

Eye in the Sky project: Intelligent Transport Infrastructure for supporting traffic monitoring and mobility information

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“Eye in the Sky” project, which is partially funded by the European Commission (IST Programme), develops an Intelligent Transport Infrastructure based on the synergy of earth observation, mobile communications and digital mapping technologies. The project’s overall objective is to provide commercially viable integrated solutions addressing issues of traffic monitoring, fleet management, customized mobility information and emergency services support. The test area of the proposed services is the sky and city of Athens, which will host the 2004 Olympic Games.

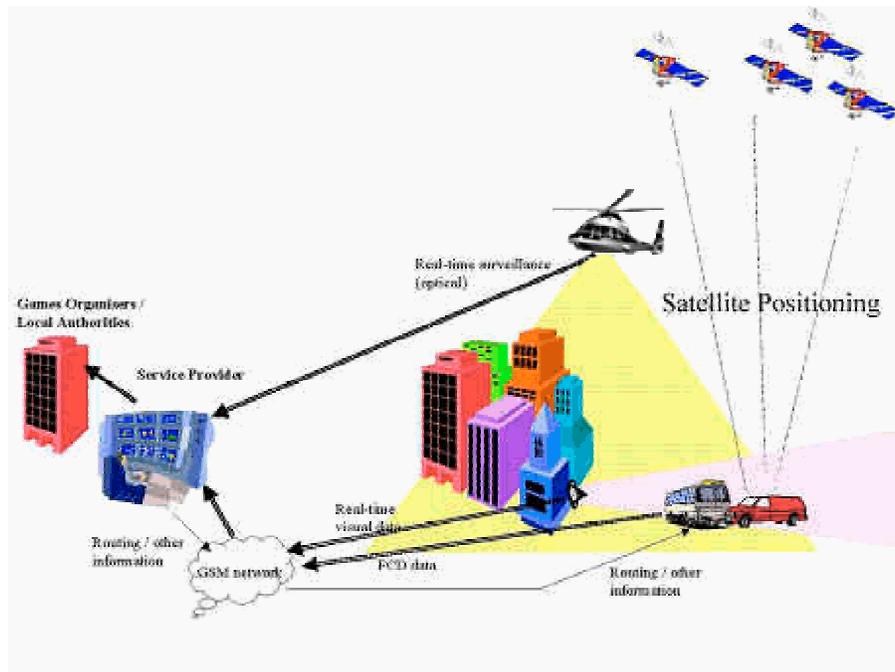
The project promotes scientific and technological innovation by utilising existing state-of-the-art technologies in novel applications and integrating diverse disciplines and data with geographical reference to successfully manage and provide traffic information in numerous levels. This abstract will focus mostly on the geographical information aspects of the project and particularly in reference with environmental issues and applications.

The basic structure of the project relies on the use of Floating Car Data (FCD) technology and Low Altitude Platforms (helicopter). A fleet of vehicles “float” throughout the road network measuring speed and travel profiles in addition to the positioning information recorded from a GPS receiver. The data is transmitted via an existing terrestrial GSM network to the Operational Centre. The data is processed in real time, using algorithms specifically designed for urban road networks, and traffic load (traffic flow) for the entire network is calculated. A secondary product of this processing can be environment related. The FCD technology for example, allows for real time monitoring of air pollutants emitted by the car by transmitting to the Operational Centre information about the kinetic status of the vehicle which can easily be translated into fuel consumption data in order to estimate various environmentally sensitive parameters.

High-resolution digital imagery of the urban area is provided by a Low Altitude Platform (camera on-board a helicopter) and is transmitted in real time to the terrestrial Operational Centre. These images are integrated in a GIS environment which allows their georeference within the area of interest in order to provide traffic meas-

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urements (density on links). The traffic information is extracted from the integrated images with the help of specifically developed algorithms for remote sensing. Then, fusion of the derived optical data and the FCD data provides high quality, reliable and up to date traffic information.



This traffic information is used for providing “dynamic” guidance and customized mobility information (e.g. travel times) to private, public and commercial vehicles by using various mobile devices (cellular phone, PDA etc.). This information will facilitate the “floating” fleet of vehicles to adapt their travel paths to the conditions of the network. The information is also provided through the internet, using a GIS environment which offers additional information. In this way several web services such as routing or pre-travel planning are made available, facilitating an even wider range of users.

The system developed in the project will be tested, demonstrated and evaluated during integrated tests and demonstrations in Athens. Results of the demonstration and the evaluation will be provided in the final paper.

The proposed integrated solutions offer dependable, cost effective and user-friendly services within a GIS environment to respond to essential needs and expectations of the society. The services offered are considered in the context of anywhere/any-time access and will ultimately be tailored to individual needs.