Increased safety and reduction of congestion by using driver assistance technology; dream or reality?

Margriet van Schijndel-de Nooij

TNO | Knowledge for business

Introduction to the project

Fileproof

- Launched in 2006 by the Dutch Ministry of Transport, Public Works and Water Management
- Addresses the possible short-term solutions to reduce traffic jams in the Netherlands
- More than 50 projects, based on input from general public

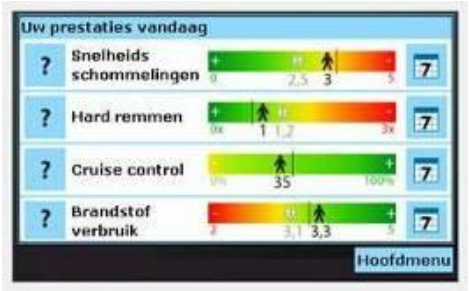
Accident Prevention Systems

Primary goal is to assess the potential
for improving safety and traffic flow by using APS

Accident Prevention Systems

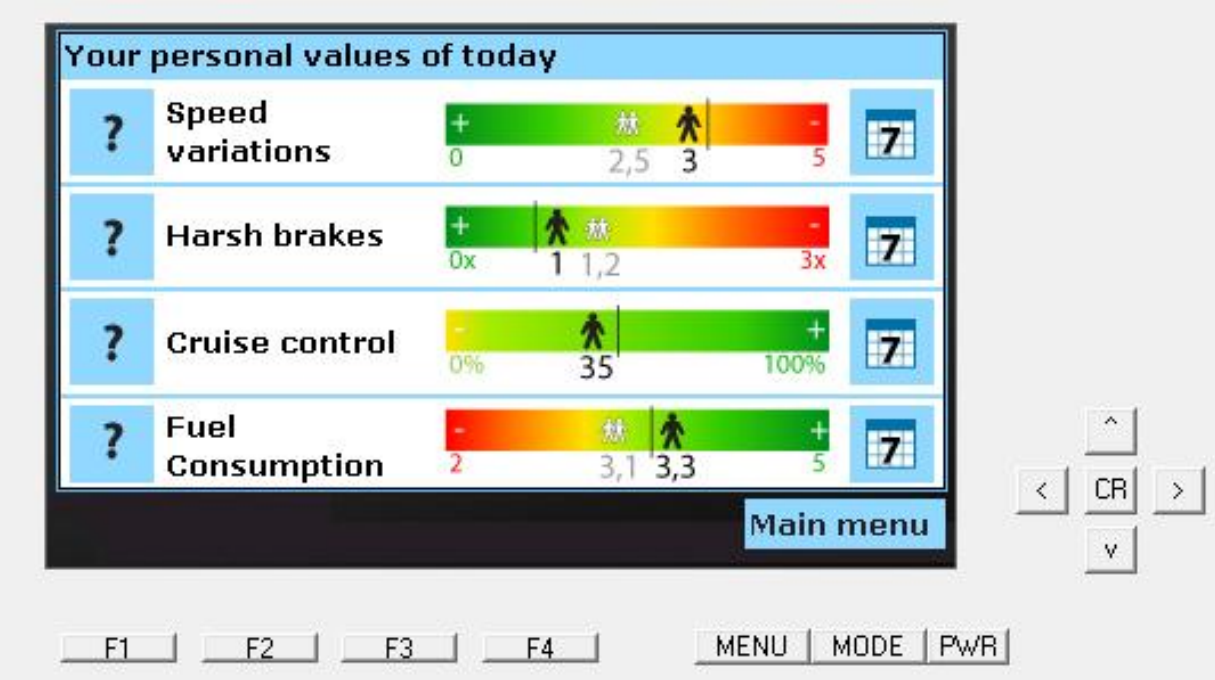
- Lane Departure Warning (LDW)
- Headway Monitoring and Warning en Forward Collision Warning (FCW/HMW)
- Directional Control (DC)
- Adaptive Cruise Control (ACC)
- BlackBox Feed Back

NEW



BlackBox FeedBack; dedicated development

- Basis: fleet management system. In the end, only remote software update needed for new functionality
- Driver gains feedback on driving behaviour, compared to colleagues and previous days
- Positive responses from drivers

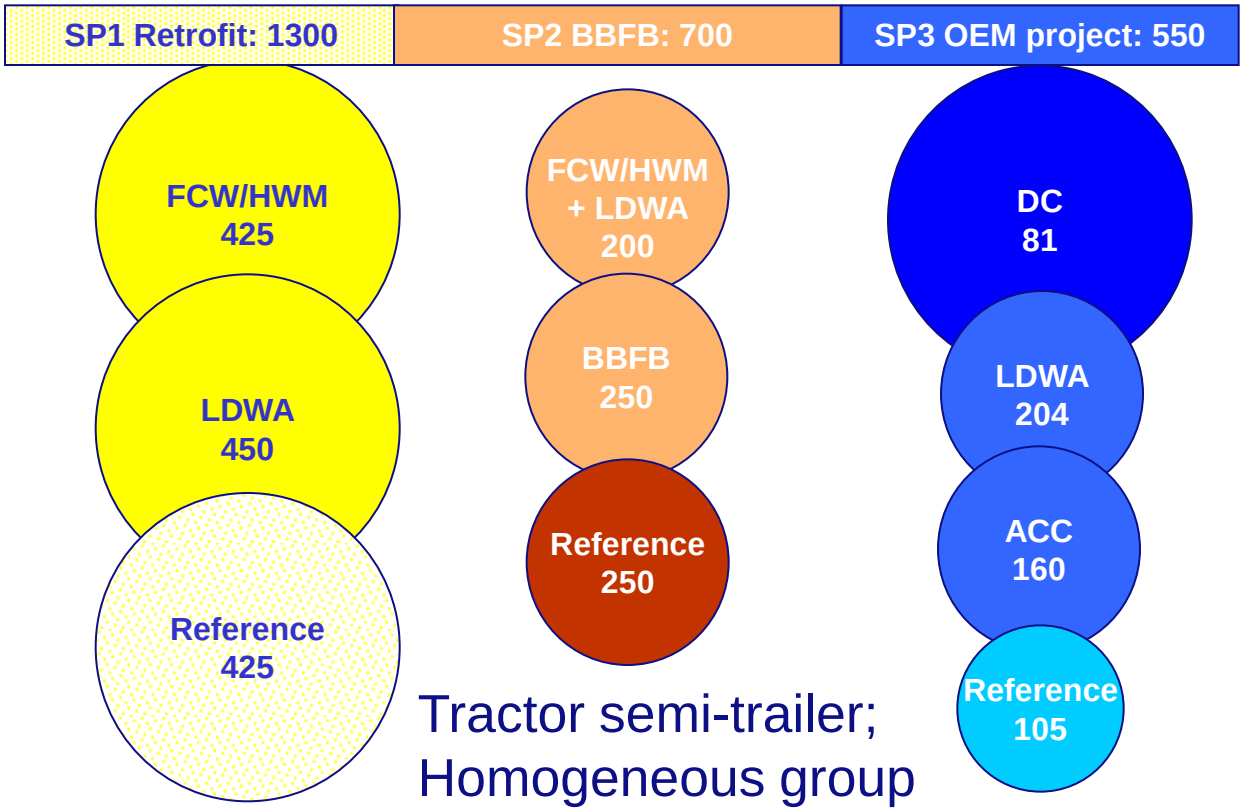


Project elements

- **FOT**
  - ± 2500 trucks
  - 114 transport companies
  - Support of DAF, MAN, Volvo, Scania, Renault, Mercedes, Iveco

- **Experiments with single vehicle**
- **Literature study**
- **Questionnaires**
- **Conceptual models for safety and traffic efficiency**
- **Workshops**

Distribution over the sub projects in FOT



Tractor semi-trailer

Tractor semi-trailer;
Homogeneous group

Mixture of trucks,
Including tank transport

Current status

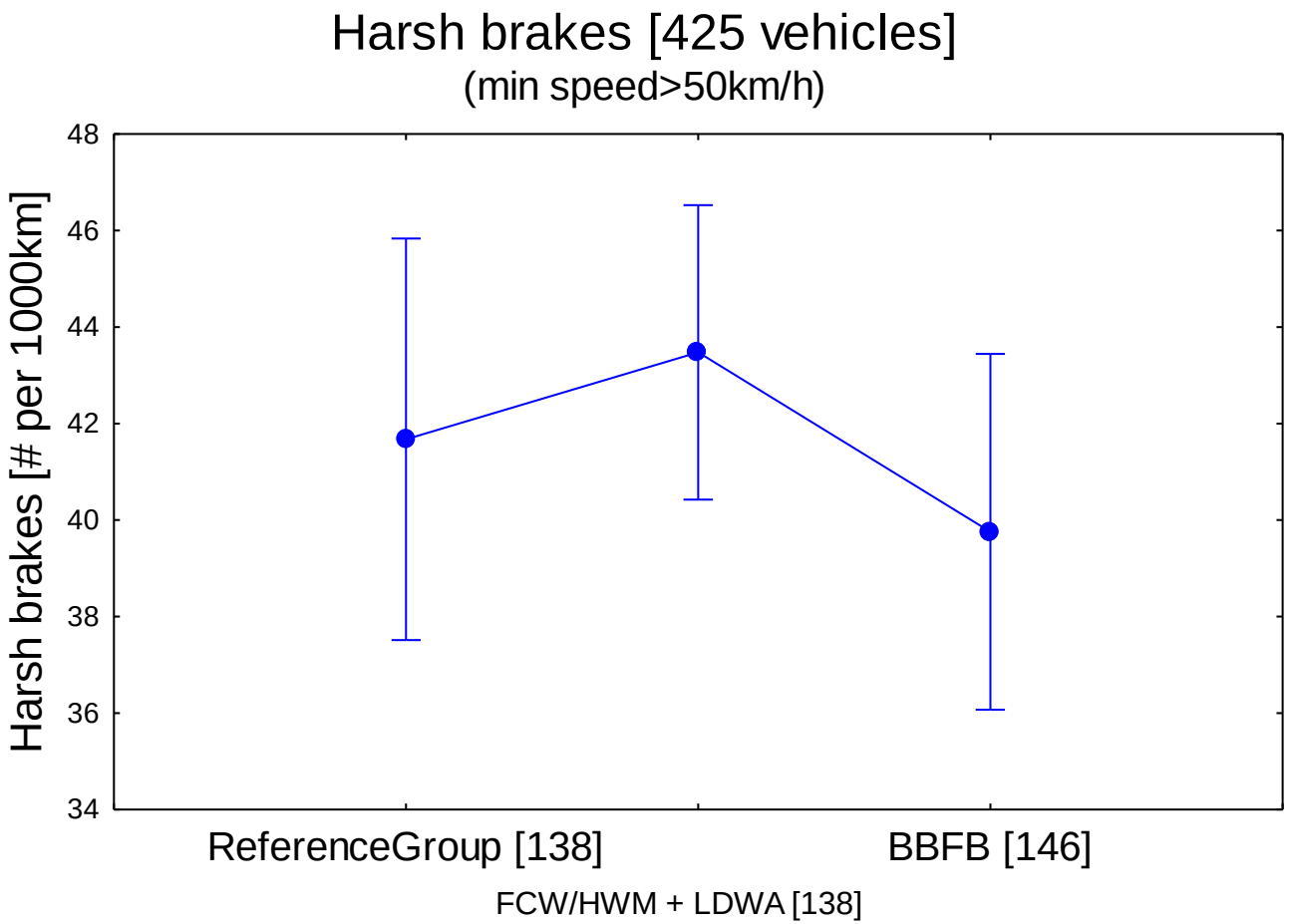
- Data gathering in full progress
  - Measurements started in September - December
- Interviews almost finished, with
  - Truck drivers
  - Management of transport companies

- Data interpretation started, to be finished in about a month.

  - No final results available yet

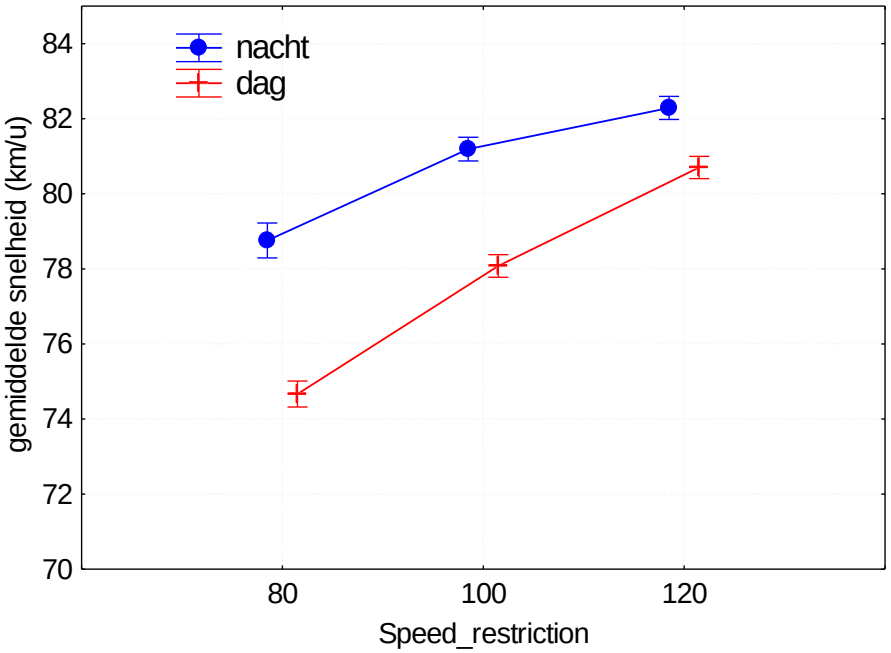
Some impressions/estimates

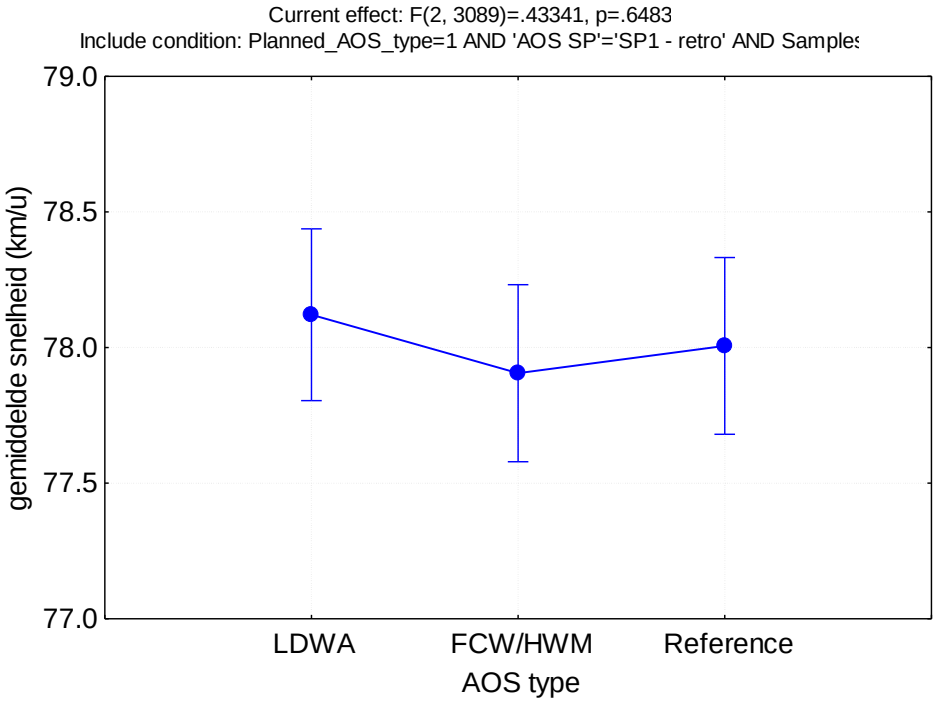
BlackBox FeedBack



Some impressions/estimates

Average speed, retrofit systems



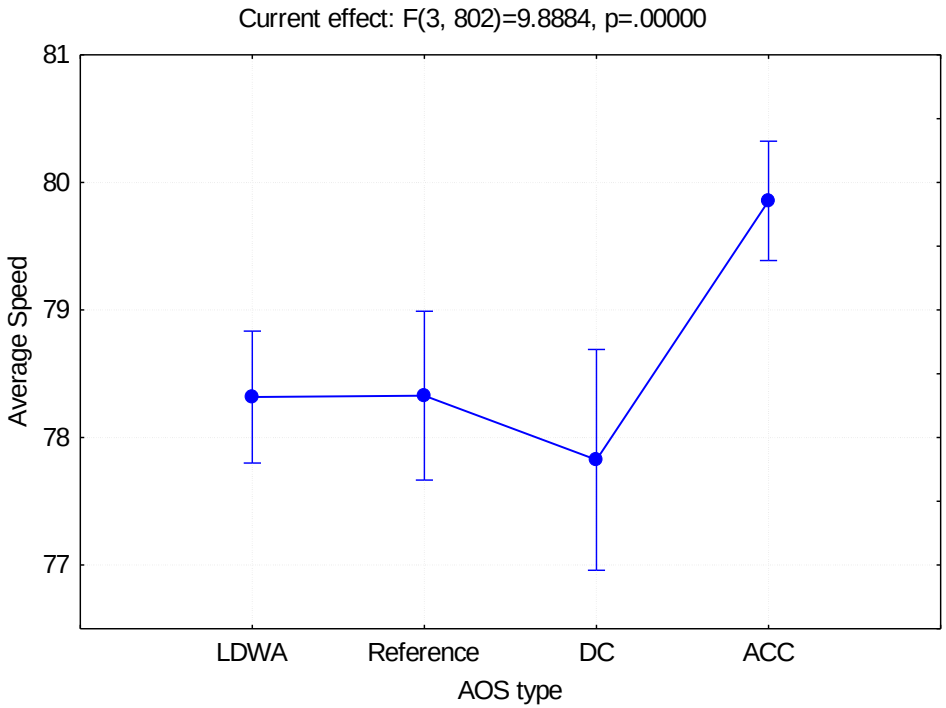


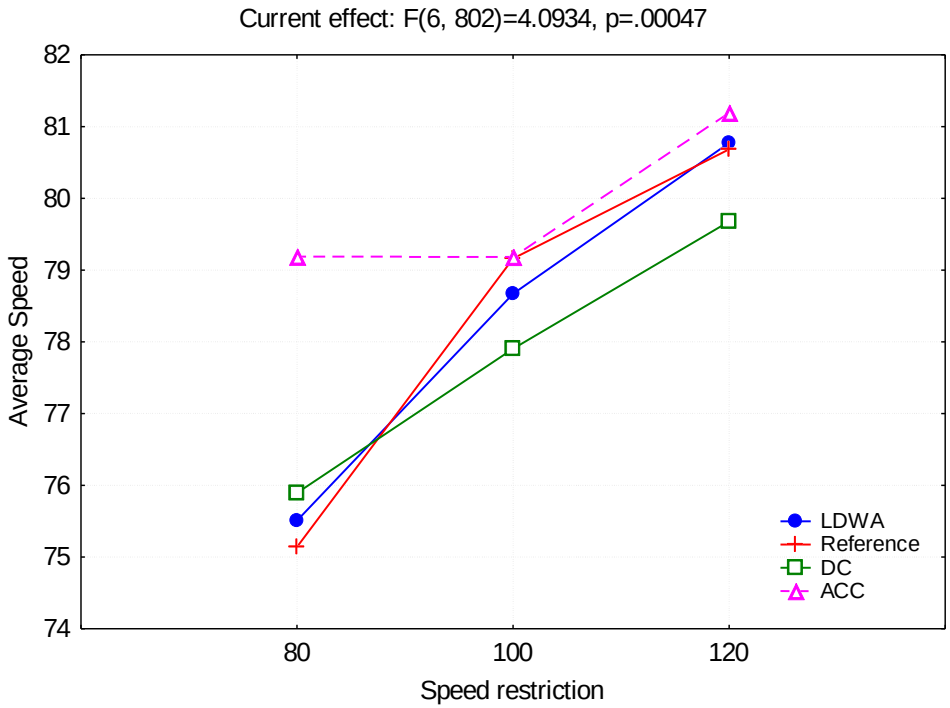
Some clear effects of day & night…

…no clear effect of type of APS

Some impressions/estimates

Average speed, OEM systems





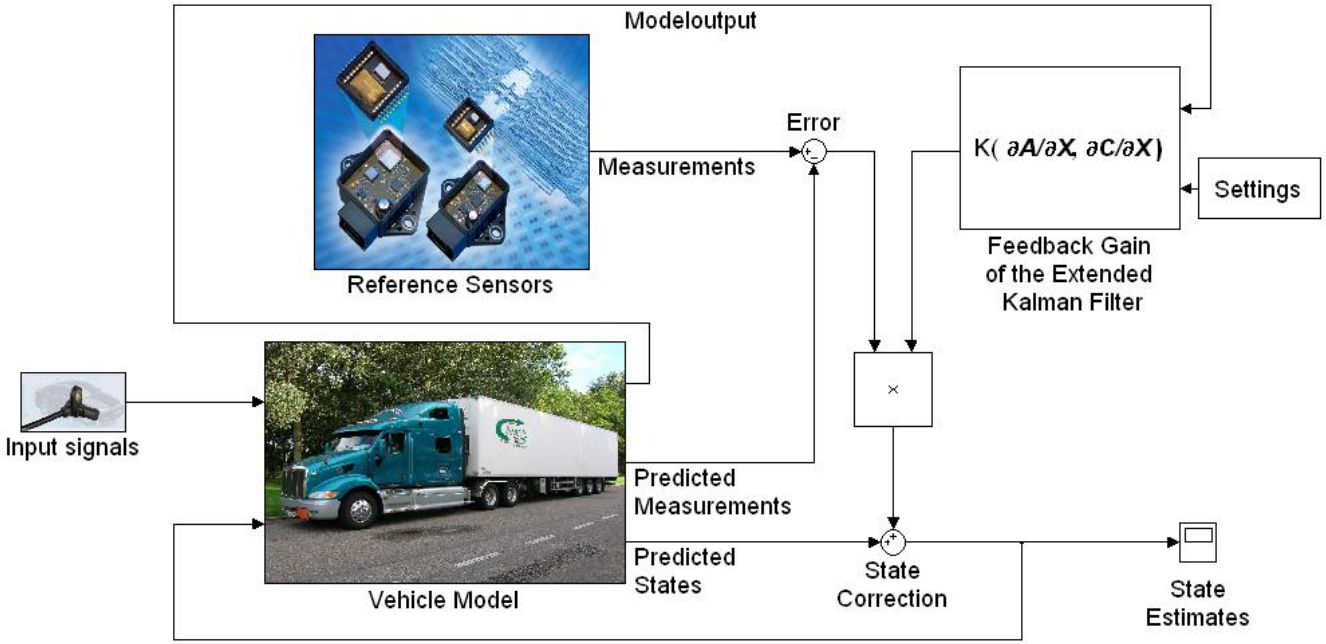
Higher average speed with ACC…

…but only in case of speed limit of 80 kph

Work with single vehicle

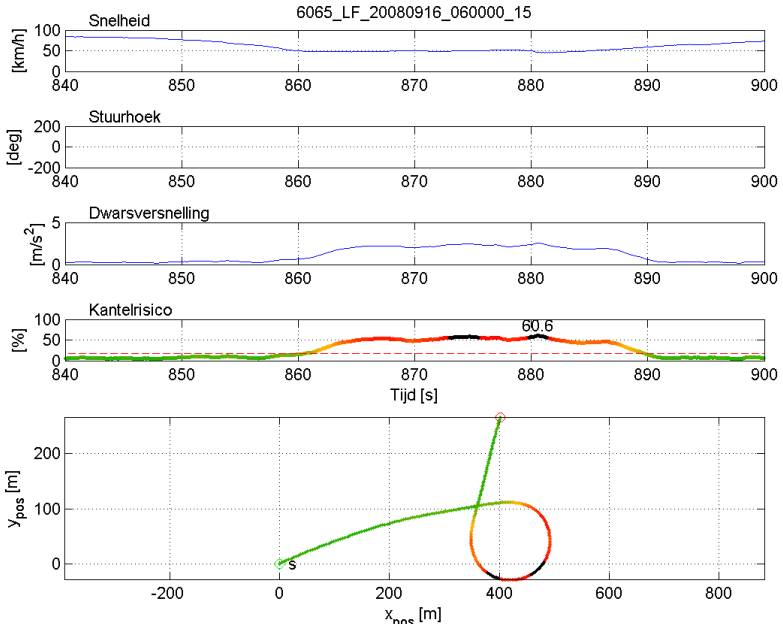
- **Performed:**
  - Test track tests with all APS
  - Practice test with fully instrumented vehicle
  - Calibration of rollover detection algorithm (RPAS)
    - Roll over risk calculated with max lateral acc/critical lateral acc

Rollover Propensity Assessment System calibrated and used for estimation of roll over risk



Results with single vehicle

- Practise test: 5 weeks, 4 transport firms, 7400 km, 6849 minutes
- Critical lateral acc depends on e.g. mass and CoG, is determined very well with RPAS algorithms
- Infrastructure has a major influence on roll over risk



Conclusion ??

- **For trucks: Increased safety and reduction of congestion by using driver assistance technology; dream or reality?**
  - No real answer yet
  - In about a month, data analysis will be done….

  - Largest truck FOT with safety systems
  - Positive responses from drivers
  - Truck drivers are well aware of the risks like roll over
  - Essential for success: support from many parties: transport companies, transport organisations, general public…