



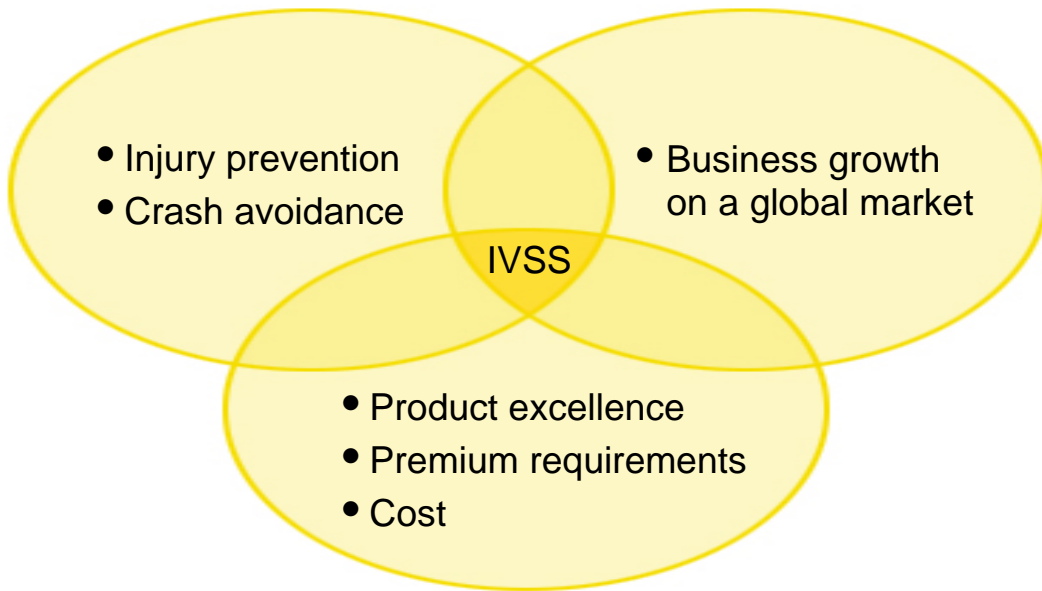
UPPÅT

IVSS Project Report

# The IVSS Programme

The IVSS programme was set up to stimulate research and development for the road safety of the future. The end result will probably be new, smart technologies and new IT systems that will help reduce the number of traffic-related fatalities and serious injuries.

IVSS projects shall meet the following three criteria: road safety, economic growth and commercially marketable technical systems.



**Three interacting components** - for better safety, growth and competitiveness:

## **The human being**

Preventive solutions based on the vehicle's most important component.

## **The road**

Intelligent systems designed to increase security for all road users.

## **The vehicle**

Active safety through pro-active technology.

Title of the report: UPPÅT - Uppföljning av åkeriers trafiksäkerhet

Author: Magnus Hjälmdahl (VTI), Tania Dukic (VTI), John Pettersson (Vehco)

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Contact person: John Pettersson (Vehco), [john.pettersson@vehco.se](mailto:john.pettersson@vehco.se)

# Table of contents

<b>1. Summary.....</b>	<b>6</b>
<b>2. Swedish summary .....</b>	<b>7</b>
<b>3. Introduction.....</b>	<b>8</b>
<b>4. System overview .....</b>	<b>9</b>
<b>5. Method .....</b>	<b>11</b>
<b>6. Results .....</b>	<b>11</b>
<b>7. Conclusions.....</b>	<b>12</b>
<b>8. Publications and attachments .....</b>	<b>12</b>



# 1. Summary

During the last 10 years, about 100 people are annually killed in crashes in which heavy trucks are involved, this makes traffic with heavy goods vehicles to one of the major traffic safety problems in Sweden. The Road Traffic Inspectorate expects that about 3-4 times more people are killed per driven kilometre for heavy goods vehicles compared to passenger cars or light trucks. Studies of speed behaviour has shown that truck drivers are worse than car drivers to keep the speed limit. Another safety issue related to heavy traffic (even though to a lesser extent than high speeds) is that the use of seatbelt is low among truck drivers.

This project aims to study whether truck drivers speed and seatbelt usage can be improved using an ITS<sup>1</sup> platform, combined with knowledge and motivation. To study this, a field operational test including eleven hauliers been carried out. The ITS platform includes an ISA-function with different user interfaces, an advanced seatbelt warning and a logging function. The aim was to see how well the monitoring worked in changing behaviour.

The results from this project shows that the so called predefined user interface had the largest effect; reducing the average speed on 90 km/h roads from around 78 km / h to 74 km / h. Unfortunately this system had the lowest acceptance and already after a few weeks there where demands from the hauliers to make it less annoying, it turned out that drivers complained too much about it.

Another positive result of this study where that the drivers after all, was quite positive to have their driving monitored and did not see it as a problem that their managers or colleagues could see how they where driving, a fear was otherwise that they would feel supervised and have their integrity violated. This was thus not a major problem.

The conclusion is that the technology is mature to be used on a larger scale, the drivers are susceptible to the technology but lack the motivation to use it. There is also interest from shippers and hauliers to use and partly pay for the technology. However, there are a number of barriers that prevent the technology from being used on a large scale and it is likely that some sort of incentive from the authority is needed to boost the market. The project recommends that it is investigated how market conditions for road safety measures for hauliers can be improved.

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<sup>1</sup> ITS: Intelligent Transport System

## 2. Swedish summary

Under de senaste 10 åren har ca 100 personer årligen omkommit i kollisioner där tunga lastbilar är inblandade; detta gör lastbilstrafiken till ett av de större trafiksäkerhetsproblemen i Sverige. Vägtrafikinspektionen räknar med att det omkommer ca 3 – 4 gånger fler personer per körd kilometer med tung lastbil jämfört med personbil eller lätt lastbil. Mätningar av hastighetsbeteende har visat att lastbilsförare är sämre än personbilsförare på att hålla hastighetsgränsen. Ett annat säkerhetsproblem i samband med tung trafik (om än i mindre omfattning än höga hastigheter) är att användningen av bälte är låg bland lastbilschaufförer.

Det här projektet syftar till att studera om lastbilschaufförers hastighetsanpassning och bältesanvändning kan förbättras med hjälp av en ITS-plattform kombinerat med kunskap och motivation. För att studera detta har ett fältförsök med elva åkerier inblandade genomförts. ITS-plattformen innefattar bl.a. en ISA-funktion med olika användargränssnitt, en avancerad bältesvarnare samt en loggningsfunktion som möjliggör uppföljning på beteende.

Resultaten från projektet visar att det förbestämda gränssnittet hade den största effekten då medelhastigheten på 90-väg sjönk från ca 78 km/h till 74 km/h. Tyvärr hade detta system den lägsta acceptansen och redan efter ett par veckor kom krav från åkerierna på att göra systemet snällare; det visade sig att förarna klagade alldeles för mycket på det.

Ett positivt resultat i den här studien var att förarna trots allt var ganska positiva till uppföljningen och få såg det som ett problem att deras chefer eller kollegor kunde se hur de kört; en farhåga var annars att de skulle känna sig övervakade och integritetskränkta vilket alltså inte var något större problem.

Slutsatsen är att tekniken är mogen att användas i större skala, chaufförerna är mottagliga för tekniken men saknar motivation att använda den. Det finns även intresse från transportköpare och åkerier att utnyttja och till viss del betala för tekniken. Det finns dock ett antal spärrear som hindrar att tekniken börjar användas storskaligt och det är troligt att någon sorts incitament från myndighetens sida krävs för att sätta fart på marknaden. Projektet rekommenderar att man från myndighetshåll vidare utreder hur marknadsförutsättningarna för trafiksäkerhetshöjande åtgärder för åkerier kan förbättras.

### 3. Introduction

During the last 10 years, about 100 people are annually killed in crashes in which heavy trucks are involved, this makes traffic with heavy goods vehicles to one of the major traffic safety problems in Sweden. The Road Traffic Inspectorate expects that about 3-4 times more people are killed per driven kilometre for heavy goods vehicles compared to passenger cars or light trucks. Studies of speed behaviour have shown that truck drivers are worse than car drivers to keep the speed limit. Moreover, the average speed of heavy trucks with trailers increased by over 5 km / h since 1996. Another safety issue related to heavy traffic (even though to a lesser extent than high speeds) is that the use of seatbelt is low among truck drivers. In 2004, the seatbelt use for drivers of heavy trucks was 33 - 38 percent, and in-depth studies of fatal accidents have shown that 11 of 17 drivers could have survived if they had used seatbelts.

This project aims to study whether truck drivers speed and seatbelt usage can be improved using an ITS platform, combined with knowledge and motivation. To study this, a field operational test including eleven hauliers been carried out.



Figur 1 The ISA solution developed in this project, installed in a truck

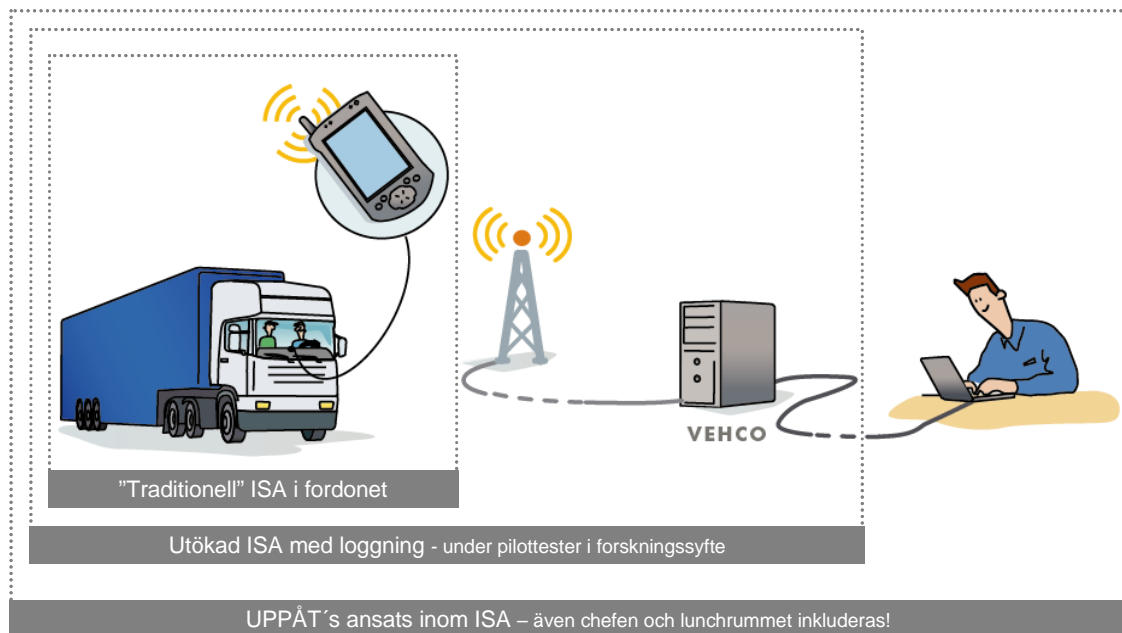
## 4. System overview

The solution developed within this project is based on an already existing Fleet Management platform called Co-Driver from Vehco AB ([www.vehco.se](http://www.vehco.se)). Co-Driver is a product for more effective information flow between staff in the office and vehicles in the field.

In the vehicle Co-Driver consists of a standard mobile computer which is both a support for the driver and an automatic gatherer of operating information. In the office Co-Driver is a PC program where you can send, receive and analyse information to and from the vehicle.

The requirement for information flow varies widely from one haulier to another. Vehco has developed a wide offer of freely-selectable services. Every haulier can select individually those services which save most time and money for its own activities.

The ITS solution in this project is developed as one service in the Co-Driver platform. It includes an ISA-function, an advanced seatbelt warning and a logging function that allows the monitoring of driving behaviour.



**Figur 2 This projects ISA compared with other traditional solutions**

The computer in the vehicle receives data from a GPS<sup>2</sup>. It can even be connected to the vehicles electrical system to access more data. The computer connects to a central server

<sup>2</sup> GPS: Global Positioning System

over GPRS<sup>3</sup>, data is continuously sent to the server and stored for later analysis. The PC program can then read data from the server and present data in different reports. The graphical user interface of the ITS service is based on the Co-Driver standard. Text and buttons are large enough to be readable even during a fast glance while driving. All buttons are clearly marked with a blue shade to inform where the user can interact.



Co-Driver can be configured to act differently for each user. Functionality can be turned on and off and graphical appearance can be changed. All configurations are made remotely from an internet administration portal.

In the ITS service, the graphical user interface has been made configurable to fit the need for this project. For example, a stronger predefined user interface can be activated; this will disable some optional settings for the users. The idea is to study if more extended feedback as sound and popup windows will affect the driver to drive safer.

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<sup>3</sup> GPRS: General Packet Radio Service

## 5. Method

The project started in 2006 with development of the technical solution, recruiting hauliers and beginning of installations. During 2007 all systems were running, end users educated and data collection started.

Data collection was made in two different states, without drivers' feedback and with driver feedback including follow-up. The data collected without feedback (at least one month) was used as baseline for normal driving behaviour. This baseline was compared with the results for each driver during the time with feedback.

All drivers were divided into groups based on the different warning and monitoring strategies. Three different strategies have been studied, one was voluntary use and monitoring of behaviour, the other voluntary use and monitoring of behaviour in addition to a bonus, and the third strategy consisted of a predefined user interface and monitoring of behaviour. The aim was to see how well the monitoring worked in changing behaviour and to see whether the effect was improved further by using either the carrot or stick.

In the end of the project the commercial aspects were also investigated. Two "focus-groups" consisting of different shippers were gathered. The aim was to gather commercial aspects of more traffic safety transports and the interest for monitoring systems as this.

## 6. Results

More than 120 trucks were equipped with the ITS-service. All drivers have been driving with the service in both states, first without and later with feedback.

A prerequisite, and in part a restriction in the project, has been a dependency of the hauliers interest and willingness to cooperate. As it turned out there was interest but it was not sufficient to make sure that training and monitoring could be implemented in a fully satisfactory manner. It turned out to be very difficult to gather the drivers for the training and the monitoring and follow-up varied among the companies.

The effect of this is that it was primarily for the predefined user interface that automatically gave feedback to drivers that had an effect. There were also signs that the bonus had an effect but the effect was relatively small and limited in time. The predefined interface however had a large effect; reducing the average speed on 90 km/h roads from around 78 km / h to 74 km / h. Unfortunately this system had the lowest acceptance and already after a few weeks there were demands from the hauliers to make it less annoying, it turned out that drivers complained too much about it.

A positive result of this study was that the drivers after all, were quite positive to have their driving monitored and did not see it as a problem that their managers or colleagues could see how they were driving, a fear was otherwise that they would feel supervised and have their integrity violated. This was thus not a major problem.

The study of the commercial aspects shows that there are several shippers that are including road safety in their demanded conditions when buying transports. Road safety is mentioned as an important factor for the trademark. Some of the companies could consider paying for road safety as a factor for higher quality.

Today after the project has finished the ITS-service is part of Vehco Co-Driver platform and part of Vehcos sales portfolio. Several of Vehcos customers have decided to buy the Vehco Co-Driver Traffic safety service.

## **7. Conclusions**

The conclusion is that the technology is mature to be used on a larger scale, the drivers are susceptible to the technology but lack the motivation to use it. There is also interest from shippers and hauliers to use and partly pay for the technology. However, there are a number of barriers that prevent the technology from being used on a large scale and it is likely that some sort of incentive from the authority is needed to boost the market. The project recommends that it is investigated how market conditions for road safety measures for hauliers can be improved.

## **8. Publications and attachments**

VTI report

UPPÅT - UPPföljning av Åkeriers Trafiksäkerhetsarbete (Swedish)  
Attachments to the report (Swedish)

IVSS partners:



Postal address: IVSS/Swedish Road Administration, SE-781 87 Borlänge, Sweden  
Street address: IVSS/Swedish Road Administration, NAVET, Lindholmspiren 5, Gothenburg, Sweden  
Phone: +46 (0)771 119 119  
ivss@vv.se  
[www.ivss.se](http://www.ivss.se)