Human Machine Interface And the Safety of Traffic in Europe
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Workshop Brussels 22.03.2005

- *HMI and Safety-Related Driver Performance* -

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Introduction

On March 22 2005 a final workshop was held at the Volvo premises in Brussels to convey the main results of the project and to invite discussion from the audience. The one-day workshop was opened by the DG-TREN HASTE project officer, Bipin Radia. At the workshop presentations on the HASTE project results were given, two invited speakers addressed the audience, and a round table discussion concluded the day. Chairman was Robert Gifford from PACTS (Parliamentary Advisory Council for Transport Safety, London, UK).

All the presentations can be found in the powerpoint file (presentations.ppt)

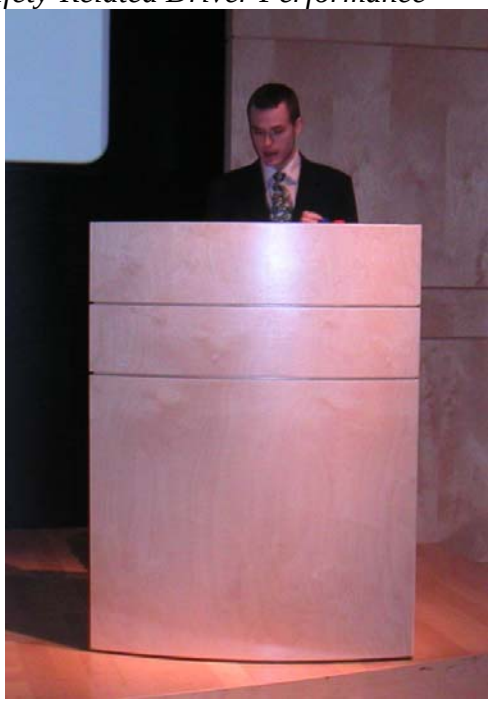
Morning sessions

Rob Gifford, PACTS (Chair)
Opening

Bipin Radia, DG-TREN HASTE Project Officer
Welcome

Oliver Carsten, ITS Leeds (HASTE)
What should criteria for in-vehicle HMI be like?

Joakim Östlund, VTI Sweden (HASTE)
WP2: HMI and Safety-Related Driver Performance



Discussion

Question: Why is the HASTE focus only on negative effects, what about advantages of In-Vehicle Information Systems (IVISs), e.g., a route navigation system is probably much safer than consulting a paper map while driving
Answer: The HASTE baseline, benchmark, is driving without the system, not a control condition with another potential distracter. However, you could use the test regime also for this type of condition, since the assessment method is independent of the device. The goal is to enable comparisons to be made of one IVIS against another, and to be able to select the better design. The HASTE evaluation should promote good design.

Question: How about the trade off between the primary (driving) task and performance on the secondary (IVIS) task? One would expect participants to be eager to perform well on the secondary task
Answer: The instruction was to drive safely, which they did. The S-IVIS (Surrogate IVIS) in the most difficult condition *had* to be demanding, but participants could prioritise their tasks.

Question: Do the gaze results reflect a tunnel effect in information uptake or could participants just be staring blankly?
Answer: In field experiments it was found that drivers miss speed limit changes, which could reflect a narrowed view. The effect is very relevant, in particular it was found in conditions whilst participants were performing the (non-visual) cognitive task.

Question: What is known about the relation between operating IVISs and accidents?
Answer: there is an indirect relation. Relationships have been shown between increased swerving (SDLP) and the increased chance of being involved in an accident, as the relationships between speed and accidents have been shown. Increased steering activity could be an indirect indication of trying harder. There is not one measure that tells it all, and one should evaluate results on a number of measures and then combine this information.

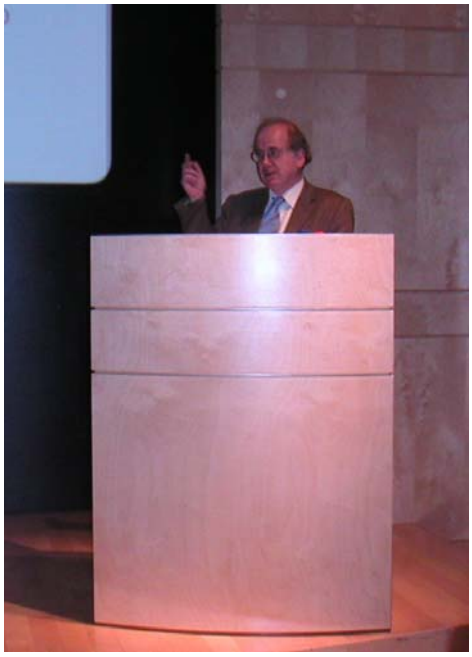
Question: Were the S-IVIS tasks practiced?
Answer: yes they were, and static (single task) performance was assessed both on the S-IVIS task, and on driving only.

Emma Johansson, VTEC Sweden (HASTE)

WP3, Validation of the HASTE protocol specification

Wiel Janssen, TNO Soesterberg (HASTE)

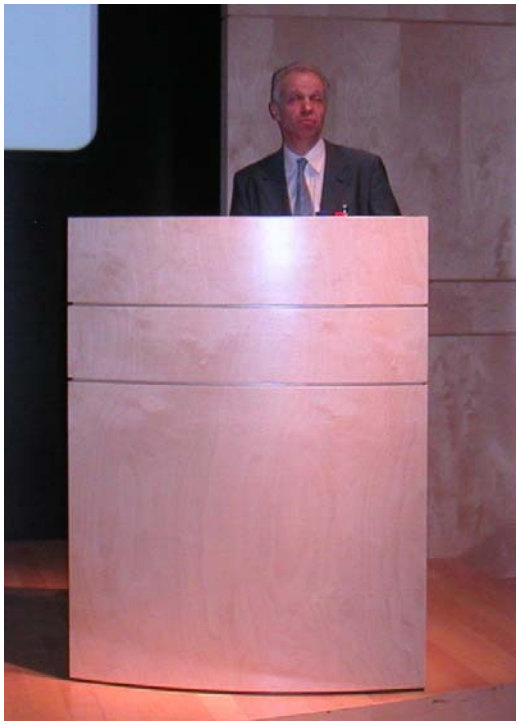
From results to regime: What have we learned?



This presentation can be found as PowerPoint print out in the section “presented material” at the end of this report.

Oliver Carsten, ITS Leeds (HASTE)

What could happen to the HASTE regime



Discussion

Question: were any stakeholders/car manufacturers (other than Volvo) consulted?
Answer: no, only within this and other consortia like the ADAM consortium. Results have been exchanged with CAMP.

Question: The rural road in the simulator is recommended for tests. Why is a closed track test not considered, as this can be a safe testing environment, and tests have high validity.
Answer: There is nothing against closed-track testing, but due to there being a lower experimental control (more variability) one would need more participants to obtain meaningful results on closed track tests. Also, the interaction with other traffic has to be set up, and in a simulator this is (repeatedly) available and under control!

Question: Pass/fail criteria are missing in HASTE, but they exist in the US guidelines. Why are these not included?
Answer: HASTE provides the tools to obtain an estimate of the change in risk due to operating an IVIS. For instance: operating a device may give a 10% higher risk of getting off the road. Its use is planned to be analogous to consumer organisation tests: i.e. to provide a number of plusses and minuses for safety risks. To end up with recommendations similar to the NCAP stars requires more steps, which will be taken, such as giving weights to these sub ratings. It would be good to have a P-NCAP (Primary-NCAP) rating on safety that is as much in demand as the crash NCAP ratings.

All car manufacturers wish to obtain four of five stars only, and they advertise with it. The idea is to go down a similar road to NCAP, and to become popular with the public. However, it should not be forgotten that it has taken NCAP 10 years to obtain the position it now has.

Question: Can the HASTE evaluation process be applied to future systems?
Answer: yes it can, it is not device dependant. If a future system is developed that makes use of haptic feedback it can be tested with this regime. All sorts of haptic systems might emerge, such as a buttock feedback system (the buttock is currently a “free channel”)!

Afternoon speakers

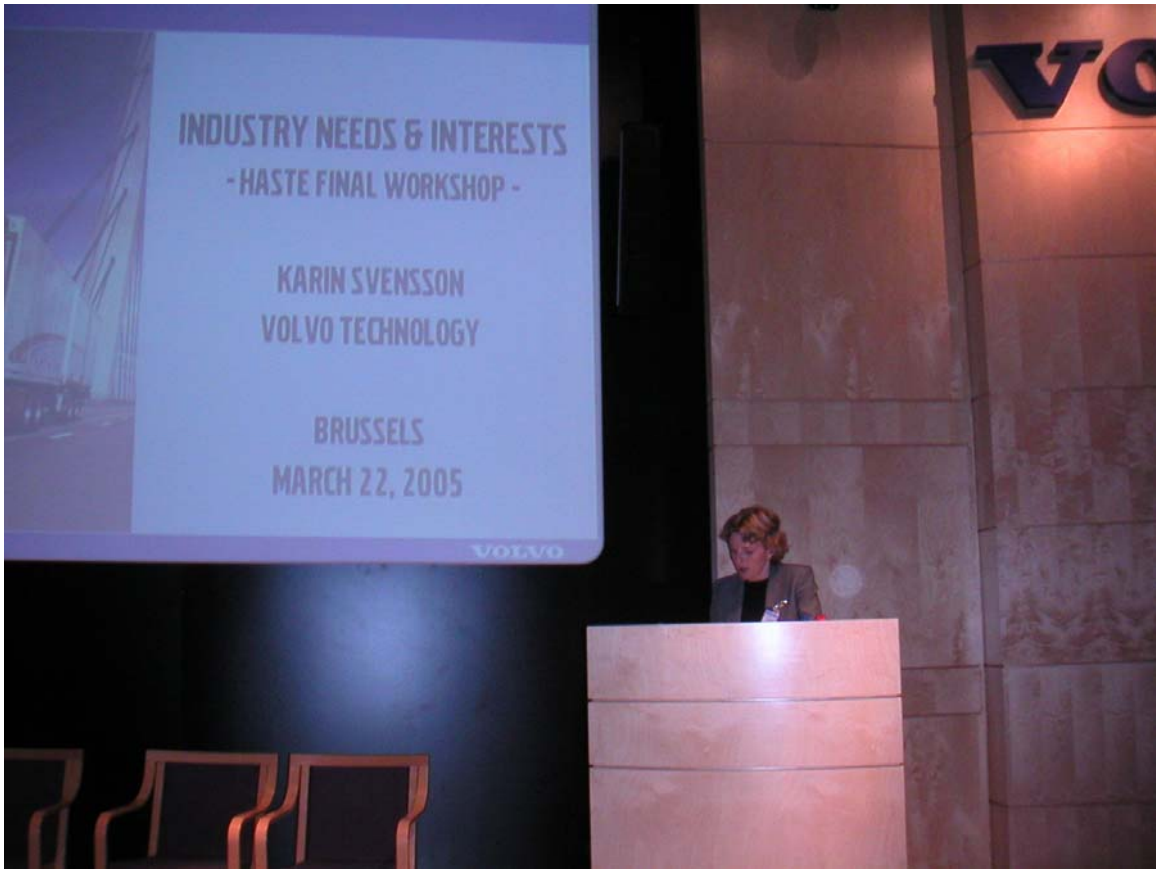
Mrs Anu Lamberg, Ministry of Transport & Communication, Finland
HASTE - Finnish experiences,
Driver's HMI and Government's role

Discussion

Remark: Sometimes it is much better to suppress information. A "windscreen washer low" message can be very disturbing in busy traffic.

Mrs Karin Svensson, Volvo Technology, Sweden

Industry needs & interests



Round table discussion

The audience is very much looking forward to the HASTE deliverables and documents, which are or will be all in the public domain very soon. Also, the S-IVIS tasks are not confidential, on the contrary, they have been given to other projects and will be used in other experiments.

HASTE evaluation does not frustrate innovation by regulations, but stimulates innovation and the better design! The discussion continued on the "NCAP-route" that HASTE should follow. HASTE is similar in the sense that one can see that one product (IVIS) is better than the other, and how it affects certain measures. Adding weights to these effects has not been done yet. An additional parameter is the frequency a certain option is used. If the use of an IVIS option is critical to safety but hardly ever used this should be taken into account, just as a frequently used option should receive more weight. It is estimated that it will take 12-18 months to make significant progress in the direction of a toolkit and P-NCAP evaluation. Funding to enable these steps, however, is uncertain. First the final report should consolidate the results and open the dialogue with stakeholders, in particular car manufacturers.

The relationship between accidents and IVIS use was raised again. In Germany the number of IVIS has increased, while the number of accidents has decreased, and that makes it difficult to believe that IVIS can be a threat to traffic safety. Assessing a relationship between IVIS use and accidents is difficult, e.g. a technique used as by Redelmeier & Tibshirani[1] could shed some light on the issue, but it will be difficult as most operation of devices is not logged, and questioning after an accident is prone to a "self-protection" bias. Also, finding no relation between an increased number of IVIS and a reduction of accidents may also be due to other measures taken, such as increased vehicle safety (crash zones, ABS, et cetera).
HASTE uses the precautionary principle, it is better to prevent accidents by encouraging good design than to wait for accidents to happen with bad systems and then establish a relationship between the two. In other words, promote the better design, give those products a market advantage and stay ahead of accidents. The HASTE process is technology independent. It establishes effects of IVIS on *driving*, with a positive look, a focus on allowing and innovation.
A discussion about the use of black boxes arose, which eventually may provide data on these issues. DG TREN has awarded a project to a large consortium on this subject that will focus heavily on the legal issues, and on who has access to data.

In the "100 car study" in the USA it was concluded that visual distraction is the only problem as no proof of cognitive distraction was found. The HASTE experiments have shown that this conclusion is too simplistic. In some of the HASTE studies it was shown that a cognitive task can be very demanding and created a heavy mental load, the example of the elderly drivers approaching a zebra crossing in Helsinki was mentioned.

[1] Redelmeier, D.A. & Tibshirani, R.J. (1997). Association between Cellular-Telephone Calls and Motor Vehicle Collisions *New England Journal of Medicine, 336,* 453-458

Finally it was stressed that from the literature it is known that there are relationships between behaviour and risks. Relationships between speed, speed variance, lane keeping, headway keeping and accident risk have been found and described. Changes in risk as a result of operating an (S-)IVIS as found in many HASTE studies therefore certainly say something about the changed chances of being involved in an accident.

It is hoped that the HASTE process will not end with the end of the project and some publications, but that the tools developed will be used and that the test regime will evolve into something like a P-NCAP evaluation contributing at a European level.

More about HASTE can be found at: http://www.its.leeds.ac.uk/projects/HASTE

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Presented material