

DYNAMIC SEGMENTATION AS A TOOL FOR TRANSPORT RELATED DATA MANAGEMENT

K. Evangelidis^{1,2} P. Symeonidis^{3,*}, K. Papatheodorou² and A. Konstantinidis²

¹ TRIAS S.A. Consulting, 39 G. Seferi str. 54250 THESSALONIKI, GREECE

² Department of Geoinformatics & Surveying, Technological Education Institute of Serres, Terma Magnisias, 62124 SERRES, GREECE

³ DRAXIS Environmental Technology, 63 Mitropoleos Str., 54623 THESSALONIKI, GREECE

Abstract. Aim of this paper is to present MANSION (MANaging Spatial InformatiON) system. MANSION is a first prototype system that exploits dynamic segmentation capabilities, through web map services and spatial databases. For demonstration purposes, custom applications have been developed, for data entry and information retrieval of point or line data events related to transportation networks. In the future, these customised web-based applications will be further developed to handle more detailed spatial information applicable to a wide range of real world situations like road safety, fleet management, incident management etc.

Keywords: Dynamic Segmentation, Linear Referencing, Road Safety, Fleet management, Traffic incident management

1 Introduction

"MANaging Spatial InformatiON" is a first prototype system developed by:

- DRAXIS – Environmental Technology (<http://www.draxis.gr>)
- TRIAS – Transport Research Information and Application Systems (<http://www.trias.gr>).

The system exploits dynamic segmentation capabilities, through web map services and spatial databases. For the evaluation of system functionalities and for demonstration purposes, custom applications have been developed, for data entry and information retrieval. In the future, customised web-based applications will be further developed to handle spatial line or point events applicable to a wide range of real world situations (eg: road safety, fleet management, incident management). The system is developed based on the Microsoft (.NET framework) and ESRI software platform since it utilize spatial databases (ArcSDE for SQLSERVER) and Web Map Services (ArcIMS).

2 System Architecture

MANSION comprises various subsystems and connectivity modules, the most important being the following ones (fig. 1):

- The Geographic Database (GDB) subsystem, maintains any kind of spatial and non-spatial information regarding the network under consideration. This subsystem may be continuously updated and accessible to the events editor end-users through customized applications and the appropriate telecommunication infrastructure (TCP/IP, 3G).
- The Web Map Services (WMS) subsystem distributes requests to GDB, performs core GIS services and it finally produces the map image, to be published via the Web Server.
- The Web Server (WS) subsystem publishes cartographic information on the WWW. The WS receives requests by the end users locates the requested data and sends it back to the client application

* Contact Person. Email: symeonidis@draxis.gr

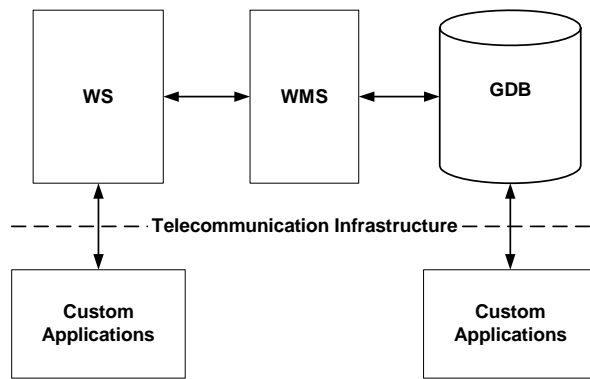


Fig. 1. System Architecture

3 System Modules

A pilot implementation of MANSION concerning Road Networks is the Road Events Management System, an application consisting of two modules: ROAD EVENTS EDITOR and ROAD EVENTS VIEWER. The application is available at <http://www.draxis.gr/roadevents>

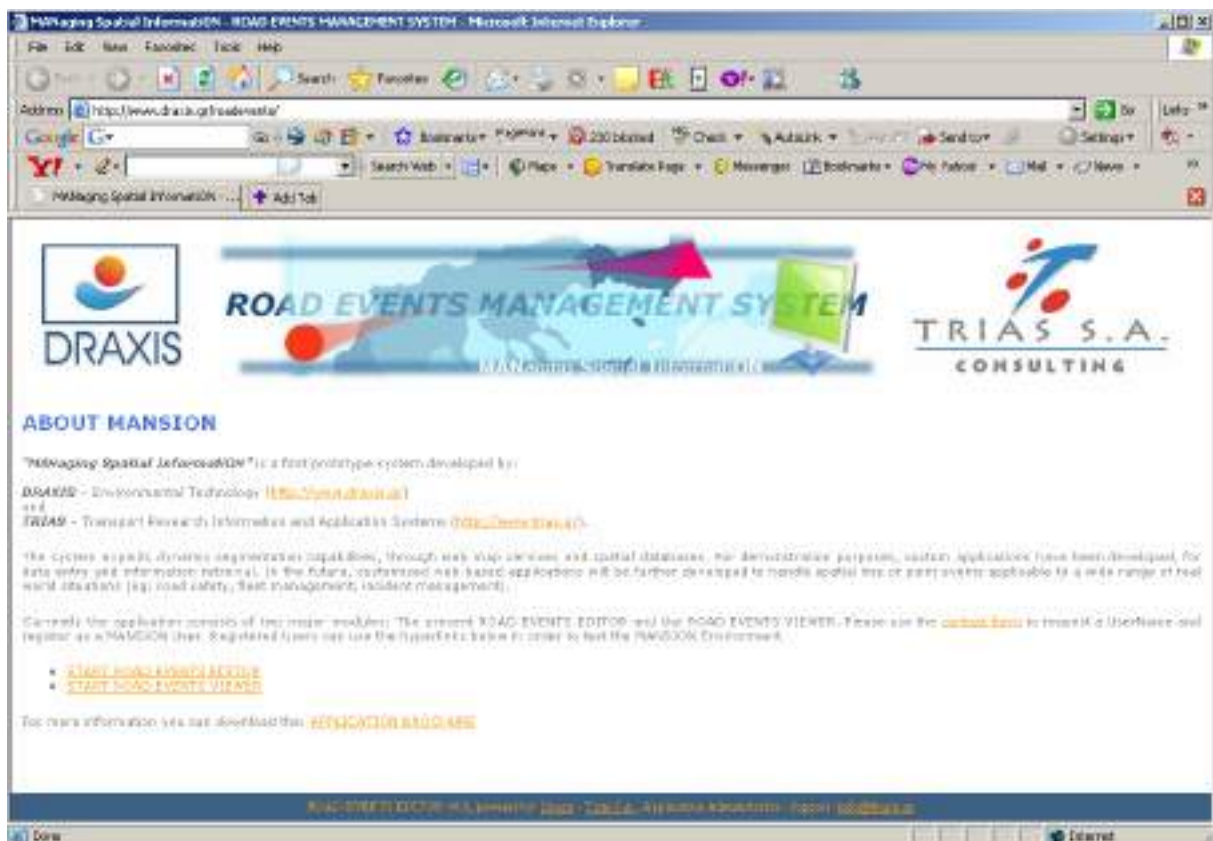


Fig. 2. The Road Events Management System Web Application

Road Events Editor (REE)

The REE module of MANSION provides the capability of entering or modifying Road Network related data possessing spatial identity, not having spatial representation of their own, though. Such data may be considered either as point or as linear events and may be referenced across the Road Network, through their exact kilometric position, or their starting and ending positions respectively. Possible events referenced across the Road Network may include, traffic accidents, pavement condition, incidents, weather conditions and other points or segments of

interest. REE end-users may interact with the Geographic Database through user friendly browser-based applications (fig. 3) and manage any kind of information related to the submitted events.

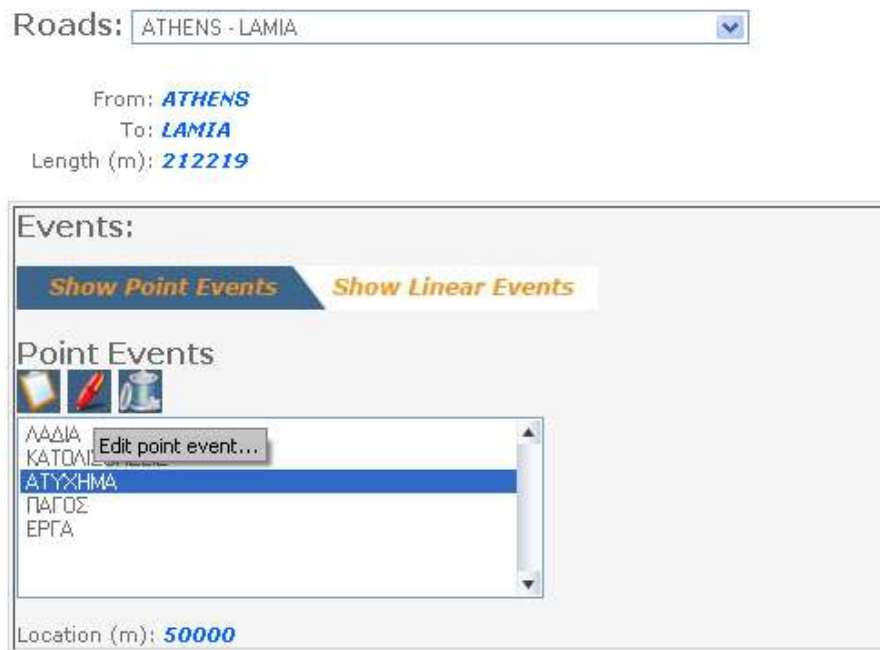


Fig. 3. Interface for the Road Event Editor

Road Events Viewer (REV)

The REV module of MANSION dynamically provides a real-time presentation (fig. 4) of any point or line event submitted through REE module. It also depicts, any descriptive information related to a requested point or line event. However, the module may be extended to provide, in tabular or other display forms, the results produced by complicated queries submitted to the Geographic Database.

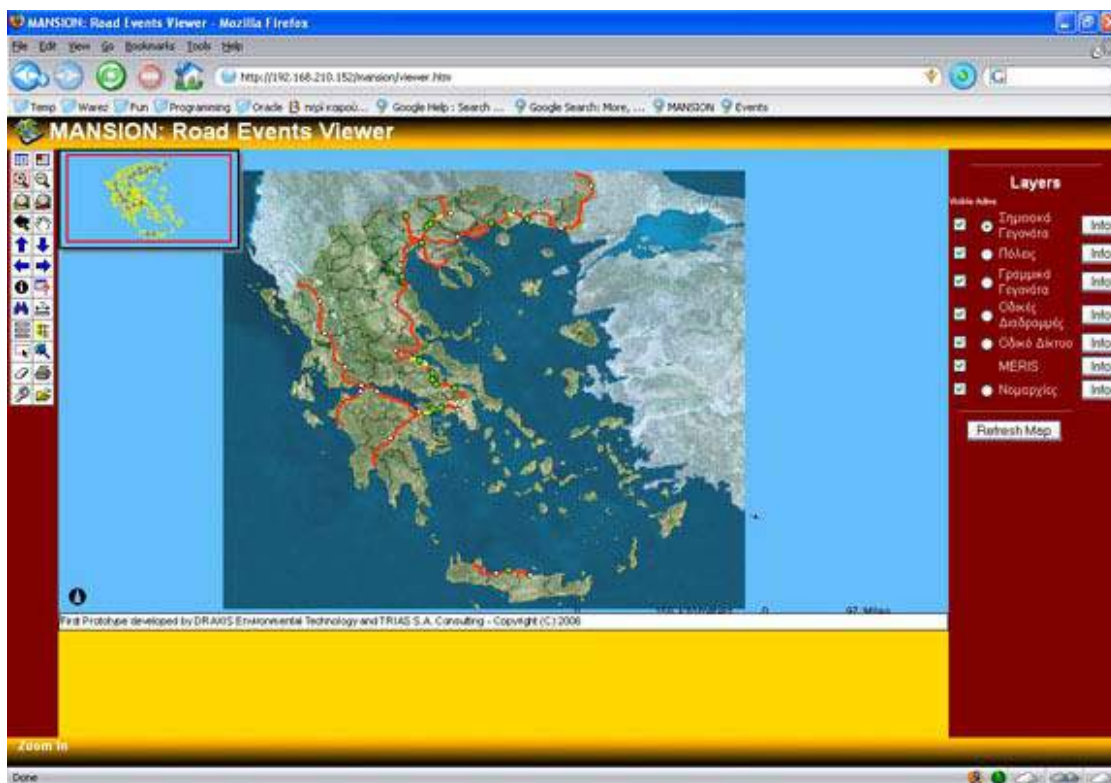


Fig. 4. Interface for the Road Events Viewer