

FEHRL

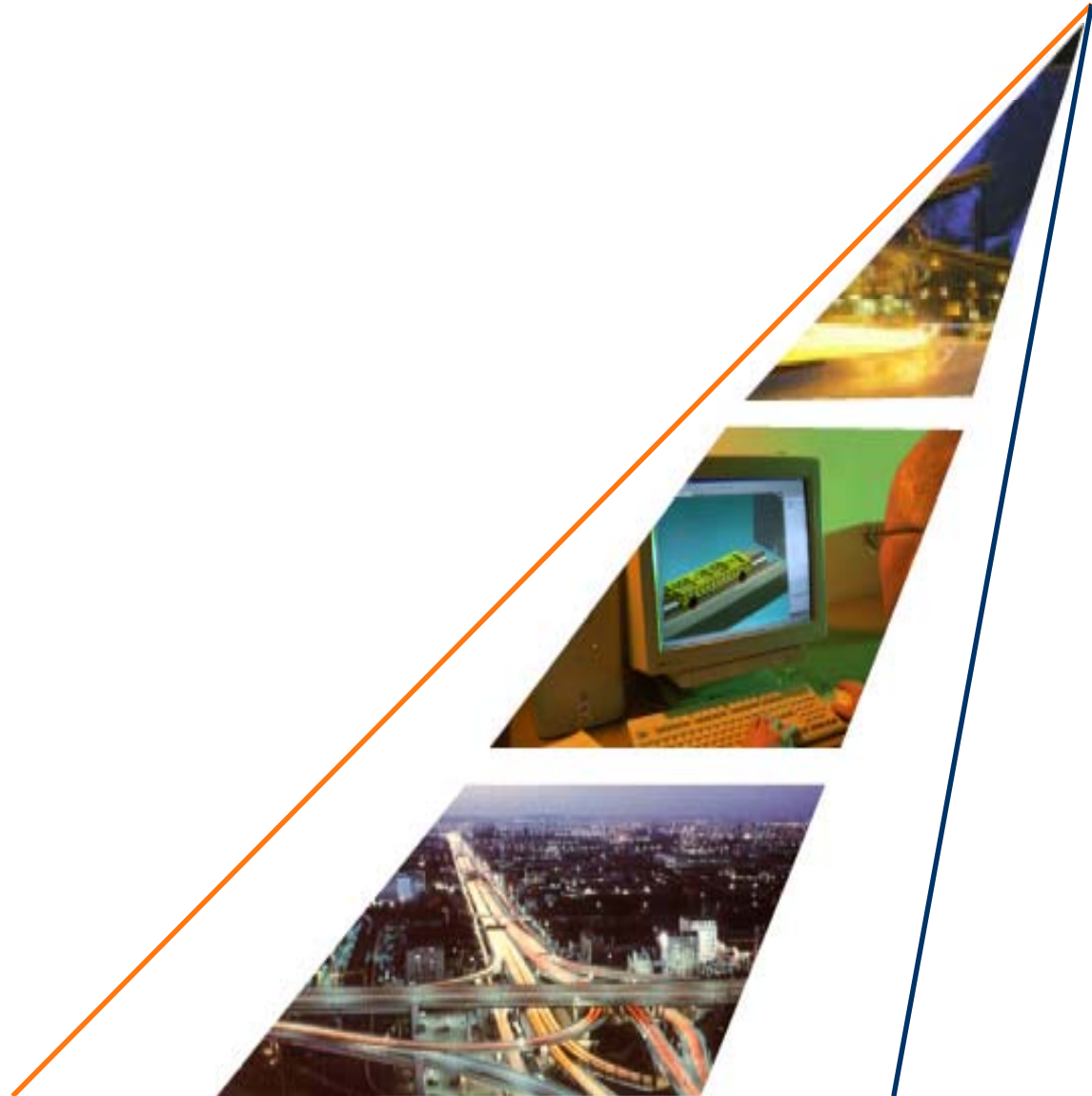
vti

HeavyRoute

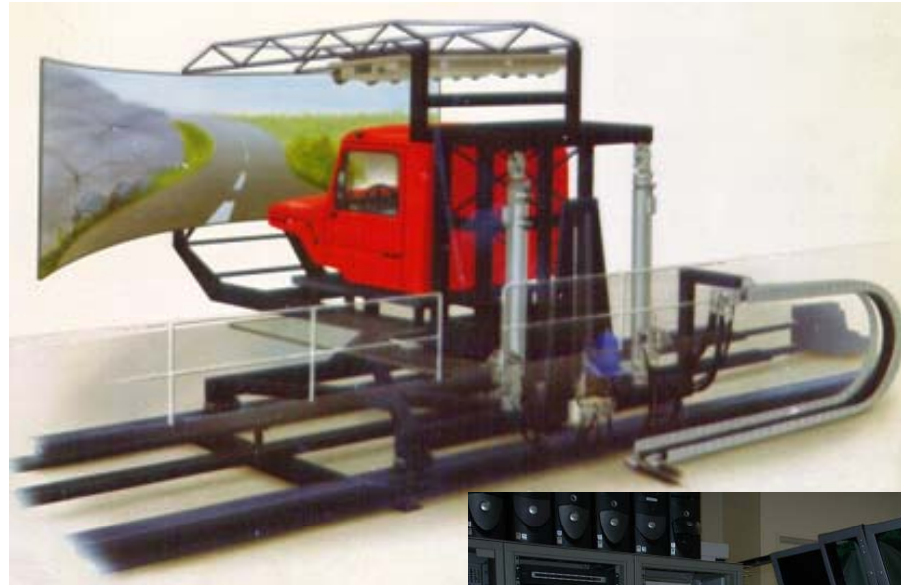
Driving simulator study

The logo for HeavyRoute, featuring a stylized blue graphic of three curved lines above the word "HEAVY" in a bold, blue, sans-serif font, with the word "ROUTE" in a similar font below it.

**HEAVY
ROUTE**



Which HMI has the greatest potential to lead to safe driving?

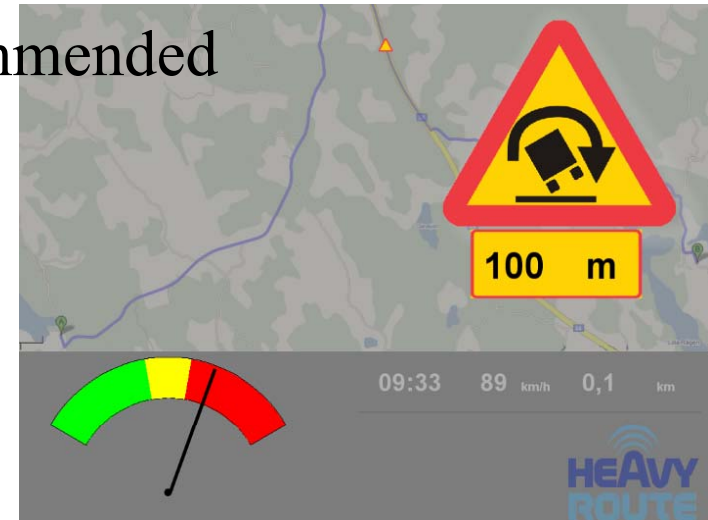


Displays

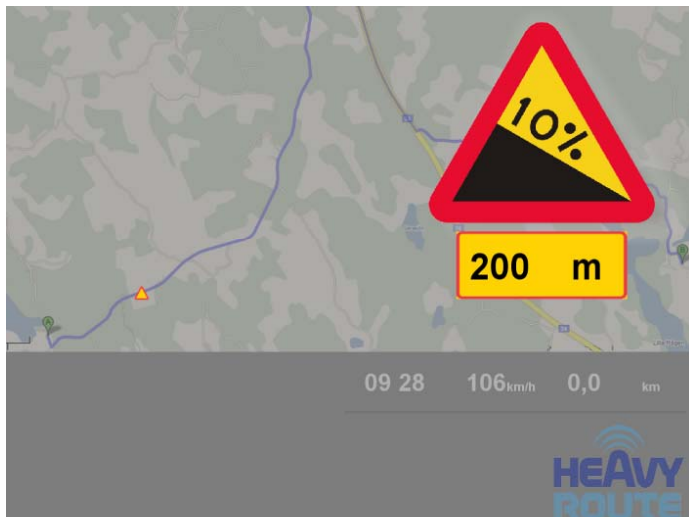
Roll-
over
risk



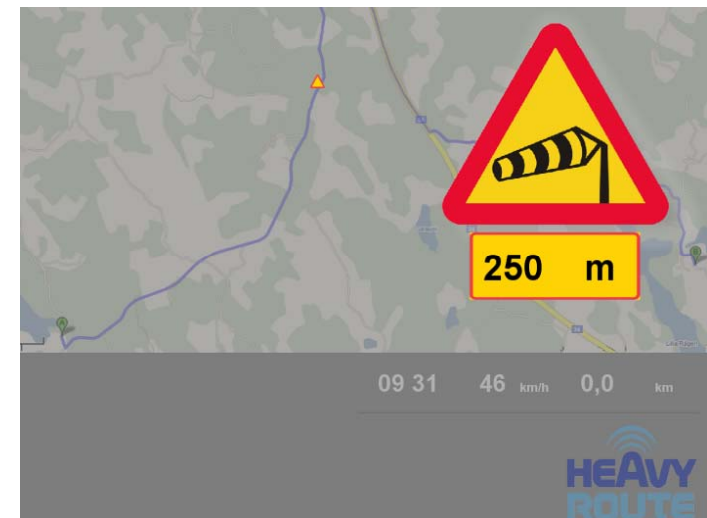
Recommended
speed



Steep
Slope



Strong
wind



Driver nr	M/F	IE/E	Timing	Part 1		Part 2		Part 3	
				Type	Road	Type	Road	Type	Road
1	M	IE	1	0	A	1	B	1+2	C
24	F	E	2	1+2	C	1	B	0	A

Timing:

1 – 8 s

2 – 5 s

Type:

0 – no warning

1 – symbol

2 – recommended speed

Road:

A: C – S – C – W

B: C – W – S – C

C: W – C – S – C

Speed (mean and variation)

Lateral position (mean and variation)

Lateral acceleration

Acceleration/retardation

Use of brakes

Steering wheel angle

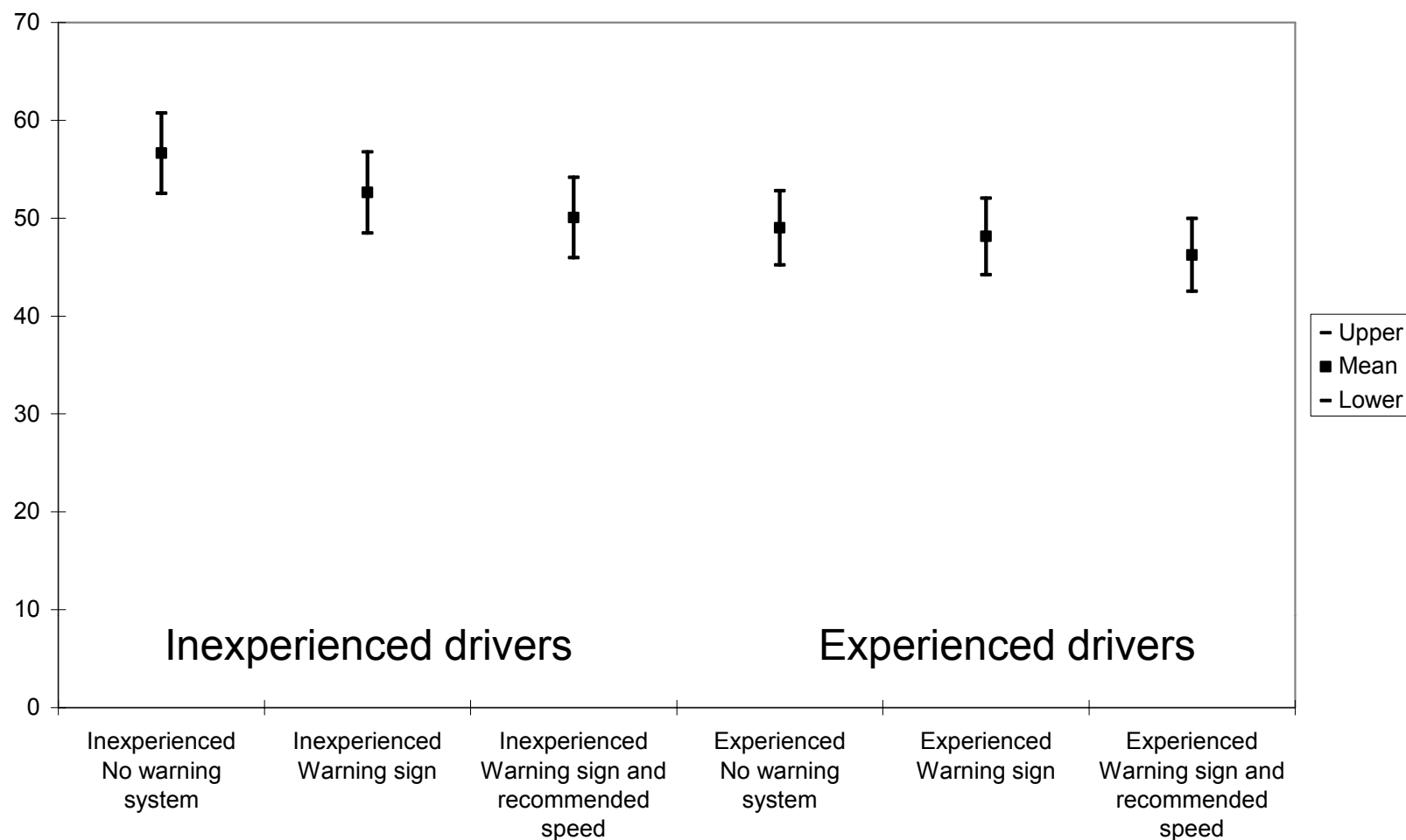
View from inside the truck



View from inside the truck cabin



Mean speed (km/h) when entering the curve



Inexperienced drivers

- significantly higher speed without warning system than with a warning sign
- no significant effect to add recommended speed to the warning sign

Experienced drivers

- significantly higher speed without warning system than with warning sign in combination with recommended speed
- no significant difference without system and only a warning sign
- no significant effect to add recommended speed to the warning sign

Questionnaire

1. What is your **attitude** towards the roll-over warning system that you have tested?

Very negative 1 2 3 4 5 Very positive

2. How **useful** did you find the roll-over warning system?

Not useful at all 1 2 3 4 5 Very useful

3. What is your opinion on the **timing**?

Much too late 1 2 3 4 5 Much too early

4. How much did you **rely** on the roll-over warning system?

Not at all 1 2 3 4 5 Completely

5. How much do you think the following factors would be influenced by having a roll-over warning system?

great decrease		no change		great increase
1	2	3	4	5

- A Traffic safety
- B Your comfort
- C Your attention
- D Your travel time
- E Your stress level

6. Can you see any risks with a roll-over warning system?

YES

NO

If yes, describe:

Conclusions

- Drivers of HGV's are positive towards having warning systems. It is assumed to have a **positive influence on safety**, but no great influence on driving comfort, driver attention and travel time.
- Drivers **adapt their speed better to critical situations**, in particular in situations with sharp curves where there is a risk for roll-over if entered at too high speed.
- It is **sufficient to show a warning symbol**, although inexperienced driver prefer a recommended speed.
- It is important that the warning is given at a timing that gives the driver **sufficient time to respond to the warning and adapt the speed**. Even the longest timing in this study, 8 s, was considered too short.

Useful route guidance functions

	Minimum	Mean	Maximum
Accessible route	1,0	1,9	5,0
Fastest route	1,0	2,6	6,0
Least fuel consumption	1,5	3,5	6,0
Shortest route	1,0	3,6	6,0
Least environmental impact	2,0	4,3	6,0
Least infrastructure damage	2,0	5,1	6,0

Result: Timing 8 s + warning sign only

