

# “Opportunities and emerging technologies in Automotive Telematics”<sup>©</sup>

**Automotive Electronics and Electrical Systems  
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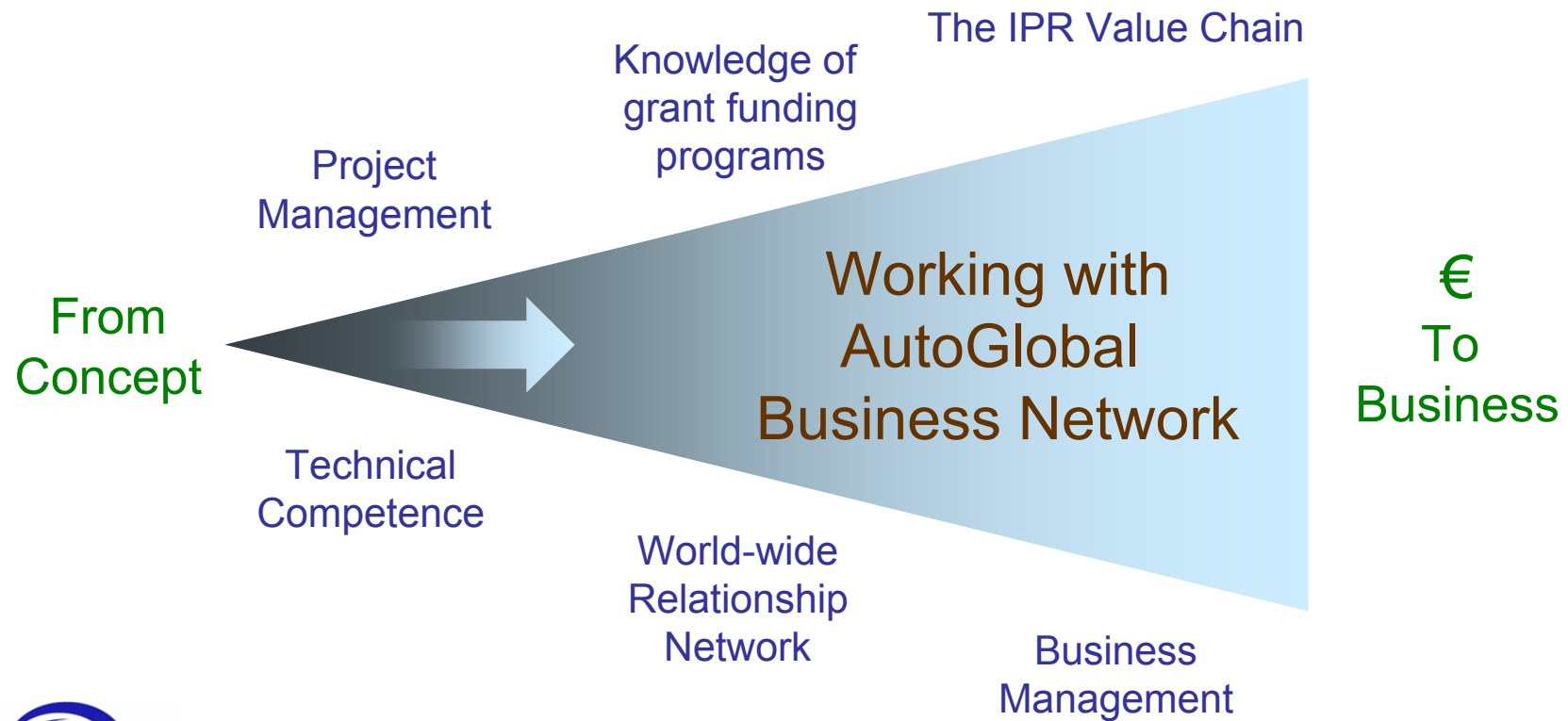
**AutoGlobal Business Network Ltd**

<http://www.autogbn.com>



# AutoGlobal

Global Vision  
Attention to local needs



# Presentation overview

- The term **Telematics** has evolved to refer to automobile systems that combine global positioning satellite (**GPS**) tracking and other **wireless communications** for automatic roadside assistance and remote diagnostics. General Motors Corp. first popularized automotive Telematics with its OnStar system.
- This presentation will explore a number of initiatives and examples of **vehicle Telematics**, particularly related to **safety**, being developed for future applications.
- We will explore **technology issues and opportunities** and the new **multi sectoral business models** required to maximise the opportunities for **new and robust products**.

# Telematics why?

- **Telematics**, is one of the most **significant drivers** for change in business, transport, education and personal communications that we have ever seen. Telematics is **influencing** and providing opportunities in most areas of our lives.
- There are **opportunities** that span a number of the **traditional sectors** creating new products and services; the need to operate in a **multidisciplinary way** has never been greater.
- Society requires technology to facilitate **cost effective functionality** that provides enjoyment, information, efficient ways of working, **safer operation**, saving of time and fuel.
- **Interoperability of systems** and the need to design products for a **global market** is creating a need for **standardization**.
- **Human factors** are a **significant issue** in the design of these systems ensuring that systems do not in themselves provide distraction and a potential source of accidents.

# European initiatives



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# Ertico

**ERTICO** – ITS Europe is a **multi-sector, public/private partnership** pursuing the development and deployment of Intelligent Transport Systems and Services (ITS)  
<http://www.ertico.com/>

**Telematics Forum** [http://www.ertico.com/en/activities/safety/telematics\\_forum.htm](http://www.ertico.com/en/activities/safety/telematics_forum.htm)

- The Forum **brings together** leading service providers, control centre operators, middleware providers, terminal manufacturers and the automotive industry to work on the **definition and market adoption** of enabling standards for telematics service delivery.

## Forum Objectives

- **Standardise** and promote the adoption of automotive technologies for the telematics market.
- **Develop** the Global Telematics Protocol (**GTP**) for telematics service delivery, merging the two leading protocols – Application Communication Protocol (ACP) and Global Automotive Telematics Standard (GATS).
- **Validate** the outcome of the [GST Integrated Project](#). **Global System for Telematics**

# Global System for Telematics (GST) project

- **GST** is an EU-funded Integrated Project that is **creating an open and standardized end-to-end architecture** for automotive Telematics services.
- The **purpose** of GST is to **create** an environment in which **innovative Telematics services** can be developed and **delivered cost-effectively**, and hence to increase the range of **economic Telematics services** available to manufacturers and consumers.

## Useful GST links

<http://www.gstforum.org/>

- [http://gstforum.org/en/downloads/papers\\_presentations/papers\\_presentations.htm#Final Validation Workshop \(Brussels, 27-28 February 2007\)](http://gstforum.org/en/downloads/papers_presentations/papers_presentations.htm#Final_Validation_Workshop_(Brussels,_27-28_February_2007))
- [http://gstforum.org/download/Public%20documents/4%20-PRE GST Architecture.pdf](http://gstforum.org/download/Public%20documents/4%20-PRE_GST_Architecture.pdf)



# European Automotive Digital Innovation Studio (EADIS)

## Background

- A project entitled the **European Automotive Digital Innovation Studio (EADIS)** has been awarded €400,000 from the European commission under its Leonardo da Vinci programme. Project led by Coventry University.

## What EADIS will do

- EADIS will use a virtual work environment called the Digital Innovation Studio to train and develop professional designers on the impact and application of 'Vehicle Telematics' so that they may integrate new technologies into future products

[www.eadis.eu](http://www.eadis.eu)





# What are the potential future scenarios?

- No road accidents in 50 years ?
  - Collision avoidance systems
- Driverless cars?
- Low carbon future
  - High energy prices
  - Energy security and reliability issues
  - Low cost, low energy vehicles
- No road side furniture/infrastructure ?
- Less need to travel with improved communications
- Far greater use of the individual “mobile phone”/communication devices for additional applications (everybody has one)

# Drivers and opportunities for use of Automotive Telematics

## The Market

Driven by

- Improved Safety
- Better traffic throughput
- Environment
- Comfort and Convenience
- Feature differentiation
- Desire and capability of Communication
- Availability of low cost technology



# Drivers and opportunities for use of Automotive Telematics

- Population demographics
- Legislation
  - Including the misuse of communications technology
    - » More hands free? Voice actuated?
  - Road tolling
  - Dedicated lanes for public transport and multi users
- Differentiation ( vehicles and mobile technology)
- Mobility related issues, traffic management
  - Average speed in London is 12mph
- Goods and logistic management
- Fuel costs – efficient driving, see :-
  - **Foot-LITE** is a revolutionary driver information system designed to educate and encourage safer and greener driving.

<http://gow.epsrc.ac.uk/ViewGrant.aspx?GrantRef=EP/F005040/1>

<http://www.theengineer.co.uk/Articles/Article.aspx?liArticleID=300099>

# Drivers and opportunities for use of Automotive Telematics

## Road safety

### Accident statistics

- Annually **1.26 million\*** people are killed globally in road traffic collisions
  - \* Figures taken from WHO newsletter on road safety, November 2003. “Road Safety is no Accident”.
- “Halving the number of road deaths by 2010” European aim <http://www.eph.org/a/1029>
- Total EU 25 CARE database European road deaths
  - (**2001**-50,396) (**2002**-49,692) (**2003**-46,662) (**2004**-43,358)
- **£1.5 million/death** in the UK, 3,500 deaths per year (see DFT stats 19 )  
<http://www.dft.gov.uk/rmd/project.asp?intProjectID=10654>

# Drivers and opportunities for use of Automotive Telematics

- Travel services
- Growth of the Internet
- Global economic shifts
  - Growth of India and China – competition and also larger customer base (if we get it right!)
- Demand for more environmentally acceptable systems
- Nomadic against integrated systems
- Location based demands
- Upgradeability of technology, software, communications. interfacing
- Standardisation
- Demand for communication (personal and business)
- Demand for information
- Availability of cheaper technology
  - » Sensors – Radar visions
  - » Mobile communications
  - » Location technology

# Drivers and opportunities for use of Automotive Telematics

## Ergonomics

- Aging population
- Computer literate younger generation
- Normalizing of the driving experience
- Less abled members of society require/demand better accessibility to transport
- De-skilling due to new technology
  - vehicle to vehicle issues – safety
- Training of systems and software engineers in the benefits of ergonomics and vice versa
- Useful UK site <http://www.dft.gov.uk/pgr/roads/designofhumanmachineinteract1704>



# Barriers and issues

- **Standardisation**

- Global approach required with collaboration between different sectors

- **Sector co-operation** is essential for new products and services

- Different expertise in the new business stakeholders
  - communication of ideas
  - Training

- Vehicle, infrastructure and communication **test facilities are lacking**

- **Different development cycles** of the emerging technologies

- Mobile technology
- Vehicle technology
- Infrastructure technology



# Vehicle functionality opportunities

- Navigation,/route planning/route guidance
- Co-driver applications
  - Alert functions
    - Hazard warnings
    - Two way communications
  - Control intervention
    - Braking
    - Steering
    - Vehicle dynamics
- Comfort and communication
- Servicing and maintenance
- Mobility related
- Environmentally related



# Vehicle functionality opportunities

- Parking technology
  - Locations and information on parking availability – pre booking
- Tracking
- Vehicle intervention control – (police slowing and stopping vehicles)
- Insurance
  - Related to mileage for example
  - Person driving – attributes
- Road tolling
- Applications and use of the internet
- Location based services (LBS)

# Technologies employed in Vehicle Telematics



# Technologies employed in Vehicle Telematics

- Communications technology
- Location technology
- Interface technology
  - Display
  - MMI
  - Voice actuation
  - Haptic
- Vehicle systems
  - Safety – ABS,ESP
- Advanced sensing and vision technology
- Infrastructure systems

# Technologies employed in Vehicle Telematics

## Communications - GSM

Reference <http://www.gsmworld.com/news/statistics/index.shtml>

GSM stats end Qrt 1 2007

- GSM is the **fastest growing** communications technology of all time
- The billionth GSM user was connected in Q1 2004 - just a dozen years after the commercial launch of the first GSM network
- The **second billionth GSM** user was connected in Q2 2006 - just two and a half years after the first billion.
- Today, GSM accounts for **82%** of the global mobile market.
- **29%** of the global population use GSM technology.

# Vehicle Telematics examples



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# Vehicle Telematics system example 1

## Telematics for safety systems

- Safety systems – vehicle to vehicle and vehicle to infrastructure
- Collision avoidance technology
- Intelligent Speed Adaptation (ISA)
- Accident and injury mitigation
- Accident prevention (pre full collision avoidance)

# Vehicle Telematics system example 2

## ITS

- **ITS** - Intelligent Transport Systems and Services - is the **integration** of **information** and **communications** technology with **transport infrastructure**, **vehicles** and users.

<http://www.ertico.com/>

## Intelligent Transportation Systems (ITS) US department of Transportation ITS

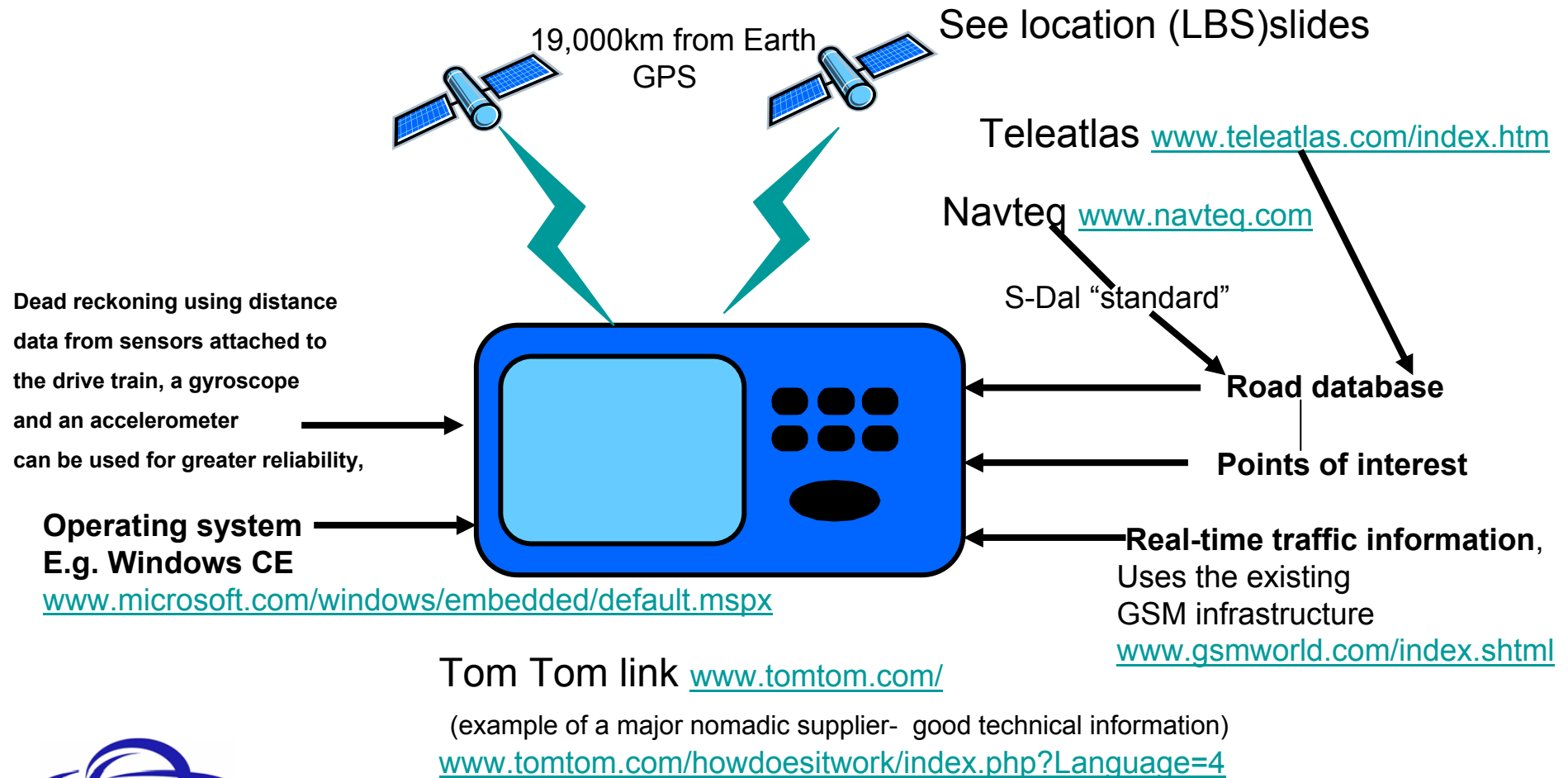
- improves **transportation safety and mobility** and enhances productivity through the use of advanced communications technologies.
- Intelligent transportation systems (ITS) encompass a **broad range of wireless** and wire line communications-based information and electronics technologies. When **integrated** into the transportation system's infrastructure, and in vehicles themselves, these technologies relieve congestion, improve safety and enhance American productivity.
- ITS is made up of **16 types of technology based systems**. These systems are divided into intelligent infrastructure systems and intelligent vehicle systems.

<http://www.its.dot.gov/faqs.htm>

# Vehicle Telematics system example 3

## Satellite Navigation

Embedded and nomadic solutions





# Vehicle Telematics system example 4

## Congestion charging

### Technology Trials stage 1 – London Transport

- <http://www.tfl.gov.uk/assets/downloads/technology-trials.pdf>
- This report provides a good overview of the technologies involved in congestion charging and the issues involved in implementing a successful system. and builds on the existing London scheme

### The trials addressed four different groups of technologies:

- [Cameras and automatic number plate recognition \(ANPR\)](#) technology;
- “[Tag & beacon](#)” detection systems, of which Dedicated Short Range Communications ([DSRC](#)) is the leading solution for road tolling;
- [Satellite navigation](#) (Global Positioning System - GPS) technology;
- [Digital mobile phone](#) technologies (GSM – Global System for Mobile).
- Building on the congestion charging foundation [additional value added services](#) can be provided enabling new services and businesses to be developed and providing an [additional revenue](#) for the main provider of the infrastructure

# Vehicle Telematics system example 5

## UK Telematics projects - innovITS COAS

- Presentation by Ricardo focusing on two projects partially funded by innovITS (COAS initiative)
  - *“Improving Fuel Economy and Safety through Telematics and Advanced Powertrain Technologies”*

<http://www.automotiveinsight.net/images/automotive%20insight%20v1.pdf>

## Sentience

- Reducing Emissions and Pollution/Improving Safety

## Co-Driver Alert

- Aims to reduce accidents by warning the driver of potentially hazardous situations
- Useful UK Telematics link is <http://www.innovits.com/> also links to the UK Knowledge Transfer Network (KTN)



# New business models

## Multi **disciplinary** and multi **sectoral** business opportunities

- Much of the new business value will come from **collaborations** between what were quite separate **sectors**
  - Automotive
  - Communications
  - Service
  - Extensive applications of internet related services and functionality
- Completely **new types** of products and services will be **enabled**

# Summary

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# Any Questions?

Acknowledgements to the Coventry University EADIS team

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