



Methodology for Field Operational Test Implementation: Study environment

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Aim and Overview



“The environment can seriously ruin your experiment”

- Experimental environment
 - ▶ geographical location
 - ▶ road type
 - ▶ weather conditions





Environment: geographical



- Location can be chosen because it is representative of the intended area of use for a vehicle/system
- The population within a particular geographical location may affect the running of the FOT (cultural issues, population characteristics, car ownership, use of new technologies, language issues).

For example, ACC may only be offered on higher-spec vehicles

- characteristics pertaining to the road and prevailing traffic may be of importance (road type, traffic patterns and flow/density, transport modes, enforcement activities)

For example, ACC is used predominantly in a motorway environment

- Technical considerations (Network coverage/reliability for telecoms, GPS coverage)

For example, for ISA trials you need digital maps with speed limits



Environment: geographical 'Checklist' FESTA



- type of roads
- cultural issues (countryside Albania vs downtown London)
- population characteristics
- car ownership
- use of new technologies
- language issues (is info on system in in vehicle system)
- traffic patterns (e.g., traffic density)
- infrastructure
- environmental information sources
- other transport options (relates to car use)
- legal and enforcement
- logistical issues
- availability of other data



Environment: Road type



There is a clear link with geographical location and road type





Environment: Road type



An FOT may want to include roads with specific characteristics, including:

- Typical traffic speeds and/or headways
- Number of lanes, and presence of lane marking
- The types of manoeuvres that a driver will need to undertake (e.g. stopping at traffic lights, or overtaking manoeuvres)

Classification of roads varies in different countries

- Urban
- Rural
- Motorway



Environment: Road type



However we can not expect drivers to change their route behaviour to suit our FOT

Therefore there is an important task to select road types when pre-processing the data. So you need

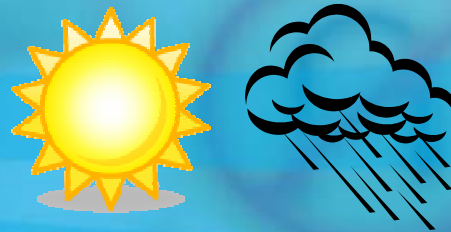
- ▶ GPS data
- ▶ map matching
- ▶ video analysis

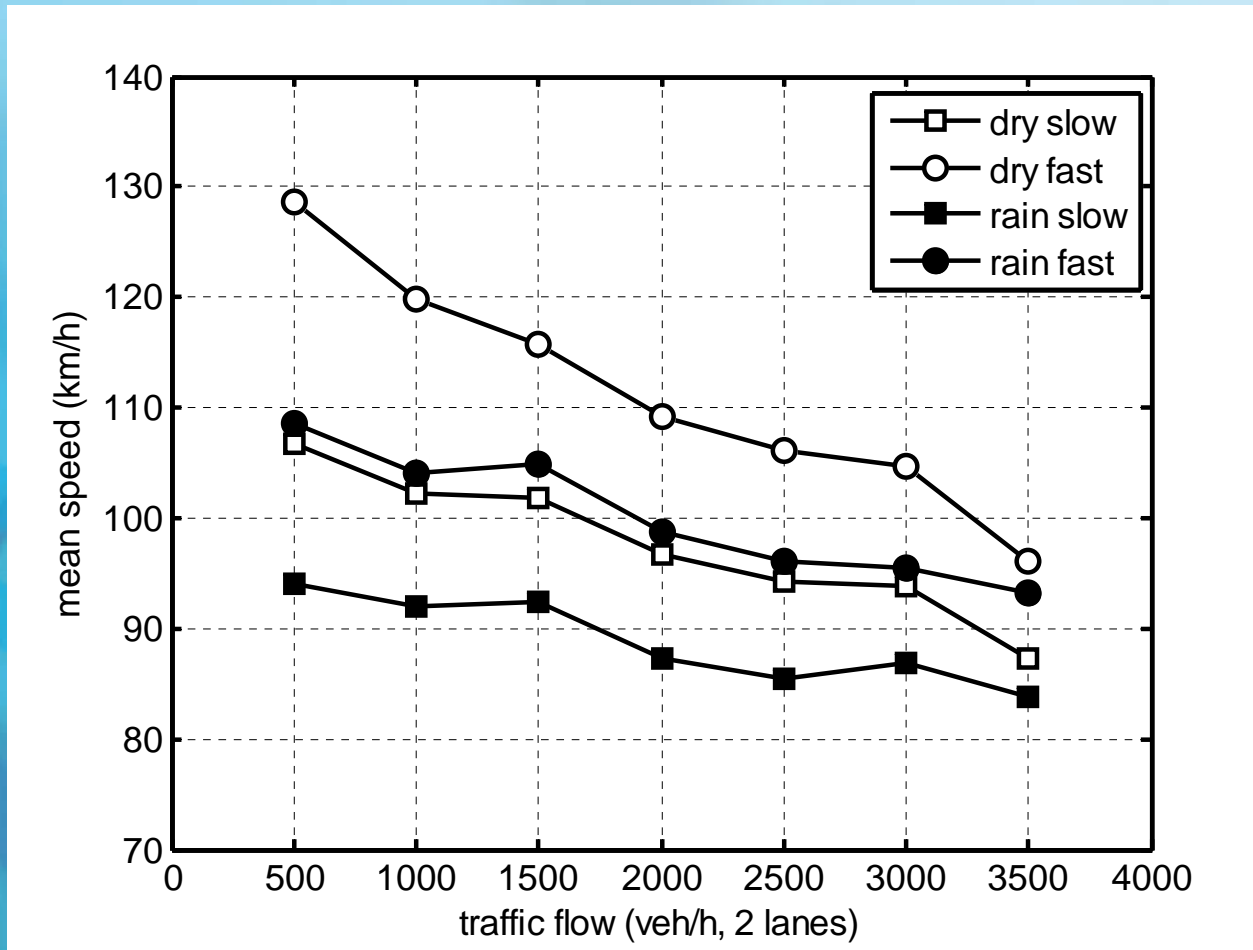


Environment: Weather



- Weather conditions are hard to predict, control for, and measure accurately Data may be confounded (snowfall/glare)
- Extreme weather conditions present a risk to FOTs - can destroy equipment.





Hogema, J.H. (1996). *Effects of rain on daily traffic volume and on driving behaviour* (Report TM-96-B019). Soesterberg, The Netherlands: TNO Human Factors Research Institute.



Environment: Weather



Photograph by Sisse Brimberg

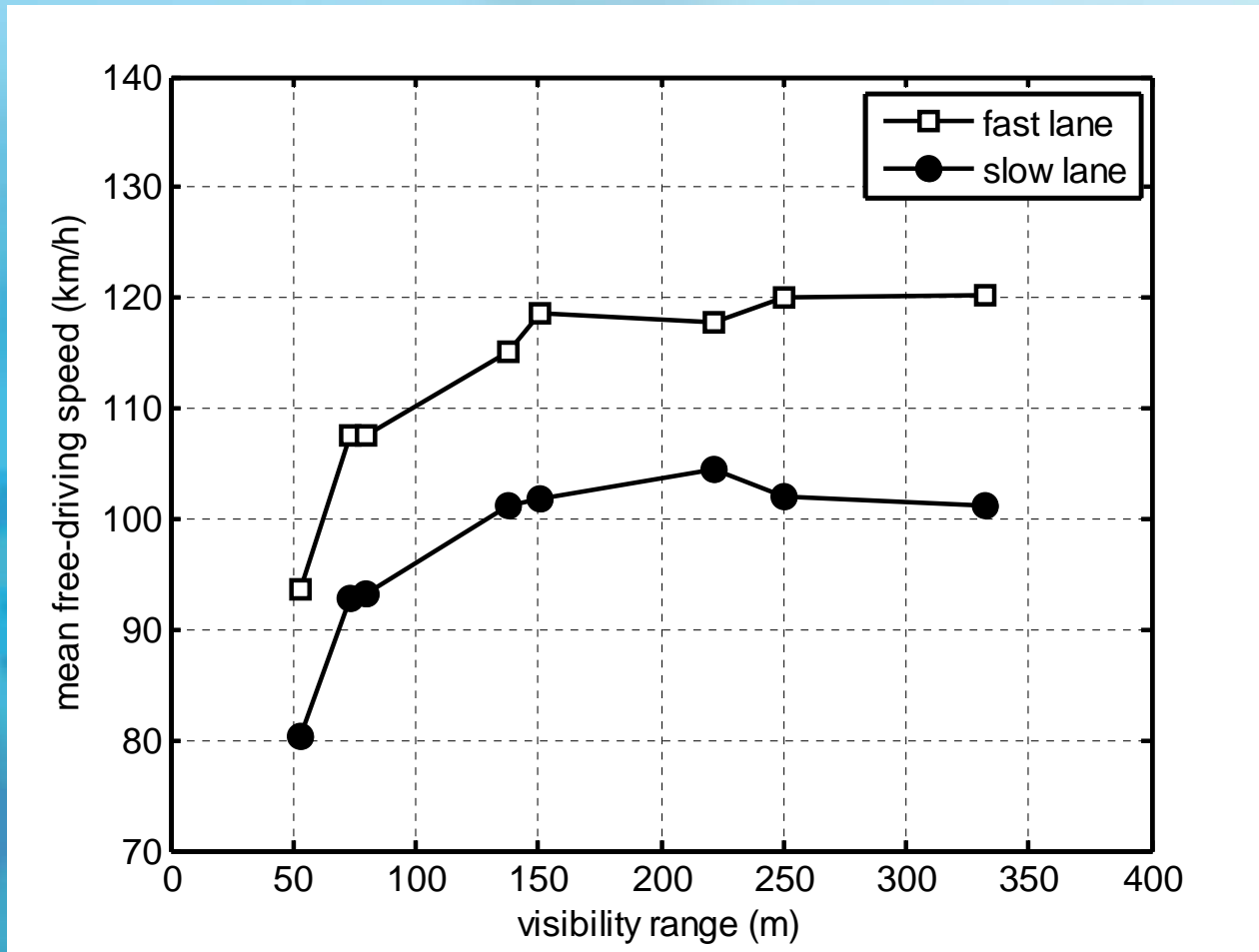


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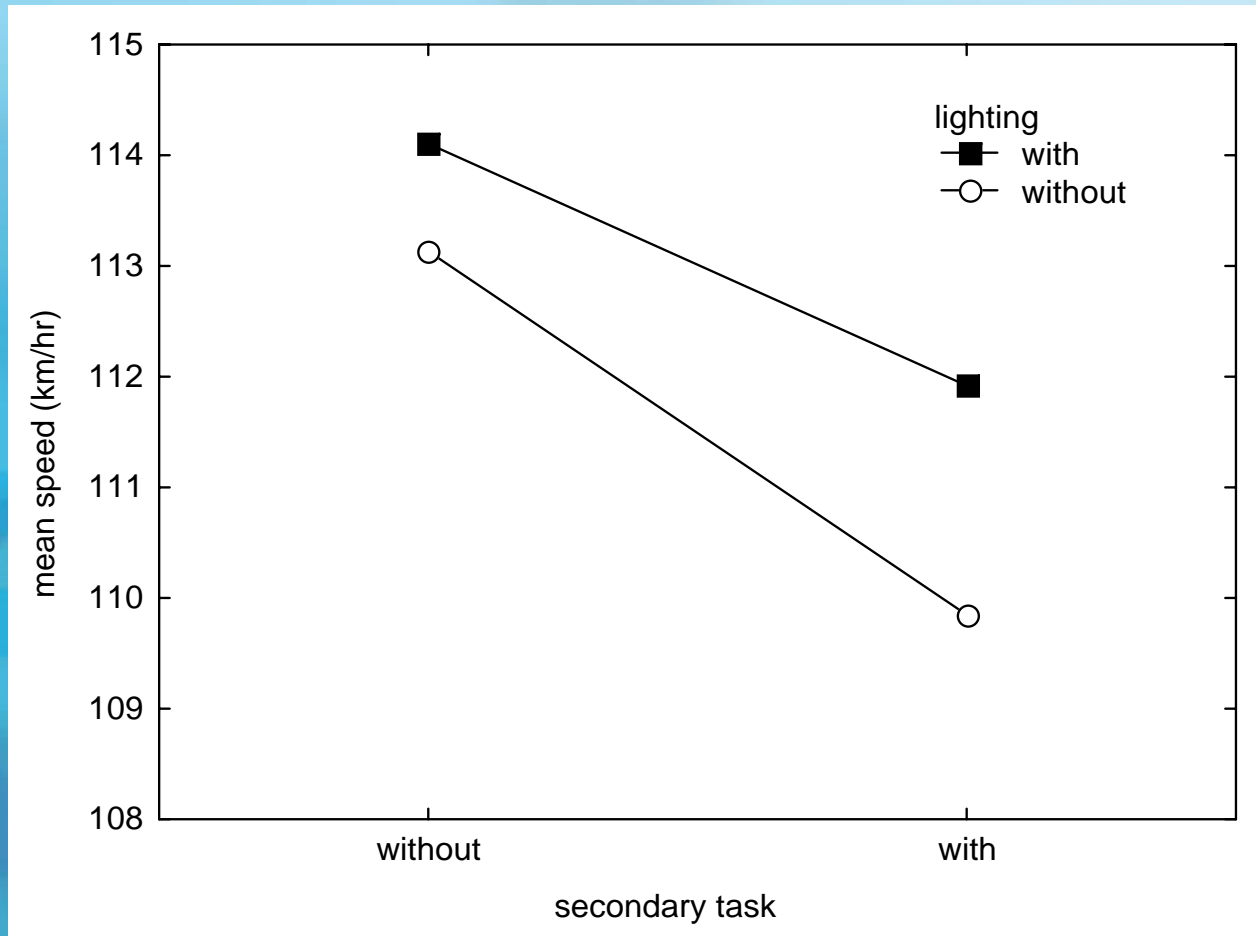
Environment: Weather



Hogema, J.H., & Van der Horst, A.R.A. (1994). *Driving behaviour in fog: analysis of inductive loop data* (Report TM 1994 C-6). Soesterberg, The Netherlands: TNO Human Factors Research Institute.



Environment: Weather



Hogema, J.H., Veltman, J.A., & Van 't Hof, A. (2005). Effects of motorway lighting on workload and driving behaviour. 12
G. Underwood (Ed.), *Traffic & Transport Psychology - Theory and application*. Proceedings of the ICTTP 2004



Environment: Weather



There are several ways of potentially measuring weather conditions:

- Direct (real-time) measurement e.g. vehicle sensor to measure ambient temp.
- Indirect (real-time) measurement using a surrogate sensor (e.g. recording the use of the windscreen wipers to indicate when it is raining)
- Subjective rating scales (completed by the driver or other)
- Post-hoc mapping –use of weather records to estimate the weather conditions
- Post-hoc analysis of video data by a data coder





Environment: Weather



However there is also a general impact of 'weather' to be considered

baseline

'experiment'

winter

spring/summer

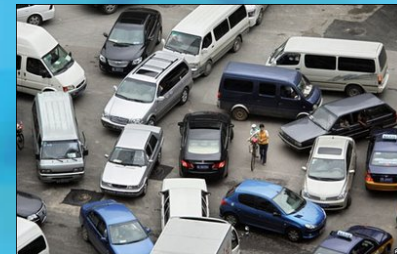




Study environment



- What kind of study environment do you want in your FOT?
 - ▶ Geographical location
 - ▶ Road type
 - ▶ Weather conditions
- How are you going to exclude or include certain circumstances





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