

## **PRESS RELEASE**

Leidschendam, 3<sup>th</sup> January 2008

### **Road users quite good at compensating for unexpected behaviour**

During each car journey you are likely to encounter risky situations, but they generally end well. This has little to do with miracles, but everything with the expectations (motorized) road users have about each other in traffic situations. SWOV's Maura Houtenbos discusses this issue in her PhD thesis entitled [Expecting the unexpected](#) which she will defend on January 8th 2008 at Delft University of Technology. Her findings are important for the development of Advanced Driver Assistance Systems (ADAS) that can provide support for the communication between road users. Because the better the communication, particularly in unexpected situations, the safer traffic will be.

#### **Unexpected not always unsafe**

The results of the study show that expectations are important for the safe development of encounters between road users on intersections. Two factors were of specific interest: uncertainty about the other road user's behaviour, and the time and space which is available to react to the other's behaviour: the interaction space.

It is remarkable that other road user's unexpected behaviour doesn't necessarily result in an unsafe situation. The encounters usually end well because drivers compensate for the other road users's deviant and unexpected driving behaviour. If, for example, a driver does not receive right of way, he just brakes himself. Drivers, for that matter, do not seem to be very aware of this mechanism.

#### **More interaction space, fewer critical situations**

The study also investigated what happens when the interaction space increases, for example by improving visibility of the intersecting road or by providing extra in-vehicle information. In the latter case beeps and flashing lights were used to provide drivers with information about the direction and the speed of traffic on the intersecting road. This information was not only considered to be useful, but also to facilitate the driving task. The extra information did not seem to influence the decision of whether or not to yield. An increase of interaction space led to fewer cases of hard braking and fewer "near misses". Drivers who were often involved in near misses, generally tended to release the throttle later when approaching an intersection.

#### **Background**

A better understanding of all aspects of interactive driving behaviour is indispensable for developing Advanced Driver Assistance Systems (ADAS) that can assist drivers in safe interactions with other road users. Houtenbos' PhD research increases the understanding of the characteristics and the course of the interaction process between drivers, especially at intersections. For her study she developed a new research method that made it possible to investigate how road users generally tune their driving behaviour to each other and the what role expectations play in the process. The new method consists of linking two driving simulators in which two participants can react to one another. This makes detailed study of interactive behaviour possible. Traditional driving simulators use programmed behaviour of other road users which limits the understanding of the interaction process. Linking two simulators has shown to be a promising method for systematic and intensive study of interactive traffic behaviour.

## **Approach**

Houtenbos has made an attempt to develop a theoretical model which describes the information processing by multiple drivers in the interaction process. The role of expectancy has explicitly been included in the model.

Next still pictures and video fragments were used to investigate which aspects drivers mention when they are asked about their expectancies at intersections. These aspects fell into three main categories:

- right of way;
- other road users;
- the location of other road users.

Subsequently two simulator experiments were used to investigate how expectancy influences the way encounters are dealt with. Expected as well as unexpected situations were simulated.

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## **PhD ceremony**

Maura Houtenbos (1977) will defend her PhD thesis on Tuesday January 8th at Delft University of Technology. Prof.dr. A.R. Hale and prof.dr.ir. P.A. Wieringa are her tutors. The research was part of the BAMADAS (Behavioural Analysis and Modelling for the Design and Implementation of Advanced Driver Assistance Systems) project which was financed by NWO and Connekt, and was carried out at Delft University of Technology and SWOV.

Maura Houtenbos studied Cognitive Psychology at VU University Amsterdam. During her graduate training at TNO Soesterberg she was introduced to applied psychology in the field of traffic. In 2002 she began her PhD research at Delft University of Technology and also started work as a researcher at SWOV.

Her PhD thesis entitled Expecting the unexpected: A study of interactive driving behaviour at intersections is available in its entirety [at the SWOV website](#).

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## **More info:**

Further information can be obtained from SWOV's Information & Communication department, E: [persvoorlichting@swov.nl](mailto:persvoorlichting@swov.nl), T: +31-70-317 33 18.

## **About SWOV**

The Institute for Road Safety Research SWOV has been conducting fundamental and anticipatory road safety research for more than 45 years, and is the main Dutch road safety knowledge and information centre. SWOV aims at improving road safety by using research results. More information about SWOV is to be found on our website [www.swov.nl](http://www.swov.nl).