

Intelligent Infrastructure Working Group

Introduction

The aim of this document is to define the equipment and services that a road operator, either urban or inter-urban, should be equipped with to allow a faster implementation of cooperative systems and contribute more decisively to increase road safety and reduce congestion, gas consumption and CO2 emissions.

Current Items of work of the Working Group

The Intelligent Infrastructure is the technological infrastructure necessary to allow:

- The communication among the different players of the road infrastructure, the vehicles and the user;
- The storage and processing of the data collected from multiple sensors placed along the roads, motorways, bridges, tunnels, toll plazas, vehicles, etc.

aiming the maximization of safety travel of the different vehicles and its users, while assuring the minimum gas consumption and carbon dioxide emissions and under most sustainable conditions.

Today this should mean that the road operators should guarantee the following minimum infrastructures:

- A communication network constituted by an optical fiber network and, eventually, wireless systems able to support a IP v6.0 communications network assuring the communications between the operator control centre and the multiple road side equipments (RSE's) installed at the roads operated by the operator;
- A communication system able to allow users direct communication to the operator control centre to inform any event that may take place in the road and requires action from its operator;
- A Video Surveillance System able to monitor adequately the roads under operation and equipped with:
 - An AID (Automatic Incident Detection) System; and
 - Dedicated cameras for traffic counting and classification able to supply data to the Traffic Management System referred below;
- A Variable Message System able to provide a minimum level of information to the users, namely severe weather conditions and traffic conditions;
- A Meteorological Information System able to obtain the necessary information to detect severe weather travel conditions and inform the users accordingly;



- A Traffic Management System able to follow and foresee the traffic conditions of all stretches under operation and exchange bi-directionally data with other road operators running neighbour roads interacting with those under operation;
- A website where information is made available to the users both for planning as for real time;
- Communication interfaces must exist also with media (radio and television) in order to disseminate as much as possible the available information by the users;
- Special communication interfaces must exist to allow the implementation of cooperative systems, namely
 - Circuits with necessary available bandwidth among the different RSE's responsible for the Cooperative Systems implementation and the operator control centre;
 - Radio base station equipments able to settle the communication between the infrastructure RSE's and the vehicles circulating in the roads under operation:
 - These equipments may be based on different radio technologies (Wi-Fi, Wimax, GSM/GPRS, 802.11 p, etc.) and some standardization should be possible to increase the confidence of road operators and vehicle manufacturers on the technology to use for equipping their roads and vehicles massively;
- The global system must interface operators operating roads interconnected with those under operation using Datex II.
- The operator control centre must provide the management of all situations that may occur in the roads under operation and assure the storage of all data allowing the situations characterization as well as its standard processing, being equipped with:
 - An Incident Management System that shall receive alarms and treat them with standard procedures in order to provide the best and more adequately support to road users;
 - Hard break and airbag activation alarms detection and processing to inform other vehicles in the vicinity and activate closer VMS's for vehicles not yet equipped with cooperative systems equipment;
 - Access to all necessary emergency and rescue means (emergency sanitary assistance, fire brigade, road police, civil protection, etc) allowing the best and more adequately support to road users;
 - Access to information channels that may contribute for a fast information of users concerning incidents occurred in the roads where they head to in order to minimize the impacts of the incident and allow users to avoid congestion and delays;
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