Deliverable D7.3.6: Long-Term Investment Plans of ITS in Slovenia
PROJECT INFORMATION

Title: Intelligent Transport Systems in South East Europe
Acronym: SEE-ITS
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

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Short name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP</td>
<td>Centre for Research and Technology Hellas - Hellenic Institute of Transport</td>
<td>CERTH-HIT</td>
<td>Greece</td>
</tr>
<tr>
<td>ERDF PP1</td>
<td>Patras Municipal Enterprise for Planning and Development S.A.</td>
<td>ADEP S.A.</td>
<td>Greece</td>
</tr>
<tr>
<td>ERDF PP2</td>
<td>AustriaTech - Federal Agency for Technological Measures Ltd</td>
<td>ATE</td>
<td>Austria</td>
</tr>
<tr>
<td>ERDF PP3</td>
<td>Hungarian Transport Administration</td>
<td>HTA</td>
<td>Hungary</td>
</tr>
<tr>
<td>ERDF PP4</td>
<td>Bulgarian Association Intelligent Transport Systems</td>
<td>ITS Bulgaria</td>
<td>Bulgaria</td>
</tr>
<tr>
<td>ERDF PP5</td>
<td>Intelligent Transport Systems Romania</td>
<td>ITS Romania</td>
<td>Romania</td>
</tr>
<tr>
<td>ERDF PP6</td>
<td>University of Ljubljana</td>
<td>UL</td>
<td>Slovenia</td>
</tr>
<tr>
<td>ERDF PP7</td>
<td>Institute for Transport and Logistics Foundation</td>
<td>ITL</td>
<td>Italy</td>
</tr>
<tr>
<td>EU ASP1</td>
<td>Hellenic Intelligent Transport Systems</td>
<td>ITS HELLAS</td>
<td>Greece</td>
</tr>
<tr>
<td>EU ASP2</td>
<td>ITS Hungary Association</td>
<td>ITS Hungary</td>
<td>Hungary</td>
</tr>
<tr>
<td>20% ASP1</td>
<td>Italian ITS Association</td>
<td>TTS Italia</td>
<td>Italy</td>
</tr>
<tr>
<td>10% PP1</td>
<td>Albanian Association of Urban Transport</td>
<td>SHKTQ</td>
<td>Albania</td>
</tr>
<tr>
<td>10% PP2</td>
<td>Faculty of Transport and Traffic Sciences, University of Zagreb</td>
<td>FPZ</td>
<td>Croatia</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

In the current paper the development of action plans for implementing ITS systems and applications in Slovenia is taking place. The action plan is formed as a set of guidelines and proposals for the successful deployment of the services. The analysis conducted in the present activity takes into account all the previous results of the project and try to combine them in such a manner in order to conclude at transferable results. For this reason and in order to ease the generalization of the project results, in addition to the proposed action plans, business models of the ITS services and applications are developed for stimulating their implementation. The business models' development exploits the results of the Cost Benefit Analysis and the impact assessment, in order to reach at cost efficient and sustainable investment schemes.
## CONTENTS

1. **Introduction** ........................................................................................................... 10  
   1.1. Purpose and Scope of this Report ........................................................................ 10  
   1.2. Organisation of this Report .............................................................................. 10  

2. **Implementation status of ITS in Slovenia** .................................................................. 12  
   2.1. General Status of ITS in Slovenia ...................................................................... 12  
   2.2. Status of ITS Deployment in Slovenia in relation to the rest of SEE .................. 14  

3. **Legal framework** .................................................................................................... 15  
   3.1. National Laws ..................................................................................................... 15  
   3.2. European Union’s Laws ...................................................................................... 16  
   3.3. Integration of National laws within EU legislation ............................................. 17  

4. **Policy framework** .................................................................................................... 19  
   4.1. Existing ITS action plans ................................................................................... 19  
   4.2. Organisational barriers ...................................................................................... 19  
   4.3. Financial barriers ............................................................................................... 20  
   4.4. Fostering Interoperability of ITS across EU ...................................................... 20  

5. **Financing Mechanisms** ............................................................................................ 22  
   5.1. Existing Mechanisms ......................................................................................... 22  

6. **Market Analysis of the Services** ............................................................................... 23  
   6.1. National Roadmap for ITS .................................................................................. 23  
   6.2. Investment Plan Formation .................................................................................. 24  
      6.2.1. Elements of the investment plan formation ................................................... 24  
      6.2.2. Business model diagram .............................................................................. 26  
   6.3. 1st Proposed Group of Measures ....................................................................... 26  
      6.3.1. Description of the Group of Measures ........................................................... 26  
      6.3.2. Main involved actors and stakeholders ............................................................. 26  
      6.3.3. Key Activities .................................................................................................. 27  
      6.3.4. Key Resources ................................................................................................ 28  
      6.3.5. Value propositions .......................................................................................... 29  
      6.3.6. Cost structure .................................................................................................. 31  
      6.3.7. Revenue Streams ........................................................................................... 31  
      6.3.8. Business model Diagram ............................................................................. 32  
   6.4. 2nd Proposed Measure ......................................................................................... 33
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4.1.</td>
<td>Description of the Measure</td>
<td>33</td>
</tr>
<tr>
<td>6.4.2.</td>
<td>Main involved actors and stakeholders</td>
<td>33</td>
</tr>
<tr>
<td>6.4.3.</td>
<td>Key Activities</td>
<td>34</td>
</tr>
<tr>
<td>6.4.4.</td>
<td>Key Resources</td>
<td>35</td>
</tr>
<tr>
<td>6.4.5.</td>
<td>Value propositions</td>
<td>35</td>
</tr>
<tr>
<td>6.4.6.</td>
<td>Cost structure</td>
<td>36</td>
</tr>
<tr>
<td>6.4.7.</td>
<td>Revenue Streams</td>
<td>36</td>
</tr>
<tr>
<td>6.4.8.</td>
<td>Business model Diagram</td>
<td>37</td>
</tr>
<tr>
<td>6.5.</td>
<td>3rd Proposed Measure</td>
<td>38</td>
</tr>
<tr>
<td>6.5.1.</td>
<td>Description of the Measure</td>
<td>38</td>
</tr>
<tr>
<td>6.5.2.</td>
<td>Main involved actors and stakeholders</td>
<td>38</td>
</tr>
<tr>
<td>6.5.3.</td>
<td>Key Activities</td>
<td>39</td>
</tr>
<tr>
<td>6.5.4.</td>
<td>Key Resources</td>
<td>39</td>
</tr>
<tr>
<td>6.5.5.</td>
<td>Value propositions</td>
<td>39</td>
</tr>
<tr>
<td>6.5.6.</td>
<td>Cost structure</td>
<td>40</td>
</tr>
<tr>
<td>6.5.7.</td>
<td>Revenue Streams</td>
<td>41</td>
</tr>
<tr>
<td>6.5.8.</td>
<td>Business model Diagram</td>
<td>42</td>
</tr>
<tr>
<td>6.6.</td>
<td>4th Proposed Measure</td>
<td>42</td>
</tr>
<tr>
<td>6.6.1.</td>
<td>Description of the Measure</td>
<td>42</td>
</tr>
<tr>
<td>6.6.2.</td>
<td>Main involved actors and stakeholders</td>
<td>42</td>
</tr>
<tr>
<td>6.6.3.</td>
<td>Key Activities</td>
<td>44</td>
</tr>
<tr>
<td>6.6.4.</td>
<td>Key Resources</td>
<td>44</td>
</tr>
<tr>
<td>6.6.5.</td>
<td>Value propositions</td>
<td>45</td>
</tr>
<tr>
<td>6.6.6.</td>
<td>Cost structure</td>
<td>46</td>
</tr>
<tr>
<td>6.6.7.</td>
<td>Revenue Streams</td>
<td>46</td>
</tr>
<tr>
<td>6.6.8.</td>
<td>Business model Diagram</td>
<td>47</td>
</tr>
<tr>
<td>6.7.</td>
<td>5th Proposed Measure</td>
<td>48</td>
</tr>
<tr>
<td>6.7.1.</td>
<td>Description of the Measure</td>
<td>48</td>
</tr>
<tr>
<td>6.7.2.</td>
<td>Main involved actors and stakeholders</td>
<td>48</td>
</tr>
<tr>
<td>6.7.3.</td>
<td>Key Activities</td>
<td>49</td>
</tr>
<tr>
<td>6.7.4.</td>
<td>Key Resources</td>
<td>49</td>
</tr>
<tr>
<td>6.7.5.</td>
<td>Value propositions</td>
<td>50</td>
</tr>
<tr>
<td>6.7.6.</td>
<td>Cost structure</td>
<td>51</td>
</tr>
<tr>
<td>6.7.7.</td>
<td>Revenue Streams</td>
<td>51</td>
</tr>
</tbody>
</table>
6.7.8. Business model Diagram 52
6.8. 6th Proposed Measure 53
6.8.1. Description of the Measure 53
6.8.2. Main involved actors and stakeholders 53
6.8.3. Key Activities 54
6.8.4. Key Resources 54
6.8.5. Value propositions 55
6.8.6. Cost structure 55
6.8.7. Revenue Streams 56
6.8.8. Business model Diagram 57
7. Conclusions 58
LIST OF TABLES

Table 1: List of Measures ................................................................. 23
Table 2: Description of roles of involved actors .................................... 24
Table 3: Role of each involved actor in 1st Group of Measures .................. 27
Table 4: Benefit for actors and stakeholders ......................................... 29
Table 5: Role of each involved actor in 2nd Measure ................................ 34
Table 6: Benefits for actors and stakeholders ......................................... 35
Table 7: Role of each involved actor in 3rd Measure ................................ 38
Table 8: Benefits for actors and stakeholders ......................................... 40
Table 9: Role of each involved actor in 4th Measure ................................ 43
Table 10: Benefits for actors and stakeholders ........................................ 45
Table 11: Role of each involved actor in 5th Measure ................................. 48
Table 12: Benefits for actors and stakeholders ........................................ 50
Table 13: Role of each involved actor in 6th Measure ................................. 53
Table 14: Benefits for actors and stakeholders ........................................ 55
LIST OF FIGURES

Figure 1: Cost estimation of Group of Measures “Public transport services” ___________ 31
Figure 2: Business model diagram of the Group of Measures “Public transport services” __ 32
Figure 3: Cost estimation of Measure “Traffic management and traffic control system enhancing” ___________________________________________________________________________ 36
Figure 4: Business model diagram of the Measure “Traffic management and traffic control system enhancing” __________________________________________________________________________________________________________________________________ 37
Figure 5: Cost estimation of Measure “e-ParkInfo” __________________________________________ 41
Figure 6: Business model diagram of the Measure “e-ParkInfo” ____________________________ 42
Figure 7: Cost estimation of Measure “Traffic data warehouse and cross-border data exchange” ____________________________________________________________ 46
Figure 8: Business model diagram of the Measure “Traffic data warehouse and cross-border data exchange” ____________________________________________________________ 47
Figure 9: Cost estimation of Measure “Automatic and geo-location dependent message about traffic incident” ____________________________________________________________ 51
Figure 10: Business model diagram of the Measure “Automatic and geo-location dependent message about traffic incident” ____________________________________________________________ 52
Figure 11: Cost estimation of Group of Measures: “Free flow electronic toll collection” __ 56
Figure 12: Business model diagram of the Measure “Free Flow Electronic Toll Collection” 57
### Abbreviations and Terminology

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMZS</td>
<td>Automotive Association club</td>
</tr>
<tr>
<td>ARSO</td>
<td>Slovenian Environmental Agency</td>
</tr>
<tr>
<td>BCP</td>
<td>Slovenian Road Data Bank</td>
</tr>
<tr>
<td>CORS</td>
<td>Slovenian Notification Centre</td>
</tr>
<tr>
<td>DARS</td>
<td>Motorway Company in the Republic of Slovenia</td>
</tr>
<tr>
<td>DRSC</td>
<td>Slovenian Roads Agency</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GPRS</td>
<td>General packet radio service</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>IJPP</td>
<td>Integrated public transport system</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transport Systems</td>
</tr>
<tr>
<td>LPP</td>
<td>Ljubljana public transport</td>
</tr>
<tr>
<td>MI</td>
<td>Ministry of Infrastructure of the Republic of Slovenia</td>
</tr>
<tr>
<td>NCUP</td>
<td>Slovenian National Traffic Management Centre</td>
</tr>
<tr>
<td>PIC</td>
<td>Slovenian Traffic Information Centre for Public Roads</td>
</tr>
<tr>
<td>RDS-TMC</td>
<td>Radio Data System Traffic Message Channel</td>
</tr>
<tr>
<td>RMTHS</td>
<td>Risk Management of Transport of Hazardous Substances on the Main Road Network</td>
</tr>
<tr>
<td>RNC</td>
<td>Regional traffic control centre</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>SMS</td>
<td>Short Message Service</td>
</tr>
<tr>
<td>SŽ</td>
<td>Slovenian Railways</td>
</tr>
<tr>
<td>TCS</td>
<td>Traffic control system</td>
</tr>
<tr>
<td>VMS</td>
<td>Variable Message Signs</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

1.1. Purpose and Scope of this Report

In the present activity the development of action plans by country and region for implementing ITS systems and applications is taking place. The action plans are formed as a set of guidelines and proposals for the successful deployment of the services. The analysis conducted in the present activity takes into account all the previous results of the project and tries to combine them in such a manner in order to conclude at transferable results. For this reason and in order to ease the generalization of the project results, in addition to the proposed action plans, business models of the ITS services and applications are being developed for stimulating their implementation. The business models' development exploits the results of the Cost Benefit Analysis and the impact assessment contacted in previous reports of SEE-ITS project, in order to reach at cost efficient and sustainable investment schemes.

Investment plans are formed for all priority measures that have been identified in activity 4.2 of SEE-ITS and are included in the relevant national ITS roadmaps. For the formation of the investment plans the outputs of several project activities are used which describe the current ITS status in South East Europe (SEE) countries and the perspectives of each country concerning the deployment, implementation and collaboration in the field of ITS. The analysis includes financial, institutional and organizational aspects while the investment plans concentrate mainly on the proposition of an integrated structure that is able to ensure the successive, effective and viable implementation of each one of the priority measures.

1.2. Organisation of this Report

The present report is referred to Slovenia and is organized in such a way so as to briefly describe:

- The current ITS status of Slovenia
- The status of ITS deployment in Slovenia, in relation to the rest of the SEE
- The legal ITS framework of Slovenia and its connection with the European legislative framework
- The ITS policy framework of Slovenia in terms of the strategic planning and the action plans
- The funding mechanisms that are available for the country and can be used for the deployment of the proposed measures

The analysis of these main points aims at the formation of the investment plans, which are mainly composed in the description and identification of the followings:

- Key involved actors
- Value Propositions
- Key activities
- Key resources
- Cost structure
- Revenue Stream

The formation of the investment plan is finalized through the formation of a business model diagram that summarizes the key points of the analysis in a schematic way.
2. **Implementation Status of ITS in Slovenia**

2.1. **General Status of ITS in Slovenia**

After Slovenia joined the EU in 2004, many sophisticated ITS systems were installed. 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 (DRSC). 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. TCS controls five the most critical sections of the Slovenian motorways out of four regional traffic control centres (RNC) with all necessary infrastructure to monitor traffic situation and react in case of dangerous events by using VMSs or deploying field units.

Road traffic information system Kažipot was introduced by PIC and DARS d.d. It provides accurate real-time traffic information to the public using different information channels for road network users. Real time traffic information is also transmitted via RDS – TMC system, provided by private company TrafficNav Ltd. and Radio SI.

DRSC, DARS and Slovenian environment agency (ARSO) have established Road weather Information System (RWIS), which offers information on the current meteorological state of the road network and provide weather forecast for winter maintenance.

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 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).

Roads act set frames to the establishment of the National Traffic Management Centre (NCUP), which reorganize the existent PIC for state roads to NCUP with the new and very important function of traffic management for all public roads including public transport. Currently, control centre Ljubljana together with PIC are 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).

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. Project PROMET as a project of common interest as a part of Trans-European infrastructure networks (TEN-T) resulted in the integration of traffic management tactical operations across the border between Italy and Slovenia, between the operators Autovie Venete and DARS. Project was finished as the demonstration with evaluation. Continuity of traffic management is established in 2008 and is upgrading according to users’ needs. DARS d.d., ASFINAG and HAC as motorway operators from Slovenia, Austria and one of the operators from Croatia 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) in case of severe road corridor blockade. 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.

As the focus of ITS was mainly on motorways, implementation status in other fields of ITS is not as good. However, there are several successful projects also outside motorways. Travel planning in Slovenia lacks in both intermodality and integration on national level, but is moving forward in this field too. Project Integrated public transport system (IJPP) established Google transit platform for Ljubljana public transport (LPP, bus operator) and Slovenian Railways (ŠŽ). Google transit platform is planned for the whole public transport network in Slovenia. Establishment of a national public transportation management centre is planned.

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.

Control of dangerous goods in Slovenia, where dangerous goods can be identified based on video detection, is implemented in three locations (control points in motorway tunnels) in Slovenia (Šentvid, Rebrnice – Podnanos, Karavanke). Establishment of several new ADR control points is planned. Another type of point detection system is the Weigh in motion monitoring system called SI-WIM (by Cestel ltd.) with determination of dangerous goods loads. Continuous satellite tracking system Sledenje enables GNSS system for vehicle tracking and fleet management with sensors for freight control: connected to vehicle OBU or autonomous.

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 was 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 due to change in user needs in last five years, especially in the area of subsystems Public Transport Management System and Personal Device System. Urban ITS architecture based on project
FRAME was also 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 and Maribor which have their own TCC on the Municipality level.

2.2. Status of ITS Deployment in Slovenia in relation to the rest of SEE

The status of ITS deployment in SEE area is very heterogeneous. We could say Slovenia is somewhere in the middle between the countries with 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 ITS implementation.

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.

Slovenia is taking into account its 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) and is participating in several cross-border ITS initiatives to achieve cross-border interoperability. On the other hand its position emphasizes the need for top down approach for other ITS solutions (for example dangerous goods monitoring).

In the past Ministry of Infrastructure introduced SITSA-C, Slovenian ITS architecture, which has never been adopted by other ITS stakeholders. In 2012 and 2013 Slovenia prepared Development strategy with ITS Short-term plan and vision for the next decade as well as introduced Directive 2010/40 EU in the Slovenian legal order with Amendment and complement (ZCes-1A) of the Roads Act (ZCes-1), (Official Gazette of R.S., No. 109/2010, 48/2012) following some other SEE countries.

In comparison to other SEE countries, Slovenia is lagging behind in using sources other than national budget for financing ITS implementation at national level. In some other countries like Greece, Hungary, Albania and Croatia, Public Private Partnership (PPP) initiatives are also deployed as an alternative to using state budget funds. However, in Slovenia the commercial and private sector is not in any way stimulated to take part in ITS development and implementation, which results in lack of Public Private Partnership.
3. **LEGAL FRAMEWORK**

3.1. National Laws


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, there was a beginning of operational procedures for the deployment of the target date. For the implementation of the legislation are competent Ministry for Infrastructure and Spatial Planning, Slovenian Road Agency and DARS d.d. (as national motorway operator and concessioner). 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.

The main legal issues regarding data security and protection, liability issues, 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. 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 processing must be in accordance with Personal Data Protection Act in Slovenia (ZVOP-1, Official Gazette of R.S., No. 94/2007) and Information Commissioner Act (Official Gazette of R.S., No. 113/2005). The latter 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. 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.

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.

3.2. European Union’s Laws

Field of intelligent transport systems and services is subject to the transposition of Directive 2010/40 EU, has not been fully and legally regulated in Slovenia. That Directive provides a framework for the deployment of ITS in road transport interfaces to other transport modes. In accordance with the first paragraph of article 18 of Directive the member states must accept the legal and administrative provisions and regulations, which are necessary for the implementation of Directive. Directive empowers the European Commission to issue specifications as delegated acts. Member states are not obliged to introduce applications and services of intelligent transport systems on its territory, but if you decide to start, it must be in accordance with the specifications. With this document is to be achieved primarily to the specifications issued by the Commission, to develop a legal effect, whereby it is imperative to
deal with the introduction of ITS. Directive 2010/40/EU is the framework guideline, which does not contain an obligation on member states to implement applications and services, and basically prescribes what mandatory in the event of the introduction, but only draws attention to the specification, which will be published by the Commission in the future.

The directive 2010/40/EU of the European Parliaments and of the Council was on 15.5.2013 supplemented with Regulation No. 886/2013 with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users.

Data Protection 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 also require special attention in ITS, for example in cooperative traffic management.

### 3.3. Integration of National laws within EU legislation


Member states are not obliged to introduce applications and services of intelligent transport systems on its territory, but if you decide to start, it must be in accordance with the specifications. With this document is to be achieved primarily to the specifications issued by the Commission, to develop a legal effect, whereby it is imperative to deal with the introduction of ITS. Directive 2010/40/ES is the framework guideline that only draws attention to the specification, which will be published by the Commission in the future. Therefore, Slovenia with the introduction of a national framework currently does not have a cost. What will be the cost in the future will depend on the contents of individual specifications, but at the moment, as we have said, are not known, or cannot yet be predicted. Even after their entry into effect, the minister responsible for transport, decide whether the introduction of content specifications into national law actually rational.

The directive 2010/40/EU of the European Parliaments and of the Council was on 15.5.2013 supplemented with Regulation No. 886/2013 with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users. The Regulation clearly defines obligatory immediate and free of charge provision of the traffic safety related data from the operational units of DARS, PIC, road maintenance companies and police to Disaster Relief through Notification Centre (CORS). Data collected in CORS is transmitted and exchanged with PIC or other media information.

protection of individuals with regard to the processing of personal data and on the free movement of such data from October 1995.
4. **Policy Framework**

4.1. **Existing ITS action plans**

In 2013 Slovenia prepared Development strategy with ITS short-term plan and vision for the next decade. The main objectives of the strategy are:

- Optimization of road and railway capacity;
- Improving road safety;
- Reducing negative impact on the environment and sustainable resources through reducing traffic congestion;
- Promoting the harmonious and simultaneous development and deployment of ITS in the EU;
- Competitiveness and visibility of the Slovenian stakeholders in development and deployment of ITS.

The results are compiled in the strategy for the five-year period and vision by 2020 based on the priority actions of Directive 2010/40/EU.

4.2. **Organisational barriers**

In Slovenia ITS is subordinate to the Ministry of Infrastructure, but in practice development and implementation will be distributed also to other “bodies”, specially to the organisations dealing with road safety, like for example:

- The police (the constituent body of the Ministry of the Interior)
- Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (the constituent body of the Ministry of Defence)
- Motorway Company in the Republic of Slovenia (DARS)
- Slovenian Roads Agency (DRSC, the constituent body of the Ministry of Infrastructure) – with new name Slovenian Infrastructure Agency (DRSI)

A special committee was established for the coordination of the different bodies that are involved in traffic management. The work of the Committee is still at the beginning.

One of the ITS benefits is the low investment costs for benefit on safety, capacity utilisation, etc. Usually these external costs are not recognised by infrastructure managers and operators and therefore they don’t invest in ITS until there is relevant regulation or legislation to do it. They must understand that maintaining efficient transport infrastructure, which serves as a platform for integrated global supply chains, is crucial for meeting the increased demand for transportation services.

The current organisational and legal framework in Slovenia does not incapacitate, but also do not stimulate the commercial and private sector to take part in ITS development and
implementation. Consequently the industry’s participation is very poor. One of the most important benefits of ITS is the relatively low investment cost necessary to increase the efficiency of existing transport infrastructure. To put it simple, this actually means that less investment causes more positive impact. But it probably needs a governmental impetus for the Slovenian industry to break out of the existing structures and create awareness for ITS being a win-win situation for all stakeholders involved. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Due to its size and geographic position it is also important for Slovenia to increasingly participate in cross-border projects and initiatives to utilise its geostrategic advantages at the best possible rate.

4.3. Financial barriers

At the moment ITS effectiveness in Slovenia is low. Due to financial crisis and spending cuts, other investments are recognised as more important, and investments in ITS are on the side track. Infrastructure managers and operators don’t invest in ITS due to lack of budget despite the technology is ready.

There are no funding programmes and initiatives in Slovenia specifically dedicated to ITS deployment. On national level ITS deployment is financed by government budget and revenues from tolls, money collected from charges for setting road signalling in case of road (lane) closure due to renovation works, heavy goods transport and from telecommunications. There is also lack of public private partnership. Some municipalities also finance ITS deployment, especially the City of Ljubljana.

Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Raising awareness of ITS benefits is crucial for further development of cooperative traffic management services, which requires in-vehicle equipment at the expense of users.

4.4. Fostering Interoperability of ITS across EU

Slovenia is a small country, but regarding climate, relief and traffic loads it is also very heterogeneous and therefore an ideal testing site for interoperable ITS. It holds an 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 the Western Balkan region. There has already been much cooperation with the neighbour states of Slovenia, which is an important step towards regionally and internationally integrated ITS deployment.

Slovenia has achieved interoperability on city, national and even cross-border levels in some ITS fields (Traffic Management, Traffic and Travel Information Management, including Public Transport). Examples of interoperability on city level is Ljubljana’s Public Transport and
Payment facilities, on national level PIC and RWIS, and on cross border level project PROMET (see chapter 2.1 for description).

In general, Slovenia is confronting many difficulties in ITS interoperability. This lack of interoperability mainly emerges due to rather poor understanding of system complexity and lack of knowledge of the existing ITS architecture frames, especially on lower, municipality levels. Besides that, the Slovenian ITS architecture SITSA-C, which was introduced by Ministry of Infrastructure, has never been adopted by other ITS stakeholders and needs to be renewed due to changes in user needs. Sophisticated systems therefore remain disconnected; link is especially missing on national – regional- city level. Basic technical specifications with standards are needed for public procurement of ITS equipment and applications to achieve better interoperability and simplification of procedures.
5. **FINANCING MECHANISMS**

5.1. Existing Mechanisms

At the moment only the NATIONAL REFORM PROGRAMME support “An integrated public passenger transport” services (including ITS) to increase investments of national importance (energy, completing the modernisation of the railway network, promoting an integrated public passenger transport and increasing the competitive advantages of the port of Koper). In 2011 Slovenia finished the NATIONAL MOTORWAY CONSTRUCTION PROGRAMME (NPIA). On the national level state budget and revenues from tolls, road closures, overweight load transports and from telecommunications are used as funding for the Slovenian ITS deployment. 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.

On the National/EU level the most important revenues are EU funds:

- 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.

An important boost for the ITS development 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. The aforementioned list of financing mechanisms shows that the majority of them are closely related with the European Union.
6. **Market Analysis of the Services**

6.1. **National Roadmap for ITS**

The activity 4.2 of the SEE-ITS project presented 8 measures and projects for ITS deployment in Slovenia, which have been assessed as high-priority measures based on the experts’ opinions. The presentation of these projects is followed by provisional roadmaps for each priority area of the EU ITS Directive. The aim of each roadmap is to define a list of actions that are necessary for the successful implementation of the projects included in the roadmap and to pave the way for an enhanced technological drive in Slovenia. The roadmap that has been created for Slovenia is presented in the table below.

<table>
<thead>
<tr>
<th>Table 1: List of Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
</tr>
<tr>
<td>Group of measures 1</td>
</tr>
<tr>
<td>Public transport services</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Measure 2</td>
</tr>
<tr>
<td>Measure 3</td>
</tr>
<tr>
<td>Measure 4</td>
</tr>
<tr>
<td>Measure 5</td>
</tr>
<tr>
<td>Measure 6</td>
</tr>
</tbody>
</table>
6.2. **Investment Plan Formation**

6.2.1. **Elements of the investment plan formation**

The investment plans are formed for the groups of priority measures that are included in the national ITS roadmap, presented in section 6.1 and they are composed through the identification and the description of the followings:

**Main involved actors and stakeholders**

This part of the analysis describes the main stakeholders and actors that are involved in the deployment of the proposed measures. The analysis is performed according to the thematic framework and the nature of each measure, the ITS legislative background of the SEE country, the administrative structure and the role allocation that are valid in the SEE country, always in relation to the pursuit of transport policy. Therefore the role of the public and the private sector is specified and the possible and necessary synergies between them, during the deployment of the measures, are approached. Moreover there are proposed structures that can ensure the viable operation and continuity of the proposed measures, always in accordance to the administrative background and the specific characteristics of each SEE country. For each actor involved it is conferred to him a specific role. The categorization of these roles has been obtained by the Compass4D project and modified according to the needs of the SEE-ITS project. The categorization is presented in the table below followed by a short description of each category.

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>The implementation of large scale ITS projects demand the existence of a body that will have a major role during the implementation phase, ensuring the coordination and collaboration among the stakeholders.</td>
</tr>
<tr>
<td>Policy Maker</td>
<td>This role includes the responsibilities of centralised planning and the provision of the appropriate guidelines to the stakeholders. Policy makers ensure the implementation of the overall plan and update it according to the needs and the findings that occur.</td>
</tr>
<tr>
<td>Service Provider</td>
<td>This role includes all the responsibilities and activities that arise from the operation of the systems that the measures introduce. Providers are responsible for the continuous and uninterrupted service’s provision.</td>
</tr>
<tr>
<td>Service Enabler</td>
<td>Stakeholders under this role contribute to the implementation of the platform through the provision of their knowledge, their data and their infrastructure.</td>
</tr>
<tr>
<td>Technology Provider</td>
<td>Stakeholders under this role are those that provide the technological equipment, they are providing consulting services and technical support.</td>
</tr>
<tr>
<td>User</td>
<td>Stakeholders under this role use the services that the measures introduce.</td>
</tr>
</tbody>
</table>

During the implementation of the measures and the operation of the systems, there are developed flows between the stakeholders. These flows reflect the nature of the relationship between them and they form the structure of the model.
Key activities
This part of the analysis describes the main activities that the actors and stakeholder should undertake so as to ensure the successful deployment and operation of ITS obtaining and exploiting the maximum benefits that can arise from the ITS deployment in a SEE country, for themselves and for the society. Therefore the actions of each stakeholder during the implementation are presented along with the streams that are being developed between them in terms of coordination, synergies and exchanges. Except from the clear role allocation, the need for the successful deployment demands the a-priory description of the necessary actions that the stakeholders should undertake. These, as regards the group of measures that is analysed, are divided in two categories. The first category is related to the actions before the implementation, including the planning, the organization, the selection of the technological background and installation of the equipment, the functionality and the nature of the services provided. The second category includes the actions after the implementation of the platform, including the operation and the further development of the platform. All these actions arise from the role allocation and generate relationships and flows between the actors. Moreover, this step of the analysis describes the nature of the relationship between the different actors and the issues that arise from the implementation and operation of the system such as setting a fare in the provision of services, property, copyright issues and personal data protection issues.

Key resources
This step describes all the necessary resources for the implementation of the measures. These resources are analysed in financial and human terms. Therefore the possible funding mechanisms and the optimum allocation of human resources are examined. Moreover, this step of the analysis describes the nature of the relationship between the different actors and the issues that arise from the implementation and operation of the system such as setting a fare in the provision of services, property, copyright issues and personal data protection issues.

Value propositions
This part of the analysis identifies the importance and the value of the measures proposed. The benefits for the all the actors and stakeholders involved are identified and allocated to them.

Cost structure
This step of the analysis describes the nature of the costs that are being charged to the several stakeholders and also the flows of these costs between the involved actors.

Revenue Stream
This step of the analysis describes the benefits for all the involved actors and tries to transform them in monetary terms and cash-flows. The experience gained through the evaluation steps of the SEE-ITS project and especially the main findings and outputs of the cost-benefit analyses is used.
6.2.2. Business model diagram

The formation of the investment plan is finalized through the creation of a business model diagram that summarizes the key points of the analysis in a schematic way. This diagram presents the structure of the model proposed, the relationships between the actors and the flows of different nature that are developed between the actors involved.

6.3. 1st Proposed Group of Measures

6.3.1. Description of the Group of Measures

The analysis is performed for the Group of Measures entitled “Public transport services”. The measures contained in the Group focus on enhancing real time information and accessibility to Public transport services. The group of measure contains three major measures: PT Multimodal journey planner and information about public transport (EU ITS Directive Priority area 1 – Real-time travel information), Real time PT management and Integrated public transport (EU ITS Directive Priority area 1 – Real-time travel information) and e-ticketing (EU ITS Directive Priority area 2 – Continuity of traffic and freight management ITS services).

6.3.2. Main involved actors and stakeholders

The integrated transport policy in Slovenia is structured at a centralized level by the Ministry of Infrastructure (MI) and two Directorates, namely Infrastructure Directorate and Transport Directorate which will have the role of the policy maker and the coordinator. A national public transport management centre and PT system manager or agency needs to be established, which will have the role of the service provider.

Public transport operators (Slovenia Railways (ŠŽ), bus operators (42 interurban public transport operators (concessioners) all over the Slovenia, 14 cities/conurbations with urban public transport) need to be coordinated and contribute to the implementation of the services through the provision of their knowledge, their data and their infrastructure. Therefore, they have the role of service enabler.

The purchase of the new equipment (hardware and software, interfaces with public transport operators and public transport data databases, new public transport equipment) will be held from private companies, which have the role of the technology provider.

The role of consumer is allocated to everyone that will use data derived by the service. Therefore these data can be used by the by public transport operators and by the end users. The table below summarizes these main findings.
### Table 3: Role of each involved actor in 1st Group of Measures

<table>
<thead>
<tr>
<th>Actor</th>
<th>Coordinator</th>
<th>Policy Maker</th>
<th>Service Provider</th>
<th>Service Enabler</th>
<th>Technology/Knowledge Provider</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Infrastructure (Transport Directorate, Infrastructure Directorate)</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCUP</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National public transport management centre, PT manager or agency</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public transport operators</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Companies</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End Users</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Between the several actors and stakeholders specific flows and relationships will be developed. These can be analysed in terms of data flows, policy and deployment guidelines provision, money flows, technological services, equipment, knowledge provision and services provisions. An analytic description of these flows and relationships is provided on the following sections.

### 6.3.3. Key Activities

Public transport services contain three projects:

- **PT Multimodal journey planner and information about public transport**

The main goal of PT Multimodal journey planner and information about public transport is to assure user-friendly access to integrated information about public transport (PT) service. First step is the multimodal PT web portal for public awareness about availability of public transport. It is supposed that confidence in PT services would increase. The multimodal PT portal would provide information about timetables and fares of public transport (buses, railway and alternative transit solutions), and help passengers to plan multimodal public transport journeys. The common and integrated information about PT is not available in Slovenia at the moment. Information about timetables will be available on websites as well as at traffic information centres, including call centre, and it will also be accessible via smartphone app in specified data exchange format. Second step is the upgrade of the journey planner with real-time information and integration with the existing web portal at National traffic information centre.
• **Real time PT management**

In the time of information and communication technologies (ICT), satellite and other navigational devices, when the value-of-time is very important, travellers want to get faster and more accurate information about PT. Information that travellers get at the bus stop, train station or on-board a PT vehicle is often insufficient because they are not real-time defined. In Slovenia, there is no information about delays and there is no information about the type of vehicle, for example if the vehicle has a special ramp for disabled persons. PT vehicles are often not on time, especially in rush hours and in case of bad weather conditions. Some bus stops are directly on the road, resulting in safety issues and a generally lower level of service. If the PT service remains at the existing status (“leaving everything as it is”), passengers will increasingly prefer individual transport. Public transport fleet management tracking ensure that with satellite navigation (or other technology) the arrival of buses or trains can be predicted and therefore timetable could be, in case of delays, rescheduled in real time. Passengers could be informed about bus or train arrival (delays) on multifunctional arrival-departure information media. Variable message displays (VMS) at the PT station or smartphone apps should be used. Dynamic information about public transport would result in higher passenger satisfaction and higher use of public transport services, due to user-friendly access to timetables for buses and trains and due to real-time traffic information.

• **Integrated public transport and e-ticketing**

The goal of this measure is to establish conditions for the introduction of an interoperable e-ticketing system and harmonised timetables for bus and railway transport. For implementing an integrated public system it is necessary to establish a management body to manage PT system, to create a system for monitoring and classification of revenues and funding sources, to integrate and to upgrade existing information centres, to develop guidelines and rules for e-ticketing implementation and finally to test all the solutions on a pilot project, before such a system is put into real life. The implementation should be accompanied with a strong awareness campaign.

6.3.4. **Key Resources**

As already stated above and in previous SEE-ITS national reports, Slovenia is facing a financial crisis and major spending cuts that creates a significant barrier to the wider ITS deployment. The main funding sources of transport projects are the National and the European funds. However, at the moment the NATIONAL REFORM PROGRAMME support “An integrated public passenger transport” services (including ITS) to increase investments of national importance (energy, completing the modernisation of the railway network, promoting an integrated public passenger transport and increasing the competitive advantages of the port of Koper). Slovenia should also try to get benefit of the challenges that arise from the new European programming period (2014-2020).
6.3.5. Value propositions

The importance and the value of the measures proposed can be reflected on the benefits that will occur from their implementation. These benefits can be separated to the individual user and to the society. Moreover, the measures can serve other objectives arising from the nature of ITS and the policy framework for the transportation sector.

The implementation of the proposed services has several positive social impacts as well as benefits to the individual user, but also provides direct benefits to the individual users, society as well as institutions due to provision of equipment and services. The benefits for the all the actors and stakeholders involved are identified and allocated to them and there are presented on the table below.

Table 4: Benefit for actors and stakeholders

<table>
<thead>
<tr>
<th>Actor</th>
<th>Role</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| Ministry of Infrastructure | Coordinator / Policy Maker | • Promotion of transport telematics  
• Public transport would become more attractive  
• Accident reduction, reduce of fatalities and injuries;  
• Higher road capacity utilisation  
• Lower pollution and lower fuel consumption  
• De-congestion  
• Higher traffic demand on existing transport infrastructure  
• Better modal split |
| National public transport management centre, PT manager or agency, NCUP | Service Provider | • Promotion of transport telematics  
• Public transport would become more attractive  
• Accident reduction, reduce of fatalities and injuries;  
• Higher road capacity utilisation  
• Lower pollution and lower fuel consumption  
• De-congestion  
• Higher traffic demand on existing transport infrastructure  
• Public transport would become more attractive  
• Better modal split  
• Increased revenues  
• Fraud reduction  
• Increased patronage |
| Private companies | Technology Provider / Consultants / IT support | • Direct economic benefits through the provision of equipment and services  
• Higher fleet capacity utilisation  
• Optimisation of fleet and staff resources  
• De-congestion  
• Improved image of the public transport service  
• Increased patronage  
• Improved satisfaction from fare integration primary due to increased convenience and fare savings  
• Higher traffic demand on existing transport infrastructure  
• Public transport would become more attractive  
• Faster boarding times |
| Public transport operators | Service Enabler/Knowledge provider/Consumption | • Direct economic benefits through the provision of equipment and services  
• Higher fleet capacity utilisation  
• Optimisation of fleet and staff resources  
• De-congestion  
• Improved image of the public transport service  
• Increased patronage  
• Improved satisfaction from fare integration primary due to increased convenience and fare savings  
• Higher traffic demand on existing transport infrastructure  
• Public transport would become more attractive  
• Faster boarding times |
### Long-Term Investment Plans of ITS in Slovenia

<table>
<thead>
<tr>
<th>End User</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased revenues</td>
<td>• User friendly information on public transport</td>
</tr>
<tr>
<td>• Fraud reduction</td>
<td>• Lower fuel consumption</td>
</tr>
<tr>
<td>• Increased patronage</td>
<td>• Saving travel time and unnecessary bad mood; improved passenger satisfaction and passenger retention</td>
</tr>
<tr>
<td></td>
<td>• More accurate information for higher confidence in PT (reliability of PT system)</td>
</tr>
<tr>
<td></td>
<td>• De-congestion</td>
</tr>
<tr>
<td></td>
<td>• Improved satisfaction from fare integration primary due to increased convenience and fare savings</td>
</tr>
<tr>
<td></td>
<td>• Public transport would become more attractive</td>
</tr>
<tr>
<td></td>
<td>• Faster boarding times</td>
</tr>
</tbody>
</table>
6.3.6. **Cost structure**

As analysed in the relevant section, the main funding sources of the project will be the National and the European funds. This capital will be spread to the companies that will undertake the implementation of the project and to the upgrade of the current infrastructure. The operational costs will be covered by national resources. The cost estimation is shown on figure below.

<table>
<thead>
<tr>
<th>Priority area 1 - Optimal use of road, traffic and travel data</th>
<th>Cost estimation [EUR]</th>
</tr>
</thead>
<tbody>
<tr>
<td>P I-1: PT Multimodal journey planner and information about public transport</td>
<td>1.266.000,00</td>
</tr>
<tr>
<td>studies, pilots, projects’ specifications, tendering</td>
<td>240.000,00</td>
</tr>
<tr>
<td>implementation</td>
<td>770.000,00</td>
</tr>
<tr>
<td>service/system maintaince</td>
<td>256.000,00</td>
</tr>
<tr>
<td>P I-2*: Real time PT management</td>
<td>880.000,00</td>
</tr>
<tr>
<td>studies, pilots, projects’ specifications, tendering</td>
<td>160.000,00</td>
</tr>
<tr>
<td>implementation</td>
<td>600.000,00</td>
</tr>
<tr>
<td>service/system maintaince</td>
<td>120.000,00</td>
</tr>
<tr>
<td>P II-1*: Integrated public transport and e-ticketing</td>
<td>5.425.000,00</td>
</tr>
<tr>
<td>studies, pilots, projects’ specifications, tendering</td>
<td>225.000,00</td>
</tr>
<tr>
<td>implementation</td>
<td>4.000.000,00</td>
</tr>
<tr>
<td>service/system maintaince</td>
<td>1.200.000,00</td>
</tr>
</tbody>
</table>

**Figure 1**: Cost estimation of Group of Measures “Public transport services”

6.3.7. **Revenue Streams**

The revenue streams, in economic terms arise from the value that the system adds to all the actors involved. Therefore for the private companies that are involved in the development and the operation of the Public transport Services the benefit is clearly economic (charge of services and equipment). For the service provider (National public transport management centre, PT manager or agency (clearing service) and service enabler (Public transport operators) has the direct economic benefit is related to increased revenues due to modal shift. The provision of data to bodies, operators and fleet providers that serve the public interest should be made free of charge.

Besides the direct economic costs and benefits, there are also benefits that cannot directly be expressed in monetary terms, but there are strongly improve the social welfare. Therefore the reduction of road-transport’s emissions, the reduction of accidents and the reduction of travel time bring about economic benefits to the stakeholders and to the society. Economic benefits also arise from the induction of innovation in the transportation filed and the technological innovation.
6.3.8. **Business model Diagram**

All the findings of the previous sections are summarized on the following diagram. The diagram presents the flows that are developed between the actors and the nature of each flow.

![Business model diagram of the Group of Measures “Public transport services”](image)

**Figure 2:** Business model diagram of the Group of Measures “Public transport services”
6.4. 2nd Proposed Measure

6.4.1. Description of the Measure

The analysis is performed for the Measure entitled “Traffic management and traffic control system enhancing” (EU ITS Directive Priority area I – Real-time travel information). The measure focuses on traffic control system (TCS).

To ensure full operation of such a system the integrated and enhanced traffic monitoring system is needed. With the implementation of traffic monitoring devices and video surveillance traffic data can be collected and used for traffic planning and informing of road users in real-time.

6.4.2. Main involved actors and stakeholders

The integrated transport policy in Slovenia is structured at a centralized level by the Ministry of Infrastructure (MI) and two Directorates, namely Infrastructure Directorate and Transport Directorate which will have the role of the policy maker and the coordinator.

A national traffic management centre is in constitution in order to facilitate this objective, which will have the role of the service provider. 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 (DRSC). Roads act set frames to the establishment of the National Traffic Management Centre (NCUP), which reorganize the existent PIC for state roads to NCUP with the new and very important function of traffic management for all public roads including public transport. Currently, control centre Ljubljana together with PIC are 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). DARS and DRSC will therefore both have the role of service provider as a part of PIC and NCUP, but also the role of service enabler.

The purchase of the new equipment (hardware and software, interfaces with regional traffic management centres and traffic data databases, new road equipment) will be held from private companies, which have the role of the technology provider.

The role of consumer is allocated to everyone that will use data derived by the service. These data can are clearly directly used by the end users but can be used in analysing purposes also by DARS, DRSC and private companies. The table below summarizes these main findings.

Besides mentioned actors, there are many related actors (OKC-113 Operation and communication centre, CO-112 Notification centre, Clubs and associations of traffic participants, Radio-diffusion operators, Navigation and other in-vehicle system producers, Digital maps producers, IC service providers, Private sector) and Associate actors (Traffic...
Inspectorate (Police), Traffic management centre of non-motorway state roads, Slovenian traffic safety agency, Toll user centre DARS (CUC), Public transport management centre). If needed, Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (body affiliated to the Ministry of Defence) is also an actor in role of Service enabler. The table below summarizes these main findings.

**Table 5: Role of each involved actor in 2nd Measure**

<table>
<thead>
<tr>
<th>Actor</th>
<th>Coordinator</th>
<th>Policy Maker</th>
<th>Service Provider</th>
<th>Service Enabler</th>
<th>Technology/Knowledge Provider</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Infrastructure (Transport Directorate, Infrastructure Directorate)</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCUP</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DARS</td>
<td></td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRSC</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration of the Republic of Slovenia for Civil Protection and Disaster Relief</td>
<td></td>
<td></td>
<td></td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Private Companies</td>
<td></td>
<td></td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End Users</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>

Between the several actors and stakeholders specific flows and relationships will be developed. These can be analysed in terms of data flows, policy and deployment guidelines provision, money flows, technological services, equipment, knowledge provision and services provisions. An analytic description of these flows and relationships is provided on the following sections.

**6.4.3. Key Activities**

Traffic control system (TCS) consists of traffic monitoring devices (traffic flow detectors, video surveillance system, environmental data monitoring, etc.) and on-road devices or subsystems for informing road users, such as variable message signs. They are usually connected to traffic control centres operated by infrastructure managers. TCS components enable operators to control traffic easier and more effective. On the other hand also the police have the role of traffic control. With the increase of traffic volume and the construction or renovation of infrastructure, the need for defining the role of each party involved in the traffic management arises. In order to facilitate this objective in Slovenia National traffic management centre is in constitution. It will be organised as the strategic subject of traffic management and control.
To ensure full operation of such a system the integrated and enhanced traffic monitoring system is needed. With the implementation of traffic monitoring devices and video surveillance traffic data can be collected and used for traffic planning and informing of road users in real-time.

6.4.4. Key Resources

As already stated above and in previous SEE-ITS national reports, Slovenia is facing a financial crisis and major spending cuts that creates a significant barrier to the wider ITS deployment despite the technology is ready.

The main funding sources of transport projects are the National and the European funds. Specific transport projects, including the one examined here, are not expected to provide a direct economic benefit in private economy terms. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Slovenia should try to get benefit of the challenges that arise from the new European programming period (2014-2020).

6.4.5. Value propositions

The importance and the value of the measures proposed can be reflected on the benefits that will occur from their implementation. These benefits can be separated to the individual user and to the society. Moreover, the measures can serve other objectives arising from the nature of ITS and the policy framework for the transportation sector.

The implementation of the TCS mainly has positive social and environmental impacts. The benefits for the all the actors and stakeholders involved are identified and allocated to them and there are presented on the table below.

Table 6: Benefits for actors and stakeholders

<table>
<thead>
<tr>
<th>Actor</th>
<th>Role</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| Ministry of Infrastructure | Coordinator, Policy Maker | • Reduction of road accidents with fatalities and injuries  
• Higher road capacity utilisation  
• Lower pollution |
| NCUP | Service Provider | • Reduction of road accidents with fatalities and injuries  
• Higher road capacity utilisation  
• Lower pollution |
| DARS | Service Provider, Service Enabler, Consumption | • Reduction of road accidents with fatalities and injuries  
• Higher road capacity utilisation |
### 6.4.6. Cost structure

As analysed in the relevant section, the main funding sources of the project will be the National and the European funds. This capital will be spread to the companies that will undertake the implementation of the project (purchase of equipment) and to the upgrade of the current infrastructure. The operational costs will be covered by national resources. The cost estimation is shown on figure below.

![Figure 3: Cost estimation of Measure “Traffic management and traffic control system enhancing”](image)

### 6.4.7. Revenue Streams

The revenue streams, in economic terms arise from the value that the system adds to all the actors involved. Therefore for the private companies that are involved in the development and the operation of TCS the benefit is clearly economic (charge of services and equipment), while for the service provider the economic benefit is indirect.

Besides the direct economic costs and benefits, there are also benefits that cannot directly be expressed in monetary terms, but there are strongly improve the social welfare. Therefore the reduction of road-transport’s emissions, the reduction of accidents and the reduction of travel time bring about economic benefits to the stakeholders and to the society. Economic benefits also arise from the induction of innovation in the transportation filed and the technological innovation.
6.4.8. Business model Diagram

All the findings of the previous sections are summarized on the following diagram. The diagram presents the flows that are developed between the actors and the nature of each flow.

![Business model diagram of the Measure “Traffic management and traffic control system enhancing”](image_url)

**Figure 4**: Business model diagram of the Measure “Traffic management and traffic control system enhancing”
6.5. 3rd Proposed Measure

6.5.1. Description of the Measure

The analysis is performed for the Measure entitled “eParkInfo” (EU ITS Directive Priority area 1 – Real-time travel information). The measure focuses on providing information about location and available parking spaces for motor vehicles and offers the ability to plan routes with rest periods and breaks at appropriate parking facilities.

6.5.2. Main involved actors and stakeholders

The integrated transport policy in Slovenia is structured at a centralized level by the Ministry of Infrastructure (MI) and two Directorates, namely Infrastructure Directorate and Transport Directorate which will have the role of the policy maker and the coordinator.

A national traffic management centre NCUP is in constitution in order to facilitate this objective, which will have the role of the service provider. 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 (DRSC). Roads act set frames to the establishment of the National Traffic Management Centre (NCUP), which reorganize the existent PIC for state roads to NCUP with the new and very important function of traffic management for all public roads including public transport. Currently, control centre Ljubljana together with PIC are 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). DARS and DRSC will therefore both have the role of service provider as a part of PIC and NCUP, but also the role of service enabler. Private parking owners also have the role of service enabler.

The purchase of the new equipment (hardware and software, interfaces with regional traffic management centres and traffic data databases, new equipment) will be held from private companies, which have the role of the technology provider.

The role of consumer is allocated to drivers and fleet managers as well as DARS and DRSC.

<table>
<thead>
<tr>
<th>Table 7: Role of each involved actor in 3rd Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actor</td>
</tr>
<tr>
<td>Ministry of Infrastructure</td>
</tr>
<tr>
<td>NCUP</td>
</tr>
</tbody>
</table>

Deliverable D7.3.6: Long-Term Investment Plans of ITS in Slovenia
Between the several actors and stakeholders specific flows and relationships will be developed. These can be analysed in terms of data flows, policy and deployment guidelines provision, money flows, technological services, equipment, knowledge provision and services provisions. An analytic description of these flows and relationships is provided on the following sections.

6.5.3. **Key Activities**

The goal of this Measure is to provide information about location and available parking spaces for motor vehicles. The service is based on parking control system which offer information exchange about available parking spaces. With the implementation of eParkInfo drivers will save time in finding a parking place. Also the safety on the primary road network will increase and it offers the ability to plan routes with rest periods and breaks at appropriate parking facilities.

6.5.4. **Key Resources**

As already stated above and in previous SEE-ITS national reports, Slovenia is facing a financial crisis and major spending cuts that creates a significant barrier to the wider ITS deployment despite the technology is ready.

The main funding sources of transport projects are the National and the European funds. Specific transport projects, including the one examined here, are not expected to provide major direct economic benefit in private economy terms. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Slovenia should try to get benefit of the challenges that arise from the new European programming period (2014-2020).

6.5.5. **Value propositions**

The importance and the value of the measures proposed can be reflected on the benefits that will occur from their implementation. These benefits can be separated to the individual user and to the society. Moreover, the measures can serve other objectives arising from the nature of ITS and the policy framework for the transportation sector.
The implementation of the e-ParkInfo mainly has positive social and environmental impacts. The benefits for the all the actors and stakeholders involved are identified and allocated to them and there are presented on the table below.

Table 8: Benefits for actors and stakeholders

<table>
<thead>
<tr>
<th>Actor</th>
<th>Role</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| Ministry of Infrastructure   | Coordinator Policy Maker    | • Improved safety and security for truck drivers  
|                              |                             | • Reduced road accident rate and number of fatalities and injuries in case that vehicles stop on the road  
|                              |                             | • Less congestion near or on the parking facilities  
|                              |                             | • Lower pollution  
|                              |                             | • Lower fuel consumption  |
| NCUP                         | Service Provider            | • Reduced road accident rate and number of fatalities and injuries in case that vehicles stop on the road  
|                              |                             | • Less congestion near or on the parking facilities  
|                              |                             | • Lower pollution  
|                              |                             | • Lower fuel consumption  |
| DARS                        | Service Provider, Service Enabler, Consumption | • Reduced road accident rate and number of fatalities and injuries in case that vehicles stop on the road  
|                              |                             | • Less congestion near or on the parking facilities  
|                              |                             | • Optimisation of the use of parking places  
|                              |                             | • Improved parking possibilities  |
| DRSC                        | Service Provider, Service Enabler, Consumption | • Reduced road accident rate and number of fatalities and injuries in case that vehicles stop on the road  
|                              |                             | • Less congestion near or on the parking facilities  
|                              |                             | • Optimisation of the use of parking places  
|                              |                             | • Improved parking possibilities  |
| Private parking owner       | Service Enabler             | • Less congestion near or on the parking facilities  
|                              |                             | • Optimisation of the use of parking places  
|                              |                             | • Improved parking possibilities  |
| Private companies           | Technology Provider / Consultants / IT support | • Direct economic benefits through the provision of equipment and services  |
| Fleet managers              | Consumer                    | • Improved safety and security for truck drivers  
|                              |                             | • Lower fuel consumption  
|                              |                             | • Save time in finding parking place  
|                              |                             | • Improved parking possibilities  |
| End User                    | Consumer                    | • Improved safety and security for truck drivers  
|                              |                             | • Lower fuel consumption  
|                              |                             | • Save time in finding parking place  
|                              |                             | • Improved parking possibilities  |

6.5.6. **Cost structure**

As analysed in the relevant section, the main funding sources of the project will be the National and the European funds. This capital will be spread to the companies that will
undertake the implementation of the project (purchase of equipment) and to the upgrade of the current infrastructure. The operational costs will be covered by national resources. The cost estimation is shown on figure below.

![Figure 5: Cost estimation of Measure “e-ParkInfo”](image)

### 6.5.7. Revenue Streams

The revenue streams, in economic terms arise from the value that the system adds to all the actors involved. Therefore for the private companies that are involved in the development and the operation of e-ParkInfo the benefit is clearly economic (charge of services and equipment), while for the service provider the economic benefit is indirect.

Besides the direct economic costs and benefits, there are also benefits that cannot directly be expressed in monetary terms, but there are strongly improve the social welfare. Therefore the increase of safety and security for truck drivers, optimization of parking places, reduction of road-transport’s emissions, the reduction of accidents and the reduction of parking search time bring about economic benefits to the stakeholders and to the society. Economic benefits also arise from the induction of innovation in the transportation filed and the technological innovation.
6.5.8. Business model Diagram

All the findings of the previous sections are summarized on the following diagram. The diagram presents the flows that are developed between the actors and the nature of each flow.

![Business model Diagram](image)

Figure 6: Business model diagram of the Measure “e-ParkInfo”

6.6. 4th Proposed Measure

6.6.1. Description of the Measure

The analysis is performed for the Measure entitled “Traffic data warehouse and cross-border data exchange” (EU ITS Directive Priority area I – Real-time travel information). The measure focuses on cross-border traffic information exchange.

6.6.2. Main involved actors and stakeholders

The integrated transport policy in Slovenia is structured at a centralized level by the Ministry of Infrastructure (MI) and two Directorates, namely Infrastructure Directorate and Transport Directorate which will have the role of the policy maker and the coordinator. Since the
Measure focuses on cross-border data exchanges, ministries in charge of transport in neighbouring countries also have the role of policy maker and coordinator.

A national traffic management centre NCUP is in constitution in order to facilitate this objective, which will have the role of the service provider. The measure focuses on cross-border traffic data exchange, giving NCUP also the role of service enabler. 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 (DRSC). Roads act set frames to the establishment of the National Traffic Management Centre (NCUP), which reorganize the existent PIC for state roads to NCUP with the new and very important function of traffic management for all public roads including public transport. Currently, control centre Ljubljana together with PIC are 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). DARS and DRSC will both have of service enabler and consumer.

Traffic management centres of neighbouring countries, similar to NCUP, also have the role of service provider and service enabler. All of them are also consumers of exchanged data. It will be also used for data exchange with other national stakeholders, such as Notification centre (Emergency centre), the Police and tourist organisations, which have the role of service enabler and consumer.

The purchase of the new knowledge (hardware and software, interfaces with traffic management centres and other stakeholders) will be held from private companies, which have the role of the technology provider.

**Table 9: Role of each involved actor in 4th Measure**

<table>
<thead>
<tr>
<th>Actor</th>
<th>Coordinator</th>
<th>Policy Maker</th>
<th>Service Provider</th>
<th>Service Enabler</th>
<th>Technology/ Knowledge Provider</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Infrastructure</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ministries in charge of transport in neighbouring countries (or EU member states data access point)</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCUP</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Traffic management centres of neighbouring countries</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>DARS</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRSC</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 6.6.3. Key Activities

Slovenia is transit country; therefore incidents on the Slovenian road network can impact on traffic situation in all neighbouring countries and vice-versa. Therefore harmonized cross-border traffic management with ITS systems is needed.

Existing traffic-information system provides information on traffic conditions of the national roads. For more efficient and standardized information exchange on traffic condition of neighbouring countries there is the need for the system upgrade.

Cross-border traffic information exchange platform would allow almost unlimited traffic information exchange. It will be also used for data exchange with other national stakeholders, such as Notification centre (Emergency centre), the Police and tourist organisations.

### 6.6.4. Key Resources

As already stated above and in previous SEE-ITS national reports, Slovenia is facing a financial crisis and major spending cuts that creates a significant barrier to the wider ITS deployment despite the technology is ready.

The main funding sources of transport projects are the National and the European funds. Specific transport projects, including the one examined here, are not expected to provide a direct economic benefit in private economy terms. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Slovenia should try to get benefit of the challenges that arise from the new European programming period (2014-2020).
6.6.5. Value propositions

The importance and the value of the measures proposed can be reflected on the benefits that will occur from their implementation. These benefits can be separated to the individual user and to the society. Moreover, the measures can serve other objectives arising from the nature of ITS and the policy framework for the transportation sector.

The implementation of the Traffic data warehouse and cross-border data exchange mainly has social and environmental impacts. The benefits for all the actors and stakeholders involved are identified and allocated to them and there are presented on the table below.

Table 10: Benefits for actors and stakeholders

<table>
<thead>
<tr>
<th>Actor</th>
<th>Role</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| Ministry of Infrastructure, Ministries in charge of transport in neighbouring countries | Coordinator, Policy Maker | • Improved safety and security for long-distance drivers  
• Reducing road accident rate and number of fatalities and injuries  
• Optimised road capacity utilisation, minimising travel time  
• Faster incident detection and information exchange; faster response and better traffic management  
• Due to faster response decrease pollutants emissions and fuel consumption |
| NCUP, Traffic management centres of neighbouring countries | Service Provider, Service Enabler, Consumption | • Improved safety and security for long-distance drivers  
• Reducing road accident rate and number of fatalities and injuries  
• Optimised road capacity utilisation, minimising travel time  
• Faster incident detection and information exchange; faster response and better traffic management  
• Due to faster response decrease pollutants emissions and fuel consumption |
| DARS | Service Enabler, Consumption | • Reducing road accident rate and number of fatalities and injuries  
• Optimised road capacity utilisation, minimising travel time  
• Faster incident detection and information exchange; faster response and better traffic management |
| DRSC | Service Enabler, Consumption | • Reducing road accident rate and number of fatalities and injuries  
• Optimised road capacity utilisation, minimising travel time  
• Faster incident detection and information exchange; faster response and better traffic management |
| Notification centre, Police, Tourist organisations | Service Enabler, Consumption | • Reducing road accident rate and number of fatalities and injuries  
• Optimised road capacity utilisation, minimising travel time  
• Faster incident detection and information exchange; faster response and better traffic management |
| Private companies | Technology Provider / Consultants / IT support | • Direct economic benefits through the provision of equipment and services |
6.6.6. Cost structure

As analysed in the relevant section, the main funding sources of the project will be the National and the European funds. This capital will be spread to the companies that will undertake the implementation of the project and to the upgrade of the current infrastructure. The operational costs will be covered by national resources. The cost estimation is shown on figure below.

![Cost Estimation Table](image)

**Figure 7:** Cost estimation of Measure “Traffic data warehouse and cross-border data exchange”

6.6.7. Revenue Streams

The revenue streams, in economic terms arise from the value that the system adds to all the actors involved. Therefore for the private companies that are involved in the development and the operation of Traffic data warehouse and cross-border data exchange the benefit is clearly economic (charge of services and equipment), while for the service provider the economic benefit is indirect.

Besides the direct economic costs and benefits, there are also benefits that cannot directly be expressed in monetary terms, but there are strongly improve the social welfare. Therefore the increase of safety and security for long-distance drivers, faster incident detection, reduction of road-transport’s emissions, the reduction of accidents and better traffic management in general bring about economic benefits to the stakeholders and to the society. Economic benefits also arise from the induction of innovation in the transportation field and the technological innovation.
6.6.8. **Business model Diagram**

All the findings of the previous sections are summarized on the following diagram. The diagram presents the flows that are developed between the actors and the nature of each flow.

![Business model Diagram](image)

**Figure 8**: Business model diagram of the Measure “Traffic data warehouse and cross-border data exchange”
6.7. 5th Proposed Measure

6.7.1. Description of the Measure

The analysis is performed for the Measure entitled “Automatic and geo-location dependent message about traffic incident” (EU ITS Directive Priority area 3 - ITS road safety and security applications). The measure focuses on enabling eCall service.

6.7.2. Main involved actors and stakeholders

Administration of the Republic of Slovenia for Civil Protection and Disaster Relief, which is a body affiliated to the Ministry of Defence will have the role of policy maker, coordinator and service provider.

Other important actors in this service are public telecommunication infrastructure operators, since the upgrade of communication infrastructure is crucial. Public telecommunication infrastructure operators have the role of system enabler and technology provider. The integration of other actors for some issues e.g. delivering voice calls and Minimal Set of Data (MSD) to Public Safety Answering Points (PSAP) agents is also possible, making potentially involved private companies also technology providers.

112 Dispatcher and rescue service have the role of service enabler.

The role of consumer is allocated to everyone that will in any way use the service. Since the recorded general data about events could be shared for data exchange, including National traffic management centre (NCUP) and Traffic information centre (PIC), they also play the role of consumers. Finally, the consumer is also the end user. Since the end user is also respondent for the 112 call or eCall Flag, end user is also service enabler.

The table below summarizes these main findings.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Coordinator</th>
<th>Policy Maker</th>
<th>Service Provider</th>
<th>Service Enabler</th>
<th>Technology/ Knowledge Provider</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration of RS for Civil Protection and Disaster Relief (Ministry of Defence)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Public telecommunication infrastructure operators</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private companies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>112 Dispatcher</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rescue service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

Table 11: Role of each involved actor in 5th Measure
### 6.7.3. Key Activities

In the field of providing safety and emergency services new technologies allow faster and more efficient response by introducing voice and video messaging, including the data about geo-positioning. For this reason EU member states are going to enhance existing “112” services to provide cross-border eCall service. Vehicles, equipped with eCall-compliant IVSs (GPS/Galileo, GSM modem) will be serviced with the same quality of service in the case of emergency calls in any EU state; thus providing cross-border continuation and harmonization of the service in neighbouring countries. For the operation of eCall, in addition to communication technology in the vehicle, Public Safety Answering Points (PSAP) should be upgraded to provide the communication infrastructure for receiving automated calls. Mobile Network Operators (MNOs) should ensure appropriate handling of the 112 calls with “eCall_Flag”, while some other actors or MNO should take care of delivering voice calls and Minimal Set of Data (MSD) to PSAP agents. PSAP stores MSD into the centralized database storage and provides open, secured interfaces for third-party services and applications integration.

The recorded general data about events could be shared for data exchange, including Traffic control centre and Traffic information centre.

### 6.7.4. Key Resources

As already stated above and in previous SEE-ITS national reports, Slovenia is facing a financial crisis and major spending cuts that creates a significant barrier to the wider ITS deployment despite the technology is ready.

The main funding sources of transport projects are the National and the European funds. Specific transport projects, including the one examined here, are not expected to provide a
direct economic benefit in private economy terms. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Slovenia should try to get benefit of the challenges that arise from the new European programming period (2014-2020).

6.7.5. Value propositions

The importance and the value of the measures proposed can be reflected on the benefits that will occur from their implementation. These benefits can be separated to the individual user and to the society. Moreover, the measures can serve other objectives arising from the nature of ITS and the policy framework for the transportation sector.

The implementation of the Automatic and geo-location dependent message about traffic incident has mainly social impacts. The benefits for the all the actors and stakeholders involved are identified and allocated to them and there are presented on the table below.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Role</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| Administration of RS for Civil Protection and Disaster Relief (Ministry of Defence) | Coordinator Policy Maker Service provider | • Reduction of fatalities, reduction of severe injuries, rapid intervention may have favourable effect on human health for example in the case of dangerous good traffic accident  
• Shorter legal and insurance procedures if other data is recorded, including video  
• Faster response could cause lower environment pollution for example in the case of dangerous good transport |
| Public telecommunication infrastructure operators | Service Enabler, Technology Provider / Consultants / IT support | • Direct economic benefits through the provision of equipment and services |
| Private companies | Technology Provider / Consultants / IT support | • Direct economic benefits through the provision of equipment and services |
| 112 Dispatcher | Service Enabler | • Shorter legal and insurance procedures if other data is recorded, including video  
• Faster response |
| Rescue service | Service Enabler | • Reduction of fatalities, reduction of severe injuries, rapid intervention may have favourable effect on human health for example in the case of dangerous good traffic accident  
• Travel time savings for rescue teams  
• Reduction of congestion  
• Faster response |
| NCUP/PIC | Consumption | • Travel time savings for all users in case of delays  
• Reduction of congestion  
• Positive effect on emissions  
• Better traffic management |
| End user | Consumption | • Travel time savings for all users in case of delays  
• Reduction of congestion |
6.7.6. **Cost structure**

As analysed in the relevant section, the main funding sources of the project will be the National and the European funds. This capital will be spread to the public telecommunication infrastructure operators and possibly companies that will undertake the implementation of the project (Public Safety Answering Points (PSAP) upgrade to provide the communication infrastructure for receiving automated calls, Mobile Network Operators (MNOs) should ensure appropriate handling of the 112 calls with “eCall_Flag”, while some other actors or MNO should take care of delivering voice calls and Minimal Set of Data (MSD) to PSAP agents) and to the upgrade of the current telecommunication infrastructure. The operational costs will be covered by national resources. The cost estimation is shown on figure below.

![Figure 9: Cost estimation of Measure “Automatic and geo-location dependent message about traffic incident”](image)

6.7.7. **Revenue Streams**

The revenue streams, in economic terms arise from the value that the system adds to all the actors involved. Therefore for the public telecommunication infrastructure operators and private companies that are involved in the development and the operation of Automatic and geo-location dependent message about traffic incident the benefit is clearly economic (charge of services and equipment), while for the service provider the economic benefit is indirect.

Besides the direct economic costs and benefits, there are also benefits that cannot directly be expressed in monetary terms, but there are strongly improve the social welfare. Therefore saving lives through reduction of fatalities and severe injuries and also favourable effect on human health in case of dangerous good traffic accident due to rapid intervention bring benefits that are more important than strictly economic benefits. Economic benefits also arise from the induction of innovation in the transportation filed and the technological innovation.
6.7.8. Business model Diagram

All the findings of the previous sections are summarized on the following diagram. The diagram presents the flows that are developed between the actors and the nature of each flow.

**Figure 10**: Business model diagram of the Measure “Automatic and geo-location dependent message about traffic incident”
6.8. **6th Proposed Measure**

6.8.1. **Description of the Measure**

The analysis is performed for the Measure entitled “Free Flow Electronic Toll Collection” (EU ITS Directive Priority area 4 - Linking the vehicle with the transport infrastructure). The measure focuses on tolling system and addresses the revenues from collecting tolls as the current tolling system is unsustainable.

6.8.2. **Main involved actors and stakeholders**

The integrated transport policy in Slovenia is structured at a centralized level by the Ministry of Infrastructure (MI) and two Directorates, namely Infrastructure Directorate and Transport Directorate which will have the role of the policy maker and the coordinator.

The main actor is DARS d.d. (Motorway Company in the Republic of Slovenia), who is in charge of tolling system and has the role of service provider as well as service enabler.

The purchase of the new equipment (hardware and software, interfaces with regional traffic management centres and traffic data databases, new road equipment) will be held from private companies, which have the role of the technology provider.

The role of consumer is allocated to end user.

<table>
<thead>
<tr>
<th>Table 13: Role of each involved actor in 6th Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actor</td>
</tr>
<tr>
<td>-------</td>
</tr>
</tbody>
</table>
| Ministry of Infrastructure (Infrastructure Directorate) | Coordinator  
| | Policy Maker |
| | Service Provider |
| | Service Enabler |
| | Technology/ Knowledge Provider |
| | Consumption |
| DARS | | |
| Private Companies | | |
| End Users | | |

Between the several actors and stakeholders specific flows and relationships will be developed. These can be analysed in terms of data flows, policy and deployment guidelines provision, money flows, technological services, equipment, knowledge provision and services provisions. An analytic description of these flows and relationships is provided on the following sections.
6.8.3. **Key Activities**

At this moment two ways of collecting toll exist in Slovenia, namely:

- Vignette tolling system for vehicles weighing up to 3.500 kg (stickers) and
- Open and closed tolling system for vehicles weighing over 3.500 kg

For vehicles above 3.5 t regular, classical payment with cash and credit cards is possible and also pre-payment and post-payment with electronic media is available (ABC tag, DARS card).

In accordance with the EU Directive 2004/52/EC, EC Decision 2009/750/EC and the Action plan adopted by the Government of the Republic of Slovenia, DARS d.d. is planning to establish an enhanced free-flow electronic toll collection (ETC) system on the entire motorway network. The main reasons for the introduction of ETS are:

- Technical unsustainability of the current DSRC telecommunication link;
- Providing migration to charging technology, which is in accordance with European regulations (EETS Directive about interoperability);
- Creating additional (higher) income for DARS d.d. with extending the tolling system to the whole motorway network.

It can be concluded that in the next years an electronic toll collection system will become functional, initially only for heavy vehicles and in the next phase also for passenger cars.

For passenger cars step by step upgrade to ETC is in vision. First step is the introduction of RFID or e-Vignette system. In addition, RFID or other vehicle’s identifiers will enable the traffic flow analysis of passenger cars, and thus complement the existing system for traffic counting on public roads. This is one of the solutions to determine origin-destination (O/D) matrices and travel times. They are of vital importance for operation, design, analysis, and planning of transport system.

Looking technically, the introduction of ETC will open way to many other services that such a system can provide in addition. Again, step by step, the primary focus could be on logistics and freight road transport, on improvement of the supply chain management and on freight management optimisation which this technology will enable. Road safety is also an important issue.

The universal vehicle-infrastructure communication platform (CVIS) is challenge for all EU member states and not only for Slovenia. In this case we should not forget about the organisational and semantic viewpoint of interoperability and cross-border continuity.

6.8.4. **Key Resources**

As already stated above and in previous SEE-ITS national reports, Slovenia is facing a financial crisis and major spending cuts that creates a significant barrier to the wider ITS deployment.
despite the technology is ready. The main funding sources of transport projects are the National and the European funds, revenues from tolls are an important source for funding for the Slovenian ITS deployment. This particular project therefore results in a direct economic benefit in terms of boosted income. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Slovenia should also try to get benefit of the challenges that arise from the new European programming period (2014-2020).

6.8.5. Value propositions

The importance and the value of the measures proposed can be reflected on the benefits that will occur from their implementation. These benefits can be separated to the individual user and to the society. Moreover, the measures can serve other objectives arising from the nature of ITS and the policy framework for the transportation sector.

The implementation of the Free flow electronic toll collection has direct economic benefits for DARS d.d. as the service provider because of the boosted income due to better and more sustainable toll collection. Private companies also benefit directly through the provision of equipment and services. The benefits for the all the actors and stakeholders involved are identified and allocated to them and there are presented on the table below.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Role</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Infrastructure</td>
<td>Coordinator</td>
<td>• Lower accident ratio, reduce of fatalities and injuries</td>
</tr>
<tr>
<td></td>
<td>Policy Maker</td>
<td>• Interoperability with other ETS and ITS systems in the EU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lower pollution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• De-congestion and carbon savings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Traffic flow optimisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Boosted income</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fraud reduction</td>
</tr>
<tr>
<td>DARS</td>
<td>Service Provider,</td>
<td>• Lower accident ratio, reduce of fatalities and injuries</td>
</tr>
<tr>
<td></td>
<td>Service Enabler,</td>
<td>• Interoperability with other ETS and ITS systems in the EU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Traffic flow optimisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Boosted income</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fraud reduction</td>
</tr>
<tr>
<td>Private companies</td>
<td>Technology Provider /</td>
<td>• Direct economic benefits through the provision of equipment and services</td>
</tr>
<tr>
<td></td>
<td>Consultants / IT support</td>
<td></td>
</tr>
<tr>
<td>End User</td>
<td>Consumer</td>
<td>• Travel times reduction,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Safety increase,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fuel consumption reduction.</td>
</tr>
</tbody>
</table>

6.8.6. Cost structure

As analysed in the relevant section, the main funding sources of the project will be the National and the European funds. This capital will be spread to the companies that...
undertake the implementation of the project (purchase of equipment) and to the upgrade of the current infrastructure. The operational costs will be covered by national resources. The cost estimation is shown on figure below.

<table>
<thead>
<tr>
<th>P IV-1: 1. Free Flow Electronic Toll Collection</th>
<th>35.200.000,00</th>
</tr>
</thead>
<tbody>
<tr>
<td>studies, pilots, projects’ specifications, tendering</td>
<td>80.000,00</td>
</tr>
<tr>
<td>implementation</td>
<td>30.500.000,00</td>
</tr>
<tr>
<td>service/system maintaince</td>
<td>4.620.000,00</td>
</tr>
</tbody>
</table>

**Figure 11:** Cost estimation of Group of Measures: “Free flow electronic toll collection”

### 6.8.7. Revenue Streams

The revenue streams, in economic terms arise from the value that the system adds to all the actors involved. The implementation of the Free flow electronic toll collection has direct economic benefits for DARS d.d. as the service provider because of the boosted income due to better and more sustainable toll collection. Private companies also benefit directly through the provision of equipment and services.

Besides the direct economic costs and benefits, there are also benefits that cannot directly be expressed in monetary terms, but there are strongly improve the social welfare. Therefore the reduction of road-transport’s emissions, the reduction of accidents and the reduction of travel time bring about economic benefits to the stakeholders and to the society. Economic benefits also arise from the induction of innovation in the transportation filed and the technological innovation.
6.8.8. **Business model Diagram**

All the findings of the previous sections are summarized on the following diagram. The diagram presents the flows that are developed between the actors and the nature of each flow.

![Business model Diagram](image)

**Figure 12:** Business model diagram of the Measure “Free Flow Electronic Toll Collection”
7. **Conclusions**

This report clearly analyses 1 Group of Measures and 5 Measures, namely:

- **1st Proposed Group of Measures**: “Public transport services” including measures:
  - PT Multimodal journey planner and information about public transport (EU ITS Directive Priority area 1 – Real-time travel information),
  - Real time PT management and Integrated public transport (EU ITS Directive Priority area 1 – Real-time travel information) and
  - e-ticketing (EU ITS Directive Priority area 2 – Continuity of traffic and freight management ITS services).

- **2nd Proposed Measure**: “Traffic management and traffic control system enhancing” (EU ITS Directive Priority area 1 – Real-time travel information).

- **3rd Proposed Measure**: “eParkInfo” (EU ITS Directive Priority area 1 – Real-time travel information).


- **5th Proposed Measure**: “Automatic and geo-location dependent message about traffic incident” (EU ITS Directive Priority area 3 - ITS road safety and security applications).

- **6th Proposed Measure**: “Free Flow Electronic Toll Collection” (EU ITS Directive Priority area 4 - Linking the vehicle with the transport infrastructure).

All the above measures were assessed as high-priority measures based on experts’ opinions and presented in activity 4.2 of the SEE-ITS project and together they form Slovenian national roadmap for ITS. This report analyses each Measure/Group of Measures in terms of key involved actors, value propositions, key activities, key resources, cost structure, revenue stream and is finalized by the formation of a business model diagram that summarizes the key points of the analysis in a schematic way.

The major problem seems to be of an economic nature. Majority of ITS projects, are not expected to provide a direct economic benefit, but rather in low investment costs for benefit on safety, capacity utilisation, etc. Usually these external costs are not recognised by infrastructure managers and operators and therefore they don’t invest in ITS until there is relevant regulation or legislation to do it. They must understand that maintaining efficient transport infrastructure, which serves as a platform for integrated global supply chains, is crucial for meeting the increased demand for transportation services. In times of economic crisis, when Slovenia’s National budget is facing major spending cuts, ITS projects are confronted with a significant financial barriers to wider deployment, despite the technology is ready. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Slovenia should try to get benefit of the challenges that arise from the new European programming.
period (2014-2020). Raising awareness of ITS benefits is also crucial for further development of cooperative traffic management services, which requires in-vehicle equipment at the expense of users.

The current organisational and legal framework in Slovenia does not incapacitate, but also do not stimulate the commercial and private sector to take part in ITS development and implementation. Consequently the industry’s participation is very poor. One of the most important benefits of ITS is the relatively low investment cost necessary to increase the efficiency of existing transport infrastructure. To put it simple, this actually means that less investment causes more positive impact. But it probably needs a governmental impetus for the Slovenian industry to break out of the existing structures and create awareness for ITS being a win-win situation for all stakeholders involved. Creating a dedicated funding programme for ITS and new mobility technologies in general would probably give an important impetus to the Slovenian ITS industry. Due to its size and geographic position it is also important for Slovenia to increasingly participate in cross-border projects and initiatives to utilise its geostrategic advantages at the best possible rate.

With business models defined, overcoming these financial barriers with possibly benefit of the challenges that arise from the new European programming period (2014-2020) is the most important step toward successful implementation of the proposed measures into practice. Another important aspect for implementation of the measures, which is obviously highlighted with definition of business models is the importance of cooperation and coordination of the different actors, especially

- The Police (the constituent body of the Ministry of the Interior)
- Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (the constituent body of the Ministry of Defence)
- Motorway Company in the Republic of Slovenia (DARS)
- Slovenian Roads Agency (DRSC, the constituent body of the Ministry of Infrastructure).

A special committee was established for the coordination of the different bodies that are involved in traffic management. The work of the Committee is still at the beginning. Coordination of all the actors and their cooperation with service enablers (public transport operators, public telecommunication infrastructure operators) and technology providers is important for successful implementation of the proposed measures and for reliability of all the proposed ITS.