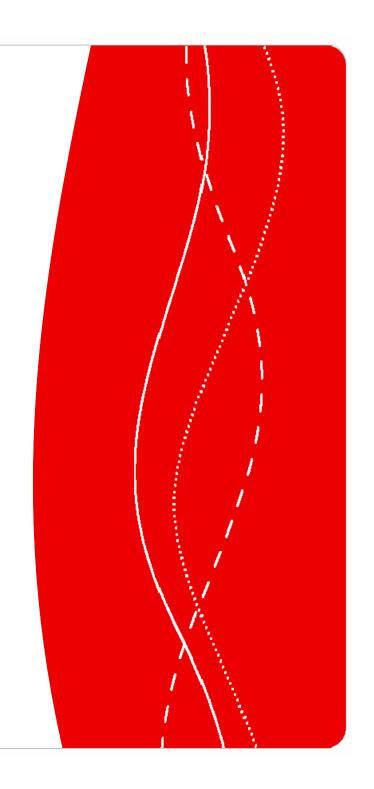


FINDING A BETTER WAY

Test of mobile reflectometers

Belgium – September 2010



Sven-Olof Lundkvist



S-O Lundkvist



Esso



Field study carried out by

Belgian Road Research Centre (BRRC)

Swedish National Road and Transport Research Institute (VTI)





Project leaders at the road authorities:

Denmark Kenneth Kjemtrup Finland Tuomas Österman Norway Bjørn Skaar Sweden Hans G Holmén



Aim of the measurements:

To be the basis for a new EN-standard for mobile reflectometers, comparable to EN-1436



Four instruments participated:

Ecodyn 30 Ennis Prismo, UK
Ecodyn 30 Euroconsult, Spain
LTL-MDELTA, Denmark
Zehntner ZDR 6020 Zehntner, Switzerland













испытательными станциями в России





21 test sites, each of length 200 m were used for the evaluation

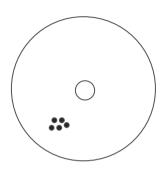




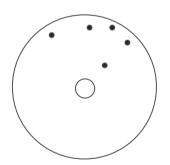
We wanted to investigate

- The accuracy
- The precision
- The uncertainty
- The repeatability

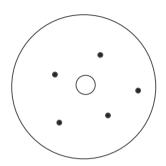




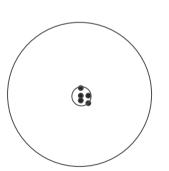
Good precision Poor accuracy



Poor precision Poor accuracy



Poor precision Good accuracy



Good precision Good accuracy



In the study the instruments were not identified by name.

Instead they were numbered randomly 1-4.



Problem: The measurement area of the instruments differed.

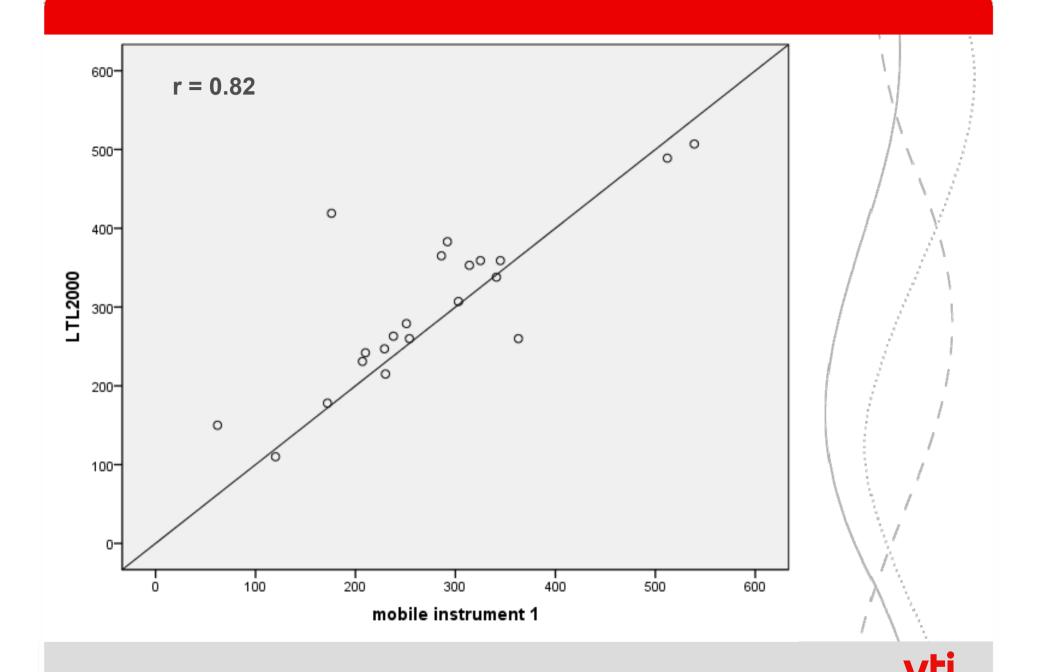
Instrument 1 The whole road marking area focused optical system

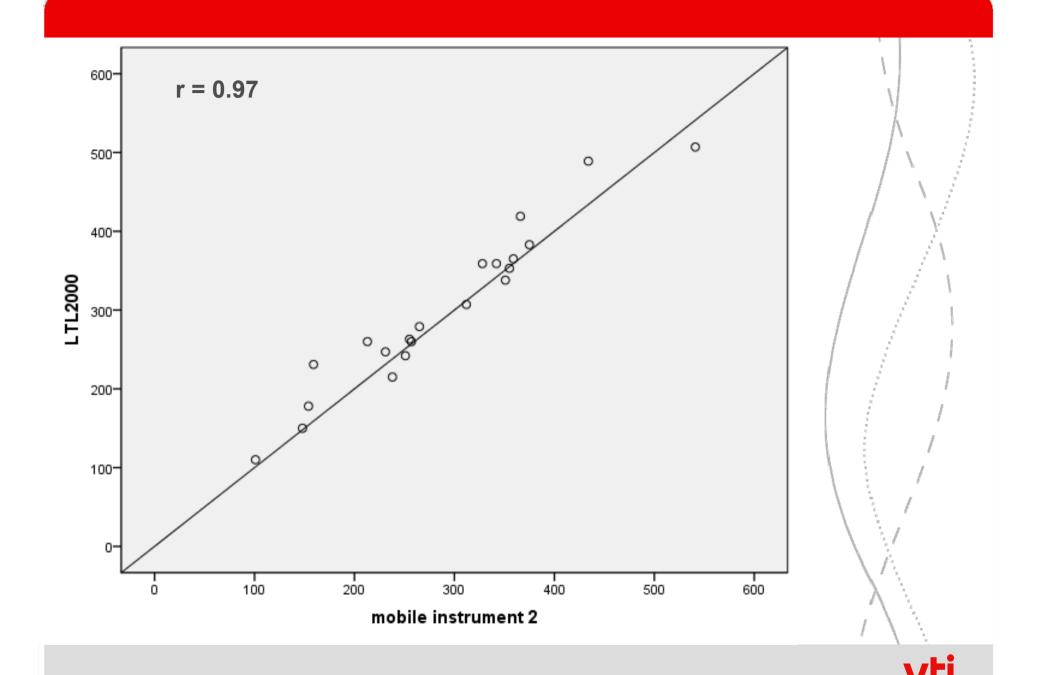
Instrument 2 5 cm in the centre of the road marking *or* the whole road marking area *defocused optical system*

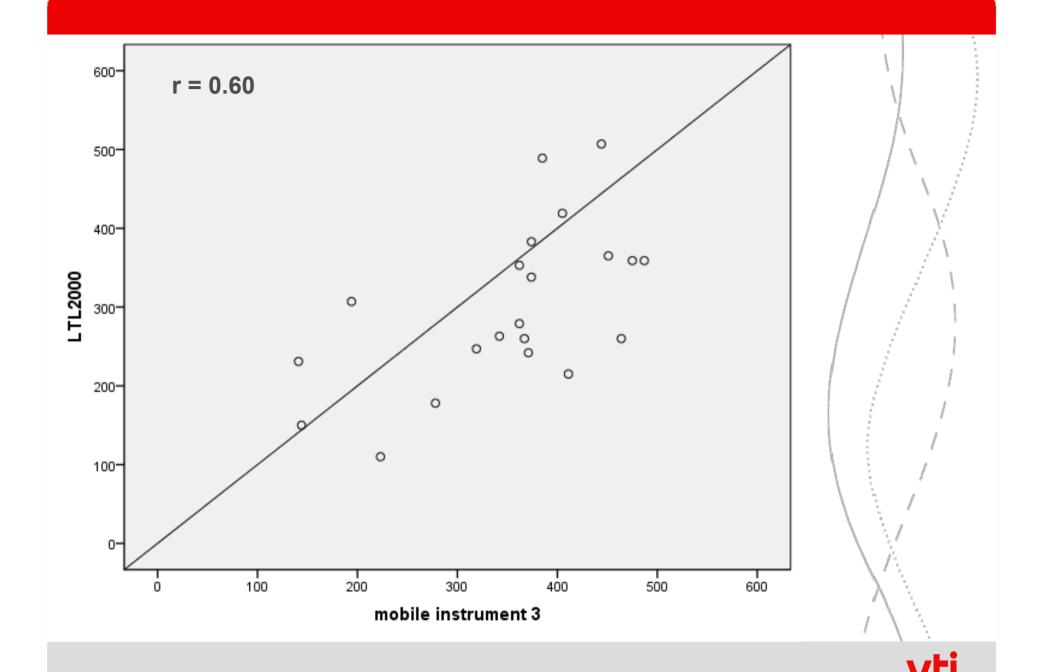
Instrument 3 & 48 cm where the highest readings were found focused optical system

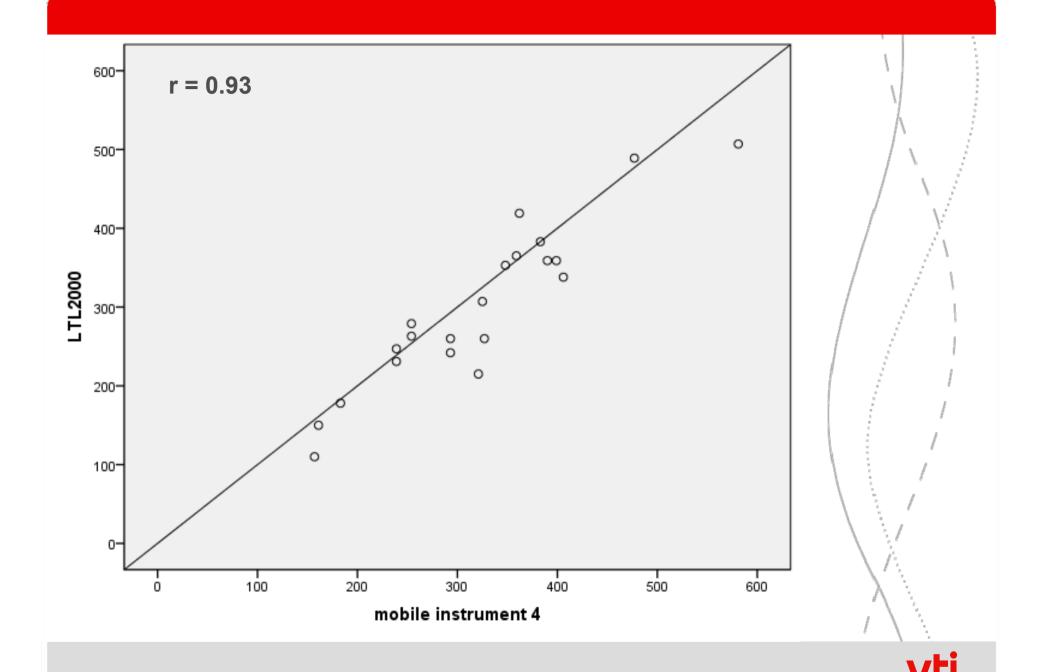
Reference instrument 4 cm in the centre of the road marking (LTL-2000) defocused optical system











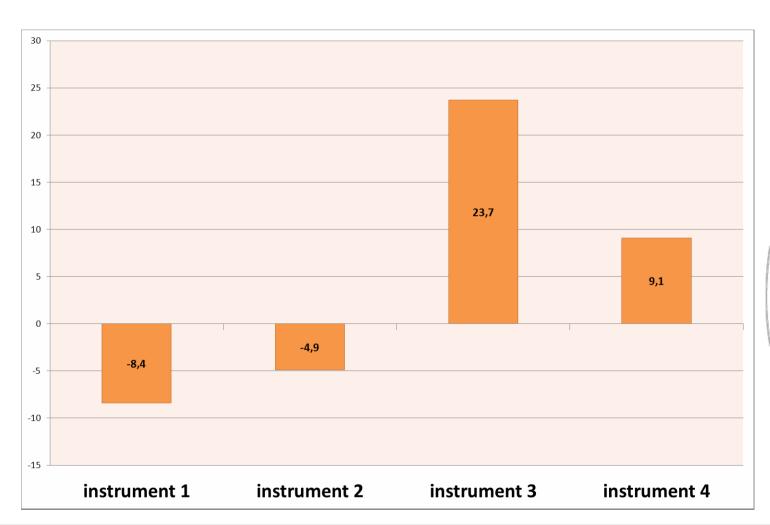
Important to remember:

The deviations in the figures are overestimations:

- different measurement areas
- •uncertainty in the reference readings
- operational mistakes

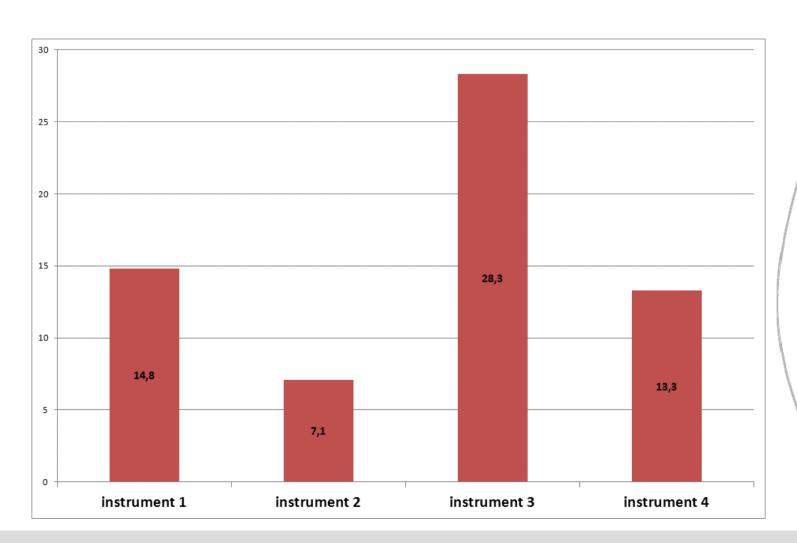


Accuracy – systematic deviation



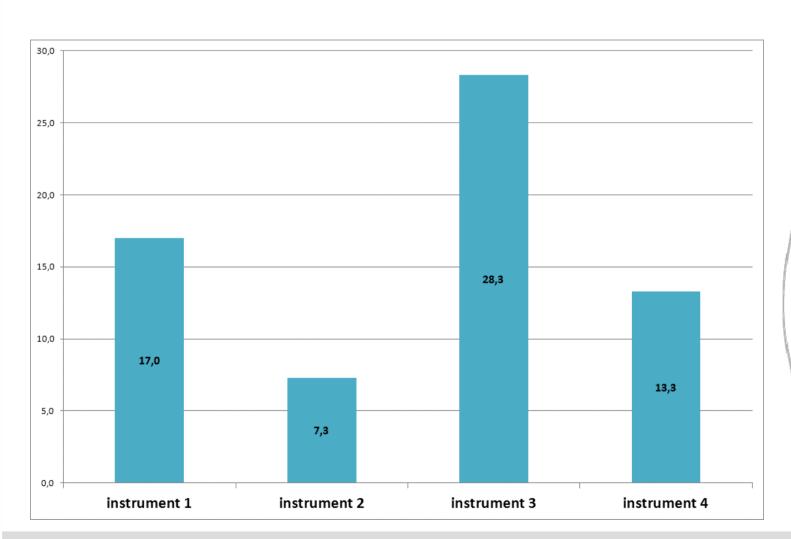


Precision – random deviation



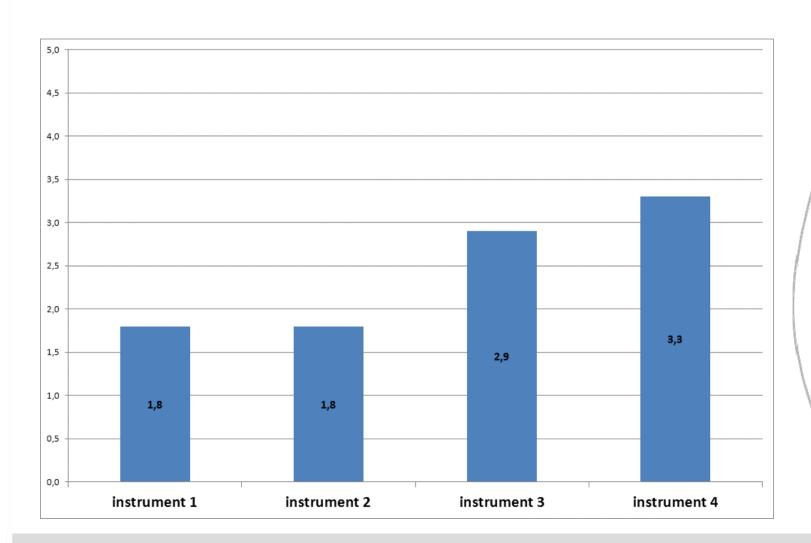


Uncertainty – total deviation





Repeatability





Conclusion:

It is up to the Expert Panel of CEN/TC 226 WG2 to evaluate the results in this study

