public Transport Modes
- Organization’s incomes increase

These were specified through the following targets:
- Tracking and management of the bus fleet in real time
- Capability of redesigning the provided transport services
- Direct communication with the vehicles
- Collection of historical and statistical data
- Prompt reply to incidents
- Dynamic information services to passengers
- Optimization of the human resources management
- Precision in the recording and processing of data

**Duration:**

a. Sub-project (a) has been in implemented in August 2005.
b. By 2008 the in-vehicle variable message signs have been installed and working properly along with the Smart Bus Stop displays and the web-based tools. The public financing for the specific sub-project was approved in December 2003.
c. The voice announcements in-transit were also available in 2008.
d. The service was launched in December 2010.
e. The service is available from June 2010.

**Financing sources:**

a. Sub-project (a) had a total budget of € 865,452.96 and has been funded in total by OASTH’s own resources.
b. Sub-project (b), of total budget of € 2,520,000, has been funded by the 3rd Community Support Framework of the European Union (75%) and the Public Investment Program (25%). The agreement signed with the contractor company included a total budget of 2,015,000, which enabled OASTH to submit a proposal for extension of the system in 64 public buses and 43 bus stops (of total budget of € 490,271, 10).
c. Sub-project (c) has been funded in total by OASTH’s own resources with a budget of € 639,238.00.
d. The sub-project was funded by OASTH’s own resources.
The sub-project was funded by OASTH’s own resources.

| Stakeholders involved/Roles: | OASTH (funding body, beneficiary)  
LINK Technologies (technology provider) |
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<tr>
<td>Technology used:</td>
<td>SkyLog (GPS receiver, GSM/GPRS modem and TETRA cellular network and radio for vehicle tracking); exandas GIS (Web-based Telematics fleet management application); LED panels (smart bus stops); servers; Vehicle Audio and Visual Announcements.</td>
</tr>
</tbody>
</table>
| Status and main results:    | A questionnaire survey conducted by the Aristotle University of Thessaloniki regarding the evaluation of advanced traveller information system in the city of Thessaloniki* revealed high levels of satisfaction for both the content and the reliability of the provided information. Furthermore, the specific telematics system seemed to generate new trips. “In economic terms annual benefits are twice the investment cost of the system. In financial terms, the system increases patronage by 1.8% or approximately 320,000 new passenger trips, with a total value of 160,000 €. This figure is not enough to cover the investment and maintenance cost of the system, but the main financial benefits come from the reduction of the PT operations costs as a result of the Automatic Vehicle Location system. The system can be fully recovered financially by a fare increase of 5%–10% which will not result in significant patronage decrease” (Politis, Papaioannou, Basbas, & Dimitriadis, 2010). From the operator’s point of view, main benefits are summarized as follows:  
- Better utilization of the IT infrastructure  
- More reliable and accurate calculation of operation indicators  
- Less human resources in the collection of data from field surveys  
- More efficient monitoring and assessment of the transportation services provided  
- Useful information for possible adjustments to the network  
- Useful information about possible changes in the schedules of the bus fleet  
- Information related to the performance of the vehicles  
In regards to the interactive phone line, it is currently working under the phone number: 0030.2310.981.100. The information service through the use of smart phone technologies is provided through m.oasth.gr. |
| Relevant links and references | OASTH’s official website: www.oasth.gr  
http://www.oasth.gr/service/phonetelematics.php  
m.oasth.gr |
Activity/project name: Thessaloniki Ring Road Traveller Information System

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th>The project is related to the implementation of an Intelligent Transport System for the real time information of the users of the Thessaloniki’s Ring Road through VMSs installed in selected points within the road axis, as well through the internet (access through PC or mobile phone application). The provided information includes real time traffic conditions along the Ring Road, as well as incidents that occur.</th>
</tr>
</thead>
</table>
| **Main objectives:** | To inform the users of the traffic conditions and incidents, thus providing a tool to the users for planning their trips, based on real time traffic conditions. Also to:  
  - Improve road traffic conditions along the ring road  
  - Increase road safety  
  - Collect statistical data |
| **Duration:** | The project has been launched in March 2007 and completed in July 2009. |
| **Financing sources:** | The project was part of the Operational Programme “Information Society” of the 3rd community support framework. It was funded at 80% by the European Regional Development Fund and 20% by national resources, with a total budget of € 1.377.901. |
| **Stakeholders involved/Roles:** |  
  - Region of Central Macedonia (Ring Road management authority)  
  - TRIAS SA (technology provider) |
| **Technology used:** | The system entails the following sub-systems:  
  - The Traffic Management Centre (TMC). It is equipped with 8 servers, 3 clients, 6 monitors, 1 video wall and peripheral equipment (printers, etc.). The application server bears the Traffic Management Software (TMS), while in the data base server the data bases have been installed. The TMS chooses the messages that are displayed in the VMSs, detects and manages the incidents, records the traffic data that are selected from the roadside equipment and connects with the internet.  
  - The roadside sub-system (VMSs, CCTVs). It includes 5 VMSs and 17 CCTVs that monitor the traffic flow and select traffic data, thus enabling the detection of incidents (based on Video and Image Processing Units installed in the CCTVs)  
  - The telecommunication sub-system (wireless or wired) |
| **Status and main results:** | The system is currently operational and it provides:  
  - Information to drivers through Variable Message Signs and the internet  
  - Incident management (detection, information)  
  - Road traffic monitoring throughout the road’s length and in most of the interchanges  
  - Traffic management operations via the Control Centre |
### Data collection

According to a questionnaire survey that was conducted as part of a thesis regarding the user acceptance of the telematics system of the city’s Ring Road*, the majority of the users of the ring road (63% of the survey participants) were completely to averagely satisfied with the system, nonetheless stating that improvements could be made, such as the installation of more VMSs or the provision of information regarding alternative routes.

### Relevant links and references

Official site of the project: http://rrits.damt.gov.gr/, where the user can get information on the traffic flow and the incidents of the ring road. “Mobile view” is available through the webpage.

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### Activity/project name: Consolidated combined transport system of Attica Region (Routing Portal)

#### Description:

The project has implemented an Internet-based planning tool, which enables citizens and visitors to find out all the options of “navigation” from one place to another, planning routes by taking into consideration all available means of transport. The system delivers various alternative routes based on the real time traffic conditions in the origin and destination points that the user selects. The user may choose the “quickest trip”, the “shortest trip” or the trip with “the least walking distance”. The system processes all the parameters that the user selects and delivers the recommended route displayed on a digital map along with various information regarding the trip, such as the estimated travel time, walking distance, etc. Moreover, the Incident Management sub-system that operates through the Portal, enables the relevant public authorities to know the exact prevailing traffic conditions.

#### Main objectives:

To address the citizens’ and visitors’ need for real time information regarding their daily multimodal trips, by helping them to choose the optimal combination of all the available transport means. Therefore, to raise awareness of public transportation and to reduce car use, thus contributing to the “green economy”. Also, to support incident’s management and the better surveillance of the Attica Region’s traffic conditions.

#### Duration:

The integrated system operates since August 2009.

#### Financing sources:

The project was included in the measure «Regional systems geography and innovative measures» of the operating plan «Information Society» and was funded by E.U resources by 80% and by national resources by 20%.

#### Stakeholders involved/Roles:

- Hellenic Republic Region of Attica (beneficiary)
- ANCO S.A. (contractor)

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*Ring Road:* A specific road or road network designed to handle a high volume of traffic. It usually includes features like on-ramps, off-ramps, or a limited-access design. In the context of ITS, it refers to the implementation of intelligent transport systems along such a road to enhance traffic management and user experience.
Status and main results:
The Routing Portal is operable under the URL: www.atticaroute.gr. The application is also accessible through PDAs and smart phones. The integrated system enables public authorities to quickly manage incidents and inform the citizens promptly. Moreover, the system supports high quality information services provided to citizens and visitors, by delivering useful information.


Description:
The project is related to the implementation of an integrated telematics system for urban transport, which includes systems for the dynamic information of passengers and the automatic ticket issuing. More specifically, the main actions undertaken under the project include:
- The supply and installation of outdoor automatic ticket machines (24/7 operation) in hot spots of the each city’s urban environment (i.e. hospitals, universities, public squares, etc.).
- The installation of equipment of in-vehicle GPS devices (buses), which will provide information on the vehicle’s position, speed and direction. The information will be sent in an operation centre and the bus arrival time is, afterwards, being forwarded to the bus stop VMSs.
- Smart card that the passengers can use instead of paper tickets. The passenger can get the card from selected KTEL SA information spots, buy and store credits on it. Before his trip, the passenger uses the on-board validator in order to pay with credits for his trip.
- Smart ticket validation machines (on-vehicle). The machines are equipped with barcode readers in order to check the validity of the tickets, while they are connected with the vehicle in order to send the vehicle data to the control centre.
- Smart bus stops, where Variable Message Signs have been installed, in order to provide information on the bus arrival time. The signs are also equipped with voice announcement systems.

Main objectives:
The main objective of the project is to address the needs of passengers of urban bus services for reliable information concerning their daily trips. The project aimed at reaching this objective through the implementation of an integrated management system of the urban bus services that includes dynamic passenger information systems and automatic ticketing systems through the use of advanced technologies in the field of telematics.

Duration:
The project was launched in 2006 and was gradually completed to all participating cities until 2012.

Financing sources:
The project was part of the Operational Programme „Information Society”, „Intelligent Transport” and was funded at 75% by the European Union (European Regional Development Fund) and at 25% from the Public Investment Program (national resources). The total budget of the project is estimated to 14 million euros.
Stakeholders involved/Roles:  
- Urban KTEL S.A. (beneficiary)  
- National Federation of Urban Transport  

Technology used:  
Automatic ticket machines; VMSs; GPS technology and GPS devices; on-board smart-ticket validation machines; voice announcement systems.

Status and main results:  
The urban bus services that participated in the project included 19 cities, namely: Thessaloniki, Larisa, Katerini, Veroia, Volos, Kavala, Lamia, Kozani, Iraklio, Chania, Serres, Arta, Ptolemaida, Alexandroupoli, Komotini, Drama, Corfu, Chalkida and Agrinio.  
The project has resulted in:  
- A wider use of advanced technologies in the field of urban bus services for the automation of the operating procedures, of the collection of data and of the provided services  
- The increase of the quality of the provided services, through the provision of direct and valid information to passengers  
- Friendlier customer services to mobility impaired people and elderlies (through the installation of voice announcement systems and VMSs)  
- Innovation in the field of urban bus services  
- More secure transactions  
- Optimization of the cost control operations  
- Provision of direct and valid information to relevant public authorities, in order to make the bus services related policies

Activity/project name: The Athens Dynamic Traffic Map for multimodal travel information services

Description:  
The Athens Dynamic Traffic Map (ADTM) is an Internet-based dynamic map with interactive features for the provision of travel information to the users of the multimodal transport network in the metropolitan area of Athens. The map offers a state-of-the-art geospatial representation of the time-varying road traffic conditions, in conjunction with information on the services provided by all available public transport modes.  
The information required for the display of the road traffic conditions by the ADTM is originated by 163 inductive loop detectors that provide raw data concerning traffic volumes and road occupancies (the data is collected by Athens Traffic Management Centre and provided to ADTM). All the data sets are further processed by a combination of specific tools and algorithms. The information displayed on the map is being automatically updated every 5 minutes.

Main objectives:  
To provide multimodal traveller information about the completed metropolitan transport network, including major road arterials and all available (urban and suburban) public transport modes.

Duration:  
N/A

Financing sources:  
The application is an upgrade of the real-time traffic map of Athens and took place in the framework of the programme "Information
### Stakeholders involved/Roles:

- National Technical University of Athens (NTUA)/Department of Transportation, Planning and Engineering (map designer and developer)
- Athens Traffic Management Centre (traffic data provider)
- Athens Urban Transport Organization (public transport data provider)

### Technology used:

- Traffic counting subsystem; CAD model; web server; ISDN network; GIF images.

### Status and main results:

This combination of private and multimodal public transport information services allows users to timely update their pre-trip or en-route travel decisions, including departure time, route, destination, mode selection and combinations of them, depending on the prevailing traffic conditions and/or the existence of incidents and special events. The interactive map is provided through the following link: http://www.transport.ntua.gr/map/en/.

### Activity/project name: The “Geodata” Portal

**Description:** The service “Geodata” Portal enables the public administration to offer publishing, searching and displaying of open geospatial data to citizens. The development of the Portal was based solely on Open Source Software and open standards. The service was developed by IMIS (Institute for the Management of Information Systems) /RC “Athena”, in cooperation with the e-Government Team of the Prime Minister’s Office, the Hellenic Mapping and Cadastral Organization, and the Ministry of Environment, Energy, and Climate Change.

The service offers three basic options for the geospatial data: search engine, data upload in various formats (in order to enable the provision of data even to users that do not own specific software, i.e. GIS software) and illustration.

Regarding transport, the Portal provides interactive maps that illustrate:

- The railway network
- Stations and stops of Athens’ urban public transport network

**Main objectives:** The project’s main objectives, are summarized below:

- To enable free and open access of all citizens to public data
- To contribute to the economic development through the exploitation of the provided data by the private sector and the research community, thus promoting the development
of better, cheaper and innovative products.

- To offer to citizens direct access to information regarding Greece, thus supporting the protection of the environment and its sustainable exploitation.
- To offer simple, re-usable, open and expandable services in order to cover temporal gaps of public administration in regards to infrastructure and services of geospatial data management.
- To provide information to potential foreign investors.

Duration: The service is available from 14/08/2010.

Financing sources: The services was designed and implemented by IMIS, one of the institutes of "Athena", the Research and Innovation Centre in Information, Communication and Knowledge Technologies. The project was funded by IMIS/RC “Athena”, own resources.

Stakeholders involved/Roles:

- Institute for the Management of Information Systems) /RC “Athena” (system designer and developer)
- e-Government Team of the Ministry of Administrative Reform and E-Governance (collaborating body)

Technology used: Digital background (provided by Google Maps, OpenStreetMap and Ktimatologio S.A.); open source code; WMS (Web Map Service); WFS (Web Feature Service)

Status and main results: The service is provided under the URL: www.geodata.gov.gr

During its more than two years of operation, the service has saved approximately 20 million euros for the public sector (source: http://www.geodata.gov.gr/open-geodata/images/geodatagovgr_info_en.pdf), through the re-use of data. Moreover, it has resulted in the provision of free added-value services from the private sector (i.e. multimodal routing provided by Google with the use of open data from the Athens Urban Transport Organization (OASA)).
route, considering a large number of variables, including road conditions, availability of vehicles and drivers, timetables, time of the open/closing engine and maximum routes. The Telenavis Traffic Information Services uses the traffic data coming from the Athens Traffic Management Centre and delivers real time traffic information for major streets of Attica agglomeration. Information on the traffic at the streets of Attica has always been a big issue for all the residents of Athens. Everybody would like to have the possibility to know where the streets are jammed but also which streets are free so that they can choose an alternate route—especially during morning hours when activity reaches its peak and people need to get to their destination on time.

**Main objectives:** The Telenavis services aim at allowing customers to manage their professional fleet in real time, by monitoring the vehicles 24/7, the performance of the fleet, the cost of the routes and the time schedules. They also aim at the optimization of daily routes according to the orders, thus reducing unnecessary routes and, thereafter, travel kilometres and carbon emissions. Finally the information services aim at informing drivers/users on the traffic conditions in major Attica’s road, thus giving them the ability to change their route in case of traffic jams.

**Duration:** N/A

**Financing sources:** Company’s own capital.

**Stakeholders involved/Roles:** Telenavis Hellas S.A. (service’s designer and developer)

**Technology used:** The Telenavis services use GIS, GPS and GSM technologies.

**Status and main results:**
- Telenavis NavFleet contributes to the improvement of the driver’s safety and allows fleet managers to react promptly in case of unplanned situations or violations (speed violations, temperature violations, getting out of routes, etc.).
- Telenavis Dispatcher achieves reduced transportation costs by 5-25%.
- The aforementioned applications and services are ITS products provided by a private company (http://www.telenavis.com).
- The traffic information services of the company are provided through the website: www.realtraffic.gr

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**Activity/project name:** “Myroute” Info-mobility services Portal

**Description:** The Portal “Myroute” consists of the following basic services:
- Traffic. Through the service, the user is informed on all kinds of traffic events, such as traffic accidents, sport events, road works, traffic jams, etc. The user receives dynamic information regarding the traffic situation on selected routes, information on
<table>
<thead>
<tr>
<th>Main objectives:</th>
<th>The aim of the Portal is to provide traffic information to travellers and Municipalities.</th>
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<tbody>
<tr>
<td>Duration:</td>
<td>N/A</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>The implementation of the “Myroute” Portal was funded by 50% as part of the project &quot;Integrated Transport Data Collection Platform and Applications Services Dynamic Navigation, Routing, Design and Travel Awareness Movement&quot;, which is included in the Operational Program ‘Information Society’ of the Community Support Framework. The funding was provided in a 75% by the European Regional Development Fund and in a 25% by national funds.</td>
</tr>
</tbody>
</table>
| Stakeholders involved/Roles: | Infotrip S.A. (Portal's designer and developer)  
| | Athens Traffic Management Centre (traffic data provider) |
| Technology used: |                                                                                                   |
| Status and main results: | The Portal services are provided free-of charge through the website: http://www.myroute.gr |

Activity/project name: Train-Taxi combined booking and ticketing service of TRAINOSE

Description: The service regards combined ticket issuing for trips with train and taxi. The traveller can issue a combined ticket for his train and taxi trip through the e-ticketing services of the train operator (the same
services is also offered through ticket offices in specific stations).

<table>
<thead>
<tr>
<th>Main objectives:</th>
<th>To facilitate the accessibility of the train stations through taxi services.</th>
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<tbody>
<tr>
<td>Duration:</td>
<td>The service is available since 18th of April 2012.</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>The project was funded by TRAINOSE S.A. own resources (TRAINOSE S.A. is the national provider of railway transports in regional, suburban, national and international level).</td>
</tr>
</tbody>
</table>
| Stakeholders involved/Roles: | • TRAINOSE S.A. (service designer, developer and provider)  
• Taxi operators |
| Technology used:         | GSM                                                                           |
| Status and main results: | The service is currently available on the train axis Athens – Thessaloniki and only for trips that have end point the city of Thessaloniki. Passengers can find information on the services through the link: http://www.trainose.gr/nees-ypiresies/traino-taksi (only in Greek) |


| Description: | The project deals with the installation of a network of 1000 “smart stops” in the area of responsibility of the Athens Urban Transport Organization, which will provide real time information to the passengers about the arrival time of the vehicles through VMS installed in the stop. The passenger will also have the ability to be informed via Internet by using his mobile phone or his PC. The project also foresees the operation of a Control Centre that will monitor, in real time, the operational conditions of the transport system and will intervene accordingly in order to maintain a good operational level. |
| Main objectives: | The main objectives of the project are provided below:  
• Real time monitoring of the fleet  
• Provision of advanced information services to the passengers (through “smart stops”, Internet and mobile phone services)  
• Communication between the driver and the Control Centre  
• Monitoring of the reliability of the fleet’s itineraries, thus optimizing the planning of the itineraries |
| Duration: | Installation and beginning of operation of the system is expected in 2015 |
| Financing sources: | The project will be implemented through a Public-Private Partnership (PPP). The total budget of the project reaches 52 million Euros. The national sources cover a maximum of 40% of the budget |
| Stakeholders involved/Roles: | Athens Urban Transport Organization (funding body and beneficiary) |
Technology used:
- GPS and GSM technologies for vehicle tracking and tracing
- VMSs (dot matrix boards) for display of information at “smart” bus stops
- Website

Status and main results:
The Athens Urban Transport Organization has already approved candidacy for the project and after the announcement of the tender and the submission of the proposals, the nomination of the concessionaire and the signing of the contractual agreement is expected between April and October 2013. The construction and a partial operation of the project are expected within 2013 and 2015. The concessionaire will undertake the maintenance, operation and technical management of the systems for 10 years after their complete installation.

Activity/project name: A Unified Automatic Fare Collection System for the Athens Urban Transport Organization

Description:
The system will replace the existing paper tickets with 3 new ticket types:

i. Multiple ticket in the form of an electronic card. This is a smart card (magnetic strip) that will “store” certain number of trips.

ii. Smart card, which will replace the current monthly and annual cards. It will be made available in various types.

iii. Ability to pay for a ticket by sending SMS. The passenger will have the ability to purchase a ticket by sending a text message via mobile phone or through online banking (e-banking).

Main objectives:
To provide a flexible and easy ticket issuing and at the same time to eliminate the free rider phenomena. Currently, it is estimated that around 33.7 million Euros per year are lost due to non-cancellation of tickets in public transport in Athens. Specifically, the percentage of passengers who do not pay ranges from 6 to 7% in Metro and Tram, 10% in the Urban Public Railway, 17.5% to Trolley up to 40% on Buses.

Duration:
The launch of the project’s implementation is expected within 2013 (see Status and main results).

Financing sources:
The total budget of the project is estimated to 34.758.000 Euros. The project will be funded 100% by the European Regional Development Fund.

Stakeholders involved/Roles:
Athens Urban Transport Organization (funding body and beneficiary).

Technology used:
- Smart cards
- GSM (SMS)

Status and main results:
The project is currently in the tender phase. The nomination of the concessionaire, the signing of the contractual agreement and the beginning of the project is expected within 2013.

Activity/project name: GEOPortal of Egnatia Motorway
**Description:** This system will provide access to geospatial information services through geographical display, retrieval, and synthesis of information. All users of GEOPortal will be able to browse, search, find, print etc. geographic information, maps, routes, etc., associated with the use of the motorway and its vertical axes. The users of navigators (iPhone, android, GPS Mobile, etc.) will be able to connect and download data. The partners will be able to insert and update the data they handle. This WebGIS will be a gate (Portal) for cooperation and organization.

**Main objectives:** To facilitate the simultaneous access of external users (involved government agencies, partners of Egnatia Motorway operation company, drivers/users of the motorway, etc.) in a variety of information.

**Duration:** The call for the implementation of the project was made at 12/09/2012 (http://www.egnatia.eu/page/default.asp?la=1&id=2313&archive=1)

**Financing sources:** The total budget of the project is estimated at 558.495 Euros. The project is funded by the European Regional Development Fund and the Operational Programme 'Digital Convergence'.

**Stakeholders involved/Roles:**
- Ministry of Development, Competitiveness, Infrastructures, Transport and Networks (funding body)
- Egnatia Odos S.A. (the motorway operator)

**Technology used:** WebGIS technology

**Status and main results:** The project is in procurement procedure.

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**Activity/project name:** Geographical Information System of the North Aegean Region

**Description:** The project deals with the organization and the mapping of main geographical data through the web, as well as with the provision of basic geographical services. Under this main application the following services rest:
- Road network maintenance. The application will map the road maintenance works, in order to enable the spatial distribution.
- Road accidents. The application will enable the mapping of the accidents that cause injuries or deaths and will provide relative aggregated data.
- Transport connection. The application will map the transport connections and the entry/exit points of the road network in the limit of the area under examination (Lesvos Prefecture).

**Main objectives:** To enable the identification of the spatial distribution of the accidents and the road maintenance works, the identification of ‘black spots’ within the road network and the spatial correlation of all the information with other data or phenomena.

**Duration:** The contractual agreement between the Region of North Aegean and the University of the Aegean was signed in August 2012.

**Financing sources:** The project is funded by the North Aegean own resources (national resources). The overall budget of the project amounts to € 10.000.

**Stakeholders**
- Region of North Aegean (funding body)
**Activity/project name:** Digital Traffic Information Services in metropolitan Municipalities of the island of Crete

| **Description:** | The project aims at developing telematics services for the provision of real time traffic information to citizens of four metropolitan Municipalities of Crete, namely Chania, Heraklion, Rethymnon and Agios Nikolaos. The information will be provided to the citizens through VMSs, which will be located on the main roads of each municipality, through the web, via continuously updated maps that will enable the travellers to obtain information related to points of interest and traffic, but also through telephone centres (IVR), which will provide, free of charge, information on the traffic conditions within each city. The system will also provide information on public transport modes (i.e. arrival time at bus stops). |
| **Main objectives:** | The aim project is to enable citizens and travellers:  
- To know the real time traffic conditions on main roads of the cities.  
- To estimate the time required for drivers to complete their selected journey.  
- To choose alternative routes in case of significant obstruction of traffic, and, thus, to be able to estimate their travel time.  
- To easily identify available parking spaces.  
- To move easier with the public transport modes. |
| **Duration:** | The accession date of the project to the Operational Programme was 19/07/2011. |
| **Financing sources:** | The project’s total budget amounts to € 397.670. The project is funded by the European Regional Development Fund and the Operational Programme 'Digital Convergence'. |
| **Stakeholders involved/Roles:** | - Ministry of Interior (funding body)  
- Municipality of Chania (implementation body) |
| **Technology used:** | - GPS and GSM technologies for bus vehicle tracking and tracing.  
- VMSs (dot matrix boards) for display of information at “smart” bus stops.  
- IVR technology. |
| **Status and main results:** | The project is currently in consultation phase. |
use of vehicle tracking technologies and will estimate the arrival time of the vehicles in bus stops.
- Application for a Telematics Data Collection Centre. The Centre will collect the telematics data and be responsible for the communication between the fleet management system and all the telematics modules.
- The on-board equipment that will include the vehicle positioning system and the drivers screen.
- The VMS located in the “smart stops” that will inform passengers on the estimated bus arrival time.
- Monitors that will be installed on-board and will inform passenger on the next stop.
- Citizens’ information systems via web and mobile services.

**Main objectives:**
The aim of the project is to improve the provision of advanced information to citizens regarding their public transport trips via multiple communication channels, thus improving the level of the provided public transport services and increasing the share of public transport modes.

**Duration:**
The accession date of the project to the funding mechanism was 06/07/2011.

**Financing sources:**
The project’s total budget amounts to € 168,208.8 €. The project is funded by the European Regional Development Fund.

**Stakeholders involved/Roles:**
- Ministry of Interior (funding body)
- Municipality of Naxos (implementation body and beneficiary)

**Technology used:**
- GPS and GSM technologies for bus vehicle tracking and tracing.
- VMSs (dot matrix boards) for display of information at “smart” bus stops.
- On-board audio announcement system.
- Website.
- Smart phone technologies.

**Status and main results:**
The project is currently in consultation phase.

**Activity/project name:** An Integrated Multichannel System for the Management and Monitoring of the Conditions in the Road Networks of the Municipalities of Lamia, Domokos, Makrakomi and Stilida

**Description:**
The project will implement a system for monitoring and managing the road network conditions in the cities of Lamia, Domokos, Makrakomi and Stilida. The services include:
- Estimation of travel times and identification of traffic conditions in the road networks of the areas under examination.
- Provision of information for the environmental condition in the mountainous road network.

**Main objectives:**
To address traffic congestion problems and increased road travel risk due to extreme weather conditions. Also, to reduce travel delays, improve the level of service and inform drivers on their travel time in specific road axes (through VMSs and SMS/mobile site services) and on dangerous weather conditions.
| **Duration:** | The accession date of the project to the funding mechanism was 27/06/2011. |
| **Financing sources:** | The project’s total budget amounts to € 255,500. The project is 100% funded by the European Regional Development Fund. |
| **Stakeholders involved/Roles:** | - Ministry of Interior (funding body)  
- Municipality of Lamia (implementation body and beneficiary) |
| **Technology used:** | - Road traffic sensors for the measurement of the traffic flow.  
- Weather stations and sensors in the mountain network of the Municipalities.  
- VMSs for the display of information to the drivers.  
- Mobile technology for the information of the drivers (i.e. through SMS) |
| **Status and main results:** | The project is currently in consultation phase. An overall decrease of 15% in road accidents is expected due to the operation of the system. |

Activity/project name: Park-n-Ride: An integrated system for driver’s information on available parking spaces and for passengers’ multichannel information in the Municipality of Corinth

| **Description:** | The project concerns the implementation of a system that will allow:  
• The provision of information, through various communication channels, to drivers related to free parking places (roadside and/or within parking stations) but also to parking places for disabled people.  
• The guiding of the drivers to those free parking spaces, via smartphones.  
• The patrolling of the parking spaces for disabled people and the direct fine issuing (in case of illegal parking). For the efficient patrolling of the parking places, the Municipal Police will carry portable devices with printers that will enable them: to monitor and record the occupied parking places; supervise and control the compliance with the parking regulations; prevent the parking violations and issue fines in case such violations occur.  
At the same time, the project will provide multi-channel passenger information about the buses itineraries through:  
• VMS located in “smart stops” that will inform passengers on the estimated bus arrival time.  
• Internet  
• SMS and mobile applications for smartphones |
| **Main objectives:** | The aim of the project is to improve the provision of advanced information to citizens regarding their public transport trips via multiple communication channels, thus improving the level of the provided public transport services and increasing the share of public transport modes. Also, to tackle the problem of parking by facilitating drivers’ on finding available parking places and assisting the parking patrolling, thus contributing to the elimination of the illegal parking. |
| **Duration:** | The accession date of the project to the funding mechanism was 28/06/2011. |
| **Financing sources:** | The project’s total budget amounts to 282,215 €. The project is 100% funded by the European Regional Development Fund and the |
Operational Programme ‘Digital Convergence’.

**Stakeholders involved/Roles:**
- Ministry of Interior (funding body)
- Municipality of Corinth (implementation body and beneficiary)

**Technology used:**
- Smart phone technology
- GPS and GSM technology for the location of the bus vehicles.
- VMSs for the display of information to passengers on bus stops.
- Website.
- Portable devices for parking monitoring and fine issuing.

**Status and main results:**
The project is currently in consultation phase.

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**Activity/project name:** Intelligent parking and transport services in the Municipality of Kropia

**Description:**
The project includes the supply and installation in a Control Centre of an integrated platform for the management of telematics equipment, information and passenger information services. The provided services will include:
- Centre for the homogenization / diffusion of data.
- Intelligent parking management system and drivers’ information system. The parking management system will include electronic payment services via SMSs and information services to the Municipal Police regarding the occupied roadside parking places. The drivers’ information system will provide information through VMSs and SMSs regarding the available roadside parking places and parking station. Guidance to special parking places will be also provided for mobility impaired people.
- Software for the Municipal transport fleet monitoring, which will inform on the bus arrival time at smart stops.
- Development of a Portal and a multimedia city guide for user’s information on transport and traffic conditions within the city. Citizens will be informed on emergency road incidents and traffic conditions either via VMSs or SMSs.

**Main objectives:**
The aim of the project is to improve the provision of advanced information to citizens regarding their public transport trips via multiple communication channels, thus improving the level of the provided public transport services and increasing the share of public transport modes. Also, to tackle the problem of parking by facilitating drivers’ on finding available parking places and assisting the parking patrolling, thus contributing to the elimination of the illegal parking.

**Duration:**
The accession date of the project to the funding mechanism was 28/06/2011.

**Financing sources:**
The project’s total budget amounts to 267,871 €. The project is 100% funded by the European Regional Development Fund.

**Stakeholders involved/Roles:**
- Ministry of Interior (funding body)
- Municipality of Kropia (implementation body and beneficiary)

**Technology used:**
- Smart phone technology
- GPS technology for the location of the bus vehicles
- VMSs for the display of information to passengers on bus stops
- Website

**Status and main results:**
The project is currently in consultation phase.
Activity/project name: Innovative drivers’ information system for emergency road incidents and free parking places in the Municipality of Nestos

| **Description:** | The project deals with the implementation of an intelligent parking system, which will enable the real time monitoring of the parking places through an automatic control system. At the same time, the system will allow the reception of the data, through GPRS, that concern the parking time and the processing of data for individual parking places or groups of parking places that are selected by the Municipal authorities. Drivers will be informed in real time via VMSs, SMS and applications for mobile devices. Additionally, through a dedicated application drivers will be informed on emergency road incidents (i.e. accidents, traffic congestion, road works, etc.) that occur in specific segments of the road network. |
| **Main objectives:** | The aim of the project is to tackle the severe problem of parking, by guiding drivers in available parking places and by promoting the short-term parking. Also, to inform citizens on emergency incidents that could affect their trip, thus providing them the opportunity to change their route in advance and save travel time and cost. |
| **Duration:** | The accession date of the project to the funding mechanism was 24/06/2011. |
| **Financing sources:** | The project’s total budget amounts to 100.700 €. The project is 100% funded by the European Regional Development Fund and the Operational Programme ‘Digital Convergence’. |
| **Stakeholders involved/Roles:** | - Ministry of Interior (funding body) - Municipality of Chrisoupoli (implementation body and beneficiary) |
| **Technology used:** | Each roadside parking place will be equipped with a sensor within the pavement that will detect whether the parking place is occupied or not. The sensor sends the relevant message (free/occupied) to the control centre and the control centre distributes the information across all communication channels (VMSs, SMSs). |
| **Status and main results:** | The project is currently in consultation phase. |

Activity/project name: An integrated drivers’ information system for free parking spaces within Municipality of Kalamaria (Thessaloniki)

| **Description:** | The project will implement a smart parking system that will enable the real time monitoring of parking spaces and of parking fee payment through a control centre. At the same time, the system enables the receiving, through GPRS, of all the data that concern the parking time and the payments that have been made as well as the processing of these data either for individual parking places or groups of parking places that are selected by the Municipal authorities. For the area of application, the system will identify the detailed mapping of the current parking situation, the available parking services, the parking regime, etc. For the efficient patrolling of the parking places, the Municipal Police |
| **Status and main results:** | The project is currently in consultation phase. |
will carry portable devices with printers that will enable them: to monitor and record the occupied parking places; supervise and control the compliance with the parking regulations; prevent the parking violations and issue fines in case such violations occur.

**Main objectives:** The aim of the project is to tackle the severe problem of parking and minimize parking violations.

**Duration:** The accession date of the project to the funding mechanism was 24/06/2011. The call for the implementation of the project was made at 29/10/2012.

**Financing sources:** The project’s total budget amounts to 261.780€. The project is 100% funded by the European Regional Development Fund and the Operational Programme 'Digital Convergence'.

**Stakeholders involved/Roles:**
- Ministry of Interior (funding body)
- Municipality of Kalamaria (implementation body and beneficiary)

**Technology used:**
- GPRS technology
- Portable devices for parking monitoring and fine issuing

**Status and main results:** The project is in procurement procedure.

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Activity/project name: Integrated information system for Public Transport passengers multichannel information in the islands of Rhodes and Kos, the cities of Kalamata and Xanthis and the Municipality of Kordelio-Evosmos (city of Thessaloniki)

**Description:** The project concerns the implementation of an integrated intelligent transport system which consists of a fleet monitoring system and management of telematics information. The intelligent transport platform will operate via a Control Centre and will allow the real-time monitoring of the urban transport fleet, thus enabling necessary interventions in the bus fleet operation and calculation of the expected arrival time in the stops. The ITS includes:

a) fleet management and passenger information with operations such as: vehicle tracking, interventions in the fleet operation, calculation of the expected arrival time in the stops, bidirectional communication between the fleet management system and passenger information system
b) the on board units that will include the vehicle positioning system and driver screen
c) VMSs that will inform passengers on the expected arrival time of buses
d) software of journey planning that will be based on an algorithm that calculates the optimal travel by car or by a combination of transport modes (car, walking, public transport modes)
e) information systems to citizens through multiple channels such as the internet and mobile devices.

**Main objectives:** The aim of the project is to improve the provision of advanced information to citizens regarding their public transport trips via multiple communication channels, thus improving the level of the provided public transport services and increasing the share of public transport modes.

**Duration:** The accession date of the project to the funding mechanism was:
### Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries

- 24/06/2011 for the Municipality of Rhodes
- 28/06/2011 for the Municipality of Kos and Kalamata
- 27/06/11 for the Municipality of Xanthis
- 19/07/2011 for the Municipality of Kordelio-Evosmos

#### Financing sources:
The project has a total budget of 191,504 Euros for the municipality of Rhodes, 139,110 Euros for the Municipality of Kos, 196,650 Euros for the Municipality of Kalamata, 190,000 Euros for the Municipality of Xanthis (Operational Programme „Digital Convergence“) and 255,000 Euros for the Municipality of Kordelio-Evosmos and is 100% funded under the European Regional Development Fund.

#### Stakeholders involved/Roles:
- Ministry of Interior (funding body)
- Municipalities of Rhodes, Kos, Kalamata, Kordelio-Evosmos and Xanthis, respectively (implementation bodies and beneficiaries)

#### Technology used:
- GPS and GSM technology for the location of the bus vehicles.
- VMSs for the display of information to passengers on bus stops.
- Website.
- Smart phone technologies.

#### Status and main results:
The project is currently in consultation phase.

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### Activity/project name: Integrated platform for traffic management and monitoring aiming at informing citizens about traffic conditions through multiple communication channels in the cities of Ioannina and Kavala

#### Description:
The project includes the development of an information system for the traffic conditions of the road network in the cities of Ioannina and Kavala. The provision of information to the drivers will be performed through multiple communication channels such as VMSs installed in certain points of the road network, portal, mobile apps and SMSs. The project will also implement a guidance system for helping drivers to find parking places within the city. Finally, the system will include the development of a website for route planning accessible also through mobile devices.

#### Main objectives:
The objective of the project is the optimal traffic management of central road axes of the city, as well as provide a tool for the network's monitoring that will enable the authorities to gain knowledge of the traffic trends and intervene where necessary (in accidents, infrastructure works or special events). Finally, to provide citizens with various information channels for the traffic conditions in the city.

#### Duration:
The accession date of the project to the funding mechanism was 28/06/2011 for both Municipalities

#### Financing sources:
The project has a total budget of 213,956€ for the municipality of Ioannina and 211,761€ for the Municipality of Kavala and is 100% funded under the European Regional Development Fund (Operational Programme: “Digital Convergence”)

#### Stakeholders involved/Roles:
- Ministry of Interior (funding body)
- Municipalities of Ioannina and Kavala, respectively (implementation bodies and beneficiaries)
Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries

| **Technology used:** | - VMSs for the display of information to drivers  
- Website  
- Smart phone technologies |
| **Status and main results:** | The project is currently in consultation phase. |

Activity/project name: Integrated Information System for passengers on the municipal transport and for drivers on available parking place - Municipalities of Vironas, Ilioupoli and Pefki (Athens)

**Description:** The project concerns the implementation of a system that will allow:
- The provision of information, through various communication channels, to drivers related to free parking places (roadside and/or within parking stations) but also to parking places for disabled people.
- The guiding of the drivers to those free parking spaces, via smartphones.
- The patrolling of the parking spaces for disabled people and the direct fine issuing (in case of illegal parking). For the efficient patrolling of the parking places, the Municipal Police will carry portable devices with printers that will enable them: to monitor and record the occupied parking places; supervise and control the compliance with the parking regulations; prevent the parking violations and issue fines in case such violations occur.

At the same time, the project will provide multi-channel passenger information about the buses itineraries through:
- VMS located in “smart stops” that will inform passengers on the estimated bus arrival time.
- Internet.
- SMS and mobile applications for smartphones.

**Main objectives:** The aim of the project is to improve the provision of comprehensive information to citizens regarding their public transport trips via multiple communication channels, thus improving the level of the provided public transport services and increasing the share of public transport modes. Also, to tackle the problem of parking by facilitating drivers’ on finding available parking places and assisting the parking patrolling, thus contributing to the elimination of the illegal parking.

**Duration:** The accession date of the project to the funding mechanism was:
- 24/06/11 for the Municipalities of Vironas and Ilioupoli.
- 28/06/2011 for the Municipality of Pefki.

**Financing sources:** The project has a total budget of 278,320 Euros for the Municipalities of Vironas and Ilioupolis and a budget of 226,775 Euros for the Municipality of Pefki. It is 100% funded under the European Regional Development Fund.

**Stakeholders involved/Roles:**
- Ministry of Interior (funding body)
- Municipalities of Virona, Ilioupoli and Pefki, respectively (implementation bodies and beneficiaries)

**Technology used:**
- Smart phone technologies
- GPS and GSM technology for the location of the bus vehicles
- VMSs for the display of information to passengers on bus stops
Activity/project name: System for the electronic control of the parking places availability and the automatic information of the drivers in the Municipality of Megara

| **Description:** | The project concerns the implementation of an intelligent system of multichannel information regarding available parking places (roadside but also in specific municipal open parking stations) in the city of Megara. The proposed solution consists of:  
- Counting system for outgoing / incoming vehicles in the outdoor parking spaces.  
- Data collection system in real-time.  
- System for the automatic patrolling of the parking spaces for disabled people and the direct fine issuing (in case of illegal parking). For the efficient patrolling of the parking places, the Municipal Police will carry portable devices with printers that will enable them: to monitor and record the occupied parking places; supervise and control the compliance with the parking regulations; prevent the parking violations and issue fines in case such violations occur. At the same time, the project will provide multi-channel passenger information about the free parking spaces through VMSs, the Internet and SMS and mobile applications for smartphones. |

| **Main objectives:** | The aim of this project is to reduce severe traffic problems that are caused due to the intense parking problem, thus improving the overall transportation services and the urban environment. |

| **Duration:** | The accession date of the project to the funding mechanism was 27/07/2011. |

| **Financing sources:** | The project has a total budget of 194.733 Euros and is 100% funded under the European Regional Development Fund. |

| **Stakeholders involved/Roles:** | - Ministry of Interior (funding body)  
- Municipality of Megara (implementation bodies and beneficiaries) |

| **Technology used:** | - Wireless sensors located in roadside parking places  
- Smart phone technologies  
- VMSs for the display of information to drivers  
- Website  
- Portable devices for parking monitoring and fine issuing |

| **Status and main results:** | The project is currently in consultation phase. |

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Activity/project name: Intelligent Transport Systems and parking services in the Municipality of Vrilissia (Athens)

| **Description:** | The proposed project regards the development of a controlled parking system and a monitoring system of the Municipal public transport fleet. More specifically, the project regards the implementation of:  
- A Centre for the collection, management and dissemination of data. |

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Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries
- An intelligent parking management system and drivers’ information system for the availability of parking places.
- A software for the fleet monitoring of the public transport that will inform passengers (through VMSs located in bus stops) on the bus arrival time.
- An application that will connect with the Municipality’s Internet Portal in order to provide transport and traffic related information.

The services provided by the system are the following:
- Passenger information services provided through “smart stops”.
- Citizens’ information services regarding emergency road incidents and the real time road traffic situation (information will be provided through VMSs, the Internet and SMSs).
- Electronic payment services through the use of mobile phones (SMSs).
- Municipal Police Information services regarding the occupied parking places.
- Drivers’ Information services regarding free parking places (information will be provided through VMSs and SMSs).
- Services for supporting the accessibility of mobility impaired drivers to available parking places.

**Main objectives:**

The aim of the project is to improve the provision of advanced information to citizens regarding their public transport trips, thus improving the level of the provided public transport services and increasing the share of public transport modes. Also, to tackle the problem of parking by facilitating drivers’ on finding available parking places and assisting the parking patrolling, thus contributing to the elimination of the illegal parking. Moreover to provide information to drivers regarding unexpected road incidents that could affect their road safety but also their travel times.

**Duration:**

The accession date of the project to the funding mechanism was 15/07/2011.

**Financing sources:**

The project has a total budget of 251.624 Euros and is 100% funded under the European Regional Development Fund

**Stakeholders involved/Roles:**

- Ministry of Interior (funding body)
- Municipality of Vrilissia (implementation bodies and beneficiaries)

**Technology used:**

- GPS and GSM technology for the location of the bus vehicles
- VMSs for the display of information to passengers on bus stops but also on selected points of the road segment
- Website
- Smart phone technologies

**Status and main results:**

The project is currently in consultation phase.

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**Activity/project name:** EasyTrip: Multimodal route planning application and advanced traveller information services for smart devices

**Description:**

The project will implement the following electronic services for the travellers of the cross-border area of Greece-Bulgaria: passenger information services; environmental friendly routing; information on the passenger’s destination points; road traffic information; parking
information; tourist information; points of interest; public transport information; taxi information; road safety related information; weather information.
The services will be provided through the web and smart phone applications.

**Main objectives:** The project aims at providing adequate mobility and accessibility services to the passengers, in order to make their trips easier and safer at the level of national road networks, but more importantly at the level of regional and local roads at trip ends. In addition, project aims to support the sustainable development of the cross border areas, upgrade the residents’ and visitors’ quality of life and offer an environmental added value.

**Duration:** The project was launched in January 2012 with 2-year duration.

**Financing sources:** The total budget of the project amounts to 1.011.025€. The project is funded by the cross-border European Territorial Cooperation Programme “Greece-Bulgaria 2007-2013”. The total budget (ERDF and national contribution) for the European Territorial Programme “Greece-Bulgaria 2007-2013” is €138,691,303.00. The total financing consists of €117,887,607.00 (85%) ERDF funding and €20,803,696.00 (15%) national contribution.

**Stakeholders involved/Roles:** Centre for Research and Technology Hellas-HIT, Municipality of Bansko (BG), Centre for Research and Technology Hellas-CPERI, Municipality of Thessaloniki (GR), Municipality of Kavala (GR), Municipality of Serres (GR), Municipality of Thermi (GR), Municipality of Krumovgrad (BG), TRAINOSE S.A. (GR)

**Technology used:**

**Status and main results:** The project is currently in implementation phase. More information can be found in the following links:
http://www.greece-bulgaria.eu

6.5.2. **Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations**

**Activity/project name:** Intelligent Urban Mobility Management System of Thessaloniki

**Description:** Thessaloniki’s Intelligent Urban Mobility Management System is a unified effort of the key players of the city dealing with urban mobility, transport and environment. The Intelligent system is divided into two separate service Centres which act complimentary and parallel:
- The Centre for Urban Mobility
- The Traffic Control Centre

Through these Centres the following operations are achieved:
- Dynamic traffic management along the major axis of the city centre (Tsimiski Avenue)
- Traffic monitoring in the city centre
- Use of real time traffic data that are collected through road traffic counters in order to provide citizens with advanced traveller information services, such as personalized optimal routing, real time traffic information, environmental info, public transport info, dynamic ride-sharing, user awareness tools and more.

**Main objectives:**
The system aims, through the services provided, to assist citizens through improved information so as to travel easily in the city by avoiding congested areas and also to raise the environmental public awareness and to promote public transportation and alternative modes of transport (such as walking and cycling). At the same time, through intelligent traffic management and control in the central area of Thessaloniki, the system aims to reduce the levels of traffic induced pollutants. The direct involvement of citizens in planning their trips will provide them with the opportunity to actively contribute to the improvement of the environmental quality of the city. Finally, through user awareness tools for urban mobility, a new culture for urban mobility is formed in the city.

**Duration:**
Project development: 01/04/2009 – 30/04/2012. Service provision and updating is on-going.

**Financing sources:**
The Intelligent Urban Mobility Management System is a project funded by 50% through the "European Economic Area" (EEA) Grants and by 50% through National Funds (Ministry of Finance). The total budget of the project was 2,916,852 Euros.

**Stakeholders involved/Roles:**
CERTH/HIT (technical project coordinator, overall scientific responsible); Region of Central Macedonia (project coordinator, Traffic Control Centre operator and equipment manager); Municipality of Thessaloniki (environmental equipment manager); Thessaloniki Integrated Transport Authority (Public Transport data provider); National Observatory of Athens (environmental indexes calculation); TOI (urban mobility knowledge transfer)

**Technology used:**
Bluetooth detectors, servers, GIS, adaptive traffic control system, event detection cameras (and software), traffic counters (radars and cameras), Traffic Control Centre equipment

**Status and main results:**
The services are provided through the website: http://www.mobithess.gr as well as through the information kiosk at the Urban Mobility Management Centre of Thessaloniki.

Activity/project name: Athens Traffic Management Centre (ATMC)

**Description:**
The ATMC deals with the monitoring of traffic conditions in main roads of Athens, the adoption of measures for dealing with emergency incidents (accidents, vehicles immobilizations, abstractions, works in progress, events, etc.) and the provision to the
drivers of real time traffic data concerning the traffic conditions. The traffic management system (TMS) is operated by ATMC from two control centres (for continuity in case one control centre fails). TMS collects the relative traffic data through various sources situated in main road axes - close circuit television cameras, traffic signals, autoscope video-detection cameras, ground loop detectors and speed radar devices - analyses and processes them and displays the output – real time traffic conditions – using a graphic user interface (GUI).

The decision-making algorithms programmed into the TMS determine the best actions to be implemented:

- Variable message signs inform the road users about the current traffic conditions, possible emergency incidents that have occurred and estimated times of travel in selected routes.
- Traffic signals phases are being adjusted to ensure continuity of traffic signals in given traffic conditions.
- In case of emergency incidents, the relevant Services are being alerted.

<table>
<thead>
<tr>
<th>Main objectives:</th>
<th>To improve the traffic conditions and to promote an immediate response to traffic incidents within the municipality of Athens.</th>
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</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>The ATMC is operational since July 2004.</td>
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<tr>
<td>Financing sources:</td>
<td>The development and operation of ATMC is funded by national resources. The ATMC is operating under the jurisdiction of the Region of Attica since October 2011.</td>
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<td>Stakeholders involved/Roles:</td>
<td>Region of Attica (ATMC’s developer and operator).</td>
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<tr>
<td>Technology used:</td>
<td>ATMC has installed the following equipment within the Attica region:</td>
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<td>* 208 closed-circuit TV cameras.</td>
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<td>* 500 monitoring locations.</td>
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<td></td>
<td>* 76 Autoscope traffic detection cameras (SOLO Pro NC Video Vehicle Detection Systems - vision processors for video vehicle detection systems). The systems are equipped with high-resolution, low visibility AIS Cameras and can detect speed, vehicle density, vehicle types, stopped vehicles, traffic incidents and vehicles travelling the wrong way.</td>
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<td>* 24 Variable Message Signs.</td>
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<td>Further to the above, ATMS controls 850 traffic signals in the greater Athens area.</td>
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<td>Status and main results:</td>
<td>The ATMC is operating 24 hours per day, 365 days per year.</td>
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<tr>
<td><strong>Description:</strong></td>
<td>The project is related to the use of the telematics technology in the Egnatia Motorway (a 670 km dual carriageway that connects West and East Greece) that supports the following operations:</td>
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<td>• Traffic count system that performs traffic counts on the Egnatia Motorway and its Vertical Axes. The systems applied at the traffic count stations involve the use of inductive loops and Remote Traffic Microwave Sensors. The collected data are transferred from all locations to Egnatia Odos S.A. headquarters with the use of telematics equipment.</td>
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<td>• Traffic surveillance within tunnels and in selected points of the motorway (through CCTVs).</td>
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<td></td>
<td>• Vehicle Detector System, which provides traffic data to the Control Centre through the use of inductive loop detectors, Remote Traffic Microwave Sensors and Video Image Processors.</td>
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<td></td>
<td>• Traffic monitoring through Lane Control Signs, Variable Speed Limit Signs, Traffic Signals and Over Height Vehicle Detectors.</td>
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<td>• Provision of information to drivers via Variable Message Signs (VMSs), Limited Message Signs, Blank-Out Signs, etc.</td>
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<tr>
<td></td>
<td>• Traffic surveillance within tunnels and in selected points of the motorway (through CCTVs).</td>
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<td></td>
<td>• Management of emergency situations within tunnels with the use of inductive loops placed in the road surface and CCTVs (detection and verification of the emergency situation) and emergency telephone lines (communication between the user of the highway and Egnatia’s Control Centre or between the user and emergency services).</td>
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<td></td>
<td>• Detection of frost conditions and other hazardous environmental conditions in critical spots of the motorway through the use of stations measuring Ambient Temperature and Road Weather Information Systems (RWIS) stations. The Ambient Temperature measurement stations automatically collect the data through wireless communication technologies (GSM, VHF). The RWIS collects data from meteorological stations, processes them and delivers to the tunnel Traffic Control Centres all the parameters that are related to the pavement conditions and environmental conditions.</td>
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<td></td>
<td>• Surveillance and monitoring of the electromechanical infrastructure through the use of Programmable Logical Controllers of SCADA system.</td>
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<td></td>
<td>• Toll Control System that enables the data exchange between the toll stations and nearby toll stations or between the toll stations.</td>
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</tbody>
</table>
### Main objectives:

The project’s general objective is to select the necessary data in order to manage the direct actions for the operation and maintenance of the highway (i.e. regulation of traffic, surveillance of the infrastructure, management of maintenance, etc.), as well as plan the futures ones, and to provide useful information to the drivers that will help them travel in safe and comfort. More specifically, the project aims at:

- Selecting traffic data that will enable reliable traffic forecasts (through a traffic model that has been developed by Egnatia Odos S.A.), thus contributing to the decision-making process for the design of the road, the necessary E/M installations and telematics applications, the toll collection system, the Service Areas, the feasibility studies, the calculation of environmental parameters, the planning of pavement maintenance works, etc.

- Promptly undertaking measures for the prevention and efficient tackling of possible traffic flow disturbances. This is crucial especially in those highway segments that present a significant traffic flow or a high road accident possibility, in road tunnels and bridges and in interchanges.

- Avoiding unwanted situations and reducing the possibility of road accidents

- Reducing the risk of an over height vehicle collision, thus the subsequent damage to the vehicle and infrastructure.

- Contributing to the prompt provision of information to the users regarding hazardous environmental conditions (i.e. frost, strong wind, etc.), thus contributing to the road safety.

- Promptly and dynamically alerting drivers for accidents or incidents or periodical phenomena of traffic peak, thus increasing road safety and optimizing traffic flow management

- Optimizing winter maintenance work (salt spreading, timely notification of snow ploughs, etc.).

### Duration:

Egnatia motorway traffic count system is being operating since 1997. All the systems are currently in operation.

### Financing sources:

In general terms, the construction of the highway and its systems was funded by:

- National resources.

- The European Union (at a 50%): Cohesion fund, European Regional Development Fund and Trans-European networks.

- The European Investment Bank.

- The Community Support Framework.

### Stakeholders

EGNATIA ODOS S.A. (project’s contractor and operator)
### involved/Roles:

<table>
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<tr>
<th>Technology used</th>
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<tbody>
<tr>
<td>Remote Traffic Microwave Sensors; inductive loops; CCTV; Video Image Processors; Lane Control Signs; Variable Speed Limit Signs; Over Height Vehicle Detectors; servers; Programmable Logical Controllers of SCADA system; Ambient Temperature and Road Weather Information Systems; GSM technologies.</td>
</tr>
</tbody>
</table>

### Status and main results:

The systems are currently in use. Egnatia Motorway’s official webpage: [http://www.egnatia.eu/](http://www.egnatia.eu/)

### Activity/project name: ITS services and systems of Attica Tollway

#### Description:

The ITS services and system in Attica Tollway (Attica Tollway is a high-speed private motorway, constituting the ring road of the greater metropolitan area of Athens and one of the longest ring roads of Europe) include:

- Traffic Management and Motorway Maintenance, provided through the Traffic Management Centre (TMC) of Attica Tollway. The TMC controls and monitors traffic, manages emergency incidents and planned activities and maintains the highway in a good infrastructural condition. The TMC operations are supported by the Traffic Management System (TMS), which is the technological interface for the TMC personnel. This includes: Incident detection systems (inductive loops, CCTVs and meteorological stations) and systems for incident response (communication with patrol units, notification of drivers through VMSs, communication with Traffic Police Department or the ambulance services, coordination of works that are programmed for the maintenance of the motorway).

- Electronic payment of the tolls through the e-PASS device. The e-Pass device is a transceiver attached in the vehicle’s windscreen, which allows the toll system to activate the electronic transaction process automatically.

#### Main objectives:

To enable an efficient monitoring of traffic conditions in Attiki Odos, a quick response to various random incidents and an immediate delivery of passive and dynamic information through variable message signs to the road users mainly related to safe driving.

#### Duration:

The overall Attica Tollway project was awarded to the “Attiki Odos” consortium in March 1996 and was gradually constructed until June 2004. The operation of the automated toll systems was done at January 2003.

#### Financing sources:

In the early 90’s, the Greek State held an international tender for the assignment of the construction of the Attica Tollway project, by the concession and co-financing method. The Greek group of companies,
under the corporate name "Attiki Odos", was the successful bidder in the tender, and the new motorway was eventually named after it. The Attica Tollway project was completed without exceeding budgeted construction costs, which amounted to approximately 1.3 billion Euros. The cost was financed by the Greek State (by 35%, i.e. EUR 420 m.), and also included funds from the Community Support Framework. The Concession Company "Attiki Odos S.A." covered the remaining 65% using equity and loan capital, contributing the amount of EUR 880 m. The loans granted to the Concession Company have been covered by the European Investment Bank and Commercial Banks, while the shareholders of Attiki Odos S.A. obtained guarantees for all loans from a Group of International Banks, over the full duration of the construction period.

### Stakeholders involved/Roles:
- Ministry of Development, Competitiveness, Infrastructure, Transport and Network (funding body)
- Attiki Odos S.A. (concessionaire, developer)
- Attikes Diadromes (operator of both the Attiki Odos and the systems)

### Technology used:
The ITS systems and services are currently operable. The highway is equipped with:
- 222 Closed Circuit Cameras (CCTV),
- 15 Mainline Variable Message Signs (MVMS),
- 57 Access Variable Message Signs (AVMS),
- 71 Toll Variable Message Signs (Toll VMS);
- 586 induction loop arrays (every 500m in the open motorway and every 60m inside tunnels, registering traffic volume and speed;
- 540 Lane Control Signs (LCS);
- 366 Variable Speed Limit Signs (VSLs);
- 44 Over High Vehicle Detectors (OHVD), located at entrance points;
- 3 meteorological stations, measuring parameters such as temperature, wind, humidity and air pressure;
- Environmental Stations, transmitting real-time measurements (8 fixed locations for air pollution, 8 fixed location for noise pollution, 1 mobile noise measurement unit);
- Emergency Telephone line;
- TETRA communication systems.

### Status and main results:
The ITS services of Attica Tollway are currently operable. More information can be found in Attiki Odos S.A. official website: http://www.aodos.gr.
Activity/project name: e-Trikala ITS system

**Description:**
The e-Trikala project refers to a number of actions and infrastructure, which aim to the development of integrated broadband applications and e-services for the citizens, based on ITS technology. The ITS systems developed in the city of Trikala include:

- Digital information boards installed at all city’s public bus stations that display the bus arrival times.
- Information boards informing drivers about parking places and spaces (off-street) around the city. The number of free spaces is automatically updated.
- Monitoring systems for the municipal vehicle fleet
- Inductive loops for the study of the city’s traffic data.
- A digital guide (GIS) offered to citizens through internet or mobile phones, which illustrates on a digital map the city’s parking places and the taxi stops.
- “mobiPark”, a mobile phone based services for on-street controlled parking. Through the service, the user can be informed on empty parking spaces and pay for parking space occupation. Moreover, municipality police officers are guided by the system in order to perform patrol and issue fine tickets (in cases of parking violations) by using a high end mobile terminal. The municipality administration services collect fines, issue monthly parking cards, schedule police patrols, evaluate police performance and study real-time system’s statistics.

**Main objectives:**
To develop Information and Communication Technology based applications that will improve citizen’s everyday life, simplify public transactions, reduce telecommunication costs and deliver new services related to the local way of life.

**Duration:**
The project was approved in April 2005 and it had a contractual duration of 18 months.

**Financing sources:**
The project was funded under the Information Society Programme of the 3rd Community Support Framework. The total budget reached € 654,095.

**Stakeholders involved/ Roles:**
e-Trikala S.A. The Municipality of Trikala is the basic stakeholder of the company, owning 99% while the rest is owned by the local Chambers of Commerce. e-Trikala S.A. has designed, developed and currently operating the ITS system.

**Technology used:**
The technology used is summarized below:

- 900 e-parking places (on-street)
- 4 parking information signs
- 5 inductive loops measuring traffic data
| Status and main results: | The e-services are provided by the e-Trikala official webpage: http://www.e-trikala.gr |

**Activity/project name:** Priority of Athens tramway to road intersections

**Description:** The project is related to the use of ITS technology for the provision of priority for the Athens tramway in road intersections. The exact position of the tramway is defined by the tramway’s GPS and the priority demand signal is automatically received by the local traffic signal regulator. The signal is, then, decoded and sent to the traffic controller in order to activate the tramway priority towards the road vehicles.

**Main objectives:** To reduce delays in the operation of Tram vehicles passing through intersections, thus improving the level of service of the Athens tramway.

**Duration:** The system is operational since 2004.

**Financing sources:** National and EC funding sources.

**Stakeholders involved/Roles:** ‘STASY’ Urban Rail Transport S.A. (developer and operator)

**Technology used:** In every tramway vehicle a specific transceiver (maxstream) is placed that sends signals to the traffic signal controller. The maxstream is connected with the on board unit of the vehicle and includes the algorithm for the detection of the vehicle’s position. The algorithm collects information from the vehicle’s GPS, odometer, itinerary and door situation and the area’s map and detects the vehicle’s position. When the tramway vehicle approaches the road intersection (in a distance less than 400m) the maxstream sends a signal to the traffic signal controller. The signal includes the receiver’s ID, the direction of the tramway’s movement and the type of the signal (i.e. 5m before the stop line, 300m, etc.). The traffic signal controller is also equipped with a maxstream that is connected to a PLC (Programmable Logic Controller). The provision of tramway priority is done automatically without the drivers’ intervention and according to the direction and the exact position of the tramway vehicle.

**Status and main results:** The system is currently operable. Extensions of the system to critical intersections are being done up until today. Tramway’s official site is provided under the URL: http://www.stasy.gr/index.php?id=343&L=0 (only in Greek).

**Activity/project name:** Intelligent Traffic Management System in the Prefecture of Chalkidiki

**Description:** The Intelligent Traffic Management System in the Prefecture of Chalkidiki

| • 25 digital information boards installed at bus stations |
| • 20 Municipal vehicles and 25 public buses equipped with GIS positioning systems |

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Chalkidiki consists of:
- Inductive Loops for traffic data collection.
- A Control Centre that uses GSM/GPRS wireless communication with the field equipment.
- VMSs for the drivers’ information regarding the road traffic situation in main roads within the Prefecture.
- A system for the information of the users through mobile phone sms (the user sends a request asking for information on specific spots and receives a sms with the requested information).

Main objectives: To offer advanced information services to the travellers of the Chalkidiki Prefecture.

Duration: Project was completed in 2009.

Financing sources: N/A

Stakeholders involved/ Roles: • Prefecture of Chalkidiki (funding body and service provider).
• TRIAS S.A. (consulting partner)
• INFOTRIP S.A. (technical developer)

Technology used: GSM and GPRS technologies; inductive loop detectors; VMSs; mobile phone technologies.

Status and main results: The users can be informed on the road network condition, in time in order for them to optimize their journey planning and avoid unexpected incidents.

Activity/project name: The Egnatia Motorway Observatory

Description: The Egnatia Motorway Observatory, based on documented scientific methods and the development of modern infrastructure of information systems, collects, processes, and provides valid and updated data concerning parameters, such as:
- the mobility in and accessibility to regions, urban centres, markets, and services,
- the development level, the cohesion degree, the competitiveness, and the intraregional inequalities,
- the building development and the networking of urban centres,
- the properties of the transport system and the operation of the road network, and
- the quality of the environment.

The Observatory of the Egnatia Motorway disposes of a structured Information System of Documentation and Data Management which relies on the operation of a specifically configured Geographic Information System (GIS) and includes processed statistics and cartographic information relating to the Prefectures, the Regions, and the settlements in both the immediate and wider area of influence of
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<tr>
<th>Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries</th>
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<tr>
<td><strong>Main objectives:</strong></td>
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</table>

To monitor the development, spatial, environmental and transport impact of the construction and operation of the Egnatia motorway and of its vertical axes. More specifically, the objective of the Egnatia Motorway Observatory is to collect and process data, and calculate indicators to be used for monitoring the long-term impact of the motorway on the social and financial cohesion, the physical planning arrangement, the system of transport, and the environment.

| **Duration:** |

The Observatory is operational.

| **Financing sources:** |

The construction and completion of the Egnatia Motorway Observatory was funded by the:

- European Union
- Greek Government (National resources)
- European Investment Bank
- Community Support Framework
- For the period 2003-2008 the Observatory was funded by the Operational Programme "Road Axes, Ports and Urban Development" (3rd Community Support Framework for Greece)

| **Stakeholders involved/Roles:** |

EGNATIA ODOS S.A. (design, development and operation)

| **Technology used:** |

The Egnatia Observatory Information System depends on the following infrastructure:

- A Network of computers supported by a Spatial Database Engine and equipped by specialized operating systems (GIS, measurement processing, statistics, graphics and Web development, production of documents etc) and peripherals (colour printers, plotter, scanner etc.).
- Official data and processed statistical data of censuses and researches of the NGSS and Eurostat-REGIO.
- Environmental data on the basis of official data of the EU.
- Traffic and Transport data (volume counts in the road network, road network composition, classification and evaluation data, data of Origin – Destination National Researches etc.).
- Digital files of Regional and Spatial Plans and Programmes, as well as EU data on Trans-European Networks (TENs-T),
<table>
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<tr>
<th>Pan-European Corridors (TINA), and policies – programmes of regional development:</th>
</tr>
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<tr>
<td>• Spatial (GIS) data namely: a digital earth model (DEM, 3D); aerial photographs, SPOT satellite pictures, and orthophotomaps; administrative and geographical boundaries (NUTS 1-3, LUAs, FUAs, protected areas, CORINE land use etc.); digital data WDC-ESRI; updated Road and Railway Network; updated Settlement Network; updated Hydrographic Network and Coastline; contour Network.</td>
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<tr>
<td>• Equipment of transport and environment measurements supported by a GPS.</td>
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<tr>
<td>• Electronic library and base for collecting supporting material and metadata.</td>
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</table>

**Status and main results:**
Through the Observatory (http://observatory.egnatia.gr), the motorway operator takes care of the assessment of spatial impacts of the Egnatia Motorway and vertical axes system in relation to the project implementation progress, i.e. in relation to “before” and “after”. In this way the impacts on the social and economic cohesion are determined, as well as on the territorial planning, the transport system, and the environment in Northern Greece. The results, reports, and generally the material produced by the Observatory is supplied to the public and interested agencies over the Internet and through leaflets, events etc.

**Activity/project name:** Integrated Management Information System for Container Terminal in the Port of Thessaloniki, Greece

**Description:**
The system develops technological applications that, in regards to the level of port/land interface, are related to the securing of an automatic and safe control of movements to and from the Terminal from the land and the sea.
The overall system is consisted of 10 subsystems, which optimize the overall container management (i.e. optimisation of container receipt/delivery time and space, control of collection/stowage in the stowage area, graphic surveillance of container position (GIS-GSP), electronic submission of official documents, etc.). The related to the port/land interface subsystems are described as follows:

- **Central Information Management System:** the central database supports all the applications, which, through appropriate interfaces, allow the dynamic exchange of data between the subsystems.
- **System for the official document submission.** The system allows the electronic submission of the official documents that are needed for the containers’ pick up/drop off through
### 6.5.3. Priority area: road safety and security

**Activity/project name:** Harmonized e-Call European Pilot

<table>
<thead>
<tr>
<th>Description:</th>
<th>The e-Call project is an automatic warning system in case of a traffic accident. The e-Call In Vehicle System is activated automatically either from a vehicle’s sensor or manually by pressing a button. The call is transferred first to the mobile service provider and then to the Public Safety Answering Point (PSAP).</th>
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<tbody>
<tr>
<td>Main objectives:</td>
<td>To increase road safety but also to optimize road accident management.</td>
</tr>
<tr>
<td>Duration:</td>
<td>The e-CALL project started on December 2010 and has an estimated end on December 2012.</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>The project is funded by the European Regional Development Fund and national resources with a total budget of 654,875 Euros.</td>
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</table>
### Stakeholders involved/Roles:
- Institute of Communications and Computer Systems – ICCS (project manager)
- COSMOTE (as a provider of mobile services is responsible for the identification and installation of the emergency call [112] and the transmission of the data in the control centre)
- Space Hellas (responsible for the pilot application of the PSAP)

### Technology used:
- GPS
- GSM, GPRS
- Public Safety Answering Point (PSAP)

### Status and main results:
The project is in the implementation phase. The first tests of the automatic emergency call system (e-Call), within the frame of the pilot national research project e-Call (http://www.ecall-hellas.eu/), have been successfully concluded.

### 6.5.4. Priority area: integration of the vehicle into the transport infrastructure

Activity/project name: Cooperative mobility systems pilot in Thessaloniki (COMPASS4D)

#### Description:
The project will implement three applications of collaborative transportation systems (Forward Collision Warning, Red Light Violation Warning and Energy Efficient Intersection) in seven European Countries (Thessaloniki, Greece is among them). Furthermore, the project will identify the possibilities for applying cooperative mobility systems, will examine potential problems and seek appropriate solutions.

#### Main objectives:
To improve road safety, reduce energy consumption and minimize traffic congestion. Also, to create the tools that will enable cities to implement cooperative mobility systems in the future.

#### Duration:
The project will be launched in January 2013 and will have a 2 year duration.

#### Financing sources:
The project’s total budget amounts to 4,998,940€. It will be funded by the European Commission, Directorate General CONNECT.

#### Stakeholders involved/Roles:

#### Technology used:
6.6. Hungary

6.6.1. Priority area: optimal use of road, traffic and travel data

Activity/project name: Parking control system in Budapest (pilot project)

**Description:**
CONNECT III. D4.6/2 (D3.4/3): This pilot was implemented with the cooperation of three public parking companies, with different parking capacity. On site equipment were implemented for collecting data of available free parking places. The collected data are sent to the parking control centre, a real-time information related the different parking houses are provided via VMSs to the road-users. One part of the pilot project was also to implement a dynamic message sign showing all data about the availability of parking places in the different parking houses, connected with the centre. There are also static signs that provide information for the travellers. The collected data can be displayed in the TCC of Budapest, in the frame of the so called “CONCERT” programme.

**Main objectives:**
Duration: CONNECT III. D4.6/2 (D3.4/3): 2008
Financing sources: CONNECT III. D4.6/2 (D3.4/3): 11 050 000 HUF (net)

**Stakeholders involved/Roles:**
Municipal Public Services Co. Ltd. – FKF
Contact person: Zoltán Jenovai, Director for Traffic Management
jenovaiz@fkf.hu

**Status and main results:**
Implemented

Activity/project name: Development of the traffic management system of Budapest, expansion its monitored area with adaptive traffic management, installation of new VMSs with special information content in favour of to foster modal shift, component I. (EWII. A1.2.2)

**Description:**
EWII. A1.2.2.: Development of Budapest TCC and extension of its supervised/controlled area by realization of adaptive traffic control, preparation of VMSs displaying special information contents supporting route and travel mode choice (component I. of the project)

The objective of this project is to enhance communication functions of Budapest TCC, and to ensure availability and accessibility of traffic information (which are produced during the function of the TCC) in order to realize digital data exchange and
<table>
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<tr>
<th>Cooperation between operators and other organizations (like public authorities, ITS service providers, other stakeholders).</th>
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<td><strong>Main objectives:</strong></td>
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<td><strong>Duration:</strong></td>
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<td><strong>Financing sources:</strong></td>
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<td><strong>Stakeholders involved/ Roles:</strong></td>
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<td><strong>Status and main results:</strong></td>
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**Activity/project name:** Establishment of a common data platform (“gate”) for operating of multimodal intelligent transport systems and services (pilot project) (EW I, project number: EWI. S1.1.1)

**Description:**
EWI. S1.1.1: Within the frame of Europe-wide Traveller Information Services of EasyWay, a “data portal” is going to be established. The target of this portal is to develop an information technology system that contains on-line traffic information. This system will be able to collect standardised (DATEX II) on-line traffic information nationwide, and serves to build up national and international/cross-border traffic information services. The Hungarian traffic information technology solutions are currently isolated from each other, therefore is needed a common data portal that gives a link between them. In accordance with the objectives of the European Union this portal enables traffic data (collected by different organisations), and business information services (based on these data) to be available for the travellers. The elaborated feasibility and system architecture study has been approved by the participants of this project, which enables the information system to be developed in a later phase.

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<th><strong>Main objectives:</strong></th>
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<td><strong>Duration:</strong></td>
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<td><strong>Financing sources:</strong></td>
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<td><strong>Stakeholders involved/ Roles:</strong></td>
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<td><strong>Status and main results:</strong></td>
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**Activity/project name:** Establishment of a data portal and insurance of professional data portal access for services according to the business model that is crated in the project (EW II, project number: EWII. A1.1.1)

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**Description:**

EWII. A1.1.1: Web-based IT development that aims to provide an on-line road transport IT system and create a 'data port' to operate traffic control and traffic information systems and traveller information services. The system is suitable to provide and collect national traffic information according to DATEX II standards.

On one hand the incoming information is provided into the system by the operator organisations of the Hungarian transport network (Hungarian Public Road Authority - Magyar Közút Non-profit Zrt, motorway operators, and operators of municipality roads), on the other hand by external partners (police, disaster-management, ambulance, passenger and freight transport etc) on an appropriate safety level (via protected information channels, protected data content, protected access) and it is stored and handled as history data. The system has to ensure the inquiry service of current on-line traffic information to each date and that it is available on different service levels (according to area, time, as well as accessibility).

The services of the system provide availability in both national and international relations by WebServices technology for the on-line traffic information stored in the system. These services have to be created to be available for the similar IT systems of the neighbouring countries with special regard to the compatibility of cross-border data and considering the achievements and requirements of the EU SeePortal project.

**Main objectives:**

**Duration:**
EWII. A1.1.1.: 2011-201

**Financing sources:**
EWII. A1.1.1.: 350 000 EUR (net)

**Stakeholders involved/Roles:**
Hungarian Public Roads Company
Contact person: Dr. András Gulyás, Technical Advisor
gulyas.andras@kozut.hu

**Status and main results:**
Implemented

Activity/project name: Development of the unified data management system for transportation networks, data visualization portal development (EW project number: EWII. A1.2.3 and 4.2.4)

**Description:**

EWII. A1.2.3 and A4.2.4: The aim of the Transport Information System and Database (KIRA) built up on the three elements implemented within the framework of EasyWay project (Data display portal, Topology server, Contact server) is to create a unified, free-of-operator traffic register. The basic task of the system is to provide communication between...
data collection systems and the connected IT systems implemented within the framework of EasyWay project and to provide a unified digital basic map and a reference system for these systems. KIRA is able to accomplish the unified space data handling and metadata service in the transport branch according to INSPIRE directive with the possibility of display the information on a common interface. The systems provide a possibility or platform for motorway companies, national road operators and the city of Budapest and other cities to display traffic information in a unified way.

Main objectives:
Duration: EWII. A1.2.3.: 2012 A4.2.4.: 2011 – 2012
Financing sources: EWII A1.2.3.: 145.000 EUR (net) EW A4.2.4.: 300.000 EUR (net)
Stakeholders involved/Roles: Coordination Centre for Transport Development
Contact person: Forrainé Hernádi Veronika, Head of Unit hernadi.veronika@kkk.gov.hu
Status and main results: Implemented

Activity/project name: Creation of a traffic portal of the metropolitan traffic management centre and give free run of data for develop further information services (Improvement of the technical background of TMC service) (EW II, project number: EWII. A1.1.5)

Description: EWII. A1.1.5: Realization of traffic portal of the Budapest traffic control centre and making data available for different information services. The purpose of this project is to provide reliable, real-time data and therefore real-time traffic information service to the road users in an effective and widely available way.

Main objectives:
Duration: EWII. A1.1.5: 2012
Financing sources: EWII. A1.1.5.: 50 000 EUR (net)
Stakeholders involved/Roles: Municipal Public Services Co. Ltd. – FKF
Contact person: Zoltán Jenövai, Director for Traffic Management jenovaiz@fkf.hu
Status and main results: Implemented

Activity/project name: D2.2/2-3: M0 motorway, travel-time forecasting system (implementation) (CONNECT III, project number: D2.2/2-3.)

Description: CONNECT III. D2.2/2-3: The main goal is to implement a trial-system for calculating predicted trip times connected to the motorway TCC. One of the most critical parts of the ÁAK motorway network is the south bypass of Budapest (the southern section of M0) – as it consists of only one carriageway with 2×2
narrowed lanes. The system displays expected travel times to road users driving on M1 or M7 motorways heading to M0 ring-road towards M5. The system is calculating real-time travel times between some pre-defined locations, and displays the calculated values on four Variable Message Signs (VMS) located before decision points of intersections (M1, M7, and M0). In the frame of the project 4 measure-points were established on the M0 (2+000 km, 6+000 km, 13+000km, and 17+000km). At the measure-points the the vehicles will be identified as well as they deliver additional information about the traffic flow.

Main objectives:
Duration: CONNECT III. D2.2/2-3: 2009
Financing sources: CONNECT III. D2.2/2-3: 29 995 050 HUF (net)
Stakeholders involved/Roles: State Motorway Management Company Ltd.
Contact person: Zoltán Jáklí, Technical Deputy General Director jakli.zoltan@autopalya.hu
Status and main results: Implemented

Activity/project name: Travel time and congestion prediction service for the road-users on M0 expressway based on the real-time database from the traffic counting stations. (Implementation) (EWI, project number: EWI. S1.2.1)

Description: EWI. S1.2.1: An Expected Travel Time Predicting system was already implemented within CONNECT Phase III for travellers driving on the south section of M0 Budapest ring-road, from the direction of motorway M1 towards M5. The system is based on license plate recognition, and calculating the average travel times for each vehicle between certain measure points, the display panels are located by M1, M7 motorways from both directions and on M0. Because of the system architecture, the calculation is strongly depending on the success of the recognition. SMMC Ltd. implemented another pilot on the eastern and northern section of M0, based on a different technology. On these sections there are various sensors within each junction, which are able to measure velocity, traffic load and appropriate for incident detection. With the help of this infrastructure it is possible to estimate travel times to some chosen destination before taking M0 or while driving on it, and displaying it on VMS’s before decision points.
The estimated travel times are calculated from the data of traffic counting stations. The figures can be shown on any chosen VMS’s with the help of this improvement. The displayed values are always the expected travel time between the adequate VMS gantry and the exit of the shown destinations.
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<tr>
<th>Main objectives:</th>
<th>Duration:</th>
<th>EWII. S1.2.1.: 2009</th>
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<tr>
<td>Financing sources:</td>
<td>EWII. S1.2.1.: 11 550 000 HUF (net)</td>
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<tr>
<td>Stakeholders involved/Roles:</td>
<td>State Motorway Management Company Ltd.</td>
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<tr>
<td>Contact person: Zoltán Jákli, Technical Deputy General Director <a href="mailto:jakli.zoltan@autopalya.hu">jakli.zoltan@autopalya.hu</a></td>
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<tr>
<td>Status and main results:</td>
<td>Implemented</td>
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Activity/project name: ÁAK's website development regarding to information services and develop a dynamic data transfer channel that can be used by road users (EW II, project number: EWII. A1.1.2)

<table>
<thead>
<tr>
<th>Description:</th>
<th>EWII. A1.1.2: The aim of this project is to integrate more on-line sensors to the ÁAK website, and to improve the visualisation of webcams. Improvement of the ÁAK website related the information services, via visualisation of additional data (traffic date with different colours, information related the travel times, data from the whether-stations, occupation data of the parking information system), as well as visualisation of the actual status of the VMS’s on the motorway network.</th>
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<td>Main objectives:</td>
<td>Duration:</td>
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<td>Financing sources:</td>
<td>EWII. A1.1.2.: 40 000 EUR (net)</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>State Motorway Management Company Ltd.</td>
</tr>
<tr>
<td>Contact person: Zoltán Jákli, Technical Deputy General Director <a href="mailto:jakli.zoltan@autopalya.hu">jakli.zoltan@autopalya.hu</a></td>
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<tr>
<td>Status and main results:</td>
<td>Implemented</td>
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</table>

Activity/project name: Further development of “Müszinfo”, create external links to FIR and website of ÁAK and develop other links to external host (EW II, project number: EWII. A1.1.6)

<table>
<thead>
<tr>
<th>Description:</th>
<th>EWII. A1.1.6. : Connecting the digital 'log book' of the dispatcher service (Müszinfo) to the traffic control centre (FIR) and the official website, and implementing interfaces for external centres/services (TMC provider) to be able more information. This digital log-book contains all incidents, and road works on the ÁAK network. For the integration of this data base to an information service, some improvements must be done, and some interfaces must be defined.</th>
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<td>Main objectives:</td>
<td>Duration:</td>
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</table>
Financing sources: EWII. A1.1.6.: 60 000 EUR (net)

Stakeholders involved/Roles: State Motorway Management Company Ltd.
Contact person: Zoltán Jákli, Technical Deputy General Director
jakli.zoltan@autopalya.hu

Status and main results: Implemented

Activity/project name: RDS TMC service

Description: Implementation of RDS-TMC service consists of three phases:
- Traffic data collection. TrafficNav has developed real-time data collection technology with in contract of the Hungarian data provider.
- Data procession: TrafficNav makes geo-coding according to localisation table and assigns traffic data from several sources that are in several formats to the event codes that fits to ISO specification.
- Data transfer: Normalized TMC data transfers into the national radio transmission by the cooperation of National Radio in favour of travellers get actual information about traffic related events in real-time.

Main objectives:

Duration: 2008

Financing sources:

Stakeholders involved/Roles: TrafficNav Ltd.
Csaba Antal, Managing Director

Status and main results: Implemented

6.6.2. Priority area: continuity of traffic and freight management ITS services

Activity/project name: System Architecture Plan for the Hungarian road network and harmonisation of national System Architectures (ITS Architectures)

Description: CONNECT II. D8.1 /1: The study gives an overview of the entire scope of the available preliminary materials that are serving as the basis of the Hungarian ITS Framework Architecture (HITS). The original Selection Tool has been adopted, as it is to assist the use of the European, and now also the HITS. A website has been structured to include in its first version the user manual for the software, the study, the demo and the associated leaflets. All the persons concerned have the option to download the HITS utility software from here as free of charges. The www.frame-online.hu website is planned to function as a repository of the domestic
achievements, documentations of FRAME.
CONNECT III. D8.1./1.: We have delivered lectures for the following stakeholders in order to boost the visibility of the HITS framework architecture:
- Governmental bodies (Ministry of Transport, Telecommunication and Energy, Hungarian Public Roads Company, Municipal Public Services Co. Ltd., State Motorway Management Company Ltd.)
- ITS developers, manufacturers (ITS Hungary Association, Bay-Logi Foundation)
- Service providers, distributors of ITS-based services (MAKADAM Klub, developers of a fleet management service, the Hungarian consortium for the development of TMC)
- ITS-users (Budapest University of Technology and Economics, public transport organizations: BKV Ltd. – Budapest Public Transport Company; Volánbusz, Borsod Volán – bus transport companies; MVK Zrt. Ltd. – Miskolc Public Transport Company.)

As a result of the information events, the HITS Selection Tool was used in the preparatory phase of developing the traffic control centre and passenger information system of BKV. The HITS functional structure that has been prepared with the involvement of experts from BKV and VOLÁNBUSZ is expected to be attached as an annex to the public procurement documentation.

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<th>Main objectives:</th>
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| **Duration:** | CONNECT II. D8.1./1.: 2007  
CONNECT III. D8.1./1.: 2009 |
| **Financing sources:** | CONNECT II. D8.1./1.: 5 855 980 HUF  
CONNECT III. D8.1./1.: 7 953 182 HUF |
| **Stakeholders involved/Roles:** | Technical and Information Services on National Roads (predecessor in title of Hungarian Public Roads Company)  
Contact person: Zoltán Vályi, Deputy Head of Department  
valyi.zoltan@kozut.hu |
| **Status and main results:** | Implemented |

Activity/project name: Implementation of a traffic control and information system on the M7 motorway (pilot project)

| Description: | CONNECT II D3.4./2: The implemented integrated traffic control and information (pilot) system, utilizing the data of traffic counting detectors, weather-stations and speed-indicators along M7 motorway, is able to send automatic warnings to the traffic centre |
and simultaneously make a proposal for the traffic signs to be displayed on the matrix-VMSs and the prism-VMSs installed in frame of this project. On the graphic desktop of the system data from various information-sources, sub-systems can be displayed on the same screen; arbitrary tools and arbitrary survey-data can be inquired. The actualities are presented on the display by coloured signs.

**Main objectives:**

**Duration:** CONNECT II D3.4.: 2007

**Financing sources:** CONNECT II D3.4./2-3: 500 320 459 HUF (net)

**Stakeholders involved/Roles:** State Motorway Management Company Ltd.

Contact person: Zoltán Jákli, Technical Deputy General Director

jakli.zoltan@autopalya.hu

**Status and main results:** Implemented

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**Activity/project name:** Implementation of a traffic control and information system using VMS on a selected section of the motorway network (implementation) (CONNECT II, project number: D3.4/3)

**Description:** CONNECT II D3.4 /3: Main objective of the project was to ensure the needed “input information” for the operation of the traffic information and control system, using variable message signs, to eliminate the existing gaps of the monitoring infrastructure, moreover to enhance the coverage of the system.

The project consisted of several sub-projects. As a result of the parallel sub-projects, on motorway M1 the data of the traffic counter loops is now already being collected in on-line manner and on the M0 ring road and on the M1 motorway 10 new traffic monitoring cameras had been placed too. On motorway M7 on the most congested section between Budapest and Székesfehérvár - on the M1-M7 motorway, in the area of the intersection of the motorways M1 and M7 as well as in the area between the M1-M7 junction and the M7- M0 intersection - the monitoring coverage have increased significantly, the data-transfer/communication is ensured by using optical telecommunication cable. Moreover a new traffic monitoring station had been implemented too, which capable of congestion-monitoring as well as traffic-counting.

As part of the project three new variable message sign portals had been also implemented (one had been placed on motorway M1, two on motorway M7).

Within the CONNECT project also 22 web-cameras had been installed, these provides very important pre-trip information.
Activity/project name: Implementation of a traffic control and information system using VMS on a selected section of the motorway network – deployment of webcams (implementation) (CONNECT III, project number: D3.4/2-1)

**Description:** CONNECT III D3.4/2-1: The establishment of new measure devices serves the interest of the road-users and well as that of the road-operator at the same time. The goal is to implement cameras at new sites of the motorway network, for providing real-time traffic information of the different sections as pre-trip information to the users via the web-site of ÁAK (overloaded sections near to Budapest). The pictures / data of the web-cameras support the road-operators every-day work with picture related the actual traffic / weather situation. In the framework of this project, webcams were installed altogether 36 cameras at 32 sites (most of the cases in both direction).

**Main objectives:**

**Duration:** CONNECT III D3.4/2-1-5: 2008-200

**Financing sources:** CONNECT III D3.4/2-1-5: 418 529 913 HUF (net)

**Stakeholders involved/Roles:** State Motorway Management Company Ltd.
Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu

**Status and main results:** Implemented

Activity/project name: Implementation of a traffic control and information system using VMS on a selected section of the motorway network – deployment of area surveillance cameras (implementation) (CONNECT III, project number: D3.4/2-2)

**Description:** CONNECT III D3.4/2-2: The main goal of ÁAK is to have the necessary additional information for the operation of VMSs on the network and to be able to improve the level of service provided to road users. This project is the continuation of the surveillance camera deployment in CONNECT II. The aim is to increase the covered section along M1 motorway by implementing 17 more new DOME cameras on critical sections, dangerous places, and service areas for supporting the operation works at the maintenance centres in Bicske, Komárom and Lébény. The
enlarging of the monitoring via cameras supports the cross-border traffic management in co-operation with Asfinag, as well as increase the general safety situation in the service areas.

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<tr>
<th>Main objectives:</th>
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<tr>
<td><strong>Duration:</strong></td>
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<tr>
<td><strong>Financing sources:</strong></td>
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| **Stakeholders involved/Roles:** | State Motorway Management Company Ltd.
Contact person: Zoltán Jáčkli, Technical Deputy General Director jakli.zoltan@autopalya.hu |
| **Status and main results:** | Implemented |

Activity/project name: Implementation of a traffic control and information system using VMS on a selected section of the motorway network – deployment of new VMSs (implementation) (CONNECT III, project number: D3.4/2-3)

<table>
<thead>
<tr>
<th>Description:</th>
<th>CONNECT III D3.4/2-3: The development concentrate to the M1-M7-M0 motorway triangle, mainly to the area of “diverging junction” of M1-M7 motorway where a network control system is needed because of frequent traffic congestions. The main goal is to install additionally VMSs on the left carriageway to complete – as a network control system - the previously installed line control system. The new VMS can display also additional text messages to road users. Location were identifies taking in account the frequent congestions (first of all in the morning rush-hours, as well as the possibility of re-routing (“Egérút” junction). On the right carriageway of the M1 motorway new VMSs were installed on several spots, based on an earlier feasibility study (before the diverging junction M1-M7 a well as the diverging junction of M1 and M0).</th>
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<tr>
<td><strong>Main objectives:</strong></td>
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<tr>
<td><strong>Duration:</strong></td>
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<td><strong>Financing sources:</strong></td>
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| **Stakeholders involved/Roles:** | State Motorway Management Company Ltd.
Contact person: Zoltán Jáčkli, Technical Deputy General Director jakli.zoltan@autopalya.hu |
| **Status and main results:** | Implemented |

Activity/project name: Implementation of a traffic control and information system using VMS on a selected section of the motorway network – deployment of new VMSs on the south side of motorway M0 (implementation) (CONNECT III, project number: D3.4/2-4)

<table>
<thead>
<tr>
<th>Description:</th>
<th>CONNECT III D3.4/2-4: The aim of this project is to implement a missing element of the traffic management system on the M0</th>
</tr>
</thead>
</table>
Budapest ring road (south bypass) near to the M0-M5 junction. The section of M0 ring-road between road No. 51 and M5 motorway will not be the part of further developments, but until the new section will not be completed the indicated section will have a heavy traffic with high transit transport. The M51 highway will be infrastructure element with high importance, as far as traffic management measures, this section of M0 ring road can be used also for re-routing functions. On the carriageway in the direction towards the M1 motorway, the nearest VMS is in a distance of 17 km. The operation of the new VMSs (via the TCC) based on the data/information of monitoring equipment, installed in CONNECT Phase III.

**Main objectives:**
- **Duration:** CONNECT III D3.4./2-1-5: 2008-2009
- **Financing sources:** CONNECT III D3.4./2-1-5: 418 529 913 HUF (net)
- **Stakeholders involved/Roles:** State Motorway Management Company Ltd.
  Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu
- **Status and main results:** Implemented

Activity/project name: M0 motorway congestion warning system (implementation) (CONNECT III, project number: D3.4/2-5)

**Description:** CONNECT III D3.4/2-5: On the ring-road M0 – between the intersections of the main-road M51 and the motorway M5 - traffic monitoring and traffic control system were established. The M0-M5 intersection is a real black spot, among others because of the extremely high traffic volume – the accidents cause congestions with a length of 10 – 15 km (there is no emergency lane on this section). The purpose of the established system is the continuous monitoring of the traffic flow parameters and early detection of incidents / accidents causing congestions near the intersection, so based on the early detection traffic control measures are possible, using the newly implemented variable message signs (prism type). The monitoring is based on two different technologies: AID cameras and traffic counting loops.

**Main objectives:**
- **Duration:** CONNECT III D3.4./2-1-5: 2008-2009
- **Financing sources:** CONNECT III D3.4./2-1-5: 418 529 913 HUF (net)
- **Stakeholders involved/Roles:** State Motorway Management Company Ltd.
  Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu
**Status and main results:** Implemented

**Activity/project name:** Cross-border traffic management on the border area of the motorway network in a co-operation with of Austria, Hungary and Slovakia (implementation) (EW I, project number: EWI. S2.1.1)

| Description: | EWI. S2.1.1: In the frame of the CONNECT project Austria and Hungary elaborated a TMP for the motorways in the Austrian-Hungarian-Slovakian border area, which could be the basis of a future co-operation. However without the Slovakian road operation there is no possibility for re-routing in a cross-border area. The necessary infrastructure (monitoring, VMSs) for operating of cross-border traffic management plans has been established. |
| Main objectives: | |
| Duration: | EW I EWI. S2.1.1.: 2009 |
| Financing sources: | EWI. S2.1.1: 129 169 641 HUF (net) |
| Stakeholders involved/Roles: | State Motorway Management Company Ltd. Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu |
| Status and main results: | Implemented |

**Activity/project name:** Cross-border traffic management plan (TMP) with DATEX II based data exchange, involving the neighbouring CONNECT partners (AT, SLO, SI), (implementation) (EW II, project number: EWII. A2.2.1)

| Description: | EWII. A2.2.1.: The co-operation in operating of cross-border traffic management systems / plans is important from strategic point of view – for a common handling of congestions, for providing information for the road-users (also for re-routing). This project will concentrate on the possibilities of further co-operation with the neighbouring countries, and to restart expert-discussions with the Slovakian motorway operator, to join the elaboration of common TMP’s that was already approved by the Hungarian and Austrian road-operators. Elaboration of cross-border TMP’s involving other neighbouring CONNECT countries (AT, SK, SLO) with DATEX II based data exchange. |
| Main objectives: | |
| Duration: | EWII. A2.2.1.: 2012 |
| Financing sources: | EWII. A2.2.1.: 18 000 EUR (net) |
| Stakeholders involved/Roles: | State Motorway Management Company Ltd. Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu |
Activity/project name: Evaluation of the monitoring plan for the motorway M7, and based on the evaluation realisation of a pilot monitoring system in a selected road section, (feasibility study + pilot project), Part I. and II.

**Description:**
CONNECT II. D1.2/1.: The selection of the sites for the pilot monitoring system was based on the evaluation / feasibility study of CONNECT, 1st Phase. The monitoring test-site field was equipped with an image processing traffic counting device that observes the traffic situation 24 hours a day. Besides the primary, traffic counting function, the system can recognise and alert in case of standing vehicle, congestion, hazard object or car driving in opposite direction. Connected to the pilot project a feasibility study was carried out for the comprehensive extension and application of the system.
CONNECT III. D1.2.1: The main goal of the M7 monitoring pilot project was the automatic analysis of the images from the traffic surveillance cameras installed on the M7 motorway (like vehicles on the emergency lane, ghost-rider and traffic counting data). As the number of cameras grew rapidly, there had been a need arisen, to release the operator, by highlighting only those pictures, where an incident/incident occurred. During the trial, image processing has been used for traffic counting, and incident detection with quite good results. During the trial, image processing has been used for traffic counting, and incident detection with quite good results.

**Main objectives:**

**Duration:**
CONNECT II. D1.2./1.: 2007
CONNECT III. D1.2./1.: 2008

**Financing sources:**
CONNECT II. D1.2/1: 12 485 120 HUF (net)
CONNECT III. D1.2/1: 6 500 000 HUF (net)

**Stakeholders involved/ Roles:**
State Motorway Management Company Ltd.
Contact person: Zoltán Jákli, Technical Deputy General Director
jakli.zoltan@autopalya.hu

**Status and main results:**
Implemented

Activity/project name: Continuation of the development concept and migration plan of motorway TCC of Hungarian State Motorway Management Company, (pilot project)

**Description:**
CONNECT III. D2.2. /1: The TIC/TCC upgrading project attains the semi or fully automatic identification and/or handling of incidents on motorway network. The pilot part of the
Implementation covers two main issues; one is the use of DATEX II for some means of communication (device-centre, subsystem-control software), and the other is to implement the adaptive traffic management module. This module in one hand is able to learn from the previous decisions the operator made, while choosing from the strategy toolkit, and in the other hand it can generate warnings in advance, by following the tendencies of the traffic situation.

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<td><strong>Duration:</strong> CONNECT III. D2.2.: 2009</td>
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<td><strong>Financing sources:</strong> CONNECT III. D2.2: 274 222 518 HUF (net)</td>
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| **Stakeholders involved/Roles:** State Motorway Management Company Ltd.  
Contact person: Zoltán Jákli, Technical Deputy General Director  
jakli.zoltan@autopalya.hu |
| **Status and main results:** Implemented |

Activity/project name: Continuation of the development concept and migration plan of motorway TCC of Hungarian State Motorway Management Company, (implementation), (CONNECT III, project number: D2.2/2)

| Description: | CONNECT III. D2.2/2: In this phase, the main issue is to set up the sub-centres on each motorway line, and to transmit all data (incl. loop detectors, speed sensors, SOS phones, weather stations, camera pictures) to these centres, and to the TCC at the same time. Due to this process, a bigger network can be managed by using less manpower. The TCC can control every system via an integrated common graphic user interface.  
The system has an inner intelligence allowing the operator to alert, based on defined preconditions and giving proposals for the appropriate measure (using the predefined collection of measures/tools). |
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<td><strong>Financing sources:</strong> CONNECT III. D2.2: 274 222 518 HUF (net)</td>
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</table>
| **Stakeholders involved/Roles:** State Motorway Management Company Ltd.  
Contact person: Zoltán Jákli, Technical Deputy General Director  
jakli.zoltan@autopalya.hu |
| **Status and main results:** Implemented |

Activity/project name: M0 motorway, enlargement of the communication systems for operation on the south-sector and integration to the AAK’s TCC, (implementation), (CONNECT III, project number: D2.2/2-1)
### Description:
CONNECT III. D2.2/2-1: The main goal of this project is to establish a high bandwidth communication network for the existing and the recently implemented sensors and cameras, for the integration to the motorway TCC. The aim is to raise the level of monitoring system to reduce the time of response, if an incident occurs, and to prevent secondary accidents, by providing the necessary communication network for the ITS tools deployed that area.

### Main objectives:

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<tr>
<td>Stakeholders involved/Roles:</td>
<td>State Motorway Management Company Ltd. Contact person: Zoltán Jákli, Technical Deputy General Director <a href="mailto:jakli.zoltan@autopalya.hu">jakli.zoltan@autopalya.hu</a></td>
</tr>
<tr>
<td>Status and main results:</td>
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</table>

Activity/project name: M0 motorway, travel-time forecasting system, (implementation), (CONNECT III, project number: D2.2/2-3)

### Description:
CONNECT III. D2.2/2-3: The main goal is to implement a sub-system for calculating predicted travel times connected to the TCC of ÁAK. One of the most critical parts of the ÁAK motorway network is the south bypass of Budapest (the southern section of M0) – as it consists of only one carriageway with 2×2 narrowed lanes, so the planned information system focus on this section, providing expected travel time values to road users, driving from the direction M1 and M7 motorways on M0 ring-road towards the motorway M5. The system is calculating real-time travel times between some pre-defined locations, and displays the calculated values on VMSs.

In the frame of the project 4 measure points were installed for average speed calculation (in 2+000, 6+000, 13+000 and 17+000 km section of M0 ring road) and 4 new VMSs were installed alongside M1, M7 motorway and M0 ring road. At one of the measure points vehicles are identifying based on their number plates and they get individual (non-decodable) codes. The measure points also monitor continuously the speed of the traffic flow.

### Main objectives:

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<th>Duration:</th>
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<tr>
<td>Stakeholders involved/Roles:</td>
<td>State Motorway Management Company Ltd. Contact person: Zoltán Jákli, Technical Deputy General Director <a href="mailto:jakli.zoltan@autopalya.hu">jakli.zoltan@autopalya.hu</a></td>
</tr>
</tbody>
</table>
Status and main results: Implemented

Activity/project name: Incident management on motorway sections (monitoring, automatic incident management and prediction with data providing to the road- users), (implementation), (EW I, project number: EWI. S2.3.1)

**Description:**
EWI. S2.3.1: The aim of the work is to monitor the traffic situation on the most overloaded motorway sections close to Budapest (the common section of M1- M7 motorways and M3 motorway), monitoring the changes in the traffic flow and sending an alert to the operator in case of an accident / incident. The monitoring system is using the advantages of the widely used magnetic loop detectors and the Automatic Incident Detection (AID) cameras, trying to minimize the weaknesses of them applied separately. The implementation projects running in this topic were concentrating on the improvement of the background ICT infrastructure on motorway sections leading to Budapest, which are actually the most crowded sections of the network of the ÁAK. The improvements had two main directions: one was based on the data and alerts coming from the traffic counting stations, and the other one was the use of AID cameras. The data acquired from these two sources is integrated to the Traffic Management Centre of the ÁAK.

**Main objectives:**

**Duration:**
EWI. S2.3.1.: 2009

**Financing sources:**
EWI. S2.3.1: 197 060 616 HUF (net)

**Stakeholders involved/Roles:**
State Motorway Management Company Ltd.
Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu

**Status and main results:** Implemented

Activity/project name: Updating/development of the Motorway TCC, involving new sections in the traffic control system in operation, (implementation), (EW I, project number: EWI. S4.2.1)

**Description:**
EWI. S4.2.1: The aim of the project is to enlarge the monitoring infrastructure, focusing on the mostly overloaded motorway sections, as the sections of the motorways leading to Budapest and on the M0 ring road.
The implementation of the work program was carried out by splitting the works into sub-projects based.
The most important sub-project was the implementation of the missing high bandwidth fibre optic network (built on 13 km...
length), on M0 between the junction of the motorway M5 and expressway no. 4.

On this section 9 new gantries of Variable Message Signs (VMSs) were set up, altogether 10-10 Automatic Incident Detection and traffic surveillance cameras were deployed (2 from both type were installed on the expressway no. 4, close to the junction with M0 – this area has a high accident rate). Besides the above mentioned device, 2 weather stations were set up, and the traffic counting on junction ramps at M0-M5 and M0-4 junctions are also deployed.

Another sub-projects, the traffic surveillance systems were also improved- extended on motorways M1 (1 camera) and M3 (26 cameras).

In connection with improvement of the ITS infrastructure of the future M51- M0-M5 expressway triangle, a new VMS and a traffic counting station were deployed on the right carriageway of motorway M5, before the future M51 (present M0) junction.

The emphasis of the implementations was on the future possibility of lane control on motorway sections leading to Budapest (the left carriageway). Within one of these sub-projects, the old displays, which were able to show only a limited variation of messages, were replaced on 4 VMS gantries by full colour, full matrix LED VMSs on the left carriageway of the M1-M7 common section.

Besides these new VMSs, the monitoring infrastructure was also improved.

By the improvement of the motorway TCC, the integration of the SOS telephone system on M1 motorway by maintenance centres at Bicske and Komárrom was also carried out, so now, the whole system on M1 motorway is within the TCC.

### Main objectives:

**Duration:** EWI. S4.2.1.: 2009

**Financing sources:** EWI. S4.2.1: 1 430 377 555 HUF (net)

**Stakeholders involved/Roles:**
- State Motorway Management Company Ltd.
- Contact person: Zoltán Jákli, Technical Deputy General Director
  jakli.zoltan@autopalya.hu

**Status and main results:** Implemented

Activity/project name: Management of sensitive road segments, automatic incident detection and data providing to the road-users in a selected road section of the motorway network, (implementation), (EW II, project number: EWII. A2.1.1)

### Description:

EWII. A2.1.1: The project has the sub-projects as follows: Establishing and upgrading of VMS’s for traffic management measures as network-control, section-control, and control of
selected junctions. The project concentrates on the M2, M3, M4 motorway + expressway.
Replacing of traffic counting stations as well as upgrading the traffic control centres on the sensitive road section of the motorway M3, for the real-time visualisation of traffic data.

**Main objectives:**

**Duration:** EWII. A2.1.1.:2012

**Financing sources:** EWII. A2.1.1: 1 482 000 EUR (net)

**Stakeholders involved/Roles:** State Motorway Management Company Ltd.
Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu

**Status and main results:** Implemented

Activity/project name: Development of monitoring systems (traffic monitoring, automatic incident detection, CCTV, travel time and weather monitoring), implementation, (EW II, project number: EWII. A4.1.1)

**Description:** EWII. A4.1.1: The project has the sub-projects as follows: For the integration of new equipment into the traffic control centre the establishing of high-bandwidth communication cable and power supply in the intersection of the motorways M4-M0. Development of the monitoring systems for traffic management measures (incident detection, CCTV and web-cams, weather station as well as traffic accounting station).
The project concentrates on the motorway-section leading into Budapest, first of all on the motorways M4 and M2, M0.

**Main objectives:**

**Duration:** EWII. A4.1.1.: 2012

**Financing sources:** EWII. A4.1.1: 1 070 000 EUR (net)

**Stakeholders involved/Roles:** State Motorway Management Company Ltd.
Contact person: Zoltán Jákli, Technical Deputy General Director jakli.zoltan@autopalya.hu

**Status and main results:** Implemented

Development and upgrade of traffic information and traffic management centres II.

Activity/project name: Realisation of a DATEX based communication (pilot) system – traffic data and strategy exchange and tactical cooperation between motorway TCC of Hungarian State Motorway Management Company, the TCC of Budapest, and UTINFORM, (pilot project, Phase II), (CONNECT III, project number: D2.4/1)

**Description:** CONNECT III D2.4/1: In the frame of this project the possibility of Datex II based communication between ÁAK and Budapest Traffic Control Centres has been realized. Furthermore this pilot
The project also enabled the possibility of standardized data exchange between Budapest TCC and UTINFORM (Road Information Service. Due to this development the traffic data, meteorological / environmental data as well as information related incidents (accidents, road constructions, etc) can be exchanged in a standardised form/language. The data provided from the TCC of ÁAK to the Budapest TCC can be visualised on a map via the so called “Concert” management system of Budapest. The real time traffic data exchange between the two centres gives the possibility for co-operation in the field of traffic management measures. The co-operation in traffic management issues in the area of the M0 ring-road has a high priority.

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<td>Stakeholders involved/Roles: Municipal Public Services Co. Ltd. – FKF Contact person: Zoltán Jenovai, Director for Traffic Management <a href="mailto:jenovaiz@fkf.hu">jenovaiz@fkf.hu</a></td>
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<tr>
<td>Status and main results: Implemented</td>
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</table>

Activity/project name: Development of the traffic management system of Budapest, extension the monitored area with adaptive traffic management, installation of new VMSs giving information with special information content in favour of to foster modal shift, I. component, (EW II, project number: EWII. A2.2.2)

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<th>Description:</th>
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<tr>
<td>EWII. A2.2.2: Development of Budapest TCC and extension of its supervised/controlled area by realization of adaptive traffic control, preparation of VMS-s displaying special information contents and preparation of route and travel mode choice, (component II. of the project) The aim is the development of hardware and software tools of Budapest traffic control and management centre to produce, collect and make available the accurate, up-to-date traffic data and information.</td>
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<td>Financing sources: EWII. A2.2.2.: 750 000 EUR (net)</td>
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<td>Stakeholders involved/Roles: Municipal Public Services Co. Ltd. – FKF Contact person: Zoltán Jenovai, Director for Traffic Management <a href="mailto:jenovaiz@fkf.hu">jenovaiz@fkf.hu</a></td>
</tr>
<tr>
<td>Status and main results: Implemented</td>
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</table>
Activity/project name: Modelling and incident detection on the black spots of urban road sections (EW II, project number: EWII. A4.1.2)

**Description:** EWII. A4.1.2: Incident detection on the critical sections of urban road network, modelling and ensuring the enforcement functions. The purpose of this project is the territorial extension of traffic monitoring and the preparation of new visual information as well as other traffic information. Further aims are to make the currently produced data accessible and to improve technical background of data-processing.

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<td><strong>Contact person:</strong></td>
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<td><strong>Status and main results:</strong></td>
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Activity/project name: Development of freight traffic entrance monitoring and enforcement system (pilot project) (EW II, project number: EWII. A4.1.6)

**Description:** EWII. A4.1.6: Implementation of a pilot system for the control of the freight traffic (drive-in) on the road-network of the capital. For the detection of the unauthorized road users fix and mobile camera equipment should be implemented/installed on strategic points of the road-network. This system is also capable to support the enforcement process regarding unauthorized "drive-in" by data collection/data process functions of the system. The system should be realized (as much as possible) by the utilization of the existing infrastructure elements.

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<td><strong>Stakeholders involved/Roles:</strong></td>
</tr>
<tr>
<td><strong>Contact person:</strong></td>
</tr>
<tr>
<td><strong>Status and main results:</strong></td>
</tr>
</tbody>
</table>

Activity/project name: Further development of central traffic database (EW II, project number: EWII. A4.1.5)

**Description:** EWII. A4.1.5: The central traffic database setting up includes the results of traffic survey of national roads (including motorways and main roads). The data has to be entered in the database as soon as
possible. The practical introduction of an effective quality assurance system on both local and central levels makes it possible to store even more reliable data. The system processing and handling basic traffic data completes appropriate selection and control to ensure data for the central database. The central traffic database that provides up-to-date and reliable traffic data creates a new type of access to traffic data immediately after it is issued. The aim of the development is to provide on-line real time traffic situation data for the information centre of the road operator (UTINFORM) and for the users of the national traffic data port.

Main objectives:

Duration: EWII. A4.1.5.: 2012

Financing sources: EWII. A4.1.5.: 200 000 EUR (net)

Stakeholders involved/Roles:

Hungarian Public Roads Company

Contact persons:
EWII. A4.1.5.: Zoltán Vályi, Deputy Head of Department, valyi.zoltan@kozut.hu
EWII. A4.2.1.: Ibolya Bali, Head of Department bali.ibolya@kozut.hu

Status and main results: Implemented

Activity/project name: Network organization of isolated traffic management and control devices - Further development of the national UTINFORM real-time data centre (TIC) (EWII. A4.2.1)

Description:
EWII. A4.2.1: The Hungarian Public Road Authority (Magyar Közút), the State Motorway Management Company (ÁAK), Budapest and several cities with county rights have traffic control systems on different quality. As it is known most of them operate on low efficiency or out of order because of moral worn-away or its services are not used. It is proved by the frequent criticism of certain services or the inappropriate details of the information provided.

It is high time to create a central system suitable to link not only to the national 'traffic control centres' but also the neighbouring EU countries’ systems and capable to exchange data by the use of a standard on-line information exchange protocol (DATEX II).

The exchange of data provided by display device in the information centres of different road operators have to be carried out and tested in a pilot project. It is necessary to apply an intelligent electronic image analysis system that makes it possible to send out warning signs towards the staff on duty when there is
a significant change, possibly requiring human intervention, in the traffic monitored by the security camera.

**Main objectives:**

**Duration:** EWII. A4.2.1.: 2012

**Financing sources:** EWII. A4.2.1.: 1 000 000 EUR (net)

**Stakeholders involved/Roles:** Hungarian Public Roads Company

Contact persons:
- EWII. A4.1.5.: Zoltán Vályi, Deputy Head of Department, valyi.zoltan@kozut.hu
- EWII. A4.2.1.: Ibolya Bali, Head of Department bali.ibolya@kozut.hu

**Status and main results:** Implemented

---

**Activity/project name:** Establishment of a supporting system, that filter overload vehicle because of the ceasing of inner EU country borders (data transfer with neighbour CONNECT partners)

**Description:** EWII. A3.2.1: Freight devices with increasing capacity (and increasing axle load) and the year by year increasing transit and inland freight traffic, beside their economic advantage, are largely responsible for the current condition of our road network. One of the important tasks of the road operator is to remove overweight vehicles which are mainly responsible for the damage made on the road network and to build and run a complex system that is preventive and deters regulation violators. The amendment of the relevant regulation (410/2007 (XII. 29)) creates favourable environment for this. The regulation pays special attention to those who are responsible for the damage of roads, especially the removal of overweight vehicles.

The damage in the condition of roads caused by overweight vehicles exceeds 10 billion HUF per year. For the very small portion of that amount an automatic pre-selection system can be built up to provide basic function as well as additional services (traffic survey, road user authorization, road user statistics etc.). As a result of joining the Schengen-zone the conditions of an efficient total weight and axle road measurements implemented at the border have been abolished therefore they have to be implemented in the area of the country and a network based on randomly implemented measures and meets the EU requirements has to be created. In 2008-2009 a system containing 18 HSWIM set units serving 11 measuring points was deployed within the framework of the road protection programme to pre-select overweight vehicles and it has provided promising results. We
6.6.3. **Priority area: road safety and security**

**Activity/project name:** Establishing of a dynamic information service, providing additional information (route-guidance, occupancy of parking areas, etc.) for the freight transport on the TEN-corridors of Hungary (Implementation)

**Description:** EWI. S3.2.1/2: Within this project, a pilot-project for parking management on motorway M1 was carried out based on the above mentioned feasibility study (S3.2.1/1 project). The proposed location for a pilot was the service area ARRABONA North on the right carriageway of motorway M1 (leading to Vienna), at km 119 nearby the city of Győr.

To calculate the free parking places, an innovative solution was implemented: it is based on 3D picture modelling. The occupation is calculated real-time and the system is able to detect whether a truck is parking wrongly, e.g. using more places at the same time.

6 cameras were deployed at the rest area, all of them in pairs on 3 posts, similar to human eyes, and these cameras (with the help of a special program) can set up a 3D picture from the observed area. The data coming from this calculation (the number of available places) can be shown on a dynamic traffic sign located 15 km far from the rest area, and later on the web page of SMMC.

**Main objectives:**

**Duration:** EWI. S3.2.1/2: 2009

**Financing sources:** EWI. S3.2.1/2: 18 784 400 HUF (net)

**Stakeholders involved/Roles:** State Motorway Management Company Ltd.

**Contact person:** Zoltán Jákli, Technical Deputy General Director

**jakli.zoltan@autopalya.hu**

**Status and main results:** Implemented
Activity/project name: Establishing of a static information service, providing information about parking possibilities/systems for the freight transport on the TEN-corridors of Hungary (Pilot project) (EW I, project number: EWI. S3.1.1)

| **Description:** | EWI. S3.1.1 (pilot, implementation): Services provided on the Trans-European network of the EU include an appropriately equipped and supplied, safe network of lay-bys with special regard to the requirements of professional drivers of heavy vehicles. It is proved therefore that the current situation of the national lay-bys and the possible way of extension of their network have to be investigated. According to the tender-documents it is an elementary road user demand to provide clean and civilized roadside lay-by network to spend the compulsory rest period there and to provide an Internet-based information system which is capable to bear frequent, daily use. The aim of the project is to create a website for freight services to provide information about the main freight directions of the road network and parking possibilities in an easily accessible, multilingual environment. |
| **Main objectives:** | |
| **Duration:** | EWI. S3.1.1: 2009 |
| **Financing sources:** | EWI. S3.1.1: 25 500 EUR (net) |
| **Stakeholders involved/Roles:** | Hungarian Public Roads Company  
Contact person: EWI. A4.1.5.: Zoltán Vályi, Deputy Head of Department, valyi.zoltan@kozut.hu |
| **Status and main results:** | Implemented |

Activity/project name: Static information collection and dissemination for freight traffic about parking systems and possibilities of the main transport corridors (TEN-T corridors) (EW II, project number: EWII. A3.1.1)

| **Description:** | EWI. A3.1.1 (pilot, implementation): Services provided on the Trans-European network of the EU include an appropriately equipped and supplied, safe network of lay-bys with special regard to the requirements of professional drivers of heavy vehicles. It is proved therefore that the current situation of the national lay-bys and the possible way of extension of their network have to be investigated. According to the tender-documents it is an elementary road user demand to provide clean and civilized roadside lay-by network to spend the compulsory rest period there and to provide an Internet-based information system which is capable to bear frequent, daily use. |

Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries
Internet-based information system which is capable to bear frequent, daily use.
The aim of the project is to create a website for freight services to provide information about the main freight directions of the road network and parking possibilities in an easily accessible, multilingual environment.

<table>
<thead>
<tr>
<th>Main objectives:</th>
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</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>EWII. A3.1.1: 2011</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>EWII. A3.1.1: 50 000 EUR (net)</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>Hungarian Public Roads Company</td>
</tr>
<tr>
<td></td>
<td>Contact person: EWII. A4.1.5.: Zoltán Vályi, Deputy Head of Department, <a href="mailto:valyi.zoltan@kozut.hu">valyi.zoltan@kozut.hu</a></td>
</tr>
<tr>
<td>Status and main results:</td>
<td>Implemented</td>
</tr>
</tbody>
</table>

Activity/project name: Real-time dynamic information services for freight traffic on the main transport (development of parking monitoring system, occupancy monitoring, guidance, navigation, etc.) (EW II, project number: EWII. A3.1.2)

Description: EWII. A3.1.2: The extension of the M1 parking control system implemented within the framework of EasyWay I project is completed in the current project involving Arrabone left and Moson right lay-bays. The parking control system of trucks helps drivers to spend their rest-period by indicating free parking places in advance according to each lay-bay at that moment. The operation of the system is based on image processing and the measurement of the occupancy includes cameras and processing units operating beside them. The display is carried out by a dynamic indicator integrated in a fix board.

<table>
<thead>
<tr>
<th>Main objectives:</th>
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<tbody>
<tr>
<td>Duration:</td>
<td>EWII. A3.1.2: 2012</td>
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<td>Financing sources:</td>
<td>EWII. A3.1.2: 130 000 EUR (net)</td>
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<tr>
<td>Stakeholders involved/Roles:</td>
<td>State Motorway Management Company Ltd.</td>
</tr>
<tr>
<td></td>
<td>Contactperson: Zoltán Jáklí, Technical Deputy General Director <a href="mailto:jakli.zoltan@autopalya.hu">jakli.zoltan@autopalya.hu</a></td>
</tr>
<tr>
<td>Status and main results:</td>
<td>Implemented</td>
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</table>

Activity/project name: Supporting the pedestrian transport by navigation system/ supporting the transport of road users with restricted abilities/, connection of pedestrian and public transport (implementation) (EW I, project number: EWI. S1.1.2/2)

Description: EWI. S1.1.2/2: Within the frame of this project a city journey-planner service was elaborated, which can make route – planning
and gives route-advises considering personalized, individual requirements and the public transportation network in the area of municipal Budapest. With the help of the website, people with restricted moving abilities (using wheelchair or having other disability) can get a detailed rout-plan that is the most appropriate for them, and also partially sighted people can use this service to find the safest route taking into consideration the current features of the infrastructure. The design and the distribution of the website make it possible to handle the special requirements of partially sighted people. In addition there’s a mobile version of the website, which enables owners of mobile devices with internet connection to use this service and its most functions.

### Main objectives:

<table>
<thead>
<tr>
<th>Duration:</th>
<th>EWI. S1.1.2/2: 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing sources:</td>
<td>EWI. S1.1.2/2: 7 500 000 HUF (net)</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>Municipal Public Services Co. Ltd. – FKF</td>
</tr>
<tr>
<td></td>
<td>Contactperson: Zoltán Jenovai, Director for Traffic Management</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:jenovaiz@fkf.hu">jenovaiz@fkf.hu</a></td>
</tr>
<tr>
<td>Status and main results:</td>
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</tr>
</tbody>
</table>

### 6.7. Italy

#### 6.7.1. Priority area: optimal use of road, traffic and travel data

Activity/project name: CCISS

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>CCISS – Road Safety Information Coordination Centre</td>
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<tr>
<td>The CCISS is coordinated and managed by the Ministry of Infrastructure and Transport. It collects information on events that disturb the regular flow of traffic and circulates it through:</td>
</tr>
<tr>
<td>- broadcast and satellite TV bulletins</td>
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<tr>
<td>- radio bulletins on RAI channels</td>
</tr>
<tr>
<td>- Internet (<a href="http://www.cciiss.it">www.cciiss.it</a>)</td>
</tr>
<tr>
<td>- Call-centre: with a freephone number (1518) operational 24 hours a day with the option of four macro-regional bulletins, weather bulletin and latest radio bulletin broadcast or direct interaction with the operator.</td>
</tr>
<tr>
<td>- Geo-referenced news on smartphone mobile apps (iCCISS – iCCISSpro)</td>
</tr>
<tr>
<td>- RDS-TMC (digital channel superimposed on FM radio transmissions) operated by the RAI that can be displayed on satellite navigation systems.</td>
</tr>
</tbody>
</table>
Main objectives:  
- collecting, processing and selecting information on traffic and the road system;
- circulating useful information about traffic flow and safety;
- preparing and delivering road safety campaigns

Duration: 1990 – continuous development

Financing sources: National

Stakeholders involved/Roles: Ministry of Infrastructure and Transport

Technology used: The CCISS operates its own proprietary information platform (RTTI) developed to provide native support for the DATEX protocol used to exchange data with other national and European DATEX hubs.

Status and main results: Finalised

6.7.2. Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations

Activity/project name: 5T - TURIN

Description: The 5T System (Tecnologie Telematiche per i Trasporti e il Traffico a Torino – Telematic technologies for transport and traffic in Turin) is one of the most important ITS-based mobility management systems in Europe. The Project was launched in 1992 and the 5T System is currently made up of seven subsystems.

Main objectives: Public Supervisory Operating System, guarantees the integration of all subsystems with the aim of generating the best service to mobility while protecting the environment. The system records traffic progress every five minutes, forecasts mobility hour by hour, monitors pollution and formulates a general strategy for environmental protection. Public Transport management sub-system, guarantees the regular flow and speed of the public transport system by monitoring vehicles on the road and user information at stops. The system operates with 353 incoming arrival display units (VIA) at stops and 500 next stop announcement units installed on board vehicles. Traffic control subsystem (UTC), manages traffic lights in accordance with local measures and area policies suggested by the Supervisory Operating System, also guaranteeing that public transport vehicles are given priority at traffic lights. The system operates at 300 intersections within the urban area, with some 3000 traffic detection units. Parking management subsystem connected to 28 automatic car...
parks, provides forecasts of place availability. Environmental subsystem forecasts short-term environmental conditions using weather forecasts, data on pollution and traffic and makes them available to the Supervisory Operating System for implementation of appropriate mobility policies. Collective direction subsystem (VMS), provides dynamic direction information towards city areas and real time information on places available in automated car parks. The system operates using 26 direction signs and 20 guide signs to car parks. User information subsystem, offers real time information on the status of public transport, traffic and parking via the Internet and text messaging. In particular, the system provides travellers with on-line information to help them plan the best form of transport and route from origin to destination before or during the trip.

| **Duration:** | 1992 – continuous development |
| **Financing sources:** | |
| **Stakeholders involved/Roles:** | managed by 5T, a public company owned by Piemonte Region, the Municipality of Turin and the Province of Turin |
| **Technology used:** | 170 intersections  
26 variable message signs (VMS)  
18 mobile VMS  
1300 traffic sensors  
50 cameras (15 intersections)  
And also  
1300 GTT buses/trams  
9 electronic access control cameras  
6 speed excess lanes |
| **Status and main results:** | Finalised; The 5T system has made it possible to achieve a reduction of approximately 20% in travelling time for private traffic in the area controlled by the system and an increase of 17% in the commercial speed of public vehicles due to the management of traffic light priority. It should also be emphasised that the 5T System managed all traffic flow to areas involved in the Games during the 2006 Turin Winter Olympics and has been selected together with partners to manage the Sochi Winter Olympics in 2014. |

Activity/project name: Rome – Integrated traffic and mobility management system

| **Description:** | Rome’s economy is mainly based on services that are chiefly located in the centre of the city. In 1999 the Municipal Administration promoted the development of an integrated ITS for traffic monitoring and management with the aim of reducing |
the negative impact caused by traffic.

The heart of the Rome RTS system is a Traffic Control Centre that monitors, manages and controls urban traffic through various subsystems, each dedicated to the performance of specific traffic flow monitoring and/or regulation functions.

**Main objectives:**

Mobility Management System (MMS) incorporates the various subsystems through biunivocal data exchange based on a geo-referenced reference graph representing the main road systems of the city of Rome. Communication between subsystems takes place through WAN and LAN networks and TCP/IP protocols.

Traffic light regulation system controls more than 400 traffic light sets centrally and is based on SPOTS/UTOPIA software for the dynamic regulation of traffic light cycles.

Traffic flow monitoring system consisting of more than 2500 on-road Induction loops and more than 65 real-time traffic monitoring stations located at critical points of the road system. Traffic data are generated by sensors every minute and are available via MMS every five minutes. The system also provides input data for planning activities making it possible to validate the models against actual traffic data.

User information system via variable message signs located on the main road routes. The signs automatically provide information on service status (delays, congestion, queues and so on) of certain road routes obtained by processing traffic data generated by local sensors. The signs can also display general information concerning, for example, planned events (e.g. strikes, demonstrations, closures or deviations) or recommendations of a general nature (e.g. road safety campaigns).

IRIDE access monitoring system for automatic monitoring of access to the historic centre ZTL (restricted traffic area). The system is based on gates and TV cameras that automatically detect incoming vehicle licence plates and cross-check them against a list of authorised plates. If the vehicle is not on the list, the system automatically activates the penalty procedure.

Video surveillance system, consisting of more than 60 TV cameras that can be controlled remotely (swinging and zoom) located around the main Roman churches near problem intersections. The images are also sent in real-time to both the Centre and the Municipal Police Operations Room as a support for accident detection.

PARK system for monitoring of parking manages Laurentina and Magliana interchange car parks by means of units for automatic counting of vehicles entering and leaving that are able to
communicate space occupation status in real time to the Traffic Control Centre. TIC traffic information system manages the dissemination of information on traffic status (delays, queues, etc.), road works, planned events (road closure, demonstrations, etc.) and exceptional events (accidents, etc.). The information is supplied by e-mail, website, video-text and text message.

Duration: 2000 – continuous development
Financing sources: Roma Servizi per la Mobilità

Technology used: Traffic Control Centre
Traffic lights network (1320 devices) through the UTOPIA system
Access to Limited Traffic Zones of the historical centre
Parking systems on road (79,000 places, 2,2000 parking meters)
Interchange parking areas (29 Park & Ride with 12,000 places)
UTT (Urban Travel Time) system for information on travel times
Local Public Transport network (2600 vehicles, 325 bus lines, 7 tramway lines, 2 underground lines for a total of 1.2 billions passengers-km every year)
Users information systems (Variable Message Signs, Internet, mobiles)

Status and main results: Finalised;
The Rome ITS system has been in operation since the Jubilee in 2000 and it has allowed a 10% reduction in travelling times, a 12% reduction in the number of accidents and a 15% reduction in polluting emissions in areas managed by the Traffic Monitoring Centre.

Activity/project name: Safety Tutor
Description: The Safety Tutor System developed by Autostrade per l’Italia can be used to measure average speed and capture images of the license plates of speeding vehicles on roads with multi-lane carriageways with high traffic density at speeds of up to 255 km/h. The system is operational 24 hours a day, 365 days a year. The Safety Tutor system has been installed along road sections with higher than average mortality rates. Speed control by means of the Safety Tutor is currently active on approximately 2700 km of highways (equivalent to approximately 39% of the network operated by the Autostrade per l’Italia Group).
Main objectives: reduction in average speed and peak speed
reduction in the accident rate and consequences to people
Duration: 2005 – 2006
6.7.3. Priority area: Road safety and security

Activity/project name: East Brescia truck park

Description: The East Brescia truck park located along Corridor V at the A4 motorway exit was built by the Autostrada Brescia-Padova company to a brief by the Brescia FAI (Federation of Italian Hauliers), which wished to see the setting up of equipped rest areas tailored to drivers throughout Italy that could offer services for people and vehicles for use by the drivers during their stay. The East Brescia truck park covers an area of 173,000 m² and is absolutely new and unique within Italy due to its size and characteristics.

Main objectives: To achieve the highest level of efficiency and meet the required specifications of size, structure and function, the truck park incorporates a set of infrastructures designed for accessibility, safety and quality. To this end, a system has been installed for the monitoring and management of entrances and exits that uses state-of-the-art technologies and guarantees a round-the-clock monitoring and video surveillance service. The entire area has been fully wired.

Duration:

Financing sources:

Stakeholders involved/Roles: Autostrada Brescia-Padova

Technology used: Access is controlled by electronic procedures and the entire complex is managed and subject to video surveillance, including the implementation of a monitoring system for the area by means of the technology used.
of sensors and TV cameras. The video surveillance system installed at the gates has been enhanced to enable the management system to link each entrance ticket with the vehicle license plate details. The parking area includes 430 bays, 300 of which are standard and approximately 10 of which are equipped with electrical power hook-up for vehicles carrying perishable foodstuff. The bays are marked out by horizontal signs on the road surface in order to ensure the orderly positioning of vehicles. The sizes of the access and exit routes are sufficient to ensure easy transit and manoeuvring of vehicles.

A photovoltaic plant installed on the perimeter allows energy saving by covering the lighting needs of the entire fleet: in addition to saving money, this energy production also aims to safeguard the environment against further pollution. The area offers an extensive range of services and is divided into various sections. Because the new European rules on employment contracts for hauliers require longer rest times of up to nine hours and sometimes more, a hostel has been set up consisting of 12 rooms for overnight stays in case of emergency. Another area is set aside for vehicle services. This is also open 24 hours a day and includes a reception with multilingual staff who are able to assist customers by directing them toward the relevant area.

An IT system to connect the equipped rest areas to the Internet is being developed by the Hauliers Central Committee and will provide another benefit for hauliers. It will be possible to book the necessary services in advance online or via a call centre and then plan stopovers with greater ease during the journey.

**Status and main results:** Finalised;

### 6.7.4. **Priority area: Integration of vehicle into the transport infrastructure**

**Activity/project name:** Development of smart autonomous vehicles

**Description:** An important initiative is the development of smart autonomous vehicles by Vislab, a spin-off of the University of Parma. Vislab has been active for more than 15 years in the application of artificial vision techniques and instruments on vehicles to increase road safety. It has successfully participated in international calls for tender in the US in the past with autonomous vehicles developed in its laboratories.

**Main objectives:** -
### Activity/project name: PReVENT2 (intelligent vehicles for safer travel)

<table>
<thead>
<tr>
<th>Description:</th>
<th>PReVENT is a European automotive industry activity co-funded by the European Commission to contribute to road safety by developing and demonstrating preventive safety applications and technologies.</th>
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</thead>
<tbody>
<tr>
<td>Main objectives:</td>
<td>The aim of the project is to prevent side collisions and/or shunting when reversing, assist drivers when they have no line of vision and prevent them from becoming distracted at the wheel.</td>
</tr>
<tr>
<td>Duration:</td>
<td>4 years starting from February 2004 to January 2008</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>The PReVENT project is one of the largest initiatives on road safety co-funded as an Integrated Project by the European Commission. The total budget amounts to more than €55 million.</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>It involves more than 50 European partners from the most prominent vehicle manufacturers and equipment suppliers (Tiers I) to the best intelligent vehicle research laboratories in Europe.</td>
</tr>
<tr>
<td>Technology used:</td>
<td>This is achieved through safety applications directly aided by information and communication technologies (ITC) that can help the driver to avoid an accident or limit its severity</td>
</tr>
<tr>
<td>Status and main results:</td>
<td>Finalised;</td>
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</table>

### Activity/project name: CVIS3 (Cooperative Vehicle-Infrastructure System)

<table>
<thead>
<tr>
<th>Description:</th>
<th>CVIS3 (Cooperative Vehicle-Infrastructure System). In this system, vehicles interact with one another and with road infrastructures.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main objectives:</td>
<td>The CVIS project aims to design, develop and test new technologies necessary to allow vehicles to interact with one another and with adjacent road infrastructures. The ambitious goal is to bring about a genuine revolution in the fields of passenger mobility and the free circulation of goods by completely</td>
</tr>
</tbody>
</table>

Duration: 1995 – continuous development

Financing sources: 

Stakeholders involved/Roles: Vislab - University of Parma

Technology used: 

Status and main results: In particular, in 2010 Vislab organised an expedition by four autonomous vehicles with TV cameras, lasers and on-board computers over a route of more than 13,000 km. The expedition lasted approximately three months and travelled from Italy to China, crossing countries such as Hungary, Ukraine, Russia and Kazakhstan with the ultimate destination of the Shanghai Expo.
reinventing the method of interaction between drivers, their vehicles, goods transported and transport infrastructures. In this way the CVIS project will be able to increase road efficiency and safety and also reduce the environmental impact of road transport.

**Duration:** 2009 - ongoing

**Financing sources:** -

**Stakeholders involved/Roles:** The consortium consists of 60 partners, among which top vehicles manufacturers, suppliers and other industries, universities, research institutes, national road administrations and representative organizations from the European member states, including some of the newly joined member states.

**Technology used:** The fundamental enabling technology for cooperative systems is a “universal communications module” that can interface to existing in-vehicle systems, and to existing roadside installations, and that can maintain a continuous wireless high-capacity data channel. The CVIS module can use existing bearers such as 2.5/3G cellular phone and DSRC, and will be specifically designed for the new “Wi-Fi for mobiles” wireless local networking supporting both vehicle to vehicle and roadside infrastructure communications. This means that an operator, service provider or other nearby vehicle will be able to address a vehicle in entirely new ways, such as by location or by IP address, and provide new kinds of service. Traffic management systems will be able for the first time to communicate with individual vehicles, and to optimise the network efficiency in the knowledge of every vehicle’s position and trajectory, and even its desired destination. This opens the way to provide personalised routing guidance using instantaneous traffic information, safety alerts to vehicles in a certain area and speed recommendations to groups of vehicles. This will increase total network capacity and reduce localised congestion, thus also reducing the number of accidents. Traffic will flow more smoothly with fewer stops, thus improving air quality. Special priority can be given to classes of vehicles, such as emergency or public transport vehicles, or goods vehicles. Drivers will benefit from more complete and up-to-date information about traffic hazards and congestion, presented in new ways – for instance road signs, variable message signs and traffic light status can be displayed in the vehicle. Through new interfaces drivers will be able to exchange requests and recommendations. The “always-connected” communications channel will allow access to information and entertainment content available on the Internet, and to interact (in safe ways) with home and office.
### 6.8. Romania

#### 6.8.1. Priority area: optimal use of road, traffic and travel data

**Activity/project name:** Traffic and road conditions monitoring and information system – development strategy and pilot project

| Description: | The goal of the project is to monitor traffic and road infrastructure, provide information regarding traffic and driving conditions and develop a short and medium term development strategy aiming in two directions: traffic and road infrastructure monitoring and information regarding traffic and driving conditions; |
| Main objectives: | The project’s main objectives are:  
- traffic data gathering: number of vehicles, vehicle classification, speed, weight (weight in motion), gauge, traffic density;  
- road weather data gathering, visibility;  
- data gathering regarding infrastructure: video information and system equipment status (security);  
- vehicle identification;  
- incident detection;  
- ensuring communication/connection between sensors, data acquisition equipment, local processing units and the monitoring centre;  
- local data processing;  
- centralized data processing;  
- data storage and archiving;  
- alarm generation |
| Duration: | September 1st 2010 – April 12th 2011 |
| Financing sources: | 80% State Budget and 20% European Commission financing through the EasyWay project |
| Stakeholders involved/ Roles: | RNCMNR |
| Technology used: | CCTV, weather stations, inductive loops |
| Status and main results: | 100% complete. Monitoring and traffic information equipment were installed in 6 nodes along the A1 highway, (km 10+650; km 22+380; km 36+000; km 71+000; km 106+500; km 119+900). The Traffic and Road Weather Monitoring Centre was established by RNCMNR in Bucharest (100 m from the A1 highway entrance). |

**Activity/project name:** Extension of the Traffic and road conditions monitoring and information system from the A1 onto A2 motorway

| Description: | Traffic and road infrastructure monitoring as well as information for |
traffic and road conditions on the A2 motorway. Monitoring will be done from the centre established by RNCMNR in Bucharest, built for the system implemented on the A1 motorway. Communication between dispatch and the equipment will be done via radio.

### Main objectives:

- traffic data gathering: number of vehicles, vehicle classification, traffic density;
- road weather data gathering, visibility;
- data gathering regarding infrastructure: video information and system equipment status (security);
- driver information via VMS’s;
- incident detection;
- ensuring communication/connection between sensors, data acquisition equipment, local processing units and monitoring centre;
- local data processing;
- centralized data processing;
- data storage and archiving;
- report generation

### Duration:

Date of signing: April 29th 2011, End date: July 15th 2011

### Financing sources:

80% State Budget, 20% European Commission financing through the EasyWay project

### Stakeholders involved/Roles:

RNCMNR

### Technology used:

CCTV, weather station, VMS, radio communication, inductive loops

### Status and main results:

The system is completely in testing. Equipment for monitoring traffic, road conditions and infrastructure were installed as well as driver information equipment. Thus: at km 64+000 and km 105+300 were installed cameras for traffic monitoring, incident detection cameras, traffic counting systems as well as variable message signs and at km 111 a weather station was installed and sensors were embedded in the roadway for determining the temperature for the roadway surface.

Activity/project name: Services for refurbishing and maintenance of the Communication and Traffic Monitoring System on the A2 motorway Bucharest - Lehliu (km 9 + 500 – km 64 + 020)

### Description:

Refurbishing the communication and electrical power system for the Communication and Traffic Monitoring System on the A2 motorway, Bucharest – Lehliu sector as well as maintenance for the system.

### Main objectives:

The project’s main objectives are refurbishing the system for obtaining the following information:

- traffic data: number of vehicles, classification of vehicles, traffic density;
- road weather data, visibility;
<table>
<thead>
<tr>
<th>Activity/project name: The Timisoara – Arad motorway construction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Building the Timisoara – Arad highway. Within the project intelligent transport systems will be implemented every 2 km.</td>
</tr>
<tr>
<td><strong>Main objectives:</strong> The ITS component aims to implement Video surveillance systems – CCTV; Telephone network for emergency calls – SOS; Variable message sign system – VMS; Traffic Control System - TCS; Weather stations – MS; Radio system – VHS</td>
</tr>
<tr>
<td><strong>Duration:</strong> Date of signing : December 11th 2008 with a deadline for: 1st quarter 2012</td>
</tr>
<tr>
<td><strong>Financing sources:</strong> State budget, Structural Funds, European Investment Bank</td>
</tr>
<tr>
<td><strong>Stakeholders involved/ Roles:</strong> RNCMNR</td>
</tr>
<tr>
<td><strong>Technology used:</strong> -</td>
</tr>
<tr>
<td><strong>Status and main results:</strong> The system is 58% completed. The goal is to install a set of sensors and controllers for data acquisition and processing, as well as communication interfaces for establishing a link and synchronize with the central data base Weather station installation and roadway freeze sensors; SOS phone installation</td>
</tr>
<tr>
<td>Traffic flow improvement</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>Increase traffic capacity to prevent traffic congestion</td>
</tr>
<tr>
<td>Reduce number of serious accidents and deaths by 60%</td>
</tr>
</tbody>
</table>

Activity/project name: The Timisoara - Lugoj motorway construction Km 44+500 – Km 54+000

<table>
<thead>
<tr>
<th>Description:</th>
<th>Building the Timisoara Lugoj motorway Km 44+500 – Km 54+000. As part of the construction project, intelligent transport systems will be installed every 2 km.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main objectives:</td>
<td>The ITS component aims to:</td>
</tr>
<tr>
<td></td>
<td>• monitor traffic via</td>
</tr>
<tr>
<td></td>
<td>• incident detection;</td>
</tr>
<tr>
<td></td>
<td>• real-time data transmission</td>
</tr>
<tr>
<td></td>
<td>• measure weather conditions, visibility, precipitations</td>
</tr>
<tr>
<td></td>
<td>• SOS telephones placed on both sides</td>
</tr>
<tr>
<td></td>
<td>• concentrations points with security systems</td>
</tr>
<tr>
<td>Duration:</td>
<td>Date of signing : May 20th 2011 End date: April 2013</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>State budget, Structural Funds</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>RNCMNR</td>
</tr>
<tr>
<td>Technology used:</td>
<td></td>
</tr>
<tr>
<td>Status and main results:</td>
<td>The ITS system is still in the design stage.</td>
</tr>
<tr>
<td></td>
<td>The following will be installed:</td>
</tr>
<tr>
<td></td>
<td>• VEH traffic measuring subsystem</td>
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<td></td>
<td>• vehicle detectors;</td>
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<tr>
<td></td>
<td>• weather condition measuring system;</td>
</tr>
<tr>
<td></td>
<td>• CCTV video surveillance subsystem</td>
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<tr>
<td></td>
<td>• automatic license plate recognition and monitoring/sanctioning system for vignette ANPR composed of specialized video cameras for license plate recognition;</td>
</tr>
<tr>
<td></td>
<td>• SOS emergency telephone system;</td>
</tr>
<tr>
<td></td>
<td>• CONC concentration points;</td>
</tr>
<tr>
<td></td>
<td>• IFRA security system.</td>
</tr>
</tbody>
</table>

Activity/project name: Road traffic monitoring via traffic counters

<table>
<thead>
<tr>
<th>Description:</th>
<th>Determining the sectors of road characterized by similar traffic to install road sensors that will determine traffic intensity and characteristics via the electronic module.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main objectives:</td>
<td>Collecting traffic data for more accurate determination of traffic characteristics, intensity, total axle tonnage, speed, number of vehicles for each class by automatic registering with traffic equipment.</td>
</tr>
<tr>
<td>Duration:</td>
<td>Permanent; Starting date: 2000</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>Budgetary allocation</td>
</tr>
</tbody>
</table>
### Stakeholders involved/Roles:
- **RNCMNR – DRDP I-7**

### Technology used:
- Inductive loops

### Status and main results:
- System is currently being used. Traffic data is extracted via laptop, transmitted to CESTRIN Bucharest for processing to obtain the ADA (annual daily average) and MDA (monthly daily average).

---

**Activity/project name:** Fixed and mobile installations for checking individual axle weight on freight road vehicles

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th>Checking freight road vehicles by measuring individual axle weight.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main objectives:</strong></td>
<td>Checking freight road vehicles by measuring individual axle weight.</td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
<td>Starting date: 2000, according to monthly check-up schedules</td>
</tr>
<tr>
<td><strong>Financing sources:</strong></td>
<td>Budgetary allocation</td>
</tr>
<tr>
<td><strong>Stakeholders involved/Roles:</strong></td>
<td>RNCMNR, DRDP Craiova</td>
</tr>
<tr>
<td><strong>Technology used:</strong></td>
<td>WIM</td>
</tr>
<tr>
<td><strong>Status and main results:</strong></td>
<td>1 fixed installation placed at the entry of Bechet border point. 10 mobile weight measuring installations placed on the vehicles. Database, as a result of the systems activity which will be sent to CESTRIN at the end of each month.</td>
</tr>
</tbody>
</table>

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**Activity/project name:** Minimum ITS service requirements for Corridor IV

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th>During the study, an analysis was made regarding the current stage of ITS systems in Romania, regulations and police at a European and national level, technical specifications used in ongoing projects, as well as sets of ITS services recommended by EasyWay.</th>
</tr>
</thead>
</table>
| **Main objectives:** | The objectives of the study were to determine the reference services for a TEN T Network in Romania:  
  - ITS information services  
  - ITS traffic management services  
  - ITS services for freight transport and logistics  
  - Tolling and motorway access services  
  - Weight and tonnage monitoring and control services for road vehicles  
  - Infrastructure monitoring and security services |
| **Duration:** | March 2010 |
| **Financing sources:** | State budget |
| **Stakeholders involved/Roles:** | RNCMNR |
| **Technology used:** | - |
| **Status and main results:** | 100%. The minimum ITS service requirements have been prepared and approved by RNCMNR on March 16th 2010. These requirements are to be used in preparing the technical specifications for motorways under construction that have an ITS component. |
Activity/project name: Modernization and extension of the public transport area in the Cluj Metropolitan Area – stage 1, Cluj – Technical Project faze

| Description: | The project aims for the lasting development of the public transport system, with an impact on increasing mobility and as a result on the population’s quality of life, increasing its appeal from an operational point of view, as well as infrastructure, increasing passenger safety and improving the waiting stations and access for all categories of passenger. |
| Main objectives: | • modernize 87 public passenger stations existing in the municipality and bringing them up to international standards;  
• provide lighting in 35 of the modernized stations to ensure safe and efficient traffic for the residents of the targeted area;  
• increase the level of access to public interest information by installing sign boards which will display details related to ETA for public transport vehicles, nearby points of interest;  
• increase passenger comfort through the possibility of implementing the concepts of “time slots” (hourly charges) and “electronic wallet” for the purpose of creating a single charge for a trip using different public transport modes within the time frame allocated to a single trip;  
• increase passenger mobility by using any public transport mode for the desired destination (the possibility of using a ticket for all public transport modes in a certain time frame regardless of the chosen route);  
• a more efficient public transport offer by using the public transport system’s objective and complete information regarding the passenger flow, travel passes being used and distributed, available lines, vehicles and timetables. |
| Duration: | 20 months – from the date on which the contract was signed between the two parties  
The public authority submitted the project for funding within the Regional Operational Programme. |
| Financing sources: | Total capital invested: 39.938,370,88 lei (including VAT), of which non-refundable assistance: 27.544,504,96 lei |
| Stakeholders involved/Roles: | Ministry of Internal Affairs  
CLUJ – NAPOCA Municipality |
| Technology used: | - |
| Status and main results: | • installing 136 contactless ticket validation points in stations  
• installing 327 dual validators and on-board computers in the public transport vehicles  
• installing the other system components that feature various functionalities in a central management location, in the backup location and in the 9 data download points so as to cover the entire public transport network |
- installing 74 LED signboards in stations that will display information of interest;

From the perspective of using road data efficiently:
The implementation of an automated travel pass purchase point that will generate and interpret data regarding transport load in real-time, which means the information pertaining to the transaction is stored and later transmitted via WIFI to 9 data download points and after to the operational management locations, central and backup, secured, via Internet or GPRS, forming a complex and modular hardware/software assembly.

**Activity/project name:** Monitoring system for traffic and public interest areas in the Turda Municipality, Cluj County

**Description:** The project’s objective is to improve the conditions for ensuring public safety and order, monitor traffic and increase the safety of traffic participants, collecting evidence and deduction using high-tech equipment of traffic violations and tracking of police wanted vehicles.

**Main objectives:** General objective: satisfying the necessity for lasting local development by implementing a project that will install an integrated monitoring system for urban objectives and traffic/road infrastructure;
Specific objectives:
- monitoring traffic and all entry/exit points in and out of the Turda Municipality;
- monitoring critical areas as far as safety and order is concerned in the Turda Municipality;
- monitoring traffic speed on critical arteries in order to prevent and avoid traffic accidents;
- monitoring public parking spaces, assessing and recording parking violations;
- forming statistics that will aid authorities to take action in improving and decongesting traffic;

**Duration:** 12 months

**Financing sources:** Total capital invested: 4.502.125 lei equiv. 1.087.549 euro;

**Stakeholders involved/Roles:** Ministry of Internal Affairs
Turda Municipality

**Technology used:** Feasibility study put together and approved in the Turda Local Council.
- video surveillance system;
- data storage equipment, dispatch, connection to the monitoring services of the Traffic Police;
- monitoring systems, recording and processing of violations regarding public parking;
- monitoring systems, recording and processing of data regarding traffic speed, number of traffic participants;
- a fiber optic channel with the possibility of transmitting related data
### Activity/project name: Monitoring application for 20 busses using GPS and 2 information signboards for passengers

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th>In transit monitoring of 20 busses on line 5 and passenger information regarding arrival times for 2 destinations on the route – downtown and the train station (pilot action)</th>
</tr>
</thead>
</table>
| **Main objectives:** | 1. Optimizing the public transport activity and passenger information  
2. Provide useful information to passengers and ad messages |
| **Duration:** | April 29th 2010 - June 29th 2011 |
| **Financing sources:** | State budget |
| **Stakeholders involved/Roles:** | Ministry of Internal Affairs  
CONSTANTA PUBLIC TRANSPORT AUTHORITY |
| **Technology used:** | |
| **Status and main results:** | 1. Optimizing the dispatch, improving customer satisfaction  
2. Raising the level of traveller information |

### Activity/project name: ARCHIMEDES

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th>ARCHIMEDES is an integration project that reunited 6 European cities to approach the issues and opportunities to create a safe, lasting environment for efficient transport energy systems in urban areas.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main objectives:</strong></td>
<td>The project’s objectives are: promoting and introducing measures for a more lasting, cleaner and economic urban transport, introducing a complete set of technological and methodical measures in the field of transport and energy within 8 categories (Alternative fuels and green vehicles, Collective transport, Management requirements, Influencing passenger behaviour, Safety, security and health, Innovative transport services, Energy efficiency for freight transport, Transport telematics)</td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
<td>Starting date: September 14th 2009, End date September 15th 2012</td>
</tr>
<tr>
<td><strong>Financing sources:</strong></td>
<td>Local budget and non-refundable funds from the EU</td>
</tr>
</tbody>
</table>
| **Stakeholders involved/ Roles:** | Ministry of Internal Affairs  
Iasi Municipality, Iasi Public Transport Authority |
| **Technology used:** | CCTV, ticketing |
| **Status and main results:** | Install GPL equipment on 30 busses - COMPLETED  
Modify 10 mini-busses. - COMPLETED  
Construct 50 specialized stations for disabled people. - COMPLETED  
Construct/border, according to the situation, 11 km of bicycle track. - COMPLETED  
Install 40 audio warning systems for disabled people. - COMPLETED  
Install a video surveillance and incident and equipment management system. - IN PROGRESS  
Install ticket vending machines. - IN PROGRESS |
Activity/project name: INTERREG IVC CAPRICE (Regions of CAPitals that Integrate Public transport for energy Efficiency)

Description: The exchange of experience between already established public transport authorities (PTAs) that have been successfully functioning for years (Paris, Berlin), new PTAs are foreseen to be established in other regions (Bucharest, Warsaw, Vilnius).

Main objectives: Contract and document exchange in the interest of acquisition for the Pilot project for the public transport in Bucharest.

Duration: January 2009 – August 2011

Financing sources: -

Stakeholders involved/Roles: Ministry of Internal Affairs
- Bucharest Municipality – Bucharest Public Transport Authority

Technology used: -

Status and main results: 7 thematic seminars for the duration of the entire project
- transfer of good practices in the field of contracts
- performance services, control methods, evaluation principles

Activity/project name: TrafficGuide - Real-time information system for traffic conditions

Description: The project's goal is to disseminate information in real-time regarding traffic on national roads and the main arteries in Bucharest using multiple sources such as:
- creating a public website with information about traffic
- creating a public information system via RDS-TMC, at national level

Main objectives: - Traffic information in Romania provided by Electronic Solutions via a public website
- Traffic information in Romania provided by Electronic Solutions via GPS, using RDS-TMC, non-encrypted public access transmission
- Traffic information in Romania provided by Electronic Solutions via mobile web applications

Duration: Project duration: 24 months
Period: June 16th 2011 – June 15th 2013

Financing sources: ELECTRONIC SOLUTIONS own resources + co-financing within The Regional Operational Programme 2007-2013

Stakeholders involved/Roles: Ministry of Regional Development and Public Administration
- ELECTRONIC SOLUTIONS

Technology used: RDS-TMC, floating car data, GIS, web application

Status and main results: The project is at its beginning. The technical solution and project have been established and the first acquisition procedures for the project’s implementation have started.
1. Implementing a real-time traffic data gathering and processing system. Data will be provided by public institutions: police, RNCMNR, Bucharest City Hall as well as by using in-house
facilities
2. Creating a RDS-TMC location table for Romania
3. Creating a web portal to disseminate traffic information
4. Implementing a traffic data transmission system using RDS-TMC
Creating mobile applications to disseminate traffic data

6.8.2. **Priority area: continuity of traffic and freight management ITS services on European transport corridors and in conurbations**

**Description:**
The project consists of the following subsystems: traffic control in 16 intersections, traffic video monitoring in those intersections (36 cameras), street signalling and communications, command centre.

**Main objectives:**
- General objective: improving traffic flow and citizen safety in Galati by implementing an adaptive control management system for urban traffic and video surveillance
- Modernizing and expanding the signalling system for 19 intersections
- Equipping areas with an increased risk of criminality or dangerous areas with 19 new surveillance points
- Creating a single Command and Control Centre to coordinate traffic management activities and video surveillance that will meet future development requirements in Galati
- Reduce transit time in the city and, as a result, exhaust emissions
- Increase confidence and customer satisfaction for public transport as well as the number of public transport users as a direct result.
- Increase citizen safety and reduce crime rate in the targeted area by minimum 10% in the next 3 years

**Duration:**
Project implementation time: 10 months

**Financing sources:**
Self-funding, funds from local budget and funds from non-returnable financing

**Stakeholders involved/Roles:**
Ministry of Internal Affairs
Galati City Hall and all secondary institutions

**Technology used:**
CCTV, inductive loops

**Status and main results:**
The technical project is prepared and execution to begin depending on the budget.
Improving the conditions and quality of life in Galati by:
- introducing a urban traffic management system in Galati that will be capable of decongesting traffic using adaptive signalling;
- implementing metropolitan video surveillance for streets and public spaces in the city, which will increase safety for citizens and goods in the respective areas.
are shortened for as many possible.
Communications: local (between traffic detectors and machines, between traffic machines in adjacent intersections as well as between traffic machines and public transport vehicles or emergency intervention crews) and central (between field equipment and the Command Centre);

**Main objectives:**

Improve traffic flow and citizen safety in Ramnicu Valcea by implementing an adaptive urban traffic management system. Ensure traffic fluidity, monitoring and centrally controlling it so that traffic operators can make quick decisions, as well as give priority to special vehicles: public transport, ambulance, fire fighters and police.
The objective in the major targeted field for intervention “Integrated plans for urban development” is to increase the quality of life and create new work places in cities by rehabilitating the urban infrastructure and improving urban services, including social services, also by developing support structures for businesses and entrepreneurship.

**Duration:**

2011 – 2016

**Financing sources:**

The investment financing are formed according to current legislation and consist of self-funding, funds from the local budget and funds from non-returnable funds.
The project will be funded from the following sources:
Funds from the local budget, capital which will be included in Ramnicu Valcea’s City Hall budget for the year 2011 in order to cover non-eligible costs and own contribution to eligible costs.
The total budget is 2% of the value from eligible costs plus non-eligible costs and the VAT from non-eligible costs as well as additional costs;
Non-returnable financial aid from the Regional Operational Program 2007-2013;
Ramnicu Valcea UAT's own funds, sums which will be used for system maintenance for a period of minimum 5 years. The sums used to ensure maintenance will be subject to annual evaluation by experts in the field and entered in City Hall's annual budgets.

**Stakeholders involved/Roles:**

Ministry of Internal Affairs
Ramnicu Valcea Municipality

**Technology used:**

CCTV, inductive loops, radio communication

**Status and main results:**

Completing the documentation needed to obtain funds for the project

---

Activity/project name: Traffic management system in Bucharest and its expansion

**Description:**

A unified and integrated implementation of three open systems:
1) Adaptive urban traffic control system (UTC)
2) Public transport management system (PTM)
3) Closed circuit surveillance system for traffic management (CCTV)

**Main objectives:**

- Installing modern traffic signalling systems in intersections;
- Creating a communication network between intersections based
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<table>
<thead>
<tr>
<th>Activity/project name</th>
<th>Description</th>
<th>Main objectives</th>
<th>Duration</th>
<th>Financing sources</th>
<th>Stakeholders involved/ Roles</th>
<th>Technology used</th>
<th>Status and main results</th>
</tr>
</thead>
</table>
| Traffic management system for Zalau Municipality | The project deals with the implementation of a traffic management system in the Zalau city. | - improve traffic flow and increase accessibility for the area by introducing an intelligent traffic management system  
- reduce pollution by exhaust emissions and noise associated with traffic and reduce the impact on public health by reducing stop times in intersections resulting in a smaller fuel consumption and noise  
- increase traffic and pedestrian safety by implementing a detection system for crossing red lights and exceeding the speed limit  
- improve the quality of urban public space by using grounded optic fibre-wire and eliminating suspended cables. | unspecified | Local budget plus co-financing from the Regional Operational Programme 2007-2013 | Ministry of Regional Development and Public Administration  
Zalau City Hall | CCTV, inductive loops, traffic lights, fiber-optic communication network | Approved, next step is signing the funding contract. |
| Integrated traffic management system for Deva Municipality | Create a single command and control centre to coordinate traffic management activities and video surveillance to meet the future development requirements for Deva | Improve traffic flow and citizen safety in Deva Municipality by implementing an adaptive management control system for urban traffic | Project duration: 10 months | Local budget plus co-financing from the Regional Operational Programme | Ministry of Internal Affairs  
Bucharest Municipality | on optic fibre-wire;  
- Installing traffic management equipment in RATB vehicles;  
- Creating a Traffic Control Centre | Begins in May 2007 – expansion continues until full coverage in Bucharest is achieved | Self-funding, loans from European Bank |

Stakeholders involved/ Roles: Ministry of Internal Affairs  
Bucharest Municipality

Technology used: CCTV, inductive loops, traffic lights, fiber-optic communication network

Status and main results: 140 modernized and integrated intersections + 300 RATB vehicles  
- reduce vehicle delay time in traffic;  
- improve traffic safety;  
- reduce exhaust emissions and fuel consumption
### Programme 2007-2013

| Stakeholders involved/Roles: | Ministry of Regional Development and Public Administration  
Devta City Hall |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology used:</td>
<td>CCT, inductive loops, traffic lights</td>
</tr>
</tbody>
</table>
| Status and main results:    | Approved, next step is signing the funding contract.  
Direct results:  
- integrated traffic management system installed - 1  
- integrated and equipped - 1  
- number of adaptive synchronous intersections - 21  
- number of intersections with traffic signal lights - increase from 6 to 23  
- metropolitan communications network - 1  
Indirect results:  
- reduce travel time in the city  
- reduce total delay time  
- increase average travel speed  
- reduce exhaust emissions  
- reduce fuel consumption  
- reduce number of traffic accidents |

**Activity/project name:** Defining multimodal transport scenarios and mobility standards towards integrating the South East European transport system in the European one. South East European Axis Cooperation - SEETAC

**Description:** TEN-T development will lead to the improvement of the transport network in South East Europe and will compete to integrate this region to European standards. A better spatial integration and developed transport networks will create opportunities for major investments, increase the rate of work force occupation and improve the economic situation. The Pan European Corridors (PECs) can be integrated in the South East Transport Axis as an essential part of TEN-T, becoming a complementary transport network outside of boarders.

**Main objectives:** Reinforce cooperation between the transport ministries in the SEE region, PEC Committees and the respective secretariats.

**Duration:** April 2009 - March 2012

**Financing sources:**  
Total budget: 2.380.554,00 €  
ERDF budget: 1.700.471,00 €  
IPA budget: 323.000,00 €

| Stakeholders involved/Roles: | Ministry of Regional Development and Public Administration  
Ministry of Transport |
|-----------------------------|------------------------------------------------------|
| Technology used:            | -defining multimodal transport scenarios, standards for mobility and guides for environment protection,  
-identifying financial resources and mechanisms,  
-completing spacial planning in the SEE region in this field |
### 6.8.3. Priority area: road safety and security

<table>
<thead>
<tr>
<th>Activity/project name: Video traffic monitoring system in Satu Mare Municipality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
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<tr>
<td><strong>Main objectives:</strong></td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
</tr>
<tr>
<td><strong>Financing sources:</strong></td>
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<tr>
<td><strong>Stakeholders involved/Roles:</strong></td>
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<tr>
<td><strong>Technology used:</strong></td>
</tr>
<tr>
<td><strong>Status and main results:</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity/project name: Traffic management system for Alexandria Municipality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Main objectives:</strong></td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
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<tr>
<td><strong>Financing sources:</strong></td>
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<td><strong>Stakeholders involved/Roles:</strong></td>
</tr>
<tr>
<td><strong>Technology used:</strong></td>
</tr>
<tr>
<td><strong>Status and main results:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity/project name: Traffic management and video surveillance in Timisoara</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Main objectives:</strong></td>
</tr>
</tbody>
</table>
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**Control management system for urban traffic and metropolitan video surveillance.**

**Duration:** 12 months from signing the funding contract

**Financing sources:** Local budget, state budget, FEDR

**Stakeholders involved/Roles:** Ministry of Internal Affairs
Timisoara Municipality and its secondary institutions
- the residents of Timisoara’s border areas as well as citizens passing through;
- economic entities

**Technology used:** CCTV, inductive loops

**Status and main results:** Feasibility study, technical project and funding request have all been prepared. Documentation is being verified for the purpose of submitting it to ADR.

**Activity/project name:** Study regarding the eCall technology

**Description:** The project studied the status of emergency 112 call and eCall technologies at a national and European level. Based on these the overall architecture for the national eCall system and the implementation guide were developed.

**Main objectives:**
- Study on the development of eCall systems
- Study on the development of the national infrastructure for implementing technologies
- Developing the eCall system architecture.
- Developing the implementation methodology for eCall services in Romania

**Duration:** Project duration: 24 months
Period: November 5th 2008 - November 15th 2010

**Financing sources:** State budget + Co-financing

**Stakeholders involved/Roles:** Ministry of Communications and Information Society

**Technology used:** -

**Status and main results:** Project is completed. The project’s recommendations have lead to preparing and winning the call for the European project HeERO.

**Activity/project name:** HeERO – Harmonised eCall European Pilot

**Description:** The eCall system implies equipping vehicles with a module that automatically (or manually) dials the emergency 112 service in case of an accident and equipping the emergency call centres so they can receive eCalls and associated data.

**Main objectives:**
- Define operational and functional requirements necessary to implement the eCall systems;
- Implement existing pan-European eCall standards;
- Implement required technical and operational infrastructure;
- Identify added value services, public and/or private, that could be useful to the eCall infrastructure;
- Develop manuals for operating the eCall system;
- Evaluate certification procedures connected to eCall.
Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries

### Deliverable D3.1.0: Complete consolidated report on ITS deployment in SEE countries

**Activity/project name:** Improving traffic flow for Craiova Municipality, from east to west, by rehabilitating the Decebal – Dacia Blvd.

<table>
<thead>
<tr>
<th><strong>Description:</strong></th>
<th>Improving and developing the transport network infrastructure for Craiova Municipality and increase traffic safety.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main objectives:</strong></td>
<td>The rehabilitation of the 4 main road segments consists of rehabilitation sub-activities for the roadway and sidewalks and the systemization of traffic and public transport.</td>
</tr>
</tbody>
</table>
| **Duration:** | Project duration: 30 months  
Period: October 18th 2008 - April 18th 2011 |
| **Financing sources:** | Local budget from UAT Craiova, co-financing as part of the Regional Operational Programme 2007-2013 |
| **Stakeholders involved/Roles:** | Ministry of Regional Development and Public Administration  
UAT Craiova |
| **Technology used:** | - |
| **Status and main results:** | Project is completed.  
10.23 km of rehabilitated roadway,  
5 signalled intersections,  
1 traffic control an monitoring system |

### 6.8.4. Priority area: integration of the vehicle into the transport infrastructure

**Activity/project name:** Area information system via radio broadcasting for special, emergency situations

| **Description:** | The project analysed available information and sources for transmitting emergency messages in vehicles. |
Main objectives:

1. Establish available information and sources for transmitting emergency messages in vehicles
2. Analyse available radio broadcasting channels and communication networks. Create a transmission test platform to send messages via Radio Data System (RDS). Analyse and test transmitting capabilities for traffic information to vehicles using the Traffic Message Channel (TMC) standard.

Duration:

Project duration: 2 months
Period: September 5th 2007 - November 5th 2007

Financing sources:

State Budget

Stakeholders involved/ Roles:

Ministry of Communications and Information Society

Technology used:

RDS-TMC

Status and main results:

Project is completed.

Testing has shown the possibility to transmit emergency messages to vehicles via RDS channel using the existing radio network.

Testing has shown the potential for transmitting traffic data using the RDS-TMC technology, applications which will be developed in the future.

The concept of a data transmission platform using RDS broadcasting channels;
Designing and creating the platform;
Platform testing and implementation;
Testing potential to transmit traffic information using RDS-TMC technology;

6.9. Slovenia

6.9.1. Priority area: optimal use of road, traffic and travel data

Activity/project name: Tempo CONNECT phase 1 STUDIES

Description:

Tempo CONNECT phase 1 STUDIES

Main objectives:

CONNECT (Co-ordination and stimulation of innovative ITS activities in Central and Eastern European countries) is a cooperation between public authorities, road administrations and traffic information service providers.

In 2004 Slovenia entered the enlarged EU-25 road traffic infrastructure which was already in the process of an intensive national development and thus became part of wider trans-European networks that brought up a need for new services on the infrastructure. Services based on telecommunication and information systems enable sophisticated traffic control management and better information to road users. A characteristic of the state-of-the-art systems and services is that they exceed infrastructure operators and national borders, and that they provide service continuity based on international standards, procedures or data models.
### Activity/project name: Tempo CONNECT phase 1 DEPLOYMENTS

**Description:** Tempo CONNECT phase 1 DEPLOYMENTS

**Main objectives:**
CONNECT (Co-ordination and stimulation of innovative ITS activities in Central and Eastern European countries) is a co-operation between public authorities, road administrations and traffic information service providers.

In 2004 Slovenia entered the enlarged EU-25 road traffic infrastructure which was already in the process of an intensive national development and thus became part of wider trans-European networks that brought up a need for new services on the infrastructure. Services based on telecommunication and information systems enable sophisticated traffic control management and better information to road users. A characteristic of the state-of-the-art systems and services is that they exceed infrastructure operators and national borders, and that they provide service continuity based on international standards, procedures or data models.

**Duration:** 1.5.2004 - 31.12.2006

**Financing sources:** 17,4 mil. € of which 10% co-financed by EU TEN-T funds

**Stakeholders involved/Roles:**
- Ministry of Infrastructure and Spatial planning, Slovenian Road Agency as beneficiary and strategic partner
- DARS d.d., Motorway Company in the Republic of Slovenia

**Technology used:** ITS system and services

**Status and main results:**
- Traffic control system (SNVP) on the motorway section Vransko-Blagovica (Ljubljana – Maribor).
- Traffic control system (SNVP) on the motorway section Klanec-Ankaran (Ljubljana – Koper).
Traffic control system (SNVP) on the motorway section Klanec-Ankaran in traffic control centre RNC Kozina. Traffic control system (SNVP) on the motorway section Klanec-Ankaran in traffic control centre RNC Vransko. Implementation of safety and monitoring equipment in tunnels Kastelec in Dekani (emergency booths with equipment for emergency call, fire safety equipment and fire alarm system, airflow control system), motorway Ljubljana - Koper. Installations of VMSes (Variable message signs) with the connection to the SNVP Klanec–Ankaran and SNVP Vransko–Blagovica.

Activity/project name: Tempo CONNECT phase 2 STUDIES

**Description:** Tempo CONNECT phase 2 STUDIES

**Main objectives:** CONNECT (Co-ordination and stimulation of innovative ITS activities in Central and Eastern European countries) is a cooperation between public authorities, road administrations and traffic information service providers.

The CONNECT objectives can be summarised according to the key objectives identified in the Multiannual Indicative Programme 2001-2006 for TEN-T - Group 4: Intelligent Transport Systems (ITS) in the road sector (TEMPO - Trans-European Intelligent Transport Systems Projects): “to stimulate a harmonised and synchronised deployment of ITS systems and services on the Trans-European Road Network (TERN) and to contribute to convergence between national/regional planning and the overall implementation of the Information Society in the road transport field in Europe”.

**Duration:** 1.1.2006 - 31.3.2007

**Financing sources:** 1 mil. € of which 50% co-financed by EU TEN-T funds

**Stakeholders involved/ Roles:** Ministry of Infrastructure and Spatial planning, Slovenian Road Agency as beneficiary and strategic partner
DARS d.d., Motorway Company in the Republic of Slovenia

**Technology used:** ITS system and services

Dangerous goods and special transport monitoring in Slovenia - study.
Pilot of the ghost driver system detection and alarming.
Pilot testing of the free flow tolling (free flow ETC).
Automatic slip handlers tolling - pilot.
National guidelines for incident and emergency handling on TEN corridors.
RDS-TMC deployment plan.
Plan of multimodal traffic information portal in main EU languages (obsolete).
Upgrade of the information system for traffic information at DARS d.d.
Feasibility study of the traffic radio station deployment at DARS d.d.
National framework of the ITS architecture - proposal.
National framework for evaluations of ITS systems.
Technical, organisational and legal issues for the prevention of ETC abuse.
Upgrade and support of program TEMPO web site.

Activity/project name: Tempo CONNECT phase 2 DEPLOYMENTS

<table>
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</tr>
<tr>
<td>Duration:</td>
<td>1.1.2006- 31.3.2007</td>
</tr>
<tr>
<td>Financing sources:</td>
<td>6.6 mil. € of which 10% co-financed by EU TEN-T funds</td>
</tr>
<tr>
<td>Stakeholders involved/Roles:</td>
<td>Ministry of Infrastructure and Spatial planning, Slovenian Road Agency as beneficiary and strategic partner DARS d.d., Motorway Company in the Republic of Slovenia</td>
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<tr>
<td>Technology used:</td>
<td>ITS system and services</td>
</tr>
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</table>
Activity/project name: Tempo CONNECT phase 3 STUDIES

Description: Tempo CONNECT phase 3 STUDIES

Main objectives: CONNECT (Co-ordination and stimulation of innovative ITS activities in Central and Eastern European countries) is a co-operation between public authorities, road administrations and traffic information service providers.

To support Europe-wide services, the EU supports ITS in road transport by co-funding deployment projects. The grant programme for the Trans-European Network for Transport (TEN-T) aims at establishing interconnections, interoperability and continuity of services, especially on long-distance routes and across borders. Its guidelines cover the infrastructure for traffic management, traveller information, emergency systems and electronic fee collection.


Financing sources: 3 mil. € of which 35% co-financed by EU TEN-T funds
<table>
<thead>
<tr>
<th>Stakeholders involved/Roles:</th>
<th>Ministry of Infrastructure and Spatial planning, Slovenian Road Agency as beneficiary and strategic partner DARS d.d., Motorway Company in the Republic of Slovenia</th>
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<tbody>
<tr>
<td>Technology used:</td>
<td>ITS system and services</td>
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<tr>
<td>Activity/project name:</td>
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<tr>
<th><strong>Activity/project name:</strong> CIVITAS ELAN – Ljubljana</th>
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</table>

| **Description:** CIVITAS ELAN – Ljubljana (source: [www.civitas-initiative.org](http://www.civitas-initiative.org)): The city of Ljubljana has responded actively to the challenges of increased motorised traffic by drafting and adopting a range of key initiatives to improve traffic management and provide better services for motorised traffic. This includes the implementation of Intelligent Transport Systems (ITS) across borders. Its guidelines cover the infrastructure for traffic management, traveller information, emergency systems and electronic fee collection. |

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<tr>
<th><strong>Duration:</strong> 1.1.2007 - 31.6.2008 - extension to 31.3.2009</th>
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<tr>
<th><strong>Financing sources:</strong> 23,1 mil. € of which 10% co-financed by EU TEN-T funds</th>
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<tr>
<th><strong>Stakeholders involved/Roles:</strong> Ministry of Infrastructure and Spatial planning, Slovenian Road Agency as beneficiary and strategic partner DARS d.d., Motorway Company in the Republic of Slovenia</th>
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<tr>
<th><strong>Technology used:</strong> ITS system and services</th>
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documents defining strategic and operational objectives for the regulation of sustainable transport in the city. Discussions about the city’s sustainable transport policy have been particularly intensive in the last three years and the CIVITAS ELAN team in Ljubljana has played a very active role. The results of these discussions are summarised in the Transport Policy of the City of Ljubljana and the Instructions for Design of Transport Infrastructure in the City of Ljubljana, which will be submitted to the city council for approval before the end of 2012. The aim is to significantly reduce car use, to make public transport “greener”, more attractive and accessible to all and to improve conditions for walking and cycling, by, for example, expanding pedestrian zones and upgrading cycling infrastructure. This should help achieve the city’s 2020 target modal split of one third of trips by walking and cycling, one third by public transport and one third by car. The CIVITAS ELAN project, and its predecessor CIVITAS MOBILIS, combined with other sustainability projects, are helping to create a sustainable, green city that offers a high quality of life to all citizens.

CIVITAS ELAN brought together five European cities spanning from the northwest (Gent) to the heart of Europe (Brno), to the southeast (Ljubljana and Zagreb), and the southwest (Porto).

**Main objectives:**

The City of Ljubljana planned to implement a total of 16 measures as a part of the CIVITAS-ELAN project, as well as four additional common measures in cooperation with other CIVITAS-ELAN partners. Ljubljana’s CIVITAS-ELAN measures intend to tackle traffic jams, congestion and an unfavourable modal split ratio between public transport (PT) and individual cars.

- **CIVITAS Demonstration Corridor:** Objectives are the provision of high-quality public transport in the corridor, with separate lanes; PT priority at intersections and real-time information for passengers; and generally speaking, making the use of PT easier, more attractive, safer, and more secure. Thus, the CIVITAS-ELAN corridor will serve as a ‘laboratory’ of innovative measures, which could be applied elsewhere in the city, in other cities in Slovenia, and beyond as well.

- **Increasing the Use of Clean Vehicles and Telematics Systems:** For the first time in Slovenia the newest hybrid bus technology will be introduced in the quest for cleaner urban transport solutions. Modern telematics systems promise traffic flow improvement and an anticipated more attractive image of PT.

- **Changing Mobility Behaviour:** This means understanding and influencing mobility behaviour, and strongly promoting non-motorised transport modes. With an integrated planning perspective for urban transport, a long-term influence on sustainable PT in Ljubljana and its region is expected.

- **Improving Urban Freight Distribution:** This requires testing a combination of innovative measures in the field of limiting access and consolidated deliveries, as well as the introducing
of appropriate incentives for cleaner freight traffic.

**Duration:** 2008 – 2012

**Financing sources:** The total project budget is 29.2 mil. € the EC contribution is 17.8 mil. €, for Ljubljana 5 mil. €

**Stakeholders involved/Roles:** In Slovenia:
The City of Ljubljana
LPP—Public Transport Company of Ljubljana
Telargo d.o.o.
Urban Planning Institute of the Republic of Slovenia
University of Ljubljana
Transport Institute Ljubljana,
Agricultural Institute of Slovenia,
Regional Environmental Center – Slovenia
Jožef Stefan Institute and Slovenian Railway (Slovenske železnice d.o.o.).

**Technology used:** ITS system and services

**Status and main results:** Results from (http://www.civitas-initiative.org/docs/CIVITAS_ELAN_final_brochure.pdf):
Update of the sustainable urban mobility plan;
Real-time information (bus station VMSes with a direct communication technology called ZigBee to show the predicted arrival of the buses);
Demand responsive services: 2 free-of-charge electric vehicles were introduced in pedestrian zones;
E-ticketing and public transport portal: The online trip planning tool Google Transit was established and 676,000 Urbana e-tickets were sold;
Green procurement for the city fleet: Hybrid vehicles currently represent 10% of the city administration’s fleet and 50 company bicycles are in use by the city administration;
Pure plant oil for vehicle propulsion: three vehicles were converted for operational use on pure plant oil, 33 public presentations were held on the measure.

In some cases, the project has influenced national legislation, leaving a lasting legacy.

### 6.9.2. Priority area: road safety and security

**Activity/project name:** EasyWay CONNECT phase 1

**Description:** EasyWay CONNECT phase 1

**Main objectives:** EasyWay is a project for Europe-wide ITS deployment on main TERN corridors driven by national road authorities and operators. EasyWay partners have undertaken projects to achieve objectives (improved road safety, reduction in congestion and reduction of impacts on environment), deploying ITS services in the fields of Traffic Management, Travel Information and Freight and Logistics. The level of service was enhanced by improving the existing infrastructure and systems, filling in remaining gaps in network
coverage and ensuring a continuity of service on the TERN corridors.

**Duration:** 01.01.2007 - 31.12.2009

**Financing sources:** 13.1 mil. € of which 20% co-financed by EU TEN-T funds

**Stakeholders involved/Roles:** Ministry of Infrastructure and Spatial planning, Slovenian Road Agency as beneficiary and strategic partner
DARS d.d., Motorway Company in the Republic of Slovenia

**Technology used:** ITS system and services

**Status and main results:** In the field of Connected ICT Infrastructure main achievement was finalisation of traffic management system SNVP on the Ljubljana west ring-road and communication node transfer for the new built main corridor traffic centre RNC Ljubljana (to Dragomelj). Upgraded were Traveller information systems (deployment of weather stations, provision of road video streams to the internet) and warning systems (Mobile warning variable message signs). Most notable study was Risk analysis and proposed measures for tunnels on corridors.

### Activity/project name: EasyWay CONNECT phase 2

**Description:** EasyWay CONNECT phase 2

**Main objectives:** EasyWay is a project for Europe-wide ITS deployment on main TERN corridors driven by national road authorities and operators. EasyWay partners have undertaken projects to achieve objectives (improved road safety, reduction in congestion and reduction of impacts on environment), deploying ITS services in the fields of Traffic Management, Travel Information and Freight and Logistics. The level of service was enhanced by improving the existing infrastructure and systems, filling in remaining gaps in network coverage and ensuring a continuity of service on the TERN corridors.

**Duration:** 01.01.2010 - 31.12.2012 – extension to 31.12.2013

**Financing sources:** 10.8 mil. € of which 20% co-financed by EU TEN-T funds

**Stakeholders involved/Roles:** Ministry of Infrastructure and Spatial Planning, Infrastructure Directorate as beneficiary and strategic partner
DARS d.d., Motorway Company in the Republic of Slovenia

**Technology used:** ITS system and services

**Status and main results:** Main deployments are deployment and upgrade of tunnel traffic control and management systems in tunnel Markovec and cross border tunnel Karavanke. Traffic control centres upgrade consists of communication links for video streaming and upgrade of Traffic Information System Kažipot.

### 6.9.3. Priority area: European ITS cooperation and coordination

Activity/project name: PROMET - PROject for the Management of European Traffic
**Description:** PROMET - PROject for the Management of European Traffic

**Main objectives:** PROMET had the main goal to increase traffic safety and provide additional comfort to the drivers, by enhancing the interoperability and continuity of services in the cross-border stretches of the motorway.

**Duration:** 12.7.2007 – 1.1.2009

**Financing sources:** 1,65 mil. € of which 49,5% co-financed by EU TEN-T funds

**Stakeholders involved/Roles:**
- Ministry of Transport of the Republic of Slovenia (Slovenia) - Project Coordinator
- Ministero dei Trasporti (Italy)
- DARS d.d. (Slovenia) - Partner
- Autostrade per l’Italia S.p.A. (Italy) - Partner
- Autovie Venete S.p.A. (Italy) - Partner
- Traffic Design d.o.o. (Slovenia) – Project manager
- Politecnico di Milano - Dipartimento IN.D.A.CO. (Italy) - Partner
- Mizar Automazione S.p.A. (Italy)– Regional coordinator

**Technology used:** ITS system and services

**Status and main results:**
The integration of Traffic Management tactical operations across the border between Italy and Slovenia, between the operators Autovie Venete and DARS d.d. is done. Data Exchange link connecting in a new way a DATEX I node and a DATEX II node.
The partners have agreed on the relevant scenarios, the event list to be exchanged, the communication formats and the logical architecture.
A functional scheme has been defined, following the approach given by the European ITS architecture.
PROMET guidelines for Traffic Management.