

Hypotheses and Experimental Design

Methodological and practical lessons learned

Rino Brouwer

TNO

András Csepinszky

Ertico

Final Event

26-27 June 2012

Autoworld, Brussels



www.eurofot-ip.eu

eur
FOT

Bringing intelligent vehicles to the road

'One lesson'



Don't start an FOT in economic bad times
unless you have enough time on your hands

Participants

- ♂ Age 25 - 59
- ♂ Minimum 15000 km per year
- ♂ Due to difficulties in recruiting drivers these requirements were loosened

For a research FOT the selection of the right sample of participants (age, mileage, and experience) should prevail over having the promised numbers of drivers on the road. Preferably more time should be spent on getting the right sample of drivers.

Participants 2

- ⊗ Requirements were identified for non-professional drivers but not for professional drivers. For example,
 - ▷ km driven
 - ▷ # years of driver license

Requirements for professional drivers need to be developed

Participants 3

- ⌘ In euroFOT we had many vehicles on the road and for each vehicle we needed drivers
- ⌘ Recruitment turned out to be very challenging due to a low turn over of the relevant vehicles, incentives, etc

In order to have access to many potential drivers in FOTs as euroFOT the sales department of OEMs need to be involved and provide full support from the beginning

Incentives

- ⌘ For all drivers participating in euroFOT there was an incentive
- ⌘ Due to local limitations (e.g., taxes) the incentives differed substantially. It was very challenging to get drivers involved

The incentive must be appealing to the participants and should be at a level that the researcher does not have to make too many compromises with respect to the experimental method.

Experimental design

- ⌘ We decided on an A-B design with a small control group

M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12
Baseline						Driving with system X					

- ⌘ In most cases only the A-B design was followed without the control group. Ambitious designs were difficult to apply.

In order to assess the effects of individual systems complex experimental designs should be possible to implement. This can be achieved e.g., through complete access to the systems and substantial benefits for the driver (incentives).

Piloting

- ⌘ In the original DoW of euroFOT piloting was 'underestimated'

Piloting is a vital part in the preparation of an FOT (Sayer, 2010). Piloting needs to be done with the full instrumented vehicle and “It is strongly recommended that all components that are used during an FOT are fully developed and tested before the start of the pilot phase.”

Subjective data

- ⌘ An important focus in euroFOT was on subjective data collection in which the experience with the systems was collected.

An extensive questionnaire was developed in euroFOT. It provided a lot of information also on the drivers themselves and therefore on the sample we had in euroFOT. This is relevant information for the analyses. Extensive questionnaires are therefore difficult to avoid and much needed. Web-based questionnaires in combination with effective incentives gives a reasonable good response.

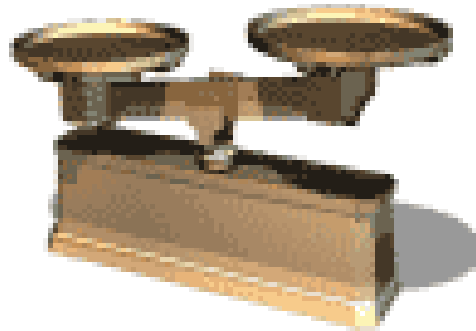
Objective data

- ⌘ One FOT, different test sites, different hypotheses, different systems.

euroFOT required a common definition of calculating performance indicators, situational variables and defining events. An extensive list was developed describing and defining these indicators, variables and events which allowed a common approach in deriving and assessing these indicators, variables and events. Which made it possible to compare effects.

'Abstract lesson'

- ⌘ One can never be completely prepared for everything that can happen.
- ⌘ You need to find the best possible balance between many factors



8 Functionalities, 28 Partners, 1000 Vehicles

1 Field Operational Test, 8 Functionalities

28 Partners, 1000 Vehicles, 1 Field Operational Test

8 Functionalities, 28 Partners, 1000 Vehicles

1 Field Operational Test, 8 Functionalities

28 Partners, 1000 Vehicles, 1 Field Operational Test

8 Functionalities, 28 Partners, 1000 Vehicles

1 Field Operational Test

