**PROJECT**

**euroFOT**

**European Large-Scale Field Operational Test on Active Safety Systems**

**Funding:** European (7th RTD Framework Programme)

**Duration:** May 2008 - Jun 2012

**Status:** Complete with results

**Total project cost:** €21,164,034

**EU contribution:** €13,905,000

Call for proposal: FP7-ICT-2007-2

CORDIS RCN: 87266

**Background & policy context:**

Innovative solutions are a key to addressing today's and tomorrow's challenges in road transport, including the increasing demand for mobility, the high cost to society in terms of road accidents, deaths and injuries, as well as delay and congestion costs and environmental and climate change issues. High-tech in-vehicle active safety and efficiency technologies represent a great opportunity to improve this situation. Such technologies, which for the most part are already in existence, have the ability to help drivers make driving safer, more comfortable and more efficient.

Their potential to bring a positive impact to traffic safety and efficiency is well recognised. Yet these technologies have not penetrated the market, largely due to a lack of understanding about the potential benefits to driving behaviour and hence to quality of life. Now is the time to get these technologies into the market and better understood. The key to achieving market penetration is to test technologies in real-life environments. Field Operational Tests (FOTs) are aimed at testing applications which are technologically mature but which are not yet commercially deployed, using ordinary road networks and drivers-users, in order to test market applications and user acceptance of the technologies.

FOTs therefore aim to make a major contribution to the market introduction of and wider uptake for intelligent vehicle systems.

**Objectives:**

The EUROFOT project aimed to make roads safer, more efficient and more comfortable to drive through testing eight intelligent vehicle systems in Europe. These are:

*Longitudinal control functions:*

- Adaptive Cruise Control (ACC)
- Forward Collision Warning (FCW)
- Speed Regulation System (SRS)

*Lateral control functions:*

- Blind Spot Information System (BLIS)
- Lane Departure Warning and Impairment Warning (LDW & IW)

*Advanced applications:*

- Curve Speed Warning (CSW)
- Fuel Efficiency Adviser (FEA)
- SafeHMI (Human-Machine Interface).

The analysis of the data gathered in real traffic conditions with selected drivers is expected to highlight
several crucial aspects of the tested functionalities. The project mainly addresses the following research issues:

- What are the performance and capability of the functionalities?
- How does the driver interact with and react to the functionalities?
- What are the impacts on safety, efficiency and the environment?

Methodology:

During the course of 2009-2010, more than 1 500 vehicles drove across Europe equipped with intelligent vehicle systems. Several operations centres are set-up, as follows:

- France: Paris (Ceesar)
- Germany: Aachen/Cologne (Ford), Sindelfingen (Daimler), Munich (BMW and MAN), Ingolstadt (Audi) and Wolfsburg (Volkswagen)
- Italy: Turin (Fiat)
- Sweden: Gothenburg (Volvo Cars and Volvo Trucks).

The EUROFOT project has brought together a comprehensive array of organisations to test intelligent vehicle systems across Europe. Car manufacturers, suppliers, universities, research institutes and others stakeholders – in all 28 companies and organisations are involved. The aim: to make road transport safer, more efficient and more pleasant! Ford’s European Research Centre in Aachen (Germany) coordinated the project.

Parent Programmes:
FP7-ICT - Information and Communication Technologies

Institute type: Public institution
Institute name: European Commission
Funding type: Public (EU)

Lead Organisation:

Ford Forschungszentrum Aachen GmbH

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EU Contribution: €1,084,716

Partner Organisations:

Bmw Forschung Und Technik GmbH

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80992 MUENCHEN
Germany

EU Contribution: €386,850

European Center For Information And Communication Technologies GmbH

Address:
TORGAUER STRASSE 12-15 EUREF CAMPUS HOUSE 13
10829 BERLIN
Germany

EU Contribution: €358,890

Volvo Bus Corporation
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<th>Organisation</th>
<th>Address</th>
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<td>Volvo Personvagnar Ab</td>
<td>Avd 50090 Hb3S 405 31 Goteborg Sweden</td>
<td>€1,251,427</td>
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<tr>
<td>Gie De Recherches Et D'etudes Psa Renault</td>
<td>AVENUE DE LA GRANDE ARMEE 75 75116 PARIS France</td>
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<td>Centro Ricerche Fiat - Societa Consortile Per Azioni</td>
<td>Strada Torino, 50 10043 ORBASSANO (TO) Italy</td>
<td>€197,500</td>
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<td>Robert Bosch GmbH</td>
<td>Robert-Bosch Platz 70839 Gerlingen-Schillerhoehe Germany</td>
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<td>Centre Europeen D'etudes De Securite Et D'analyse Des Risques</td>
<td>Rue Des Suisses 92000 Nanterre France</td>
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| Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Tno | ANNA VAN BUERENPLEIN 1
2595 DA DEN HAAG
Netherlands | €783,785 |
| Rheinisch-Westfälische Technische Hochschule Aachen    | Templergraben
52062 Aachen
Germany                      | €816,314 |
| Harman Becker Automotive Systems GmbH                  | Becker-Goring Str 16
76307 Karlsbad
Germany                      | €0 |
| Rise Research Institutes Of Sweden Ab                  | Scheelevägen 27
22370 Lund
Sweden                      | €0 |
| Man Nutzfahrzeuge Ag                                   | Dachauer Strasse 667
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Germany                      | €542,450 |
| Statens Geotekniska Institut                           | Olaus Magnus Vag 35
58193 Linkoping
Sweden                      | €0 |
Fundacion Para La Promocion De La Innovacion, Investigacion Y Desarrollo Tecnologico En La Industria De La Automocion De Galicia

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Organisation Website:
http://www.ctag.com

EU Contribution: €287,100

Irion Management Consulting GmbH

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78462 Konstanz
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EU Contribution: €41,944

Delphi Delco Electronics Europe GmbH

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EU Contribution: €92,646

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EU Contribution: €210,000

Daimler AG

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EU Contribution: €413,750

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<td><strong>Hagleitner Walter</strong></td>
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Organisation Website: http://www.ifsttar.fr
EU Contribution: €349,948

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EU Contribution: €0

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Organisation Website: http://www.iccs.gr
EU Contribution: €286,150

Julius-Maximilians Universitaet Wuerzburg

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Organisation Website: http://www.uni-wuerzburg.de
EU Contribution: €492,480

Volkswagen

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Organisation Website: http://www.volkswagen.de
EU Contribution: €217,646

Bundesanstalt Für Strassenwesen (Federal Highway Research Institute)
Technologies:

Safety systems
Longitudinal control functions for road safety

Development phase: Implementation

Safety systems
Lateral control functions for road safety

Key Results:

In June 2012, the EUROFOT consortium published the findings of a four-year study focused on the impact of driver assistance systems in the Europe. The study looked at existing technologies and their potential to both enhance safety and reduce environmental impact. The EUROFOT project revealed a link between these systems and improvements in driver behaviour, fuel efficiency and traffic safety, as well as overall cost savings.

The Key Findings of the project are:

- Adaptive Cruise Control & Forward Collision Warning: Vehicles equipped with both systems could potentially affect up to 5.7% of the injury accidents on motorways, while trucks could potentially affect up to 0.6% of these accidents. The EUROFOT project concluded that these systems might have a positive effect on the overall crash statistics, for all road types. Additionally, positive indirect effects on traffic efficiency have been identified. Due to the potential reduction of accidents, the annual incidental delay (calculated in lost vehicle hours) could be lowered about more than three million hours on an EU-27 level. The environmental impact, which was measured in terms of fuel consumption, showed a reduction of about 3% percent for passenger cars and 2% for trucks without considering the benefits from changes in traffic efficiency. Drivers participating in the study also noted that these systems were highly appreciated and used. They increased driver comfort and safety.

- Navigation Systems: Analysis shows that navigation systems are highly accepted and widely used, particularly on long trips on unfamiliar routes. These systems are able to plot a fuel efficient route. The positive effect on driver behaviour is reflected in positive changes in lane keeping behaviour, distance to the lead vehicle and harsh braking events.

- Blind Spot Information System: Approximately 80% of drivers felt that this system increases safety.
It is perceived as most useful on urban roads in heavy traffic. It is not perceived as increasing workload. Most drivers indicated that this system is an important complement to visual checks, rather than as a primary source of information.

- Speed Regulation System: Over-speeding and harsh braking were reduced when this system was active.
- Curve Speed Warning: Around 75% of the drivers felt that safety was increased thanks to this system. They also found it most useful while driving on rural roads. Some participants stated that they used it as an indicator and/or to practice

**Innovation aspects**

This is the first large-scale European Field Operational Test on Active Safety Systems. Vehicle manufacturers, automotive suppliers, institutes and other stakeholders have joined forces in a "smart drive" to test various intelligent in-vehicle systems across Europe, with the aim of making our road transport safer, more efficient, and more comfortable.

Road transport in Europe faces enormous challenges. Demand for personal mobility is increasing, and in the meantime imposing a high cost on society. More than 40 000 people die every year and more than 1.2 million are injured on European roads. In addition, transport emissions threaten our health, negatively affect the environment, and make a significant and growing contribution to climate change, while constant traffic congestion imposes delays and raises costs for every European citizen.

Field Operational Testing is an effective instrument to test new transport technologies in the real world. It is an excellent way to raise awareness, collect real data, and enhance the take-up of ICT solutions. Field Operational Tests have also proved to be a powerful tool for gaining insight into the way new functions and systems suit the user when operated in a real context. It also provided statistically sound data over a sufficiently long time.

Such testing has traditionally been carried out at national level. However, there is a growing need to incorporate these tests into a common European framework, to enable sharing and comparing at both European and national level.

**Technical Implications**

The field tests focussed on 8 distinct functions that assist the driver in detecting hazards, preventing accidents and making driving more efficient. More than 1 000 cars and trucks equipped with a range of different intelligent technologies have been tested on European roads. During these field tests, a multitude of sensors and devices have monitored every aspect of individual driver behaviour in real-world traffic conditions. In addition to that, questionnaires have been used to get driver feedback on the usefulness of the various systems. The project has resulted into much insight how intelligent systems suit drivers.

The vehicle management centres have collected the data from more the test vehicles. These data provide an operational platform.

**Policy implications**

The project aimed at making roads safer, more efficient and more comfortable to drive. The results show a link between these intelligent vehicle systems and improvements in driver behaviour, fuel efficiency, traffic safety and overall cost savings.

**Strategy targets**

- An efficient and integrated mobility system: *acting on transport safety*
- Innovating for the future (technology and behaviour): *promoting more sustainable development*

**Readiness**

For the most part, the technologies under study already exist. They have the ability to help making driving safer, more comfortable and more efficient. These technologies have a positive effect on traffic safety and efficiency. However, they have not penetrated the market. This is largely due to a lack of understanding about their potential benefits. This project makes these technologies better understood by testing them in real-life environments. That is the key and road map to achieve future market penetration.

The analysis of the data gathered in real-world traffic conditions (with ordinary drivers) highlighted crucial aspects of the intelligent vehicle systems, regarding:
• the performance and capability of the systems;
• driver interaction and reaction to the systems;
• impacts on safety, efficiency and on the environment.

Documents:
*Press Release on June 26th*

**STRIA Roadmaps:** Cooperative, connected and automated transport

**Transport mode:** Road transport

**Transport sectors:** Passenger transport  
Societal/Economic issues, Safety/Security, Digitalisation,

**Transport policies:** Decarbonisation

**Geo-spatial type:** Urban