

i-way

*Intelligent co-operative system in cars
for road safety*



I-WAY designs, develops and validates an intelligent co-operative system that increases safety in road transport:

- Improves traffic management control
- Makes transport more efficient and more effective
- Makes voyages more friendly and more comfortable for drivers and passengers

Description of the Work

The **I-WAY** platform aims to enhance driver's perception on road environment and improve his responses in time critical situations by providing real time information from other vehicles in the vicinity and from effectively located roadside equipment as well. The key feature that enhances **I-WAY** innovation is that refers to a co-operative system for road safety, where vehicles cooperate not only by receiving information from infrastructure but also by serving as scouts. The main objective of **I-WAY** is to exploit the technological know how and thrust the scientific knowledge in order to integrate existing information sources and produce an interoperable toolset supporting both road-to-vehicle and vehicle-to-vehicle communication providing greater transport efficiency and increasing safety. More specifically, the **I-WAY's** driving platform will ubiquitously monitor and recognize the road environment and the driver's state in real time using data obtained from three types of sources:

- The in vehicle sensing system
- The road infrastructure
- And the neighbouring cars

More Information:

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The i-way platform integrates several independent sub-systems that work in with, so as to provide the whole i-way functionality. It is composed of the in-vehicle subsystem and the external transport system.

The in-vehicle subsystem consists of the following modules which are located in the interior of the vehicles:

- The **vehicle sensing module**. It is responsible for the acquisition, processing and analysis of raw data coming from the on-board sensors.
- The **data acquisition module**. It is responsible for the aggregation, combination and correlation of acquired information provided by the vehicle sensing module and by external sources.
- The **mobile interfaces** of the vehicle. Through these interfaces drivers enter and receive significant information regarding accurate traffic jam estimations, weather conditions, the road shape, speed and distance from vehicles travelling ahead, etc.
- The **situation assessment module**. Its purpose is to provide estimation of the road conditions based on prior knowledge and incoming transient information.
- The **communication module** which handles the real-time exchange of data among the vehicles with each other and between a specific vehicle and the road management system.

The External Transport System which includes:

- The **Roadside equipment** which is responsible for data acquisition referring to the road environment in locations where vehicles cannot precisely recognize dangerous conditions.
- The **Road Management System** including an application and a database server which holds and manages the real-time road information.

OPERATIVE GOALS

The I-Way project is strongly committed to achieve the two strategic objectives of i) increasing road safety and ii) bettering transport efficiency by achieving the following operative goals:

To **increase safety in road transport** by empowering the information exchange among vehicles and between vehicles and the surveillance control system and by providing vehicles with active sensors that recognize driver fatigue and act on it.

To **improve traffic management control** by providing vehicles with on-car sensors recognizing weather conditions, distances to various types of obstacles on the road including automobiles, road shape and driver fatigue.

To **make transport more efficient and effective** by supporting drivers with warnings and suggestions (i.e. traffic and accident alert, distance alert from objects, warning of lane deviations, warning for driver sleepiness) thanks to an intelligent decision support system and an intelligent driving control system that monitors, collects and manages information and communication to the driver.

To **make voyages more friendly and comfortable** for drivers and passengers that endowed with a large amount of information about weather conditions and road traffic have the chance to vary their route as well as their destination for better trip.

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Participants:

The consortium consists of 14 partners: ELESIA, LOQUENDO, UPM, IARD, DATABLE, ABM, OHB, UoI, TWT, POLITECNICO DI MILANO, SWORD, ERIM, GL2006, CRF.
The project is coordinated by ELESIA S.p.A.