What is ADAS?

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What is ADAS?

- Introduction
- The need for ADAS
- Main elements of a typical ADAS
- Example of ADAS, today and tomorrow
- How can ADAS be used in urban freight solutions?
- Conclusions
ADAS
Advanced Driver Assistance Systems

ADAS are characterised by all of the following properties*:

- support the driver in the driving task
- provide active support for lateral and/or longitudinal control with or without warnings
- detect and evaluate the vehicle environment
- use complex signal processing
- direct interaction between the driver and the system

With respect to the well-known categories of driving tasks, ADAS are focussing on the manoeuvring level.

*Ref: Code of Practice for the Design and Evaluation of ADAS, Response3
Why ADAS? Situation of today (1/2)

- ~40,000 people die in European traffic every year
- Traditionally the driver is considered to cause, or partially cause of 90% of all accidents
- The problem is often a mismatch between driver – vehicle - traffic environment
Why ADAS?  
Situation of Today (2/2)

Increasing emphasis on **safety**
- ADAS create possibilities of avoiding accidents, not only minimising the consequences

Increasing emphasis on **environment**
- ADAS in combination with alternative drivelines and new materials enable cleaner transport

Higher demands on increased **productivity**
- ADAS is one enabler to efficient use of the road network
- Use of in-vehicle information systems and mobile devices made safer through ADAS
Driving Task Hierarchy

Environment
- Road Net
- Driving Space
- Road Surface

Driver
- Navigation Level
- Manoeuvring Level
- Stabilisation Level

Vehicle
- Lateral / Longitudinal Dynamics

Character. Time
- >10 sec.
- 1-10 sec.
- < 1 sec.
Maneuvering level actions

Perceive the situation → Decide what to do → Perform action
Maneuvering Level Support

Perception layer → Decision layer → Action layer

Threat assess. & functions
Lane Keeping Aid
Collision Warning
Brake Assist
Curve Speed Warn.
...

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Adaptive Cruise Control - ACC

- The truck/car itself controls the distance to the vehicle in front
  - by reducing the throttle
  - by activating braking systems

- If more braking power is needed, the driver receives a warning
Example of ADAS

- VTEC_PReVENT_ITST20070629.avi
The Urban Environment
Urban Freight Solutions and ADAS

- Intersection Assistance
- Attention Support
- Collision Avoidance
- Stop & Go
- Pedestrian Detection
- Start-Inhibit
- Load and Noise Restrictions
What is ADAS?

- A link between the driver, the vehicle and the traffic environment

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ADAS in the Urban Environment

- With a few exceptions ADAS development has been focused on non-urban environment.
- The urban environment introduces new challenges including pedestrians, narrow lanes, environmental zones etc.
- The urban environment introduces different requirements on sensors than the highway scenario.
- New challenges and new possibilities!