2005

Standard Summary Project Fiche for the Transition Facility

1. Basic Information
   
   1.1 CRIS Number: 2005/17/643.02.02
   
   1.2 Title: Study and implementation of intelligent transport systems and development of a geographical information system to incorporate information regarding Trans-European Networks as part of an EU-wide GIS
   
   1.3 Sector: Transport Policy (Transport, Intelligent Transport Systems)
   
   1.4 Location: Public Works Department, Ministry of Communications and Works, Nicosia, Cyprus

2. Objectives

   2.1 Overall Objective(s):

      To contribute to the significant improvement of the quality and efficiency of the transport system in Cyprus.

   2.2 Project purpose:

      The project has two purposes:

      1) To design a comprehensive Intelligent Transport System (ITS) for introduction in Cyprus and to implement cornerstones of it.

      2) To develop a GIS application relating to the Trans-European Transport Network, as part of a pan-european GIS.

   2.3 Justification

      The improvement of the road safety situation, the reduction of the congestion mainly in urban areas, as well as the technological modernization and upgrading of the transport infrastructure are priorities as defined in the National Development Plan (NDP) 2004-2006.

      According to the White Paper on European Transport Policy for 2010, the potential impact of intelligent transport systems has been assessed both during research and in the early stages of development, with observed reductions of up to 20% in journey times, increases in capacity of between 5-10% and safety improvements of 10-15% for certain specific types of accident. It is also stated, in the same document, that it is essential that the trans-European network be
equipped with telematic infrastructure/ systems for data collection and with traffic control and/ or road information centres in order to guarantee the quality and reliability of information.

3. Description

3.1 Background and justification

Cyprus is a major tourist attraction, with most of the tourist development occurring during the last three decades. The development has been so rapid that it has placed an enormous strain on the highway infrastructure of the island.

The Government of the Republic of Cyprus embarked on a major highway development programme aiming at linking the cities and other major traffic attractors with motorway standard roads, while also improving accessibility of the rural areas to the major urban centres. The increase in road mileage and the upgrading of the highway network has created increased responsibilities for the Government, in terms of maintaining the roads, in providing for road safety, and for keeping statistics on road use, accidents, and budgetary allocations for the entire road network.

In particular, congestion levels, mainly in urban areas, have been increasing continuously with the situation spiraling out of control. At the same time a growing car ownership level has increased the dependency on the private car, while at the same time the use of public transport has been steadily declining to less than 2% modal split. This in turn has resulted in a reduction of revenue for public transport operators and subsequently the decline of the service provided.

Despite the improvement in the road network infrastructure, road safety remains a very big concern for the government. Every year an average of about 100 people die in road accidents, which means that Cyprus has one of the worst road safety records in the EU. One of the measures recently decided upon is the installation of red light violation and speed cameras system.

Due to its small size and population, Cyprus does not have a railway network or any light transit systems in urban areas. Thus public transport is confined to urban and rural buses as well as inter-urban taxi services.

In order to improve congestion in urban areas, the government of Cyprus introduced an Urban Traffic System for the adaptive central control of traffic signalized junctions. A traffic Control Room is in place in Nicosia controlling 90 junctions in Nicosia, Limassol and Larnaca. The current system is SCOOT ver 4.5-Siemens ver. 24.4.

In addition, in order to improve the management of the road network, the Public Works Department of the Ministry of Communications and Works commissioned a study for a Highway Information Management System (financed under the Cyprus - EC Fourth Financial Protocol), that was completed in April 2004. (For more details see section 3.2 – Linked Activities).
As from May 1st 2004, Cyprus has become a full member of the European Union. In this capacity it has aligned its transport policy with that of the EU. The EU transport policy is expressed mainly by the White Paper on European Transport Policy for 2010, which sets as its main objectives the shifting of the balance between the modes of transport, eliminating bottlenecks, placing users at the heart of transport policy and managing the globalization of transport. Regarding road safety, the EU set an ambitious target of reducing the number of deaths on the roads by 50% by 2010, a target, which the government of Cyprus has to match. Furthermore, the EU initiated legislative proposals for the interoperability of electronic toll systems, the introduction of a charging system for heavy vehicles (Eurovignette), the harmonization of social legislation for transport, the setting up of structures for satellite navigation (Galileo) etc.

The European Union is proposing to increasingly use ITSs as a means for electronic user charging as well as to enhance the safety of the infrastructure users.

It is envisaged that, through the present project, systems based on variable message signs and incident (e.g. non usual disturbances to the traffic) management will be introduced in Cyprus to enhance road safety. The use of ITS in routing and re-routing emergency vehicles and the management of commercial fleets, through the use of satellite navigation (e.g. Galileo) is also contemplated. The implementation of the Highway Information Management System, which has just been developed, will provide the framework for introducing Intelligent Transport Systems in Cyprus, especially as regards the road network.

In the framework of this project a complete Geographic Information System is also contemplated which will hold information relating to roads, ports and airports and will include all details for the Trans-European network, which are relevant in the context of the European Union. It is envisaged that this GIS will be a sub-system of a pan-European Geographic Information System with mutual accessibility among the member states and the Commission.

3.2 Linked activities:

- A study for a Highway Information Management System was commissioned with financing by the EU under the Cyprus –EC Fourth Financial Protocol. The study was executed between September 2002 and April 2004 and it resulted in a GIS-based system where all pertinent information relating to the road network (primary, secondary and tertiary) is to be stored, accessed, analyzed, viewed and reported. The information held in the system includes road geometry information, planning data, maintenance activity, traffic volumes, accidents, contracts data, structures and street furniture inventory. The system also includes modules for analyzing the traffic counter information and interpolating the results to estimate traffic volumes throughout the road network, as well as the ability for users to execute the queries and view the information dynamically on digitally stored maps. The system is currently being expanded further and is in the process of being populated with data.
- A road safety strategic plan was formulated and adopted by the Government, through a relevant study and this plan is in the process of being implemented. A “black spot” (a particularly dangerous place) study was also carried for 80 locations and is also in the process of being implemented.

- Transport and land use studies were carried out for the four major urban areas during the 80s and 90s and new studies are being planned for Nicosia and Limassol in the next few years.

- A more focused study on traffic management and public transport enhancement for Nicosia was completed in early 2003 and implementation of measures proposed will be promoted soon. A relevant proposal is currently being discussed by the Council of Ministers. A follow up study on feasibility and traffic analysis for the use of hybrid public transport vehicles in Nicosia was completed in January 2005.

### 3.3 Results

- Report containing an inventory of candidate ITS for Cyprus and requirements relating to additional data and to other social, technical and legal changes needed for the ITS and GIS prepared (Activities 3.4.1 and 3.4.2)
- An Intelligent Transport System and a Geographic Information System covering all Cyprus designed (Activity 3.4.3)
- A feasibility and a cost-benefit analysis of the ITS prepared (Activity 3.4.4)
- Specifications for the selected ITS components and the GIS prepared (Activity 3.4.5)
- Selected components of the ITS developed and operational (Activities 3.4.6 and 3.4.7)
- GIS system developed and operational (Activities 3.4.9 and 3.4.10)
- ITS and GIS users adequately trained (Activities 3.4.8 and 3.4.11)

### 3.4 Activities

The activities described below relate to the introduction of Intelligent Transport Systems and the development of a Trans-European network geographic information system, as part of a pan-European GIS. The implementation of the systems is dependent on their feasibility (economic, social and political) and the priority assigned to them will determine the order of implementation. Depending on their cost and the available budget, a short list of systems will be implemented within the scope of this project, while the remaining ones will be implemented later.

Their assessment will be based on feasibility studies of each system and their ranking in terms of objective criteria (e.g. multi-criteria analysis). The feasibility study will be preceded by an evaluation of the existing situation in Cyprus and a review of Intelligent Transport Systems that have successfully been implemented in other EU member states. The consultants will then proceed with the development of the ITS systems ranked highest as well as with the GIS
application and will deliver them as finished products.

The activities shall be implemented in three components as follows:

**Component 1 (duration 8 months) - analysis and design for ITS and GIS** - shall include the following activities:

### 3.4.1 Assessment of the existing situation in Cyprus as regards available data, systems and processes

**Assessment of the existing data, regarding the transport system:** in particular, the existing data in the Highway Information Management System, as well as the data collected and the processes of the urban traffic control system (UTC/SCOOT) used by the Public Works Department should be thoroughly examined with a view towards incorporating them in the new systems or interfacing with them.

**Examination of the existing technical, social and legal environment in Cyprus** with a view towards establishing the suitability of the contemplated ITS in Cyprus or the changes needed in order to introduce such systems in the country.

### 3.4.2 Review of successfully implemented ITS and GIS in other Member States

**Investigation of the technology being applied in Europe with regard ITS to intelligent transport systems,** taking into account the latest developments concerning the Galileo satellite navigation project, as well as GIS systems that exist in member states and the possible integration and/ or inter-linking with these.

This activity shall include field visits of the project management team of the Public Works Department to up to three different locations.

### 3.4.3 Design of the ITS and GIS

The planned system could include, *inter alia* the following:

- Incident management system
- System that provides timely information to drivers about impending hazard locations
- System that warns drivers when exceeding the speed limit in sensitive areas
- System whereby the location of vehicles and certain categories of persons (e.g. physically impaired) can be accurately traced
- System that monitors specific types of traffic violations at specific locations
- Real time system that provides network and weather information to road users
- Freight and fleet management system
- Parking management system
- Urban and inter-urban road use charging system based on vehicle type, time of the day and length of travel
- Congestion charging system related to parking charges
- Navigation system for cyclists
- Real time information system on bus times at bus stops
- Bus frequency monitoring system
- Bus ticketing system
- Real time best route planning for users of the road network
- Parking availability information system
- Bus priority scheme at specific traffic signaled junctions
- Road-based system for detecting high gas emissions
- Real time system providing information to persons with reduced mobility or other impediments regarding pedestrian and road crossing facilities
- The best architecture and design for a trans-European geographic information system that will link up with other similar systems in the EU and form part of a pan-European GIS.

The above list is not exhaustive. Other systems may by suggested by the consultants based on their experience or may stem from the review of successfully implemented ITS in other Member States.

3.4.4 Preparation of a Feasibility Study and a Cost-Benefit Analysis for ITS

A feasibility study assessing each system and their ranking in terms of objective criteria (e.g. multi-criteria analysis) will be carried out. The feasibility study will include detailed technical and socio-economic evaluation of the systems considered appropriate for Cyprus with the use of traffic/transport and socio-economic models, such as cost-benefit and multi-criteria analysis tools.

3.4.5 Preparation of Specifications for the selected ITS components and the GIS

Based on the recommendations of the feasibility study and following consultations with the Project Steering Committee, the consultants shall proceed with the preparation of detailed specifications of each system selected for implementation.

Component 2 (duration 6 months) – implementation of ITS - shall include the following activities:

3.4.6 Development of the selected ITS components

The consultants will develop the selected ITS components using software platforms agreed with the Project Manager. The consultants may have to write their own code or use re-usable code according to the specific needs in each case. They should ensure that a sufficient number of licenses for the software packages needed for the operation of the systems are acquired on behalf of the Public Works Department.
3.4.7 Delivery of the systems

Upon completion and testing of the systems, the consultants will deliver them to the Public Works Department, as finished products. These shall include the software elements, hardware equipment (computer servers, IT peripherals, TV monitors, specialised telecommunications and other equipment, etc) and user and system manuals.

The consultants will also provide the Public Works Department with all the source codes which shall remain the property of the Department for use in the territory of the Republic of Cyprus.

3.4.8 Training of the users of the systems

The consultants will provide adequate training to a sufficient number of users of each system. The users may be employees of the Department or other Authorities involved in managing the road network (e.g. police, local authorities) and shall not exceed 10 persons per system. The training will take place on location, at the premises of the Public Works Department or at other designated locations in Cyprus.

Component 3 (duration 4 months) – implementation of the GIS - shall include the following activities:

3.4.9 Development of the GIS

The consultants will develop the GIS using as a software platform the Arc-CIS suite which is the platform used in the development of the existing Highway Information Management System. They should ensure that five additional licenses for the software package are acquired on behalf of the Public Works Department.

The consultants should seek to either incorporate the existing Highway Information Management System into the GIS or provide interfaces with it.

3.4.10 Delivery of the system

Upon completion and testing of the GIS, the consultants will deliver the system to the Public Works Department, as a finished product. It shall include the software components and user and system manuals.

The consultants will also provide the Public Works Department with all the source code which shall remain the property of the Department for use in the territory of the Republic of Cyprus.

3.4.11 Training of the users of the system

The consultants will provide adequate training to up-to ten persons in the use of the GIS developed. The trainees may be employees of the Department or other
Authorities involved in managing the transport network (e.g. police, local authorities). The training will take place on location, at the premises of the Public Works Department or at other designated locations in Cyprus.

The above activities will be implemented through a “turnkey” services contract.

The consultancy team should include the following professionals:

(a) A Project Manager with at least five years experience in managing projects related to Intelligent Transport Systems. He should be a professional with a wider experience in the transport related field and it is envisaged that his/ her total involvement in the project will be 10 person-months.

(b) A Traffic Engineer with at least five years experience in transport and traffic modeling as well as systems relating to traffic management. A knowledge and prior involvement in ITS and transport related GIS is essential. A total involvement of 5 person-months is envisaged.

(c) A Transport Economist with at least five years experience in feasibility studies related to transport projects. It is estimated that his/ her total input in the project will be 3½ person-months.

(d) A Systems Analyst/ Designer with at least five years experience in systems analysis and design. Prior involvement in the development of ITS and/or GIS is strongly recommended. A total input of 7½ person-months is expected.

(e) One or more programmers with at least 3 years experience in the development of systems. Some experience with transport related systems is expected. A total of 8 person-months is expected.

3.5 Lessons learned:

- Up-to date, only one Interim Evaluation Report for Cyprus was issued in June 2004, covering the National Pre-accession Programmes 2000, 2001, 2002 and 2003. According to the key achievements and findings, project design was considered generally very good and relevance of projects with respect to the acquis requirements and to national needs has been scored highly. According to the evaluators the assistance is on course for achievement of immediate objectives and hence effectiveness is likely to be high. A similar situation applies with respect to impact. It is also stated that there are very few concerns about sustainability and prospects are good because of financial provision, staffing levels and warranty and maintenance arrangements.

The same approach as the one adopted for Pre-accession aid was followed regarding project design under the Transition Facility and for this reason it is expected that assessment will continue to be positive.

There were no specific recommendations in the Interim Evaluation Report relevant to earlier projects in the field.
Through the involvement of the Public Works Department in various study-based projects, including the *Highway Information Management System* financed under the Cyprus – EC Fourth Financial Protocol, it has been recognised that the project design must be thoroughly prepared. In particular, the terms of reference must be very specific and not subject to misinterpretation. Furthermore, the scope of a project must be confined to a manageable size.

4. Institutional Framework

The Public Works Department of the Ministry of Communications and Works will be the authority responsible for the execution of this project. In this capacity it will act as the Contracting Authority and shall provide a Project Management/Coordination Team.

The Public Works Department is the executive branch of the Ministry of Communications and Works insofar as public works are concerned and its mission is to provide and maintain to a high level of service the main road network (urban and rural), as well as to design, construct and maintain government buildings, airports, fishing shelters and coastal protection works.

The Department is headed by a Director and is organized into six sectors, of which four are headed by Chief Executive Engineers and deal with the road network. These are the Planning, Design, Construction and Laboratories Sectors.

The Department has approximately 350 employees of which about 100 are university graduates in civil engineering, architecture and quantity surveying. There are also approximately 1000 hourly paid workers. All the above staff is located in the headquarters in Nicosia, the Central Laboratory, the Offices of the District Engineers in the five cities as well as in road construction site offices.

The results of this project may lead to a minor restructuring of the Department, particularly if the project leads to an independent control centre with users who will be dedicated to the systems implemented. In such a case, it is possible that an Intelligent Transport Systems Section be established in the structure of the Department.

The implemented systems under this project shall remain the property of the Public Works Department, upon completion of the project.
5. **Detailed Budget**

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<tr>
<th></th>
<th>Transition Facility Support</th>
<th>Co-financing</th>
<th>TOTAL (TF plus co-financing)</th>
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<tr>
<td></td>
<td>Investme nt Support</td>
<td>Institution Building</td>
<td>Total TF(=I+IB)</td>
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<td><strong>Component 1</strong></td>
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<td>Design of the ITS and GIS</td>
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<td><strong>Component 2</strong></td>
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<td>Implementation of the ITS</td>
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<td>€180.000</td>
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<td><strong>Component 3</strong></td>
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<tr>
<td>Implementation of the GIS</td>
<td>€30.000</td>
<td>€70.000</td>
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<td><strong>Total</strong></td>
<td>€220.000</td>
<td>€550.000</td>
<td>€770.000</td>
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</table>

*There shall be joint co-financing in the framework of the project.*

6. **Implementation Arrangements**

6.1 **Implementing Agency**

Public Works Department of the Ministry of Communications and Works  
165 Strovolos Ave.  
2048 Strovolos – Nicosia, Cyprus  
Tel. 00 357 22806502  
Fax. 00 357 22510456

Project Authorising Officer  
Mr. Efstathios Hamboullas  
Director Public Works Department  
Tel. 00 357 22806502  
Fax. 00 357 22510456  
e-mail: [ehamboullas@pwd.mcw.gov.cy](mailto:ehamboullas@pwd.mcw.gov.cy)

Project Leader  
Mr. Michael Lambrinos  
Senior Executive Engineer  
Tel. 00 357 22806583  
Fax. 00 357 22806546  
e-mail: [mlambrinos@pwd.mcw.gov.cy](mailto:mlambrinos@pwd.mcw.gov.cy)

Project Management and Coordination:

The project management/ coordination team, as well as the users of the systems will be primarily drawn from the Planning Sector, which in turn is composed of the Planning and EU Section and the Transport and Traffic Studies Section.
For the purposes of this project a Project Steering Committee (PSC) will be set up, comprising of senior officials from the Planning Bureau, the Ministry of Communications and Works, the Police, the Department of Information Technology and the Project Manager/Coordinator.

6.2 Twinning

N/A

6.3 Non-standard aspects

The project will be implemented according to the Extended Decentralised Implementation System (EDIS).

6.4 Contracts

The project will be implemented through a “turnkey” services contract amounting to €1,000,000 (Transition Facility: €770,000 and National contribution: €230,000).

7. Implementation Schedule

7.1 Start of tendering/call for proposals: January 2006

The Terms of Reference will be ready by December 2005.

7.2 Start of project activity: July 2006

7.3 Project Completion: October 2007

8. Sustainability

The Public Works Department is well established with adequate and highly skilled personnel capable of maintaining the administrative function of the project. The Department will, for the purposes of this project assign a Senior Executive Engineer as the Project Leader, as well as two Executive Engineers (transport planner and traffic engineer) and four Technicians. The Planning and EU Section and the Transport and Traffic Section will provide these persons.

When the project is completed a team of users will be established. Depending on the number of systems implemented and their complexity, the number of staff assigned as users will vary but will not exceed five at the administrative level and twenty at the technical level. The restructuring of the Department to create a new, Intelligent Transport Systems Section with the relocation of the users to one or more Control Centres and/or upgrading the existing UTC/SCOOT control room will also depend on the scope and complexity of the systems.

The required maintenance and update agreements will be covered by national funds through separate contracts that will be signed by the contracting authority. Adequate financial provisions will be included in the relevant financial year’s
Government Budget.

9. **Conditionality and sequencing**

There is no conditionality.

As regards sequencing Component 1 needs to be implemented in order for Components 2 and 3 to start. Component 2 can be implemented in parallel with Component 3.

**Milestones**

Evaluation of the existing situation in Cyprus completed, including the Highway Information Management System and other data sources for the GIS application.

Review of successfully implemented systems in other EU member states completed, insofar as ITS are concerned, as well as GIS implementations for the trans-European network. Field trips should be included.

Feasibility Study prepared, taking into account the technical, economic, social, environmental and political aspects of the ITS considered.

Proposal of alternative configurations for the GIS application accepted by the PSC.

Decision on the ITS and GIS to be implemented within the scope of the project.

Design of all the selected systems carried out.

Implementation of the systems successfully completed (including development, testing and training of users as well as acceptance of the system).
ANNEXES TO PROJECT FICHE

1. Logical framework matrix in standard format
2. Detailed implementation chart
3. Contracting and disbursement schedule by quarter for full duration of programme
4. Planned results of the full implementation of ITS in Cyprus (up-to 2015)
## ANNEX 1

### LOGFRAME PLANNING MATRIX FOR PROJECT: A STUDY AND IMPLEMENTATION OF INTELLIGENT TRANSPORT SYSTEMS AND DEVELOPMENT OF A GEOGRAPHIC INFORMATION SYSTEM TO INCORPORATE INFORMATION REGARDING TRANS-EUROPEAN NETWORKS IN CYPRUS AS PART OF AN EU-WIDE GIS.

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<tr>
<th>Contracting period expires:</th>
<th>Disbursement period expires:</th>
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<tr>
<td>December 2007</td>
<td>December 2008</td>
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<th>Total Budget:</th>
<th>EU Contribution:</th>
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<tr>
<td>1,0 MEUR</td>
<td>0,770 MEUR</td>
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<tr>
<th>Overall Objective</th>
<th>Objectively Verifiable Indicators</th>
<th>Sources of Verification</th>
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<tbody>
<tr>
<td>To contribute to the significant improvement of the quality and efficiency of the transport system in Cyprus.</td>
<td>Ability of the Department of Public Works to operate the developed ITS and the GIS</td>
<td>Reports and Maps produced by the systems</td>
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<tr>
<th>Assumptions</th>
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<tr>
<td>Full commitment of the authorities involved</td>
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<table>
<thead>
<tr>
<th>Project Purpose</th>
<th>Objectively Verifiable Indicators</th>
<th>Sources of Verification</th>
<th>Assumptions</th>
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</table>
| To design a comprehensive Intelligent Transport System (ITS) for introduction in Cyprus and to implement cornerstones of it. To develop a GIS application relating to the Trans-European Transport Network, as part of a pan-european GIS. | - ITS designed by January 2007  
- Selected ITS operational by the end of the project  
- GIS operational two months before the end of the project | Steering Committee’s reports and minutes of meetings  
Progress reports by the consultants  
Specialised reports and drawings by the consultants for each activity | Adequate resources available |

14
<table>
<thead>
<tr>
<th>Results</th>
<th>Objectively Verifiable Indicators</th>
<th>Sources of Verification</th>
<th>Assumptions</th>
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<tbody>
<tr>
<td>• Inventory of candidate ITS for Cyprus and requirements relating to additional data and/or other social, technical and legal changes needed for the ITS and GIS prepared (Activity 3.4.1 and 3.4.2)</td>
<td>List of candidate ITS ready by June 2006</td>
<td>Steering Committee’s reports and minutes of meetings</td>
<td>Skilful coordination and management of the project</td>
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<tr>
<td></td>
<td>List of additional data requirements for the ITS and GIS ready by June 2006</td>
<td>Progress reports by the consultants</td>
<td>The systems users can successfully utilise their respective applications</td>
</tr>
<tr>
<td></td>
<td>List of any social, legal and technical changes that are needed for the introduction of ITS ready by June 2006</td>
<td>Specialised reports and drawings by the consultants for each activity</td>
<td>Additional data can be readily made available, either from existing records or collected easily by the consultants.</td>
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<tr>
<td></td>
<td>Detailed design of at least 10 ITS prepared by September 2006</td>
<td>System and user manuals</td>
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<td></td>
<td>3 alternative GIS implementations designed by September 2006</td>
<td>System acceptance certificates</td>
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<tr>
<td></td>
<td>Economic, social, technical and legal evaluations of the designed ITS, including IRR, NPV and benefit/cost ratio values and a multi criteria analysis prepared by December 2006</td>
<td>Training programme/ Training material/ training attendance sheets</td>
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<td></td>
<td>Ranking of ITS prepared by December 2006</td>
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<td>Systems specifications report containing details for each ITS selected to be implemented and for</td>
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<td>• A comprehensive set of ITS and a GIS covering all Cyprus designed (Activity 3.4.3)</td>
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<td>• A feasibility and cost benefit analysis of the ITS prepared (Activity 3.4.4)</td>
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<td>• Specifications for the selected ITS components and the GIS prepared (Activity 3.4.5)</td>
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</table>
- Selected components of the ITS developed and operational (Activities 3.4.6 and 3.4.7).
- GIS system developed and operational (Activities 3.4.9 and 3.4.10)
- ITS and GIS users adequately trained (Activities 3.4.8 and 3.4.11)

<table>
<thead>
<tr>
<th>Activities</th>
<th>Means</th>
<th>Assumptions</th>
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<tbody>
<tr>
<td>COMPONENT 1.</td>
<td></td>
<td>Timely tendering and contracting procedures</td>
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<tr>
<td>Assessment of the existing situation as regards available data, systems and processes (3.4.1)</td>
<td>Consultancy services through open tenders. The Consultancy teams shall consist of:</td>
<td></td>
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<tr>
<td>Review of successfully implemented ITS and GIS in other Member States (3.4.2)</td>
<td>i. A project manager (10 person-months)</td>
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<tr>
<td>Design of the ITS and GIS (3.4.3)</td>
<td>ii. A traffic engineer (5 person-months)</td>
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<tr>
<td>Preparation of a Feasibility Study and a Cost Benefit Analysis for</td>
<td>iii. A transport economist (3,5 person-months)</td>
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<td>iv. A systems analyst/ designer (7,5 person-months)</td>
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<td>v. One or more programmers (8 person-months)</td>
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<tr>
<td>COMPONENT</td>
<td>Activities</td>
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<td>-----------</td>
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</tr>
<tr>
<td><strong>2</strong></td>
<td>Preparation of specifications for the selected ITS components and the GIS (3.4.5)</td>
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<tr>
<td></td>
<td>Development of the selected ITS components (3.4.6)</td>
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<td></td>
<td>Delivery of the systems (3.4.7)</td>
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<td>Training of the users of the systems (3.4.8)</td>
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<tr>
<td><strong>3</strong></td>
<td>Development of the GIS (3.4.9)</td>
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<tr>
<td></td>
<td>Delivery of the systems (3.4.10)</td>
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<tr>
<td></td>
<td>Training of the users of the systems (3.4.11)</td>
<td></td>
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</tbody>
</table>

A single turnkey contract will be used with three components, (a) the design and feasibility phase (8 months), (b) the ITS implementation phase (6 months) and the GIS implementation phase (4 months). Components (b) and (c) will be concurrent, with the total project duration set at 14 months.

Payments to the consultants shall be made as follows:

(i) 30% upon commencement of the project
(ii) 20% upon completion of component 1
(iii) 30% upon completion of components 2 and 3.
(iv) 20% six months after the end of the project

**Pre-Condition**
### Detailed Time Implementation Chart for the Project

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1.</td>
<td>D D D D</td>
<td>C C C C C I I I I I I I X</td>
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<td></td>
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<tr>
<td>Component 2.</td>
<td></td>
<td></td>
<td>I I I I I I I X</td>
<td></td>
</tr>
<tr>
<td>Component 3.</td>
<td></td>
<td></td>
<td>I I I I X</td>
<td></td>
</tr>
<tr>
<td>D = Design</td>
<td>C = Contracting</td>
<td>I = Implementation</td>
<td>X = Closure</td>
<td></td>
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</tbody>
</table>
ANNEX 3

CUMULATIVE CONTRACTING AND DISBURSEMENT SCHEDULE

_All figures in million EURO_

<table>
<thead>
<tr>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTRACTED</td>
<td>1,00</td>
<td>1,00</td>
<td>1,00</td>
<td>1,00</td>
<td>1,00</td>
<td>1,00</td>
<td>1,00</td>
<td>1,00</td>
</tr>
<tr>
<td>DISBURSEMENT</td>
<td>0,30</td>
<td>0,30</td>
<td>0,30</td>
<td>0,50</td>
<td>0,50</td>
<td>0,80</td>
<td>0,80</td>
<td>1,00</td>
</tr>
</tbody>
</table>

NB: 1. All contracting should normally be completed within 6-12 months and _must_ be completed within 24 months of signature of the FM.

2. All disbursements _must_ be completed within 36 months of signature of the FM.
Planned results of the complete ITS in Cyprus (up-to 2015)

- The lowering of accident rates on all categories of roads and in each district. Rates should be lowered as far as fatal, serious injury, slight injury and damage only accidents are concerned. It is aimed that the reduction in the rates will be specific and verifiable through police accident records and through the analysis tools of the Highway Information Management System.
- The lowering of the average response time of emergency vehicles arriving at the scene of an accident by a specific percentage as verified by the elapsed time between an emergency call and the arrival of the emergency vehicle as recorded in its log book.
- An increase in the compliance of road users with traffic regulations, measured as a percentage reduction in reported traffic violations in the records of the police or other traffic enforcement authorities.
- A reduction in the vehicle operating costs, indicated by a percentage reduction in fuel consumption, vehicle maintenance costs and tyre wear. Part of this information will be available from national statistics, but a complementary road user costs study will be needed.
- An increase in the efficiency of freight transport measured as a percentage increase in the average volume of freight moved per commercial vehicle kilometre. This information will be available from national statistics and the Highway Information Management System.
- The potential for the introduction of a fairer road charging system. This system should relate charges to the damage, congestion and pollution caused by individual vehicles by a mathematical and/or empirical relationship.
- A reduction in the use of private cars measured as a percentage reduction in the annual car kilometres through the Highway Information Management System.
- An increase in the use of public transport, verified by a percentage increase in the number of people using the buses, through the ticket sales recorded by the bus companies.
- A reduction in the average journey measured as a percentage reduction in travel time between an origin and a destination. This information will be extracted either from data from the Urban Traffic Control System (SCOOT), or through journey time surveys contacted ex-ante, mid-term and ex-post.
- A reduction in the average journey time of buses, measured as a percentage time reduction. The data will be gathered from bus company records and from in/bus travel time surveys.
- A reduction in the emissions of harmful gases, by a specific percentage, verified by measurements taken by the Ministry of Labour and Social Security.
- A system of advance notification of drivers about impending congested links, measured as a percentage of drivers who received advance warning, in situations where congestion existed, and estimated by surveys of drivers ex-ante, mid-term and
- Improvement of accessibility of citizens with impaired mobility to pedestrian facilities and a reduction in their difficulty to move about. This will be measured as a proportion of the people with impediments who received some kind of help relative to the targeted population. The source for such estimates will be the population census data, as well as surveys conducted on the targeted population.
- The ability to exchange information and/or mutually access information regarding trans-European networks between Cyprus and other EU member states and the Commission. This will be measured as the number of states with which Cyprus can exchange or mutually access data and verified by statistical reports printed.