



## ITS EXPERIENCE IN TRIESTE TRASPORTI S.p.A.

Trieste Trasporti SpA, transit operator in the Province of Trieste, has matured a meaningful experience in the Intelligent Transport System field, first through the co-operation with the Finalised Plan Transports II of the Italian Research Council (CNR) and subsequently with the development of own Information System for Urban Transit that covers the functions of operating management (software TSpm, copyright Trieste Trasporti SpA) and the real time monitoring of the operating fleet.

### 1. Transit Information System (TSpm)

The Transit Information System developed from Trieste Trasporti SpA, named TSpm<sup>1</sup> (Transport Scheduling planning and management) completely adopts the European standard Trasmodel (ENV 12896), developed on physical platform Oracle ©. TSpm is a multi-level ERP system conceived and realised with object technology, with characteristics of "development system", and characterised by the separation of the presentation functionality, used mostly by the internal customers, from the procedural one (*rules*).

In order to realise such architecture, in the development of the TSpm system has been chosen the DNS (Digital Network System) technology from Microsoft Corporation with their development tools. The TSpm system is conceived for the aim to supply valid instruments of planning and management of the "life cycle" of the transit service operated from the society.

The functional characteristics actually covered by TSpm are:

- Archive management in Transmodel 4.1 (European standard ENV 12896);
- Access data management multi customer and multi session to, at single field level;
- Construction of the transport network;
- Transport demand assignment on urban and extra urban network;
- Line timetables construction module;
- Shift calculation of vehicles (VSP - Vehicle Scheduling Program);
- Shift calculation of drivers (CSP - Crew Scheduling Program);
- Driver rostering and absences management;
- Real time management of external service;
- Road network management (geo coded and alphanumeric data) with CAD software;
- Depots management (refuelling, parking and service preparation);
- Bus stop management (geographic position, attributes, enclosed documents, maintenance and authorisations);
- Final reporting for maintenance, payroll, Certified Quality System, local transit Agency with detail for line, route, type of disturbance;
- Printer output for control on defined modules;
- IVR (interactive voice response) for distribution, to the drivers, with phone access, of the shift description, personal and general messages, and for holidays need collection;
- AVM (Automatic Vehicle Monitoring) (see next paragraph);
- GIS for publishing of the map of the Province of Trieste, with geo code and access to bus stop and routes

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information.

## 2. Automatic Vehicle Monitoring System

The monitoring and control system consist of hardware and software elements, installed on bus and in a central location.

The system has the goal of monitoring transit operations, controlling his regularity, increase transit safety, increase transit flexibility, certify the carried out service, distribute real time information for transit customers.

The system is actually composed by:

- 3 radio links (UHF channels) with capability of up to 600 messages/minute for channel;
- 180 equipped buses (with a global fleet of 270);
- 4 electronic bus stop for arrival time forecast (more 36 in 2004);
- 3 information kiosk with touch screen for timetables information, route and destinations search;
- 2 information panels for station and interchange points, with time departures and messages;
- 1 central operation control system, with data server (connected with the TSpm system), bus stop messages server, radio link server, short range data collection server.