GUIADE: Mobile Network Systems V2I-I2V
Madrid, España

GUIADE is a Research & Development project focused on automated positioning and driving systems for public transport vehicles, also called **Intelligent Transportation System (ITS).**

GUIADE provides real time information regarding traffic, weather conditions and traffic-light status in terms of V2I-I2V communications, "vehicle to infrastructure" and "infrastructure to vehicle".

Therefore, it constitutes a mobile V2I-I2V communication application for advanced traffic information systems.

GUIADE was created by a partnership comprising the following companies and institutions: **Albentia Systems, SICE, Univesity of Alcalá de Henares, University Rey Juan Carlos and CAR (Centre for Automation and Robotics)**, under the sponsorship of the Spanish Government.

Applications

- ➲ On-board video surveillance and mobile cameras
- ➲ Control, supervising and Internet services in public transport
- ➲ Airport services for vehicles and passengers
- ➲ Broadband connectivity for watercraft, ship and merchandise location at ports
- ➲ Emergency networks
- ➲ Communication for mining areas
- ➲ Oil & Gas: maintenance services
- ➲ Mobile broadband services for municipal vehicle fleets
- ➲ Communication for mobile TV units

The Challenges

This vehicle fleet presents challenges for all governments, mainly in:

- ⭗ **Improving the efficiency of circulation**.

- ⭗ **Reduce CO2 emissions** and optimize on demand circulatory system.

- ⭗ **Acquire, manage and disseminate the information provided by the "vehicular entity":** traffic, traffic lights, weather, etc.

The Intelligent Transportation System encompasses all technologies and solutions focused on providing answers to these challenges.

"Intelligent Transport Systems (ITS) collect, store, process and distribute information related to the movement of people and goods"

The Solution

The **ARBA Mobile Albentia Systems base station** located in the traffic control center operates in the frequency range of 5470-5725 MHz or 5725-5875 MHz. By **integrating user terminals in vehicles**, connectivity IP between the vehicles and the control center is enabled. These equipment are receivers / transmitters of all information used in each vehicle:

- ⭗ Video

- ⭗ Sensors for temperature / humidity / air pollution

- ⭗ Traffic information

- ⭗ License plate reader

Data acquisition in real time: Thanks to the Albentia Systems CPEs installed in each vehicle, images of traffic conditions, license plated and temperature information are transmitted to the base station in real time.

This information in turn is broadcast by the base station to the other vehicles that are part of the network.

Thanks to the soft-handover, the equipments can take up to 35 Mbps in motion without cuts in the cell changes.

Intelligent Vehicle Circulation WITHOUT DRIVER: Besides sensors that collect information in real time, this vehicle incorporates an automatic driving system which is able to slow down or stop depending on the information received from the ARBA Mobile Base Station.

About Technology

ARBA Mobile is Albentia Systems' point-to-multipoint broadband wireless solution for professional mobility applications.

By implementing soft-handover mechanisms, several devices in motion can connect to the network keeping excellent levels of connectivity and quality of service. Unlike other mobile systems, the ARBA Mobile family provides real-time data, voice and video transmission, delivering up to 35 Mbps from the vehicle to the network infrastructure.
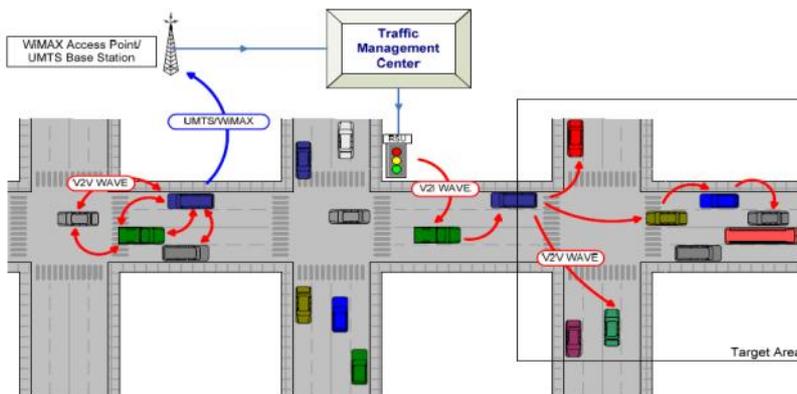
Implementing a simple network architecture, devices in motion can keep continuous connectivity with the network thanks to their soft-handover capability. In those areas covered by more than one base station, this state-of-the-art architecture allows for data redundancy.

The Benefits

GUIADE is a global solution that aims to **reduce fuels, CO2 emissions management and road safety**. This system allows the improvement in timeliness, dissemination of information to users, and productivity of public vehicles drivers.

The IEEE 802.16-2012 technology of Albentia Systems is able to differentiate various services (Data, Voice and Video) **with guaranteed quality of** service (QoS), **and controlling latencies**, **which is essential in the case of vehicle driven automatically by the acquisition of real-time information.**

Certainly, to concepts such as sustainability, energy efficiency and mobility, **GUIADE is demonstrating how ITS systems can help citizens to benefit from the technologies as part of their daily lives** by the mere fact of using public transport.

Enfoque de partida: Medida de Tráfico on-line: Sistema multicámara a bordo de vehículo (visible y FIR)

Main Chatacteristics

- ➲ Point-to-multipoint on board wireless solution

- ➲ Available in the 3.5, 4.9, 5.4 and 5.8 GHz bands

- ➲ High uplink capacity

- ➲ Soft-handover

- ➲ Protection against multipath transmission: OFDM-MIMO

- ➲ QoS guarantee

- ➲ Simultaneous voice, video and data transmission

- ➲ Real capacity of up to 35 Mbps

- ➲ Speed of up to 140 km/h

- ➲ Signal replication in overlapped areas for reduction of traffic loss
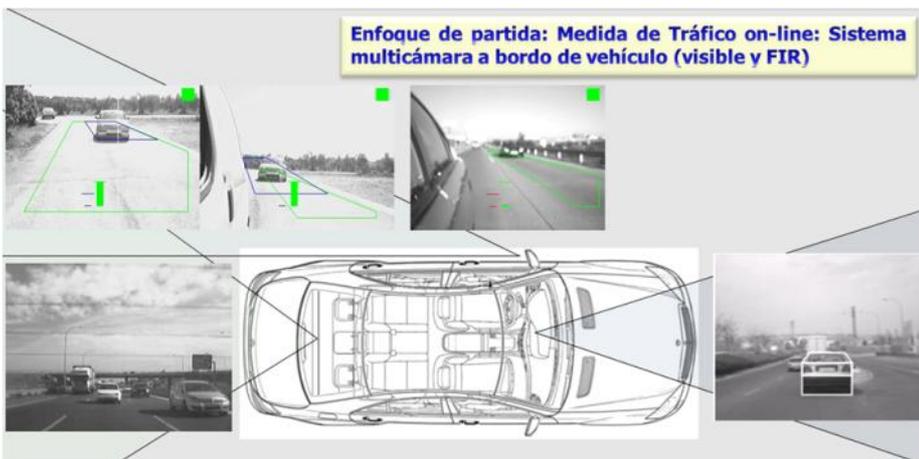
Albentia Systems, S.A.
C/ Margarita Salas, 22
Parque Tecnológico Leganés
28918 Leganés, Madrid (España)
Tel.: +34 91 440 0213
e-mail: sales@albentia.com

Albentia Systems is the leading Spanish manufacturer of broadband wireless solutions and systems with great added value. Based in Madrid (Spain), the company uses its knowledge and experience in developing innovative radio systems for IEEE 802.16 deployments, for broadband access, data, VoIP and professional video applications.