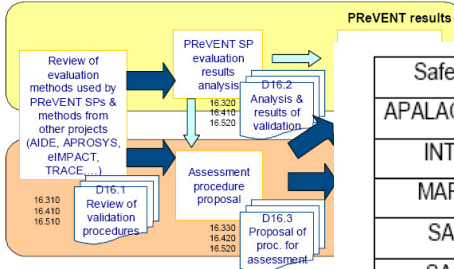
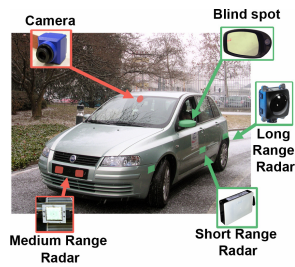
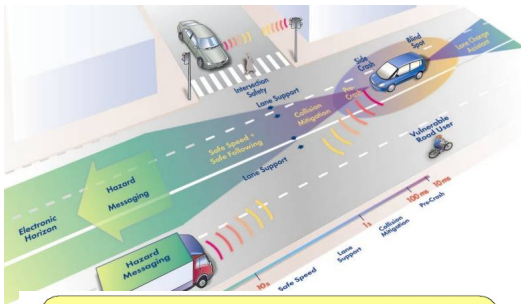




Field Operational Tests: methodology for European Wide Tests The FESTA Project

Gianfranco Burzio,
Project Manager, Centro Ricerche FIAT
Brussels - November 6, 2008

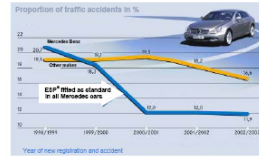
PREVENT project



Safety function	Effect on fatalities	Effect on injuries
APALACI/COMPOSE	-19,6%	-14,3%
INTERSAFE	-0.6%	-1.5%
MAPS&ADAS	-13.1%	-8.2%
SAFELANE	-13.5%	-9.5%
SASPENCE	-6.5%	-3.8%

Electronic Stability Control - ESC

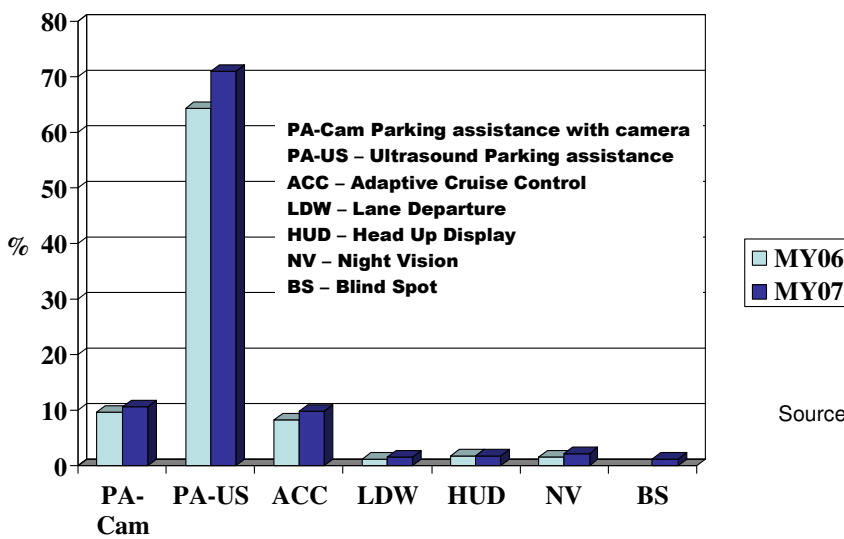
Daimler : Driving accidents analysis	- 42%
Ford : Single vehicle analysis	- 35%
VW : Fatalities	- 35%
LAB (Renault/PSA) : Driving Accidents	- 44%
Swedish NRA : All accidents	- 22%



Based on analysis of accident statistics (1999 – 2004) before and after the introduction of ESC as standard equipments (same sample)



ADAS systems market



Source: TRG TA Index



Comparison

Method	Time	Robust assessment
	One year or less	++
	Ten years or more	+++++
Field Operational Tests	Three - four years	++++



Field Operational Test

A study undertaken to evaluate a function, or functions, under normal operating conditions in environments typically encountered by the host vehicle(s) using quasi-experimental methods.



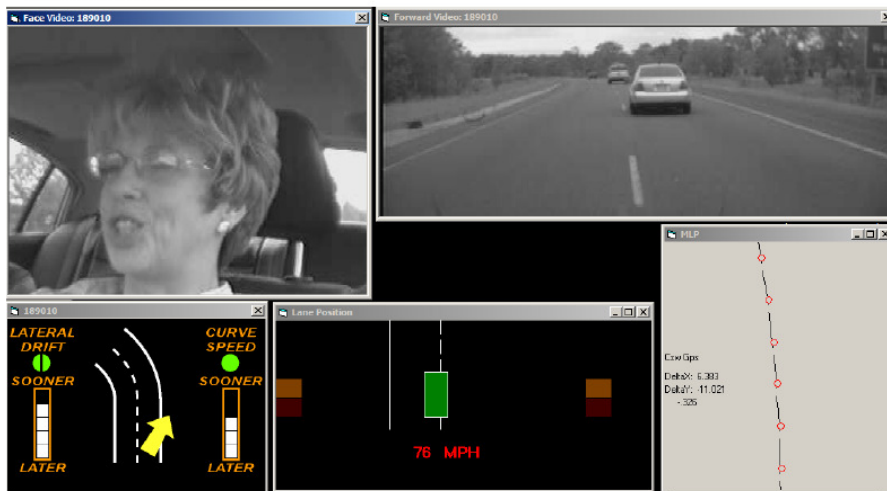
Equipped Vehicles - SAFER (Sweden)



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Field Operational Test - IVBSS (USA)

Face and forward video



DVI presentation

Lane-departure situation
Speed, lane position, brake and turn signals

CSW situation
Path and predicted path

15



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Tools for Video Sequence Analysis - SAFER (Sweden)

The SAFER software interface includes several key components:

- Simple Viewer:** A table listing events with columns for Id, Type, Start, Length, and Text.

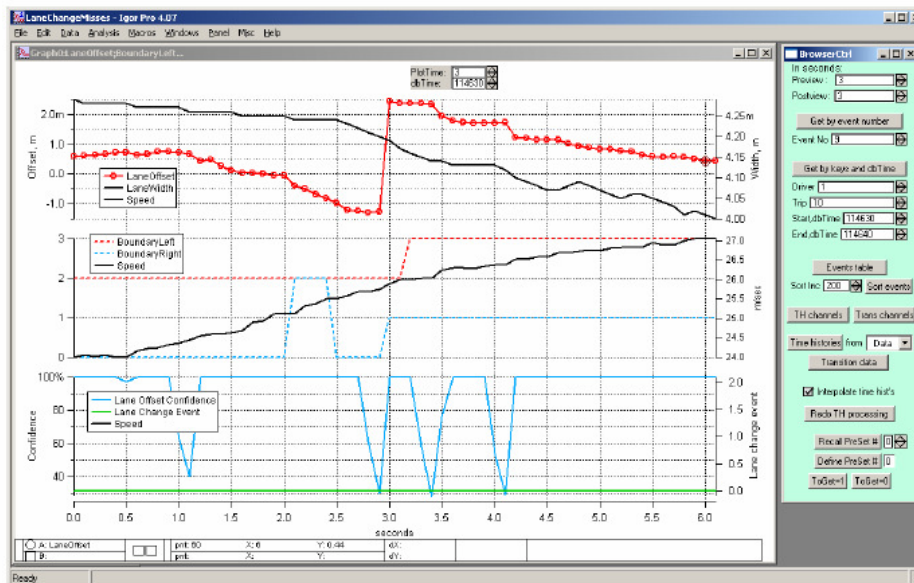
Id	Type	Start	Length	Text
22	Stop light	00:03:30.4190000	00:00:00	
29	Queue	00:05:16.3120000	00:01:21.1160000	
37	Leading vehicle	00:02:01.0580000	00:00:32.4500000	
- Video Window:** Displays multiple camera views of a road scene, including a top-down view and side views.
- Annotations Window:** A grid of buttons for various events such as 'Eyes on road (E)', 'Heavy brake (B)', 'Mobile phone (F)', 'Radio/CD (R)', 'Turning left (V)', 'Turning right (H)', 'Crossing Pedestrian (C)', 'Stop light (S)', 'Queue (Q)', 'Leading vehicle (L)', and others.
- Signals:** A table showing signal values for various parameters.

Signal	Value
CAN_Speed	41.02
CAN_rSwivel	8.95303
CAN_EngPed	1361
CAN_SteerPed	12.1
CAN_BraPed	12
CAN_eSteer	3
CAN_AngSpce	-3.015
CAN_SteerPed	12.1
CAN_eSteerLev	3

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Tools for data analysis - IVBSS (USA)



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[European Initiative on Field Operational Tests



- To validate the effectiveness of ICT based systems and functions for safer, cleaner and more efficient transport in a real environment
- To analyse driver behaviour and user acceptance of the systems
- To analyse and assess the impact of intelligent safety and efficiency functions using real data
- To improve awareness on the potential of intelligent transport systems and create socio economic acceptance
- To obtain technical data for system design and product development
- To ensure the transferability of the FOT results to the overall European and global conditions.



[Different Steps



Step 1

- *Ramping up of field operational tests: support action to analyse and define the structure, the organisational issues, the operating conditions and the assessment of field operational tests in Europe.*

Step 2

- *Large Scale Field Operational Tests for safer, cleaner and more efficient transport system in Europe.*

Step 3, 4, ...

- *FOT on all systems including co-operative*



[Objectives - from the EC

The first phase will focus on developing the methodology for planning, running and evaluating FOTs. These may include experimental planning, pre-simulation of the FOTs, techniques for measurements and registrations, methods for evaluation and conclusions, criteria to achieve scientific data, such as selection of drivers statistically representative of the population etc.

The outcome of the first phase :

- 1. methodology and structure of FOT based on state-of-the-art ICT based technology and systems*
- 2. "best-practise" handbook which will guide the design and implementation of future FOT.*



[FESTA

Field opErational teSt support Action

Proposal defined by the effective cooperation of representatives of FOT stakeholders (OEMs, Supplier, Infrastructures, ...) with academic and research institutes to develop a robust FOT methodology and guidelines



FESTA Consortium



OEMs

- Centro Ricerche FIAT (Coordinator)
- BMW
- Daimler
- LAB PSA Renault
- Volvo Car
- Volvo Tec

Suppliers

- Bosch
- Continental
- Delphi

Telecom provider

- Orange

Association

- ERTICO

Academics

- Leeds University
- Loughborough Un.
- Koeln Univ.
- SAFER (Chalmers Univ.)

Research Labs

- BAST
- INRETS
- TNO
- VTI
- VTT

Infrastructure

- Autostrade - Infoblu



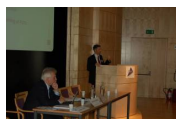
Stakeholders meetings



December 11th 2007



April 29th 2008



[Functions, Use cases, Hypothesis, Impacts

Functions

ACC, Collision Warning, Collision Mitigation, Speed Limiter, Lane Departure Warning
Blind Spot Warning, Dynamic Navigation, Electronic Stability Control,
Driver Impairment Warning
Hazard warning, Floating Car data, Road Intersection safety, Curve Warning,
Cooperative Collision Warning, Coop. Low friction warning, Coop. Lane change aid,
Vulnerable road user protection,
Traffic info, Speed Limit,

Use cases

Normal Driving, Lane change
Vehicle (type, status, ..)
Environment (traffic, road type, weather, ...)
Driver (prof/noprof, impaired, distracted, ...)

Hypothesis

ex. Reduction of accidents, speed reduction

Impacts

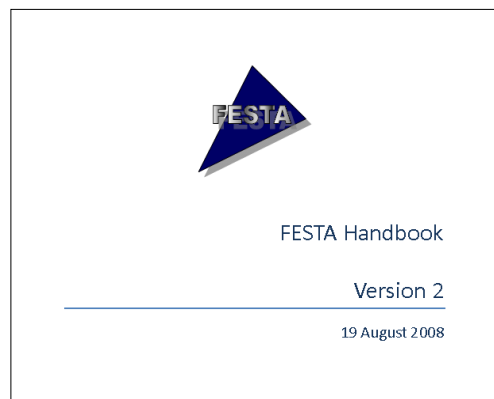
Safety, Environment, Traffic, Acceptability



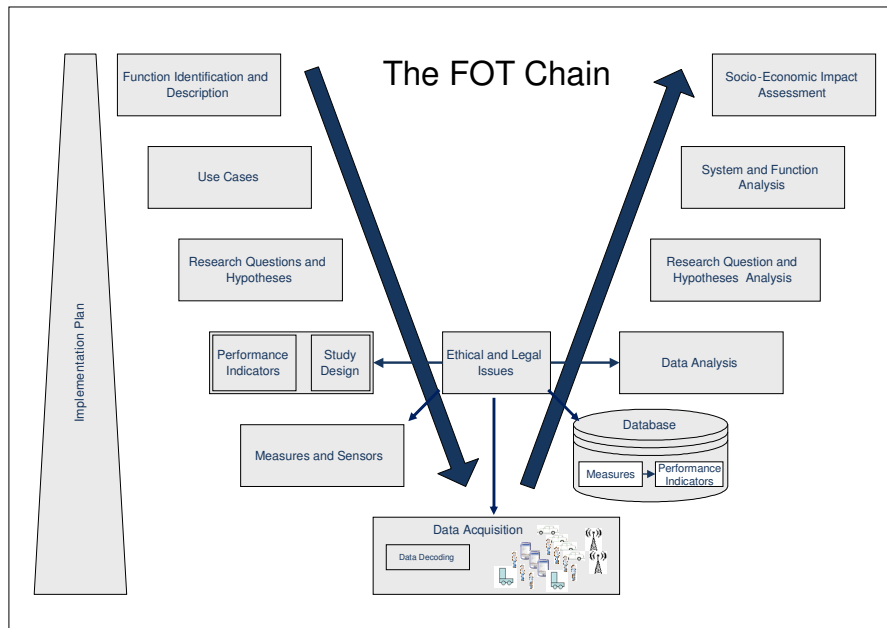
[The handbook

Definition of a FOT:

“A study undertaken to evaluate a function, or functions, under normal operating conditions in environments typically encountered by the host vehicle(s) using quasi-experimental methods.”



[FOT Life cycle – the FESTA “V”



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[The FESTA “V”

Covers the full life cycle of an FOT from planning to completion and even afterwards (e.g. data archiving)

Note the *FOT Implementation Plan* which is in an annex and which provides a checklist for planning and running an FOT

Allows “drilling down” to obtain further detail:

Manual



Deliverable



References

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[FOT methodology overview



Performance indicators - description, calculation, practical information (ease/cost)

Data requirements - to define requirements for data handling including acquisition, upload and transfer, Database storage, search and analysis

Experimental procedures - provide guidance on the overall experimental design of FOTs to ensure experimental rigour and scientific quality. Participants, experimental design

Data analysis and modelling - To provide guidance on how to properly assess the impact of the system(s) tested on driver performance, behaviour and safety

FOT implementation plan - To identify the critical tasks to manage a successful FOT by describing the technical and administrative activities and tasks which are necessary to manage a successful FOT. Personnel, legal/ethical issues, recruitment and training of participants.

Socio-economic impacts - to describe the methodology of providing a socio-economic assessment of the tested safety systems, to be used during FOTs. Draw particularly on experience in eIMPACT.



[Use of the Handbook



“The FESTA Handbook is not meant to be a substitute for consultations with experts, organising a good and capable research team, and carrying out specific investigations into the legal and ethical issues that apply to the current question and situation.

It is not an exhaustive action list, and each FOT has its own special issues and concerns that have to be dealt with on an individual basis.

Nor is the advice in it necessarily perfect and representative of the state of the art.

On many issues, there will be scope for disagreement with the recommendations or use of alternative sources of advice.

But it would certainly be preferable for major departures from the advice to be justified to funding agencies and major stakeholders.”

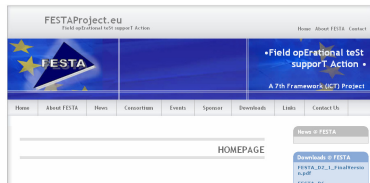


[Conclusions

FESTA has developed a common methodology and guidelines (handbook) for future European FOT

This handbook will allow :

- Faster setting up of FOTs
- Robust impact assessment;
- Comparable results;
- Save effort by avoid duplication of work;
- Reuse of tools, equipments, etc.
- Establish a common European Vision of FOTs



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



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[FESTA



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