

Galileo

*The European Programme for
Global Navigation Services*

Road Applications



The road sector is a major potential market for Galileo applications. By 2010 there will be more than 670 million cars, 33 million buses and trucks and 200 million light commercial vehicles worldwide. Satellite navigation receivers are now commonly installed in new cars as a key tool for providing new services to people on the move: electronic charging, real-time traffic information, emergency calls, route guidance, fleet management and Advanced Driving Assistance Systems. Galileo will offer urban travellers an increased availability of satellite signals, reducing the effect of shadowing by buildings.

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Some examples of practical uses of Galileo

*** *Route guidance and information systems***

Route guidance using satellite navigation is already a well-established product offered by car manufacturers. The majority of these systems are based on satellite navigation systems and onboard sensors (odometer and gyros) to compute optimal routes in real-time. However, GPS does not offer sufficient coverage in urban areas to be used alone. Galileo with its 30 satellites will increase the coverage and accuracy. This will enable manufacturers to use cheaper sensors to fill the satellite navigation gaps (tunnels, narrow streets). Thanks to the localisation provided by this guidance system, many additional services can be offered, including emergency calls with automatic transmission of location, breakdown assistance with communication of the car position together with other information such as the nature of the vehicle's malfunction, and recovery after theft (500 000 cars are unrecovered in Europe alone each year).

*** *Traffic management***

The monitoring and management of traffic fluidity will be significantly facilitated when a great number of cars are equipped with satellite navigation receivers and guidance systems. For example, if the average speed of

the cars equipped with Galileo receivers in a road sector drops significantly, a control centre can anticipate a traffic jam and suggest that approaching vehicles choose different routes. Several studies have concluded that travel time would be cut by 10-20%.

*** *Fleet management***

Taxi, bus and train fleet management are crucial and complex tasks for operators. Companies have already equipped more than 500 000 vehicles in Europe with sensors to identify the location of each to a control centre. Galileo offers the guarantee that the service will be continuous. Knowing the exact locations of their buses, operators can inform travellers on the expected time of arrival of the next.

*** *Emergency services***

A very important application will be tracking and managing emergency and rescue vehicles. Combined with dynamic traffic information, an ambulance (Europe has 60 000) with a Galileo receiver and communication link will be able to reach its destination much faster. Traffic lights could be controlled to speed the arrival of an emergency vehicle.

More than 50% of emergency calls now come from

mobile phones, so integral Galileo receivers (as planned by the European E-112 project) will dramatically shorten the rescue chain, gaining time and saving lives.

* **Advanced Driving Assistance Systems**

Advanced Driving Assistance Systems (ADAS) combine vehicle capabilities to improve mobility and active safety. Galileo will provide important additional data to ADAS on the vehicle's environment. ADAS then warns the driver of imminent danger or takes full or partial control over the vehicle. For instance, the speed could be reduced by ADAS under bad visibility conditions if the car approaches a tight turn too fast. This function will be possible only with accurate position data of guaranteed integrity furnished by Galileo and local elements. It is expected that half of the vehicles operating in Europe by 2020 will carry ADAS.

* **Interoperability for road charging**

Galileo will offer new and more advanced methods of user-friendly road charging: charge for the use of particular roads at particular times with particular vehicles, or charge users travelling in a certain urban zone, according to the distance driven. Although there are other techniques for road tolling, only satellite navigation leads to a reliable seamless service. The

vehicle will use Galileo to determine its location and to store the distance driven on every type of road (charged or free). Then it reports the results to a monitoring centre for a central charging entity to invoice the user. This would work on both inter-urban and urban roads.

A Galileo-based solution avoids expensive investment in roadside equipment and avoids traffic jams at traditional toll plazas. New charging policies will allow better demand management. For this type of application, Galileo will offer reliability and the possibility of tracing its performance in disputed cases. It will also provide a common standard for road charging.



Galileo



Galileo Benefits

By integrating Galileo with other technologies, the road community (users, car manufacturer, public authorities) can benefit from:

- advanced car navigation systems thanks to the increased availability of satellite navigation services
- reduced travel time thanks to the navigation information, demand management and traffic monitoring
- increased confidence in fleet management and tracking of goods in all industry sectors
- new ADAS functions thanks to the integrity of the Galileo signal
- more information for dynamic traffic management
- a standardised tool for road tolling

How is Galileo different from other systems?

- ✓ Galileo is specifically designed for civil and commercial purposes
- ✓ increased accuracy, service guarantees, certification and liability of the service operator
- ✓ traceability of past performance and operation transparency
- ✓ increased availability of signals in demanding environments

Galileo: The European Satellite Navigation Programme is a joint initiative of the European Commission and the European Space Agency. Galileo will offer positioning and timing services worldwide.



For additional information, please contact the Galileo Joint Undertaking: JU@galileo-pgm.org or visit the websites http://www.europa.eu.int/comm/dgs/energy_transport/galileo/ <http://www.esa.int/navigation/galileo/>