IVSS

Intelligent Vehicle Safety Systems

IVSS Project Portfolio – Approved Projects

Status March 2008

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:

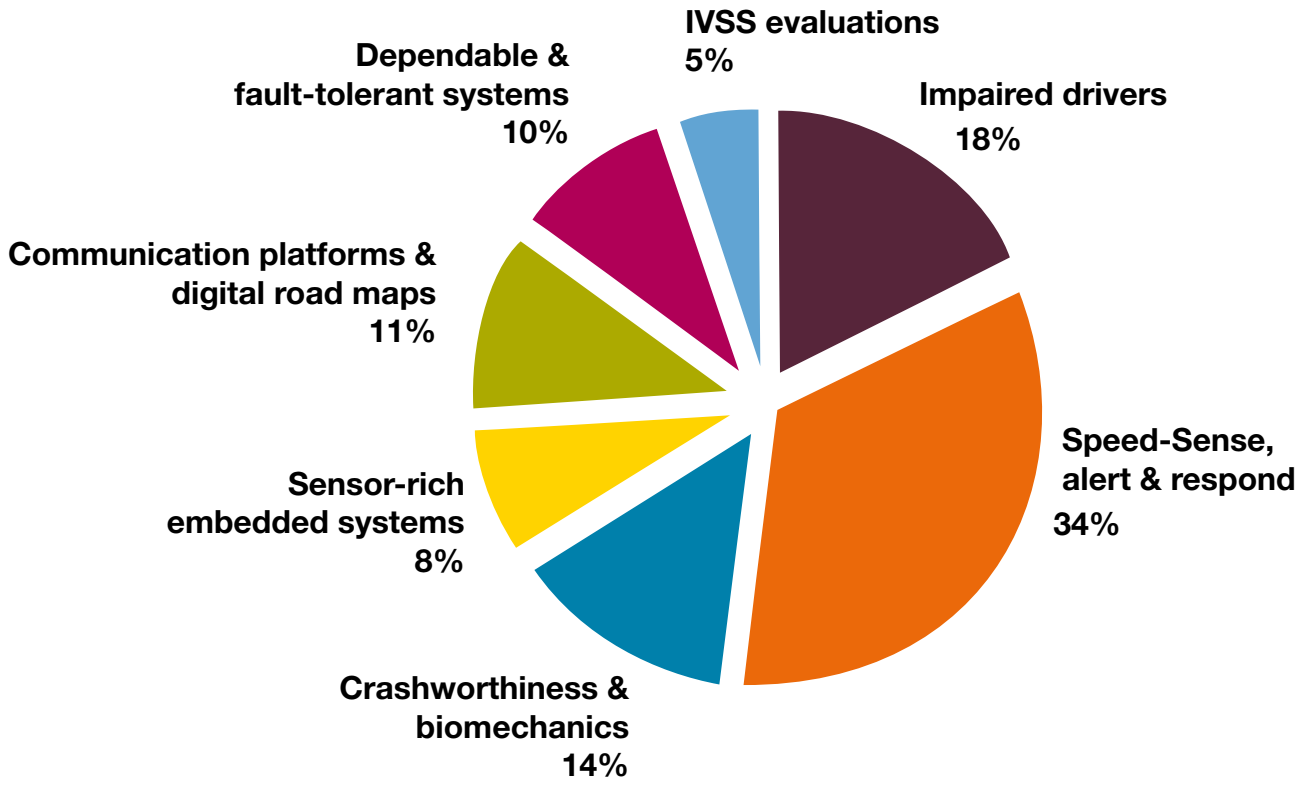
The human being
Preventive solutions based on the vehicle's most important component.

The road
Intelligent systems designed to increase security for all road users.

The vehicle
Active safety through pro-active technology.

Document title: IVSS Project Portfolio – Approved Projects, Status March 2008
Date of issue: 2008-03
Issued by: Swedisch Road Administration
Reference: Anders Haggård
Design: Ateljén, Swedish Road Administration
Printed by: Swedish Road Administration
ISSN: 1401-9612

IVSS Project Portfolio - Approved Projects. Status March 2008



TOTAL COST & FINANCING OF
APPROVED IVSS PROJECT APPLICATIONS, 2004 – 2010

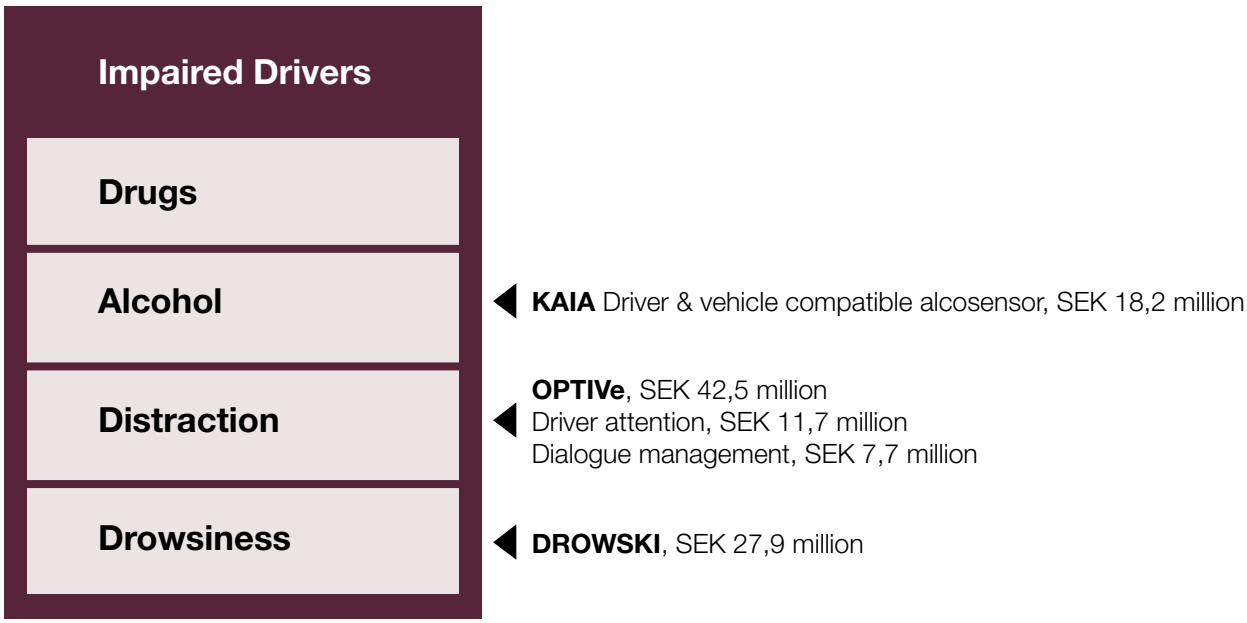
Project budget: SEK 588.6 million

whereof
Corporate finance: SEK 275,4 million
Government support: SEK 309.8 million (SRA, 259.8 million & Vinnova, 50,0 million)
University / Institute: SEK 161,8 million

Contents

The following IVSS applications have been approved and allocated to the various IVSS focus area.

1. Impaired Drivers



WORKLOAD ESTIMATION & DIALOGUE MANAGEMENT

Partners: Saab Automobile (applicant), Linköping University, ACE Simulation AB

Project manager: Arne Nåbo, Saab Automobile
Tel: +46 (0)520 780 40. E-mail: arne.nabo@se.saab.com

Project description: Driver distraction is in greater focus when developing modern transport systems, particularly considering the steady increase in support, entertainment and information systems within the driver environment in modern vehicles. It is therefore important that the use of these systems does not have a negative impact on driving ability and consequently on road safety.

To have a positive impact on driving safety it is necessary to be able to adjust the information flow to and from ”intelligent” support systems to the actual driving situation. Through being able to assess and/or measure the driving situation as well as the driver’s activities and status, interaction with secondary functions can be scheduled so as not to overload the driver.

Project start/end: 2004 Q.2 – 2006 Q.4
Project budget: SEK 7.7 million
whereof
Corporate finance: SEK 3,9 million
Government support: SEK 3.8 million (SRA, SEK 3.8 million)
University / Institute: SEK 1.9 million

OPTIVE - OPTIMIZED SYSTEM INTEGRATION FOR SAFE INTERACTION IN VEHICLES

Partners: Volvo Car Corporation (applicant), Luleå University of Technology, Alps, Volvo Technology

Project manager: Patrik Palo, VCC
Tel: +46 (0)31 59 79 97. E-mail: ppalo@volvocars.com

Project description: The introduction of new warning and information systems in vehicles places high demands on the interaction between the driver and the vehicle (HMI, Human Machine Interaction). In today's traffic environment, situations often occur where the driver's cognitive resources, for various reasons, are heavily taxed. To avoid cognitive overload in such situations, an optimised integration of the systems mentioned above is necessary. For example, the introduction of a module that identifies abnormal conditions in the driver or environment can improve driving safety. This vertical project will develop methods and concepts for a cost-efficient and safety-enhancing integration of HMI systems in vehicles.

Project start / end: 2005 Q.3 – 2009 Q.4
Project budget: SEK 42.5 million
whereof
Corporate finance: SEK 18.2 million
Government support: SEK 24.3 million (SRA, SEK 24.3 million)
University / Institute: SEK 10.6 million

DRIVER ATTENTION – DEALING WITH DROWSINESS AND DISTRACTION

Partners: Saab Automobile (applicant), Smart Eye AB, Siemens VDO, Swedish Road and Transport Research Institute (VTI), and Linköping University/IDA, Scania CV

Project manager: Arne Nåbo, Saab Automobile
Tel: +46 (0)520 780 40. E-mail: arne.nabo@se.saab.com

Project description: Continuous attention to the driving is a must to be able to drive in a safe way. However, it is known that humans are easily distracted and subject to drowsiness. This research aims to contribute to road safety by promoting attentive drivers through technical in-vehicle systems. The project will look for measurable observables that characterise an attentive driver.

Demonstrator vehicles will be equipped with sensors along with countermeasures to bring the driver back to attentive driving. Testing and evaluation will preferably take place in real traffic in order to evaluate effectiveness and user acceptance. A project will be conducted to identify the steps needed for industrial production and market launching.

Project start/end: 2005 Q.3 – 2008 Q.3
Project budget: SEK 11.670 million
whereof
Corporate finance: SEK 6.3 million
Government support: SEK 5.4 (SRA, SEK 5.4 million)
University /Institute: SEK 2.4 million

DROWSI - DROWSINESS PREDICTION AND COUNTERMEASURES – CONCEPTS AND TECHNOLOGIES

Partners: AB Volvo, Volvo Car Corporation, Autoliv Inc (applicants), Swedish Road and Transport Research Institute (VTI), Karolinska Institute, Swedish Road Administration

Project manager: Peter Kronberg, Volvo Technology
Tel: +46 (0)31 66 94 23. E-mail: peter.kronberg@volvo.com

Project description: The objective of the proposed project is to conduct multidisciplinary research and development of concepts and technologies for real-time drowsiness prediction and countermeasures. Moreover, the drowsiness problem will also be addressed on several levels through investigating safety benefit issues, cost benefits, roles of different interest groups and deployment issues. The concrete output from the project will be an all-encompassing monitoring and feedback system to be implemented in two demonstrator vehicles: a car and a heavy truck. A secondary objective in the project is to create a firm basis for further Swedish research and development in this field.

Project start/end: 2006 Q.1 – 2008 Q.4
Project budget: SEK 21.9 million
whereof
Corporate finance: SEK 6.7 million
Government support: SEK 15.2 million (SRA, SEK 15.2 million)
University / Institute: SEK 11.0 million

DROWSI 1.5

Partners: AB Volvo, Volvo Car Corporation, Autoliv Inc (applicants), Swedish Road and Transport Research Institute (VTI), Karolinska Institute, Swedish Road Administration

Project manager: Peter Kronberg, Volvo Technology
Tel: +46 (0)31 66 94 23. E-mail: peter.kronberg@volvo.com

Project description: Perform multidisciplinary research and development of concepts and technologies for real-time drowsiness prediction and countermeasures. Moreover, the drowsiness problem is dealt with on several levels through basic research on drowsiness and driving, as well as investigation of safety benefit issues, cost benefits, roles of different interest groups, and deployment issues.

The concrete output from the project are monitoring and feedback systems solutions to be implemented in two demonstrator vehicles, a car and a heavy truck vehicle. A secondary goal of the project is to create a firm basis for further Swedish research and development in the field.

The project ends in the conjunction with the ITS World Congress in Stockholm in September 2009.

Project start/end: 2008 Q.2 - 2009 Q.4
Project budget: SEK 6,1 million
whereof
Corporate finance: SEK 2,0 million
Government support: SEK 3.0 million (SRA, SEK 3,0 million)
University / Institute: SEK 3,0 million

DRIVER AND VEHICLE COMPATIBLE ALCOHOL SENSOR WITH EMBEDDED ABSOLUTE MEASUREMENT – KAIA PHASE I

Partners: Autoliv Research, Imego, Hök Instrument

Project manager: Håkan Pettersson, Autoliv Research
Tel: +46 (0)322 62 63 38 . E-mail: hakan.pettersson@autoliv.com

Project description: Aims at developing and evaluating a new sensor concept for the measurement of alcohol concentration in vehicle drivers. The sensor uses a partially
new method (patent pending), enabling contact less determination of the absolute concentration in blood. The entire project is divided into three phases, the present application concerns the first analytical phase which, if the outcome is positive, will be followed by more elaborate phases of implementation and evaluation. The analytical phase includes work packages concerning driver and vehicle integration, experimental prototyping and evaluation of the measurement principle, analysis of system implementation and patenting.

Project start/end: 2005 Q.4 – 2006 Q.2
Project budget: SEK 1.9 million
whereof
Corporate finance: SEK 0.6 million
Government support: SEK 1.3 million (SRA, SEK 1.3 million)
University / Institute: SEK 0.6 million

DRIVER AND VEHICLE COMPATIBLE ALCOHOL SENSOR WITH EMBEDDED ABSOLUTE MEASUREMENT – KAIA PHASE II

Partners: Autoliv Development AB, Imego, Hök Instrument AB, Volvo Car Corporation

Project manager: Håkan Pettersson, Autoliv Research
Tel: +46 (0)322 62 63 38. E-mail: hakan.pettersson@autoliv.com

Project description: Aims at developing and evaluating a new sensor concept for the measurement of alcohol concentration in vehicle drivers. The sensor uses a partially new method enabling contact less determination of the absolute concentration in blood. The entire project is divided into three phases. The second phase of KAIA consists of major work packages:
Development of prototypes for evaluation in laboratories and in cars. Preparation for industrialisation, including systems integration and standardisation. Long-term technical development of the chosen technology and, if needed, new technical solutions. Integration and evaluation of prototypes including functionality, robustness and usability. In the event of successful results, there will be a third concluding phase focusing on market production.

Project start/end: 2006 Q.3 – 2007 Q.4
Project budget: SEK 9.6 million
whereof
Corporate finance: SEK 4.0 million
Government support: SEK 5.6 million (SRA, SEK 5.6 million)
University / Institute: SEK 2.5 million

DRIVER AND VEHICLE COMPATIBLE ALCOHOL SENSOR WITH EMBEDDED ABSOLUTE MEASUREMENT – KAIA PHASE II CONTINUATION

Partners: Autoliv Development AB, Imego, Hök Instrument AB, SenseAir, AB Volvo, Volvo Car Corporation

Project manager: Håkan Pettersson, Autoliv Research
Tel: +46 (0)322 62 63 38. E-mail: hakan.pettersson@autoliv.com

Project description: Aims at developing and evaluating a new sensor concept for the measurement of alcohol concentration in vehicle drivers. The sensor uses a partially new method enabling contact less determination of the absolute concentration in blood. The entire project is divided into three phases. The second phase of KAIA consists of major work packages:

Development of prototypes for evaluation in laboratories and in cars. The phase II cont will include the following 4 work packages:

1. Development and improvement of resolution, driver interface, algorithms, physical size etc.
2. Adaptation of sensor module from SenseAir to the KAIA – project.
3. Testing in harsh environments in vehicles with high concentration of phthalates.
4. Development of 4 development prototypes for evaluation regarding HMI, performance, environment and miniaturised design and final prototype.

Project start/end: 2007 Q.4 – 2009 Q.2
Project budget: SEK 6,7 million
whereof
Corporate finance: SEK 3,7 million
Government support: SEK 3,0 million (SRA, SEK 3.0 million)
University / Institute: SEK 1,3 million

2. Speed – Sense, Alert & Respond

Speed Adaptation
"Sense , alert & respond"

Road conditions	**SRIS** – Slippery Road InfoSystems, SEK 32.7 million **RFE** – Road Friction Estimation, SEK 20.0 million
Performance	**IBSTruck** Heavy vehicle combinations, SEK 13.6 million **UPPÅT**, SEK 4.5 million Safety margin and feedback strategies, SEK 6.6 million Motion – Mobile ISA, SEK 5.6 million
Traffic conflict management	Intersection accidents, SEK 24.7 million Collision avoidance complex traffic situations,SEK 10 million Systems for collision avoidance, SEK 4.0 million **THREATS SEK**, 2.5 million Driver warnings in safety critical situations, SEK 4.2 million
Obstacle detection & vision enhancement	**ASIS**, SEK 37.1 million **RAPPS**, SEK 31.3 million

PEDESTRIAN PROTECTION BASED ON ADVANCED SENSORS (RADAR AND STEREO VISION SENSOR) – RAPPS

Partners: Saab Automobile, Autoliv Development

Project manager: Ingemar Söderlund, Saab Automobile
Tel: +46 (0)520 85 531. E-mail: Ingemar.Soderlund@se.saab.com

Project description: The overall objective of this research programme is to develop a concept, at the implementation-readiness level, of a reversible active pedestrian safety system. The following three enabling technologies will be required to be developed and validated:

1. Qualitative and quantitative knowledge of pedestrian-vehicle impact scenarios and performance requirements of the reversible active pedestrian safety system.
2. A reliable pre-crash sensor that can accurately and timely predict an imminent pedestrian-vehicle impact.
3. Mechanical means that can timely reconfigure the front-end of a vehicle before the imminent pedestrian-vehicle impact occurs and can automatically reset the system if the threat subsides.

Project start/end:	2005 Q.3 – 2008 Q.2
Project budget:	SEK 31.3 million
whereof	
Corporate finance:	SEK 14,0 million
Government support:	SEK 17.1 million (SRA, SEK 17.1 million)
University / Institute:	SEK 2.9 million

ASIS – ALGORITHMS AND SOFTWARE FOR IMPROVED SAFETY

Partners: Volvo Car Corporation and Chalmers University of Technology

Project manager: Jacob Hägglund, Volvo Car Corporation
Tel: +46 (0)31 325 2396. E-mail: jhagglu3@volvocars.com

Project description: ASIS intends to study:
Crash avoidance scenarios based on knowledge about the vehicle and its environment.
How to utilise passive safety systems more efficiently based on knowledge about the vehicle and its environment.
Demands on bandwidth & determinism for a greater exchange of safety information in the electric architecture.

The aim is also to increase knowledge in the academic world about vehicle electronics and safety.

Project start/end: 2007 Q.1 – 2011 Q.3
Project budget: SEK 37.1 million
whereof
Corporate finance: SEK 18.7 million
Government support: SEK 18.4 million (Vinnova 18.4 Mil)
University / Institute: SEK 10,2 million

INTERSECTION ACCIDENTS: ANALYSIS AND PREVENTION

Partners: Autoliv Development AB, Saab Automobile, Chalmers, University of Linköping and Volvo Car Corporation (VCC).

Project manager: Jonas Bärgman, Autoliv Development
Tel: +46 (0)322 62 69 03. E-mail: Jonas.Bargman@autoliv.com

Project description: Intersection accidents are overrepresented in everything from fatal accidents to property damage. The Swedish Road Administration (SRA) has focused attention on this situation in connection with "Vision Zero". The aim of the present project is to systematically study events that lead to various levels of incidents.

The collection of data will be carried out at intersections chosen in consultation with the SRA, using camera-based computer tracking of vehicles and test subjects driving an instrumented vehicle in interactive situations. The material will be used to test research hypotheses concerning the factors in the traffic environment and traffic system that affect driver behaviour, and to propose ways to enhance road safety. The most promising concepts will be demonstrated in the instrumented vehicle.

The project idea is based on results from the PFF project, FICA.

Project start/end: 2005 Q.1 – 2008 Q.4
Project budget: SEK 24.7 million
whereof
Corporate finance: SEK 9,9 million
Government support: SEK 14.8 million (SRA, SEK 14.8 million)
University / Institute: SEK 13.7 million

THREATS – THREAT ASSESSMENT SYSTEM - PHASE I

Partners: Autoliv Research, Linköping University (IAV & CVL), Volvo Car Corporation, Saab Automobile, Scania CV, SmartEye

Project manager: Johan G. Karlsson, Autoliv Research
Tel: +46 (0)322 66 75 92. E-mail: johan.g.karlsson@autoliv.com

Project description: The active safety systems currently under development will not become 100% accurate within the foreseeable future. Furthermore, warnings or intervention by the vehicle may not produce the expected result if the driver is already in the process of taking appropriate action.

The project will conduct experiments with volunteers driving a car equipped with various sensors. The data acquired will be analysed regarding potential threats using process tracing and interviews.

The objective of the project is to couple the sensor and behavioural data to determine the cues drivers use to discriminate between true and potential threats. The target application of these findings will be the development of a system that suppresses or prioritises warnings or countermeasures based on driver expectations.

Project start/end: 2006 Q.4 – 2007 Q.2
Project budget: SEK 2.5 million
whereof
Corporate finance: SEK 1.0 million
Government support: SEK 1.5 million (SRA, SEK 1.5 million)
University / Institute: SEK 1.0 million

SYSTEMS FOR COLLISION AVOIDANCE

Partners: Volvo Car Corporation and Linköping University

Project manager: Andreas Eidehall, Volvo Car Corporation
Tel: +46 (0)31 59 66 35. E-mail: aeidehal@volvocars.com

Project description: ”Systems for Collision Avoidance” is a natural extension to the current Volvo PhD project Collision Mitigation by Braking. The project is focused on research about functions for collision avoidance by steering and braking. This involves developing suitable statistical signal models appropriate for decision support in active safety features and systematically specifying the functioning of the next generation active safety system. The parameters defining the function should be chosen with respect to requirements within areas such as legal demands, customer acceptance together with physical, sensor and computational limitations.

Project start/end: 2005 Q.1 – 2006 Q.4
Project budget: SEK 4.0 million
whereof
Corporate finance: SEK 2.0 million
Government support: SEK 2.0 million (SRA, SEK 2.0 million)
University / Institute: SEK 1.0 million

DECISION –MAKING FOR COLLISION AVOIDANCE IN COMPLEX TRAFFIC SITUATIONS

Partners: Volvo Car Corporation and Chalmers University of Technology

Project manager: Erik Coelingh, Volvo Car Corporation
Tel: +46 (0)31 59 71 55. E-mail: ecoeling@volvocars.com

Project description: Define and compare algorithms for decision-making in collision avoidance systems that can deal with:

1. Multiple objects, i.e. more than one target object shall be taken into account when making a decision on intervention.
2. Complex traffic situations, i.e. situations with different road geometries, road friction and target object types, etc.
3. Combined braking and steering interventions, i.e. the decision shall take into account the fact that a combination of steering and braking can be used for avoiding and/or mitigating a collision.

Project start/end: 2006 Q.1 – 2010 Q.3
Project budget: SEK 10 million
whereof
Corporate finance: SEK 5.0 million
Government support: SEK 5.0 million (SRA, SEK 5.0 million)
University / Institute: SEK 1.1 million

DRIVER WARNINGS IN TIME – AND CRITICAL ROAD SAFETY SITUATIONS

Partners: Saab Automobile and the Swedish Road and Transport Research Institute (VTI)

Project manager: Arne Nåbo, Saab Automobile.
Tel: +46 (0)520 780 40. E-mail: arne.nabo@se.saab.com

Project description: An active safety system, or multiple systems, will present warnings to the driver when the safety margin(s) are violated. The problem is how to design the driver-vehicle interface to support quick, effective and distinguishable driver responses to both single and multiple active safety systems (which may trigger alerts in close time proximity).

The challenge is to design an intuitive global interface (ecological interface) for these systems. The project will develop rules and concepts of HMI for multiple active safety systems that meet human capabilities and limitations in time-and safety critical situations.

For the design, testing, evaluation and demonstration, driving simulators at Saab and VTI will be used.

Project start/end: 2006 Q.4 – 2009 Q.1
Project budget: SEK 4.2 million
whereof
Corporate finance: SEK 2.1 million
Government support: SEK 2.1 million (SRA 2.1 million)
University / Institute: SEK 2.1 million

SAFETY MARGIN AND FEEDBACK STRATEGIES FOR AWD VEHICLES

Partners: Saab Automobile and Chalmers University of Technology

Project manager: Gunnar Olsson, Saab Automobile
Tel: +46 (0)520 85 998. E-mail: Gunnar.Olsson@se.saab.com

Project description: Today's AWD systems provide possibilities to complement brake-based stability systems in order to achieve additional benefits in the area of active safety, combined with increased traction and improved driving performance. The project is aimed at developing control strategies at the vehicle level by combining sub-systems that affect the traction and braking torque to warn and support the driver at limit conditions. The research is to answer the following question: "How shall safety margins be quantified and which feedback strategies are appropriate to actively improve vehicle safety given the increased lateral and longitudinal performance provided by AWD systems?"

Project start/end: 2005 Q.3 – 2008 Q.4
Project budget: SEK 6.6 million
whereof
Corporate finance: SEK 3.3 million
Government support: SEK 3.3 million (SRA, SEK 3.3 million)
University / Institute: SEK 0.8 million

INTEGRATED RETARDATION CONTROL – IRC

Partners: AB Volvo, Chalmers University of Technology

Project manager: Peter Lingman, AB Volvo
Tel: +46 (0)31 327 43 42. E-mail: Peter.Lingman@volvo.com

Project description: The focus in the IRC project is on strategies for low power retardation (under 400 kw). Downhill cruising, which is a low power brake manoeuvre, is a challenging task for the driver. First of all a proper speed or distance to the vehicle ahead must be decided upon. To obtain and keep this speed the driver has to change gear and engage both foundation and auxiliary brakes, i.e. the driver must integrate the different parts of the brake system manually. The main problem is that the driver is given almost no feedback regarding vehicle mass, brake disc temperature and other important vehicle and environmental states. This makes it a challenging task to drive the vehicle in an efficient and safe way. There is a clear possibility that the driver will choose too high a speed combined with a poor distribution of retardation force between the auxiliary and foundation brakes which results in overheating of both the disc brakes (known as heat fading) and the auxiliary brakes (cooling system saturation).

Project start / end: 2004 Q.3 – 2006 Q.4
Project budget: SEK 3.5 million
whereof
Corporate finance: SEK 2.1 million
Government support: SEK 1.4 million (SRA, SEK 1.4 million)
University / Institute: SEK 0.3 million

INTEGRATED BRAKING & STEERING FOR ACTIVE SAFETY OF HEAVY VEHICLE COMBINATIONS – IBS TRUCK

Partners: AB Volvo and Chalmers University of Technology

Project manager: Peter Lingman, AB Volvo
Tel: +46 (0)31 327 43 42. E-mail: Peter.Lingman@volvo.com

Project description: The objective of this project is to investigate the possibility of improving the active safety of heavy vehicle combinations with respect to yaw and roll stability. Today ESP (Electronic Stability Program) is only available for single trucks and tractors. Furthermore, only the braking system is activated to maintain stability. In the future other actuators will be available, e.g. active front and rear wheel steering. In this project we will determine how to take advantage of these possibilities for various vehicle combinations. The project also aims to develop competence in this area both in academia (Chalmers University of Technology) and industry (Volvo 3P).

Project start/end: 2006 Q.2 – 2010 Q.4
Project budget: SEK 10.1 million
whereof
Corporate finance: SEK 5.3 million
Government support: SEK 4.8 million (SRA, SEK 4.8 million)
University / Institute: SEK 4.8 million

STEERING SYSTEM WITH ACTIVE SAFETY IN HEAVY VEHICLES

Partners: Scania CV, Royal Institute of Technology, Stockholm

Project manager: Jolle I Jkema, Scania CV
Tel: +46 (0)8 553 86386. E-mail: jolle.ijkema@scania.com

Project description: Passenger cars today use technology for controllable steering torque and variable steering ratio which enhances both stability and manoeuvrability. Even though heavy vehicles require hydraulics due to higher steering forces, similar possibilities as for passenger cars exist. Connection of this new functionality to existing functions as ESP and ABS and also other DAS-functions as LDW and brake assist enables both higher safety and better dynamics. Furthermore there is a possibility to obtain and provide information to the driver through the steering wheel, e.g. regarding closeness to roll over limit. The project intends to focus on the latter possibility through the design and testing of active safety in steering systems for heavy vehicles.

Project start/end: 2006 Q.1 – 2010 Q.4
Project budget: SEK 5.8 million
whereof
Corporate finance: SEK 2.9 million
Government support: SEK 2.9 million (SRA, SEK 2.9 million)
University / Institute: SEK 3.2 million

FOLLOW-UP OF TRAFFIC SAFETY AMONGST ROAD HAULERS

Partners: Vehicle Communications Sweden AB (Vehco), Swedish Road Administration, Swedish Road and Transport Research Institute (VTI), Scandinavian Automotive Suppliers

Project Manager: John Pettersson, Vehicle Communications Sweden AB
Tel: +46 (0)31 50 84 70. E-mail: john.petterson@vehco.com

Project description: The purpose of this project is to evaluate the effects of efficient follow-up of the degree of safe behaviour in traffic among drivers employed by road haulers. This will be accomplished by using the extensive IT infrastructure that the telematics company Vehco has established in Sweden, in the form of a large number of customers and a large installed base. This will therefore generate vast amounts of new knowledge about how to successfully work with road safety among drivers of heavy trucks. The project will be focused on speed, seatbelt and alcohol ignition interlocks.

Project start/end: 2006 Q.1 – 2008 Q.1
Project budget: SEK 4.5 million
whereof
Corporate finance: SEK 0.5 million
Government support: SEK 3.0 million (SRA, SEK 3.0 million)
University / Institute: SEK 1.0 million

MOTION MOBILE TRAFFIC SAFETY INTEGRATION WITH OFF BOARD NAVIGATION

Partners: Swedish Road Administration, Appello Systems AB, Triona AB, VTI

Project Manager: Per – Olof Svensk, Triona AB.
Tel.: +46 (243) 624 31 Email.: per-olof.svensk@triona.se

Project description: The purpose of the project is to develop the concept of ISA as a mobile service. The Project start from a new mobile ISA service that has been developed jointly by Appello and Triona and partly financed by Vägverket's Skyltfonden. The Project aims to focus on for example, enhancing the quality of the existing service, evaluate and implement options related to HMI, integrate with related services and information. The work is with the objective to increase the content acceptance and the usage of ISA functionality with companies as well as private persons. One of the most significant project result will be a series of demonstration applications and a relatively large pilot project.

Project start/end: 2008 Q.1 – 2009 Q.2
Project budget: SEK 5,6 million
whereof
Corporate finance: SEK 3,1 million
Government support: SEK 2,5 million (SRA, SEK 2,5 million)
University / Institute: SEK 0,4 million

SLIPPERY ROAD INFORMATION SYSTEM – SRIS

Partners: Swedish Road Administration, AerotechTelub, Caran, Combitech Systems AB, Klimator AB, Swedish Road and Transport Research Institute (VTI), WM-data

Project Manager: Per-Olof Sjölander, Swedish Road Administration
Tel: +46 (0)243 75 804. E-mail: p-o.sjolander@vv.se

Project description: Variations in road slipperiness and friction are closely linked and have a very pronounced effect on road safety and accessibility. The present project aims at combining data from RWIS with friction values from floating cars in order to provide drivers and road maintenance workers with better information about the prevailing road conditions. A model will be used where the weather data and the estimated friction values from the cars are transformed into high quality output that is suitable information for road users. How to best present the information will also be analysed.

Project start / end: 2006 Q.1 – 2008 Q.4
Project budget: SEK 32.7 million
whereof
Corporate finance: SEK 11.0 million
Government support: SEK 21.7 million (SRA, SEK 21.7 million)
University / Institute: SEK 2.7 million

ROAD FRICTION ESTIMATION – RFE

Partners: Saab Automobile, Volvo Car Corporation, AB Volvo, Swedish Road and Transport Research Institute (VTI), Haldex

Project manager: Gunnar Olsson, Saab Automobile
Tel:+46 (0)520 859 98. E-mail: Gunnar.Olsson@se.saab.com

Project description: Investigations show a correlation between road condition and accident risk. By estimating the friction between tyre and road the driver will be informed of the road conditions and the active/adaptive systems will be quickly set to current conditions.

The project objective is to estimate the friction between tyre and road and to evaluate/optimise the reliability and time lag of the signal.

Project start/end: 2004 Q.4 – 2007 Q.2
Project budget: SEK 10.8 million
whereof
Corporate finance: SEK 4,3 million
Government support: SEK 6.5 million (SRA, SEK 6.5 million)
University / Institute: SEK 2.8 million

ROAD FRICTION ESTIMATION – RFE II

Partners: Saab Automobile, Volvo Car Corporation, AB Volvo, Swedish Road and Transport Research Institute (VTI), Haldex

Project manager: Mats J. Andersson, Volvo Technology
Tel.: +46 (31) 322 6097. E-mail: mats.j.andersson@volvo.com

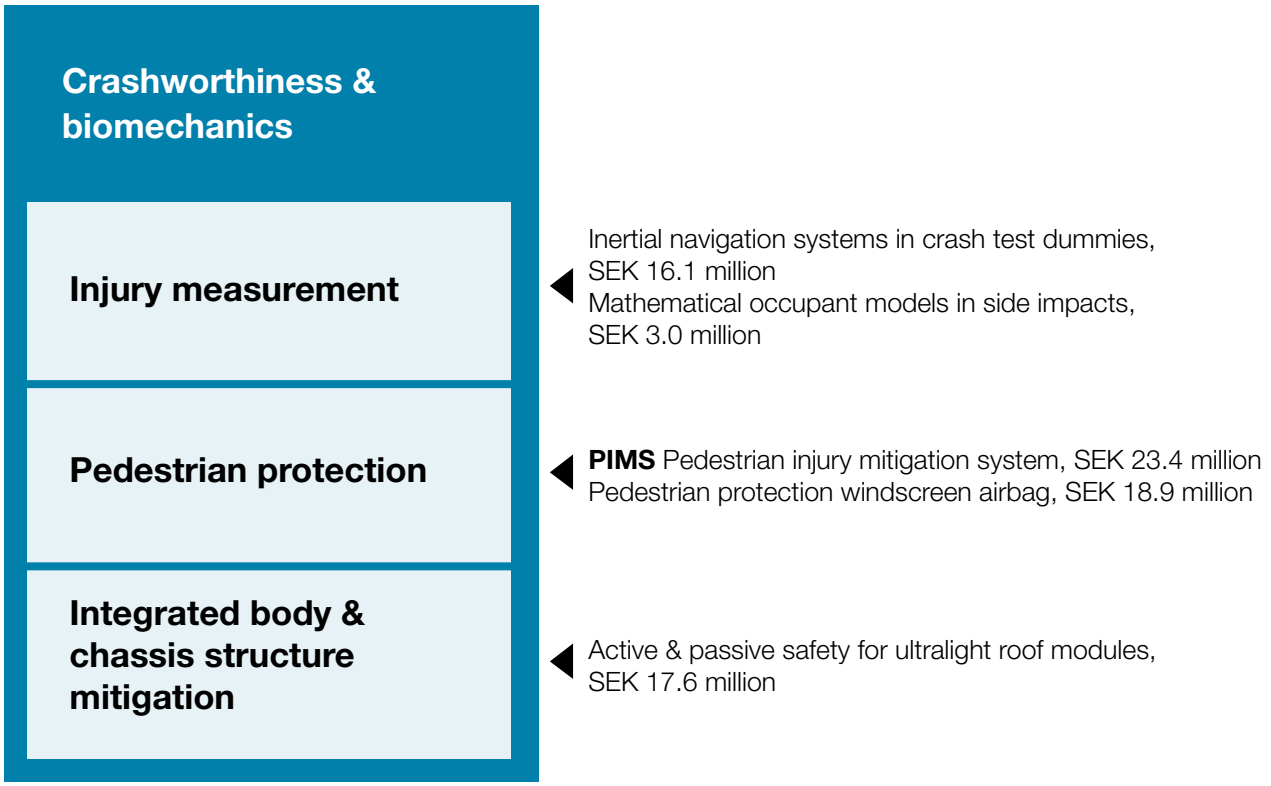
Project description: Investigations show a correlation between road condition and accident risk. The increasing accident risk with low friction between tyres and road, may be counteracted with warning systems and by adapting the active systems of the vehicle. Three methods to estimate road friction were developed during phase

1. All methods need further refinement before industrialization may commence.

Phase 2 is aiming at further developing the technology and to integrate two or more methods for friction estimation in order to improve their
confidence and coverage. In addition, one aim is to investigate current and future vehicle functions that can be improved by the friction estimate.

Project start/end:	2007 Q.4 - 2009 Q.4
Project budget:	SEK 9,2 million
whereof	
Corporate finance:	SEK 4,2 million
Government support:	SEK 5,0 million (SRA, SEK 5,0 million)
University / Institute:	SEK 2,2 million

3. Crashworthiness & Biomechanics



INERTIAL NAVIGATION SYSTEM IN CRASH TEST DUMMIES

Partners: Autoliv Development (applicant), Imego, Saab Automobile, Volvo Car Corporation

Project manager: Håkan Pettersson Autoliv Development
Tel: +46 (0)322 62 63 38. E-mail: Hakan.Pettersson@autoliv.com

Project description: Detailed information related to the loading on the chest, neck and head in a crash test dummy during a crash test is important in order to improve our understanding of the effects on an occupant in a similar situation. This type of information is also important for the development of occupant restraint systems. However, the sensors that are currently used do not fulfil the requirements from the automotive industry.

During the first phase of this project, the miniaturised Inertial Navigation System, INS, developed by Imego for another application will be modified to comply with some of the measurement requirements applicable to crash tests. This measurement system (INS) will then be used and evaluated by Autoliv, Saab and Volvo.

Project start/end: 2004 Q.3 – 2005 Q.1
Project budget: SEK 1.2 million
whereof
Corporate finance: SEK 0,5 million
Government support: SEK 0.7 million (SRA, SEK 0.7 million)
University / Institute: SEK 0.7 million

INERTIAL NAVIGATION SYSTEM IN CRASH TEST DUMMIES – PHASE II

Partners: Autoliv Development , Imego, Saab Automobile, Volvo Car Corporation

Project manager: Peter Björkholm, IMEGO.
Tel.: +46 (0)31 750 1809. E-mail: peter.bjorkholm@imego.com

Project description: To specify, design, prototype and build an IMU tailored for precision crash test dummy measurements. The IMU will measure all 6 degrees-of-freedom in a package of a size suitable for mounting in standard crash test dummies. Inertial navigation software to process output data also to be developed. The IMU will be simple to mount, have no external optical or mechanical components and use a communication protocol that is decided as most convenient for practical use. The value of this development was proven in phase 1 of this project.

Project start/end: 2007 Q.1 – 2008 Q.4
Project budget: SEK 15.0 million
whereof
Corporate finance: SEK 6.0 million
Government support: SEK 9.0 million (SRA 9.0 million)
University / institute: SEK 9.0 million

ACTIVE AND PASSIVE SAFETY FOR ULTRA LIGHT ROOF MODULES

Partners: WM-data Caran AB, Finnveden Metal Structures AB, Volvo Car Corporation

Project manager: Lisette Mikaelsson, Caran Dynamics
Tel: +46 (0)31 761 13 38. E-mail: Lisette.mikaelsson@caran.com

Project description: SUVs (sport utility vehicle) are becoming all the more common on roads today. These cars have a higher rollover tendency due to their higher centre of gravity. In order to reduce the consequences of a rollover crash, the upper vehicle body is designed either heavier or in a way that restricts sight.

The aim of this project is to use new concepts, materials as well as forming and joining methods to lower the centre of gravity and to improve sight conditions. By studying new flexible platform solutions, the increasing market demand for different upper body variants will be met in a cost-efficient and thereby competitive way.

Project start/end: 2005 Q.3 – 2007 Q.2
Project budget: SEK 17.6 million
whereof
Corporate finance: SEK 10,2 million
Government support: SEK 7.4 million (SRA, SEK 7.4 million)
University / Institute: SEK 0 million

PEDESTRIAN INJURY MITIGATION SYSTEM - PIMS PHASE I

Partners: Autoliv Development, Acreo AB, Royal Institute of Technology Stockholm, (S3)

Project manager: Håkan Pettersson Autoliv Research
Tel: +46 (0)322 62 63 38. E-mail: Hakan.Pettersson@autoliv.com

Project description: Pedestrian accidents have in general become more severe due to the trend in designing more compact cars. A pedestrian injury mitigation system would therefore be an important means of improving road safety on the whole. A camera and image analysis system makes it possible to identify a pedestrian and activate countermeasures to reduce injuries.

The analysis can be significantly simplified if a thermal infrared camera is used as this entails very little disturbance from different lighting conditions. Infrared cameras are mainly produced for military purposes and are all too expensive for automotive applications. However, new low-cost production methods are under development. A new concept has been developed by the Royal Institute of Technology and Acreo that can be adapted to different system requirements.

The aim of this first phase of the project is to evaluate the technical and commercial possibilities for a pedestrian injury mitigation system based on a thermal infrared sensor.

Project start/end: 2005 Q.1 – 2005 Q.4
Project budget: SEK 5.3 million
whereof
Corporate finance: SEK 2,4 million
Government support: SEK 2.9 million (SRA, SEK 2.9 million)
University / Institute: SEK 2.9 million

PEDESTRIAN INJURY MITIGATION SYSTEM - PIMS PHASE II

Partners: Autoliv Development AB, Acreo AB, Royal Institute of Technology, Stockholm (S3)

Project manager: Dick Eriksson, Autoliv Development AB
Tel: +46 (322) 62 63 06. E-mail: Dick.Eriksson@autoliv.com

Project description: Pedestrian accidents have in general become more severe due to the trend in designing more compact cars. A pedestrian injury mitigation system would therefore be an important means of improving road safety on the whole. A camera and image analysis system makes it possible to identify a pedestrian and activate countermeasures to reduce injuries.

The analysis can be significantly simplified if a thermal infrared camera is used as this entails very little disturbance from different lighting conditions. Infrared cameras are mainly produced for military purposes and are all too expensive for automotive applications. However, new low-cost production methods are under development. A new concept has been developed by the Royal Institute of Technology and Acreo that can be adapted to different system requirements.

Phase I of this PIMS project has now been completed. Based on its conclusions a EURIMUS/EUREKA application was submitted and evaluated by international experts, resulting in the approval of a concept verification phase II. One objective is to design and verify the IR-sensor that comprises the detector and integrate this with the signal circuits. Another objective is to further develop and verify the packaging process developed during the first phase of the project. Further, an IR camera module will be developed from the different parts and sub-modules produced earlier in the first and second phase. Finally, the signal processing algorithm from Phase I will be further developed.

Project start/end: 2006 Q.1 – 2008 Q.3
Project budget: SEK 18.1 million
whereof
Corporate financing: SEK 11.6 million
Government support: SEK 6.5 million (SRA, SEK 6.5 million)
University / Institute: SEK 11.0 million

MATHEMATICAL OCCUPANT MODELS IN SIDE IMPACTS

- A pilot study of the torso and shoulder and their influence on the head and neck motion

Partners: Autoliv Development AB, Volvo Car Corporation, Saab Automobile AB

Project manager: Bengt Pipkorn, Autoliv Development AB
Tel: +46 (0)322 626 341. E-mail: bengt.pipkorn@autoliv.com

Project description: Current crash test dummies have significant shortcomings in their spine and torso bio fidelity in side impacts (impact directions 90 ±20 degrees). It is thus difficult to evaluate new improved safety systems in detail. The shoulder and spine mechanics and how this influences head-neck motion will be studied by means of new refined human body models. The results will be an evaluation of the usability of some of the new human body models that are becoming available and at the same time give indications of the limitations of current crash test dummies. The results are expected to form the basis for new projects on dummies, test methods as well as advanced integrated safety systems.

Project start/end: 2006 Q.1 – 2007 Q.2
Project budget: SEK 3.0 million
whereof
Corporate finance: SEK 1.5 million
Government support: SEK 1.5 million (SRA, SEK 1.5 million)
University / Institute: SEK 2.0 million

PEDESTRIAN PROTECTION BASED ON ACTIVE SYSTEM, COWL AND WINDSCREEN AIRBAG

Partners: Volvo Car Corporation, Autoliv Research AB, XDIN

Project manager: Mats Erlingfors, Volvo Car Corporation
Tel: +46 (0)31 325 97 15. E-mail: merlingf@volvocars.com

Project description: The overall objective of this research programme is to develop a concept into the implementation readiness level. The purpose is to develop a cowl/windscreen airbag to protect a pedestrian from impact from hard structure under the bonnet when being hit by a car.

Project start/end: 2006 Q.1 – 2008 Q.4
Project budget: SEK 18.9 million
whereof
Corporate finance: SEK 14.2 million
Government support: SEK 4.7 million (SRA, SEK 4,7 million)
University / Institute: SEK 0 million

4. Sensor-Rich Embedded Systems

SENSOR DATA FUSION FOR AUTOMOTIVE SAFETY SYSTEMS - SEFS

Partners: AB Volvo, Volvo Car Corporation, Mecel (Delphi), Chalmers university of technology, Linköping university

Project manager: Malte Ahrholdt, Volvo Technology
Tel: +46 (31) 322 67 09. E-mail: Malte.Ahrholdt@volvo.com

Project description: Current state of the art tends to map one sensor to one application. To fulfil the objectives of future automotive safety systems, sensor data fusion technologies are needed to reduce cost, complexity and number of components.

The aim is to provide methods for sensor data fusion and to strengthen Swedish expertise in this focused area. We regard this as a way to improve vehicle safety beyond what can be achieved using current methods. It is expected that a successful implementation of this project will result in being able to offer more customers advanced safety systems at a lower cost. It will result in better competitiveness for the Swedish automotive industry. The project will be conducted in close collaboration between the private sector and Swedish universities.

Project start/end: 2005 Q.1 – 2009 Q.4
Project budget: SEK 44.4 million
whereof
Corporate finance: SEK 20.0 million
Government support: SEK 24.4 million (SRA 20.4 million, Vinnova 4.0 million)
University / Institute: SEK 10.5 million

LOW-COST ELECTRICALLY STEER ABLE ACTIVE ANTENNA FOR ADAPTIVE CRUISE CONTROL AND OTHER APPLICATIONS

Partners: SP (Swedish National Testing and Research Institute) and Chalmers University of Technology

Project manager: Jan Welinder SP.
Tel: +46 (0)10 516 5171 E-mail.: jan.welinder@sp.se

Project description: The project is a feasibility study to investigate a new type of low-cost radar sensor. The antenna has a number of elements printed directly on a circuit board. The lobe direction is controlled by a simple DC voltage. The design is considerably simpler than currently available steer able antennas.

The feasibility study shall investigate the new controller chip and circuit board technology. Inexpensive technologies suitable for mass production have to be found. The principle is demonstrated at 5,8 GHz and shall now be implemented for 77 GHz. If the study is successful a main project that involves Swedish industry will be planned.

Project start/end: 2007 Q.1 – 2008 Q.1
Project budget: SEK 0.250 million
whereof
Corporate finance: SEK 0.050 million
Government support: SEK 0.200 million (SRA 0.200 million)
University / institute: SEK 0.200 million

5. Communication Platforms & Digital Road Maps

THE SAFE COMMUNICATION PLATFORM

Partners: Saab Automobile (applicant), SP, Chalmers University of Technology, Volvo Car Corporation, Volvo Trucks

Project manager: Ingemar Söderlund, Saab Automobile
Tel: +46 (0)520 85 531. E-mail: Ingemar.Soderlund@se.saab.com

Project description: Create conditions to ensure human safety when introducing radio-based communication systems with transceivers in vehicles. This will be done through predictions and analyses based on potential telecommunication conflicts, system interaction and integration from a whole vehicle perspective, and the optimisation of the communication quality in vehicles taking into account performance, cost, design and lead time. The method will be developed to be useful in the design phase so that different solutions can be evaluated before testing. Amongst other things, a simulation code that permits a varying degree of resolution in the model will be used. The technology will be demonstrated using practical test cases.

Project start/end: 2005 Q.1 – 2008 Q.4
Project budget: SEK 5.2 million
whereof
Corporate finance: SEK 2,3 million
Government support: SEK 2.9 million (SRA, SEK 2.9 million)
University / Institute: SEK 2.9 million

VEHICLE CONTROL BY USING PREVIEW INFORMATION – LOOK AHEAD

Partners: Scania CV, LiTH and / or the Royal Institute of Technology, Stockholm .

Project manager: Tony Sandberg Scania CV
Tel: +46 8 55382213. E-mail: tony.sanberg@scania.com

Project description: The various in-vehicle control systems together with some sort of map (static, dynamic) make it possible to develop systems that reduce fuel consumption as well as improve road safety and comfort. If the control systems know in advance such things as vertical and horizontal curves, speed limits, congestion, etc, the control of auxiliary units (cooling system, compressors, etc), brakes (wheel brake, retarder), driveline (engine, gear box) as well as cruise control functions (speed, distance) can be optimised. The project will work with maps, their interfaces and architecture (information content, format, bandwidth, resolution, horizon) as well as the modelling and control of the actuators involved (auxiliary systems, brakes, driveline). The aim is to find ways to handle or generate information about the road and then use that information in the control systems to reduce fuel consumption and improve road safety as well as provide the driver with an incentive to better driving.

Project start/end: 2005 Q.2 – 2009 Q.4
Project budget: SEK 9.4 million
whereof
Corporate finance: SEK 4,7 million
Government support: SEK 4.7 million (SRA, SEK 4.7 million)
University / Institute: SEK 5.9 million

SOLVI - INCREASING VEHICULAR SAFETY IN COMMERCIAL VEHICLES WITH IMPROVED ATTRIBUTES AND ADVANCED DRIVER ASSISTANCE SYSTEMS

Partners: Navteq AB, Scania CV AB, Volvo Technology Corporation, Michael L. Sena Consulting AB, Triona AB, Appello AB and Swedish Road Administration

Project manager: Michael L. Sena, Michael L. Sena Consulting AB
Tel: +46 (0)340 656 880. E-mail: ml.sena@mlscab.se

Project description: The project will focus on the collection, processing, delivery and dynamic updating of road information for safety and performance improvements in heavy truck operations. These safety attributes, including variable speed limits, will be tested in Advanced Driver Assistance Systems (ADAS) and navigation system applications for heavy trucks developed within the proposed project. The safety and performance benefits that would accrue from integrating the road attributes and using ADAS in truck operations will be identified. The project should make a major contribution to determining how a European road database can best be created, and how ADAS can apply these attributes to improve the safe performance of commercial vehicles, particularly heavy trucks.

Project start/end: 2005 Q.4 – 2009 Q.4
Project budget: SEK 32.8 million
whereof
Corporate finance: SEK 15.2 million
Government support: SEK 17.6 million (SRA, SEK 17.6 million)
University / Institute: SEK 0 million

FEED MAP – TECHNICAL AND ECONOMIC FEASIBILITY ASSESSMENT OF MAP DATA FEEDBACK LOOPS APPLIED TO THE ACT MAP FRAMEWORK

Partners: Swedish Road Administration, Volvo Technology AB

Project manager: Olle Bergman, Swedish Road Administration
Tel: +46 (0)243 75 417. E-mail: olof.bergman@vv.se

Project description: The Feed MAP project is an EU project that aims to build a cooperative map feedback and updating framework improving the cooperation between data owners and data users. This framework will contribute to better transport efficiency and road safety by creating a sustainable source of map updates at a reduced cost for navigation and Advanced Driver Assistance Systems (ADAS) applications.

Project start/end: 2006 Q.1 – 2008 Q.3
Project budget: SEK 3,0 million
whereof
Corporate finance: SEK 1.8 million
Government support: SEK 1.2 million (SRA, SEK 1.2 million)
University / Institute: SEK 0 million

SAFE BRAKING

Partners: Volvo Technology AB, AB Volvo 3P, Chalmers University of Technology

Project manager: Lotta Holmén, Volvo Technology AB
Tel: +46 (0)31 322 59 95. E-mail: charlotte.holmen@volvo.com

Project description: The project aim is to determine safety benefits and user acceptance of preview information for brake blending control and Advanced Driver Assistance Systems (ADAS) in heavy vehicles, as well as requirements on the preview information (map data attributes) in terms of resolution, accuracy and representation necessary to reach different levels of safety benefits. Sharing preview technology with the "Truck attributes and ADAS application" project cluster and control strategies with the on-going Integrated Retarder Control (IRC) project, a number of applications will be implemented and evaluated. Enhanced brake blending (avoiding brake fading), Cruise control, Emergency braking, ESP and Roll Over Protection (ROP) are the main application areas.

Project start/end: 2007 Q.1 – 2008 Q.4
Project budget: SEK 4.2 million
whereof
Corporate finance: SEK 2.1 million
Government support: SEK 2.1 million (SRA, SEK 2.1 million)
University / Institute: SEK 0 million

SAFESPOT – SMART VEHICLES ON SMART ROADS

Partners: Swedish Road Administration (SRA)

Project Manager: Bengt Hallström, Swedish Road Administration
Tel+46 (243) 751 79. E-mail: bengt.hallstrom@vv.se

Project description: The Swedish Road Administration will support those taking part in the EU project "SAFESPOT" with connections and data exchange to and from the Traffic Management Centre to enable them to implement the applications that will be demonstrated at a Swedish test site.

The applications concerned refer to:
Longitudinal and lateral information alerts to drivers such as "blind spot" and risk for a rear-end collision.
Tunnel safety, speed adaptation with a special focus on hazardous goods transports.
XFCD with a focus on the detection and reporting of icy patches with the reporting being conducted between vehicles and to the Traffic Management Centre.

Project start/end: 2006 Q.1 - 2010 Q.1
Project budget: SEK 2.2 million
whereof
Corporate finance: SEK 1.1 million
Government support: SEK 1.1 million (SRA, SEK 1.1 million)
University / Institute: SEK 0 million

CVIS – COOPERATIVE VEHICLE – INFRASTRUCTURE SYSTEMS

Partners: Swedish Road Administration (SRA).

Project Manager: Bengt Hallström, Swedish Road Administration
Tel: +46 (243) 751 79. E-mail: bengt.hallstrom@vv.se

Project description: Cooperative vehicle-infrastructure systems will allow vehicles to cooperate directly with other nearby vehicles, and with the immediate roadside infrastructure, thus sharing information on incidents, road hazards and the latest traffic information for greater safety, efficiency and a better environment. Each equipped vehicle will be able to connect and communicate via local ad hoc networks of vehicles and roadside equipment in the vicinity as well as via an always-on network connection for accessing a wide range of journey support and other services.

Project start/end: 2006 Q.1 – 2010 Q.1
Project budget: SEK 2.4 million
whereof
Corporate finance: SEK 1.3 million
Government finance: SEK 1.1 million (SRA, SEK 1.1 million)
University / Institute: SEK 0 million

TRUCK CARGO WEIGHT CONTROL

Partners: AB Volvo, Volvo Technology, Wabco Automotive AB, Swedish Road Administration and Swedish Association of Road Haulage Companies / AB Åkerikonsult AB

Project manager: Per H. Nilsson, Volvo Technology.
Tel.: +46 (31) 772 4090. E-mail: Per.Henrik.Nilsson@volvo.com

Project description: Today, the main distribution method for goods within Europe is by truck. These vehicles are often either overloaded or the load has been incorrectly distributed. These problems result in increased wear and tear of the road network which leads to higher maintenance costs, is a road safety issue and provides illegal competitive advantages.

The development of *an integrated system for active cargo weight control* will reduce these problems. The task is too extensive to be handled by one single party. Four Swedish companies have therefore agreed to jointly develop such a weight control system. The result will be presented at the ITS World Congress in 2009.

Project start/end: 2007 Q.3 - 2009 Q.4
Project budget: SEK 6,0 million
whereof
Corporate finance: SEK 3,5 million
Government support: SEK 2,5 million (SRA SEK 2,5 million)
University / institute: SEK 0 million

6. Dependable & Fault-Tolerant Systems

COST EFFICIENT DEPENDABLE ELECTRONIC SYSTEMS - CEDES

Partners: AB Volvo, Volvo Car Corporation, Autoliv Electronics, Chalmers University of Technology and SP (Technical Research institute of Sweden)

Project manager: Håkan Edler, SP
Tel: +46 (0)31 28 15 51. E-mail: hakan.edler@sp.se

Project description: The main focus will be to study and invent software-based fault tolerant mechanisms that require a minimum of hardware redundancy. This research is expected to result in new cost-efficient fault detection methods with high coverage. The resulting mechanisms will be possible to integrate into vehicle architecture with standardised middleware interfaces and modules (e.g. AUTOSAR or EAST).

Apart from the technical systems, the project will also address the process of how to specify and develop such mechanisms in a vehicle development process.

Project start/end: 2004 Q.4 – 2008 Q.4
Project budget: SEK 44 million
whereof
Corporate finance SEK 22,6 million
Government support: SEK 21.4 million (Vinnova 21.4 million)
University / Institute: SEK 14.8 million

AUTOVAL - VALIDATION METHODS AND SAFETY REQUIREMENTS FOR SAFETY-RELATED AUTOMOTIVE ELECTRONICS

Partners: SP (Technical Research institute of Sweden), AB Volvo, Saab Automobile, Haldex Brake, QRTech

Project manager: Jan Jacobsson, SP
Tel.: +46 (0)33 16 56 97. E-mail: jan.jacobson@sp.se

Project description: New safety functions and the increased complexity of vehicle electronics enhance the need to demonstrate dependability. Vehicle manufacturers and sub-suppliers must be able to present a safety argument for the dependability of the product, correct safety requirements and suitable development methodology. The objective of the AutoVal project is to develop methods to validate the safety in a safety-related function (or in safety-related sub-systems) in a vehicle. The validation shall produce results that can be used either as a basis for a whole vehicle type approval provided by law, or for supporting dependability claims according to the guidelines of the manufacturer.

Project start/end: 2004 Q.3 – 2007 Q.1
Project budget: SEK 6.4 million
whereof
Corporate finance: SEK 3,2 million
Government support: SEK 3.2 million (Vinnova 3.2 million)
University / Institute: SEK 0 million

FAULT DETECTION AND ISOLATION FOR FAULT TOLERANT ARCHITECTURES

Partners: Scania CV, Uppsala University or Royal Institute of Technology, Stockholm

Project manager: Mattias Nyberg, Scania CV
Tel:+46 (0)8 553 83736. E-mail: mattias.nyberg@scania.com

Project description: The safety in today's vehicles is directly dependent on the reliability of safety critical systems that control the driveline, brakes, and different safety-in-traffic related systems like cruise control, ABS, ESP and air-bags. In future vehicles there will be even more safety-in-traffic related systems that depend on reliable control systems, e.g. "brake-by-wire" and "steer-by-wire". A fault in these systems could degrade the safety of the vehicle, or even be the root cause of an accident. Therefore it is important that these faults can be detected quickly and a countermeasure taken. This could involve, for example, a measure to compensate the fault, shut down the system in a safe way, or warn the driver.

The aim of this project is to develop methods for diagnosis of such faults. Diagnosis means detect and isolate; i.e. to decide exactly which component is faulty. Isolation is important to be able to compensate for the fault and to decide the degree of seriousness.

Project start/end: 2005 Q.1 – 2009 Q.1
Project budget: SEK 4.5 million
whereof
Corporate finance: SEK 2,3 million
Government support: SEK 2.2 million (Vinnova 2.2 million)
University / Institute: SEK 2.9 million

MODEL INTEGRATION FOR ANALYSIS OF ARCHITECTURE AND DEPENDABILITY

Partners: Scania CV (Systems Development Department) and Royal Institute of Technology, Stockholm (Mekatronik/Inbyggda system)

Project manager: Michael Blackenfelt, Scania CV
Tel: +46 (0)8 553 803 28. E-mail: michael.blackenfelt@scania.com

Project description: The dependability and quality of the electrical system in modern trucks depends largely on the design of the architecture; i.e. allocation of functions to ECUs, position of the ECUs in the network, cabling in the chassis/cab/engine, etc and the ability to describe and analyse the architecture. Finding the best solution and limitations in existing solutions is difficult because information from various domains (software, hardware, cables, etc) is needed for an overview. Today this information is contained in various documents and models without links. Better representation of the system and its components (UML, CAD, etc) as well as methods to integrate the information (PDM, SCM) is the path forward to ensure good architecture and dependability of complex electrical systems. This project will further investigate how that should be done.

Project start /end: 2005 Q.4 – 2006 Q.4
Project budget: SEK 1.4 million
whereof
Corporate finance: SEK 0,7 million
Government support: SEK 0.7 million (Vinnova SEK 0.7 million)
University / Institute: SEK 1.4 million

7. IVSS Evaluations & Other Projects

E-IMPACT – SOCIO-ECONOMIC IMPACT ASSESSMENT OF STAND-ALONE AND CO-OPERATIVE INTELLIGENT VEHICLE SAFETY SYSTEMS (IVSS) IN EUROPE

Partners: Swedish Road Administration SRA & all the other IVSS partners

Project Manager: Gunnar Lind, Movea
Tel: +46 (0)8 694 8850. E-mail: gunnar.lind@movea.se

Project description: Intelligent Vehicle Safety Systems (IVSS) increase the safety and efficiency of the transport system. A socio-economic impact assessment is central in this project. All other work packages and tasks are defined in relation to the socio-economic impact assessment. Key activities include the identification of the most promising stand-alone and co-operative IVSS technologies; the development of scenarios for IVSS for the years 2010 and 2020; the assessment of the road safety and efficiency impact of IVSS in these scenarios; and the identification of policy options available for enabling the implementation of IVSS. The output will be a socio-economic impact assessment including cost-benefit results, stakeholder benefits and costs and macroeconomic effects.

Project start/end: 2006 Q.1 – 2008 Q.2
Project budget: SEK 0.720 million
whereof
Corporate finance: SEK 0.390 million
Government support: SEK 0.3 million (SRA, SEK 0.3 million)
University / Institute: SEK 0 million

INTACT – INVESTIGATION NETWORK AND TRAFFIC ACCIDENT COLLECTION TECHNIQUES

Partners: Volvo Car Corporation, AB Volvo, Saab Automobile, Autoliv, Swedish Road Administration and Chalmers University of Technology

Project Manager: John-Fredrik Grönvall, Volvo Car Corporation
Tel.: +46 (0)31 325 41 69. E-mail: jgronval@volvocars.com

Project description: The aim of this pilot project is to create the base for national traffic accident investigations. A unique and effective methodology for accident investigation will be developed including the pre-crash, crash and post-crash phase with a focus on the human being, vehicles and the environment.
Co-operation between the vehicle industry, the Swedish Road Administration, health care services and universities will be further developed. The methodology will be tested through full-scale accident investigations including data collection and case analysis. A tool for data storage and extraction will be developed. The data collected will, in the long run, contribute to new knowledge about contributory factors to accidents and how passive and active systems perform in a real-world accident.

Project start/end: 2007 Q.1 – 2009 Q.4
Project budget: SEK 31.3 million
whereof
Corporate finance: SEK 13.4 million
Government support: SEK 17.9 million (SRA, SEK 17.9 million)
University / Institute: SEK 14.1 million

IVSS

Intelligent Vehicle Safety Systems

Postadress: IVSS/ Vägverket, 781 87 Borlänge
Besöksadress: IVSS/Vägverket, NAVET, Lindholmspiren 5, Göteborg

Tel. +46 31 63 50 00
www.ivss.se