# Understanding human behavior in traffic and accident reduction

*-a driver simulator study with elk and wildlife accident measures*

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# Background

VTI (old) projects involved elk collisions and elk in the driver simulator.

Current VTI projects:

- **Driver simulator study**
- **Review of road environment changes to reduce wildlife accidents**
- **Elk in car collision experiment**

# Understanding human behavior in traffic and accident reduction involving wildlife

- Studies on animal behavior and trends in wildlife accidents
- Research on human behavior: driving & wildlife occurence. Not so much explored

## Humans and vehicles

- Speed is crucial for traffic safety
- Stress can be monitored by HRV (heart rate variability, i.e.”ECG”)
- Eye-tracking

# Understanding human behavior in traffic and accident reduction involving wildlife

Field excursion to areas with high amounts of wildlife accidents together with police and hunter.

Discussions with *the Swedish National Wildlife Accident Council.* They suggested to include:

- Radiosignals (new measure in Sweden)
- Wildlife warning signs
- Speed cameras

# Road 34, outside of Linköping.

**Site characteristics:**

- Agricultural land + forest islands on both sides =optimal as a wildlife crossing

- Mixed forest (birch & oak)

- Attractive agricultural crops (rapeseed attracts deer in early season)

# Road 34, outside of Linköping.

**Site characteristics**

Clearcutting due to Erwin/Gudrun (Jan 2005)

- Attractive forage

# Road 34, outside of Linköping.

**Site characteristics:**

- Elk path and forest roads

# Understanding human behavior in traffic and accident reduction involving wildlife

Using a driver simulator we wanted to investigate:

1. Driving behavior when experiencing: wildlife warning signs, speed camera, elk, direct radio warning, forest/open vegetation and wildlife fence (alone and in combinations)

2. Are there differences in driving behavior between men/women?

3. How do the test subjects feel about the wildlife measures?

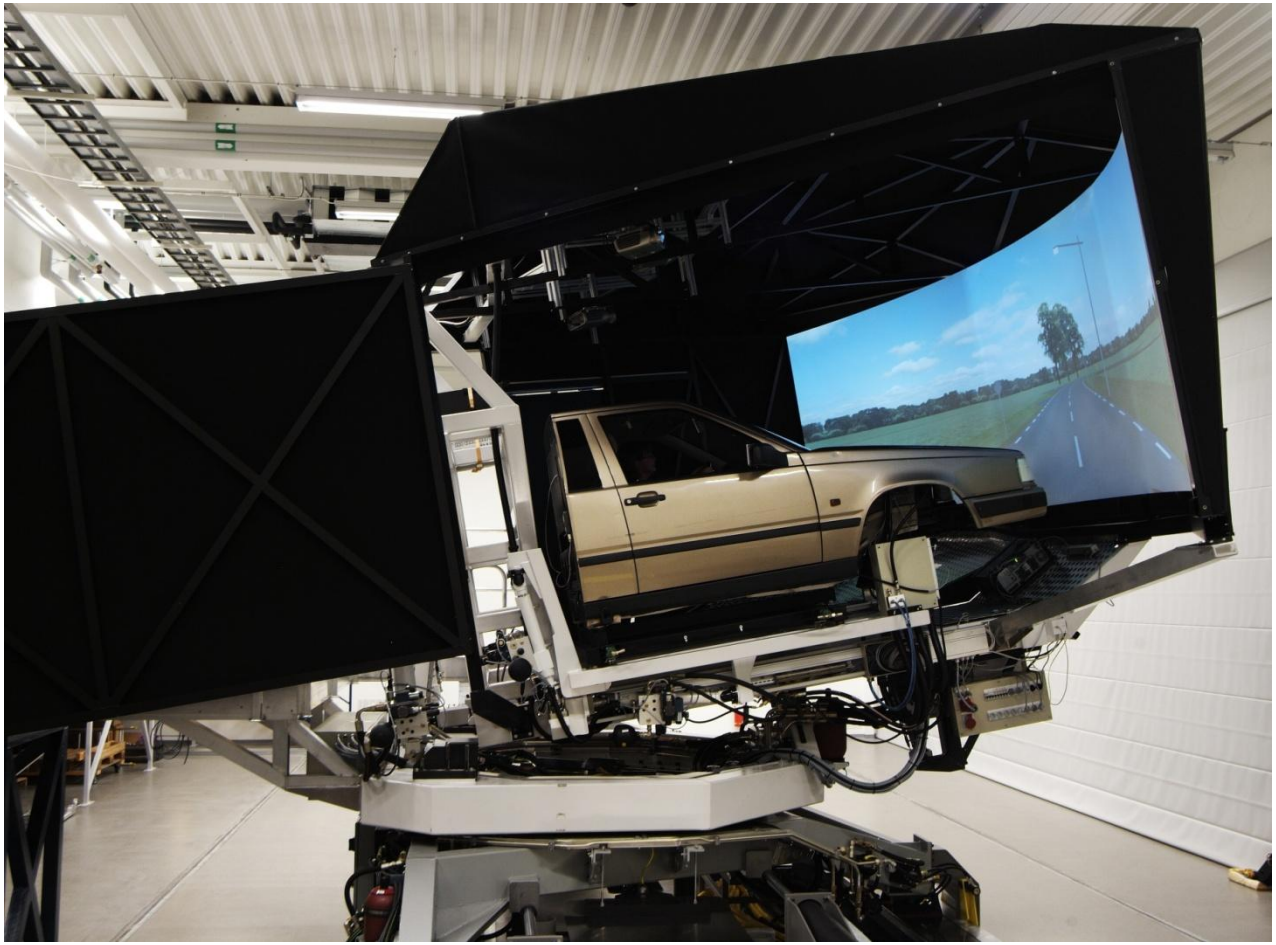
# Methods

**SIM III was used**

25 test subjects
(10 men)

Driving time approx. 1 h

# Methods



## Measurements

- vehicle speed
- eye tracking
- HRV (heart rate variability)

- And a questionnarie

# Methods

Every test subject drove 8 x 4 roadsegments that had a combination of different factors present or not present, in a factorial design.

# Speed camera and closed forest

# ”Wildlife fence”

# Warning sign

# Radio warning

# Elk

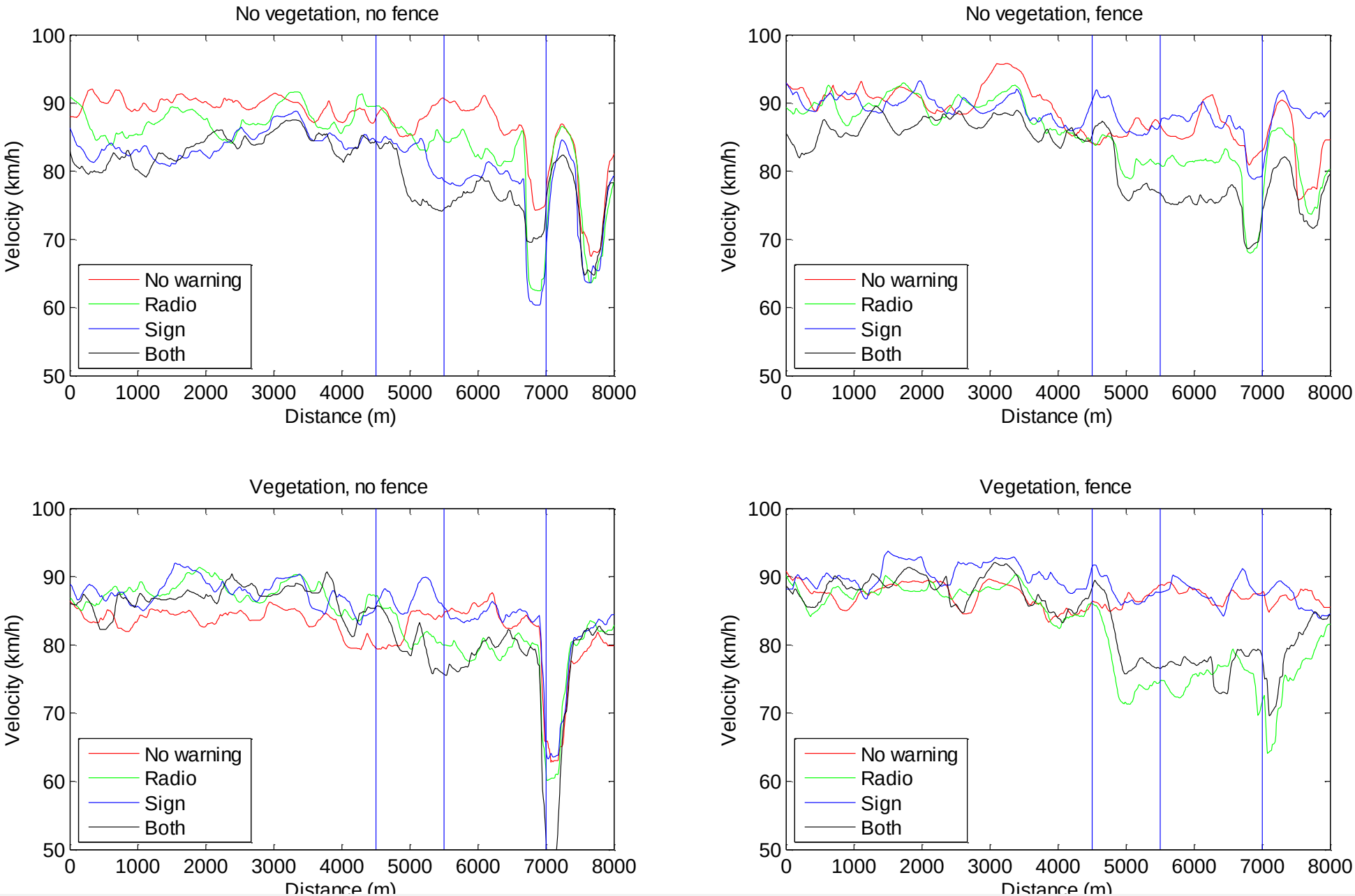



**Figure 1: Velocity profiles for the entire trip for different warning modalities. The vertical blue lines represent the time instant of the radio message (distance = 4500 m), the warning sign (distance = 5500m) and the approximate time instant of the moose event (distance = 6500m).**

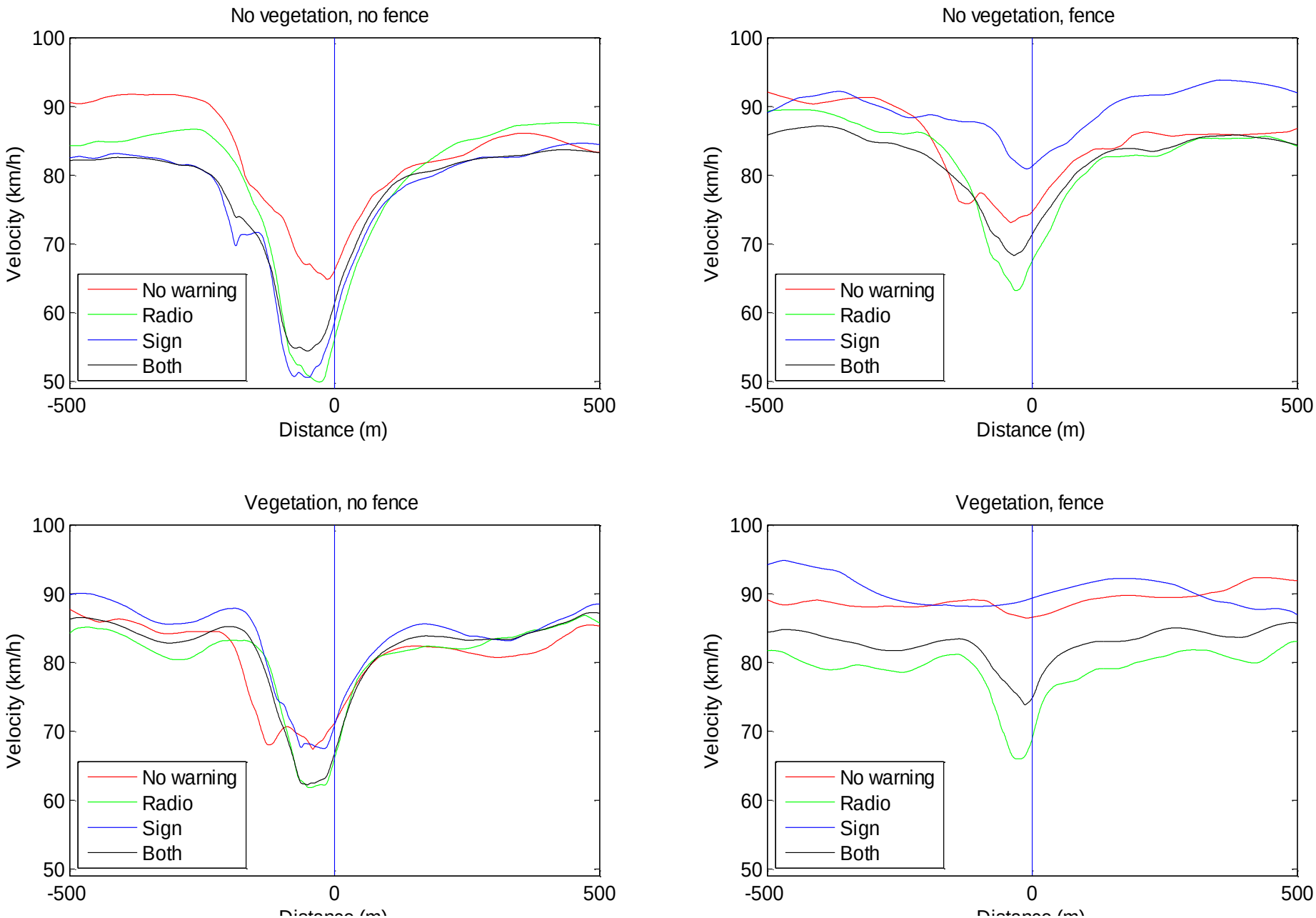



Figure 2: Velocity profiles surrounding the elk event (blue vertical line) for different warning modalities.

# Thanks!

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