



Annual Report to Shareholders

Operative Year # 9

April 1st, 2014 – March 31st, 2015



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Reflections on SAFER year 9 – April 1st, 2014 - March 31st, 2015

Wanted position 2016 is the guiding star for SAFER activities and an important focus point. The International Scientific Advisory Board (ISAB) evaluation in May 2014 encouraged us with their statement *“SAFER is a unique organization well positioned to conduct collaborative research that is of great value for national and international stakeholders as well as its industrial partners”*. It confirmed that we are well on our way towards the goals we set up three years ago.

The understanding of SAFERs added value and assets have become more profound as the more than 130 projects show successful results and international visibility. During year 9 several projects have been delivered. The 10 strategic projects decided last year have been completed with good results. New SAFER partners were involved, a new consortium on “urban personal vehicles and business models” was formed, realization of a full-scale vehicle laboratory has started, and at least one application for Horizon 2020 was submitted. The project portfolio now amounts 500 MSEK and SAFER continues to seek opportunities to further expand the portfolio. Additionally SAFER has during the year got its first Horizon 2020 project grant and is acting as a Joint Research Unit with full responsibility.

SAFER partners and researchers have further strengthened the international position and the role as spider in the global web, e.g. in collection and analysis of driving data, child safety and human body models. Research related to automated driving is rapidly growing and SAFER is active through direct projects and by participating in different national and international groups. The international collaborations will be crucial for successful research and we have consciously built collaborations with European consortia as well as US universities. At the other end of the spectrum we have also increased activities for vulnerable road users.

The ISAB findings served as input to the boards strategy meeting in August with the aim to prepare necessary directions for the set-up of “Next SAFER” beyond 2016. This resulted in a strong commitment for a continuation of SAFER and a strategic plan to work out details. This has led to engaged discussions on several aspects of SAFER such as the future scope, the added value, the need of new partners in certain areas and the way forward in relation to the challenges of future traffic safety. A survey to SAFER’s partners was undertaken in December 2014 and has provided valuable input for the development of Next SAFER.

The high momentum in year 9 continues with projects, strategic work, events etc. In June we will host the well renowned international ESV conference. It is a symbolic start of year 10 and the next step for SAFERs 33 partners and 300 key people!

Lindholmen in May 2015

Anna Nilsson-Ehle, Director

1. LONG-TERM VISION, MISSION AND STRATEGY

Vision

SAFER provides **excellent multi-disciplinary** research and **collaboration** to eliminate fatalities and serious injuries, making Swedish **society, academy and industry** a **world leader** in vehicle and traffic safety.

Mission

- Run collaborative research projects with excellent academic publications and high relevance to society and industry. Explore new research areas through pre-studies and participation in international networks.
- Combine the multi-disciplinary scientific competence available within SAFER to enhance scientific excellence as well as innovation capability.
- Serve as an open innovation centre for partners and international researchers and provide the prerequisites for creative and productive research collaboration.
- Develop world-class competence, including research tools and methods, in SAFER Focus Topics.
- Inspire students, researchers and product developers to be devoted to the area of traffic safety.
- Disseminate results and knowledge to society.

Strategy

To significantly contribute to the vision and become a well renowned international centre of excellence SAFER has to deliver results, build competence and create strong networks in selected areas.

The strategy is built on the pillars **Excellent competence, Multi-disciplinary research and Collaboration**. The strategic plan is to build long-term competence in defined Competence Areas necessary to achieve outstanding research and innovation in chosen Focus Topics (details in chapter 5).

Presently the seven Focus Topics are:

- Incidents and accidents – priorities and effect analysis
- Driver state and behaviour
- Design for accident prevention
- Methods for evaluation of vehicle and traffic safety
- Safety for novel vehicles and vehicle combinations
- Human body protection
- Care and Rescue

The strategy also includes a common **work environment**, **seminars** and work **methods**, and a **uniting name** – SAFER. Multi-disciplinary research and collaboration are supported by the SAFER environment where researchers and project members can meet and work side by side. This creates an atmosphere of true collaborative research and an ongoing dialogue involving many different actors within the safety area.

Wanted Position 2016

1. Visible and measurable results in practice
2. Hub for Swedish traffic safety research
3. Acknowledged as a world leader in traffic safety research
4. A broad set of partners and collaborations in order to ensure the strategy and explore new needs and countermeasures
5. A balanced project portfolio and a long term financing of the core operations

Values

SAFER is guided by its vision, strategy and values. The essence and ultimate purpose of SAFER is to create a setting where “World class expertise in traffic safety collaborates to save lives”. SAFER values shall be reflected in the work environment and express open minds, respect for each other, cooperative spirit, high aspirations, curiosity and joy.

Financing

According to the partner agreement for Stage 3, running from April 1st 2012 to March 31st 2016, SAFER has a funding of 126 MSEK. Of these 126 MSEK, VINNOVA is providing cash 40 MSEK, while the partners contribute 86 MSEK whereof cash 10 MSEK and the rest in inkind.

Chalmers Transport Area of Advance receives Swedish national strategic research funding for Traffic Safety for the years 2010-2015. The amount of this grant is well in the order of Chalmers’ inkind commitment to SAFER and the research grant has played an important role for the development towards a world class research centre.

The common costs¹ for SAFER are approximately 70% of the cash funding. 81% of these costs are paid by SAFER while 19% are inkind from partners. The common costs are approximately at the same level for the years 7 to 9, and have a rather stable relation to the size of the project portfolio: when the portfolio grows so do the common costs. The ability to attract external funding for projects continues to be important as well as finding complementary cash funding for centre activities.

¹ Common costs=costs that are not directly attributable to projects

Project finances

Projects in the SAFER environment are split in two categories: "Own projects" are governed according to SAFER financial rules and project procedures. "Associated projects" have external grants and governance but are part of the total project portfolio and follow-up.

They are projects where SAFER partners are engaged, often originating from SAFER-own pre-studies, and the projects are part of and contribute to the SAFER environment and community.

The total project turnover for all projects, both own and associated, is monitored regularly. The goal for SAFER is to reach an *annual* project portfolio turnover of 200 MSEK by year 2016. When SAFER started in 2006 the existing annual project portfolio was estimated to 60 MSEK. The estimation for the annual project portfolio turnover year 9 is 180 MSEK, whereof SAFER's own projects are 41 MSEK. The total value of the project portfolio is some 500 MSEK.

The growth of the project portfolio reflects the outcome of SAFER efforts, but also the effect of changes in national and international research programs for automotive and transport research. The European research program Horizon 2020 has just finalized its first round of calls. The one topic addressing safety research explicitly had a very high application rate. SAFER is a Joint Research Unit (JRU) partner in two of the projects that finally were granted in tough competition.

For the coming calls SAFER has been active in several ways to promote traffic safety as an important research topic. This is possible due to a Vinnova grant (Påverkansplattform) with the purpose to enhance presence in Europe.

2. ORGANISATION AND MANAGEMENT OF THE CENTRE

Partners and Shareholders meeting

The shareholding partners in SAFER are:

AB Volvo, Acreo Swedish ICT, Autoliv, Chalmers University of Technology, City of Gothenburg (Traffic and Public Transport Authority), Folksam, Halmstad University, If Insurance, KTH Royal Institute of Technology, Lindholmen Science Park, Lund University, Region Västra Götaland, Scandinavian Automotive Suppliers, Scania, SP Technical Research Institute of Sweden, Sweco, Swedish Transport Administration, Swerea IVF, Swerea SICOMP, TÖI – the Norwegian Institute of Transport Economics, University of Gothenburg, Viktoria Swedish ICT, Volvo Car Corporation, VTI Swedish National Road and Transport Research Institute, and ÅF (former Epsilon). During year 9, the Swedish Transport Agency became a partner in SAFER.

University of Borås, University of Skövde, Malmeken AB och Irezq AB have been associated partners since year 8. During year 9 also University West has joined.

VINNOVA is the main funder.

Board

The executive board of SAFER consists of representatives from the large partners. Year 9 the board has consisted of nine members: Magnus Rilbe, AB Volvo; Ola Boström, Autoliv; Anna Dubois and Per Lövsund, Chalmers; Jan Smith, GU; Mikael Nybacka, KTH; Erik Norrgård, Swedish Transport Administration; Jan Andersson, VTI Swedish National Road and Transport Research Institute; Cecilia Larsson, Volvo Cars. Eric Wallgren, VINNOVA, is an adjunct member. Karin Svensson, AB Volvo, is independent chair person without suffrage. There have been six board meetings during year 9, including one meeting dedicated to strategy in August 2014.

Reference Groups

The research at SAFER is conducted in four research programmes, each led by a Reference Group Leader. Projects are initiated, discussed and recommended to the board by Reference Groups for each programme. These groups include representatives from all SAFER partners that have an interest to participate and are the base for establishing world class competitive project portfolios. Each programme hosts a mix of projects: pre-studies for future projects, small and large national and international projects. Projects are both own and associated.

The four research programmes are: *Pre-Crash* which handles projects on accident prevention (accident avoidance and crash mitigation), *Crash* covers projects concerning injury prevention, *Post-Crash* handles projects on mitigating consequences of accidents

and *Traffic Safety Analysis* concerns projects aiming at understanding traffic and the causation and dynamics of accidents and injury occurrence.

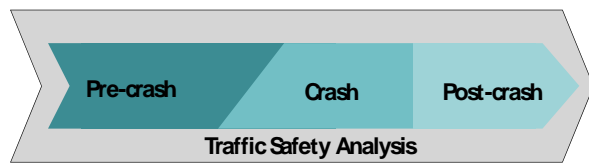


Figure 1: The four research programmes

Reference Group Leader for **Pre-Crash** is Dr Christian Grante, AB Volvo. 7 meetings were held during year 9, on average there were 16 participants at each meeting. 16 partners are on the distribution list, whereof 13 attended meetings during year 9.

Leader of the **Crash** Reference Group is Dr Lotta Jakobsson, Adjunct Professor at Chalmers and Senior Technical Leader at Volvo Car Corporation. The secretary is Dr Fredrik Törnvall, AB Volvo. 7 meetings were held, on average 10 participants attended. 14 partners are on the distribution list, whereof 11 attended meetings during year 9.

Leader of the Reference Group **Post-Crash** is Dr Bengt Arne Sjöqvist, Professor of Practice at Chalmers. During the year 9, 4 reference group meetings were held. About 5-10 participants attended the meetings.

The **Traffic Safety Analysis** Reference Group is led by Dr Robert Thomson, Associate Professor and Department Leader at Chalmers. The 5 reference group meetings during year 9 were attended by 8-10 participants per meeting. 7 unique SAFER organisations are active in the group.

Competence areas

The competence areas at SAFER are: Field Data, Human Monitoring, Behaviour in Accident Causation, Human Factors Design, Driving Simulator Applications, Sensors and Communication, Functional Safety, Vehicle Dynamics, Road Infrastructure, Structures and Materials, Biomechanics and Protective Systems, and Traffic Systems. The AstaZero research council is considered equivalent to a competence area.



Figure 2: The Competence Areas and their leaders

Each area is led by a Competence Area Leader (CAL) who gathers SAFER partners' key persons with their main research interest in the respective field. It is the responsibility of each competence area to know state-of-the art of global research and what's perceived as world-class research. Each CA should have short and long-term plans for the development of their specific competence at SAFER.

Centre management

SAFER has two management groups. The Operative Management Group consists of the Director, Deputy Director, the Reference Group Leaders, the Communications Manager, and the Financial Officer. The Extended Management Group includes the Operative Management Group and also the Competence Area Leaders, Focus Topic Strategists and leaders of "Large projects". The Scientific Leadership for SAFER is distributed to the Competence Area Leaders and Reference Group Leaders.

Participants in the Operative Management Group per March 2015 are: Anna Nilsson-Ehle, director of SAFER; Ingrid Skogsmo, deputy director; Christian Grante, Reference Group Leader Pre-Crash; Lotta Jakobsson, Reference Group Leader Crash; Bengt Arne Sjöqvist, Reference Group Leader Post-Crash; Robert Thomson, Reference Group Leader Traffic Safety Analysis; Lisa Knutsson, Communications Manager; Pia Nilsson, Financial Officer; and Daniela Michael, Program Manager. Regular meetings occur biweekly.

Participants in the Extended Management Group are per March 2015 additionally to the Operative Management Group: Cristofer Englund, Viktoria Swedish ICT; Martin

Fagerström, Department of Applied Mechanics, Chalmers; Jan Jacobson, SP; Bengt Jacobson, Department of Applied Mechanics, Chalmers; MariAnne Karlsson, Department of Product and Production Development, Chalmers; Lena Nilsson, VTI; Hans Norin, Department of Applied Mechanics, Chalmers; Erik Ström, Department of Signal and Systems, Chalmers; Mats Svensson, Department of Applied Mechanics, Chalmers; Nicole Kringos, KTH; Christian Berger, Department of Computer Science and Engineering and AstaZero research council; Helena Gellerman, area manager FOT/NDS, SAFER; and Jac Wismans, guest researcher at Chalmers and SAFER. The Extended Management Group meets on a monthly basis.

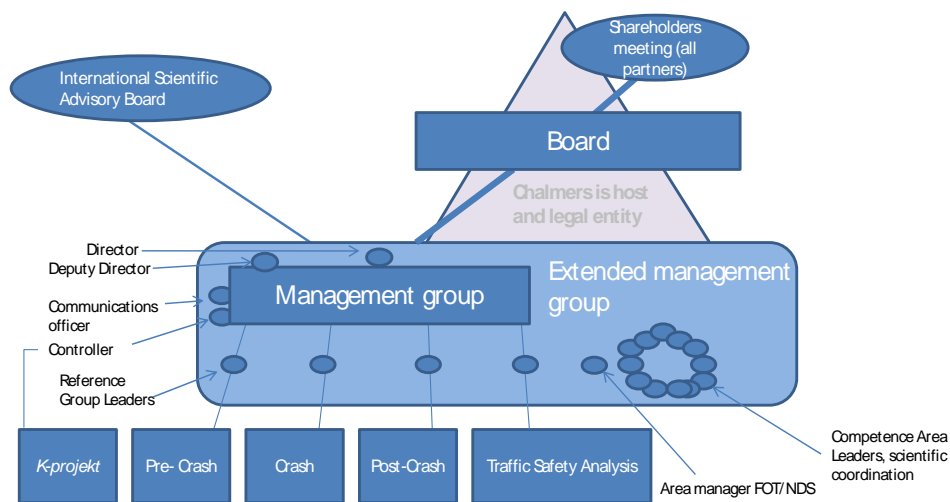


Figure 3: The organisation of SAFER and relation to Chalmers

Chalmers is the host for SAFER and SAFER is the core of the research profile Traffic Safety within the Transport Area of Advance at Chalmers (Styrkeområde Transport).

International Scientific Advisory Board (ISAB)

SAFER has an international Scientific Advisory Board (ISAB). Based on written material, presentations and interviews the ISAB provides advice about the quality, scientific relevance and organization of the research at SAFER in an international context. The ISAB consists of five members: Dr Joseph Kaniyanthra, USA; Dr Kazuya Takeda, Japan; Dr Anne Guillaume, France; Dr Martin Baumann, Germany; and Dr Marika Kolbenstvedt, Norway. A first Scientific review meeting was held in February 2011 and a second in May 2014.

3. WANTED POSITION 2016 – STATUS YEAR 9

WP 1. Visible and measurable results in practice

SAFER has continued to build competence in all relevant areas and enhanced activities in the areas of bicycling safety and automated and connected traffic. The results generated in SAFER projects are being used by the partners which evidently has contributed to increased safety on the roads. However, it is very difficult to measure and quantify SAFER's direct impact. The self-assessment we are preparing will describe different case stories as an alternative to statistical measures.

Several project results have received high attention. The SAFER-led US project "SHRP2 Safer Glances" with ground-breaking results regarding driver behaviour in accident causation and the SAFER project QUADRA with new approaches to driver modelling are just two examples.

SAFER arranged the third international cycling safety conference in November 2014. Held for the first time outside the Netherlands it was attended by a record-high audience of 160 participants from 23 countries. This was somewhat of a break-through for the conference. It gave SAFER researchers an opportunity to show their broad competence and to build new international networks.

During the year we have continued to arrange seminars regularly to bring research results both to SAFER partners, to the researcher community and to the public. The latter mainly in collaboration with NTF.

SAFER has increased visibility on the international arena in particular in Europe but also in US, Australia and Asia.

WP 2. Hub for Swedish traffic safety research

During year 9, SAFER has continued to strengthen its hub role. Since May 2014 SAFER leads the national advocacy platform "TS-Europe" towards Horizon 2020. The aims are to 1) secure that traffic safety is adequately addressed in Horizon 2020 calls, and 2) facilitate that Swedish organizations are involved in successful applications. TS-Europe core team members have been strongly involved in national and international H2020-related activities. Examples include visible contributions to proposals for 2016-2017 work programmes submitted by e.g. ERTRAC and the Swedish national representatives to EU's Programme Committee. SAFER has also been contacted by several consortia, who have asked for SAFER's specific competencies and set-up, in particular in 2015-calls. SAFER is a Joint Research Unit (JRU) in e.g. the H2020-project Safety Cube, following a successful application in a 2014 call.

SAFER continues to be a resource for traffic safety research at large. During year 9, SAFER was appointed member of Swedish Transport Administration's Grupp för nationell samverkan (GNS) Väg.

The coordination role for the traffic safety national research and innovation agenda “Safe Future”, released in 2013, has also led to participation at several other events, such as the SAFER’s participation at Tylösand Seminar 2014 in a session about the upcoming update of Sweden’s Vision Zero.

The FFI²-program heavily involves several SAFER partners. It spans the areas energy & environment, traffic safety & automation, vehicle development, sustainable production technologies and transport efficiency. SAFER has during the year acted as a coordinator of academic input to the update of FFI’s road map for traffic safety & automation.

On both the Swedish and international arena SAFER has initiated and coordinated seminars and workshops that have attracted a committed and renowned audience. Examples are NTF-SAFER events on automated driving.

WP 3. Acknowledged as a world leader in traffic safety research

An extensive report about research at SAFER was prepared for the International Scientific Advisory Board (ISAB) meeting May 15-16, 2014. The purpose of the ISAB was to assess SAFER research achievements and give recommendations for future development.

The ISAB stated in their evaluation report that: *The expertise that is available among the partners is unique and it is poised to make great strides in research in safety and other related areas with relatively less investment than other such institutions. SAFER needs a long term operational vision to continue its success beyond 2016, broken down by strategies and milestones. SAFER is definitely on track towards achieving its Mission. The SAFER concept is sound, it has an impressive Industrial network, impressive Academic Production in many areas and SAFER Researchers constitute a well-connected research community.*

ISAB recommendation for next SAFER is to

- *focus on future technologies and safety countermeasures: pre-crash post-crash integration, global safety, safety of autonomous driving.*
- *increase work on broader economic evaluation, accident consequences (for ex. functional life lost, lost of productivity...).*
- *have better visibility of the organization and a better spread of process*
- *set up a strategy for outreach to society at national and international level*
- *broaden to safety for all road users*
- *include more stakeholders at the local level*
- *promote and take part in international standardization activities*
- *make available the data base for third parties*
- *conduct real world performance evaluation to validate new technologies*

² FFI = Programmet för Fordonsstrategisk Forskning och Innovation; the Swedish program for automotive-related research and innovation

In 2016 SAFER aims to have a critical mass of researchers for each competence area (CA). During year 9 the CAs have continued to grow in importance and become stronger and more visible through arranging Thursday seminars and external seminars with national outreach. Several competence areas that address enabling technologies for safety applications have established collaborations with other research centres and platforms with similar competence interests. Examples are CA “Signals & Systems” connecting to antenna competence centres GigaHz and Chase, CA “Structures & Materials” connecting to Lighter, and CA “Road Infrastructure” connecting to KTH’s centre Road2Science.

Important research infrastructures and their associated methodology are seen as own CAs. The competence area “Driving simulator applications” is closely connected to the VIP competence centre and the associated driving simulators. AstaZero proving ground was inaugurated in August 2014 and has an own CA. Since the inauguration two one day events called “Researchers Day” have taken place at AstaZero with the purpose to get a strong presence of research at AstaZero. SAFER conducted a pre-study named ReVeRe (Research Vehicle Resource at Chalmers) to map the prerequisites for a full scale vehicle lab. This pre-study ended with a proposal and in December 2014 VGR³ decided to co-fund a start-up project for ReVeRe in collaboration with Chalmers, Volvo and Volvo Cars. The purpose is to establish a laboratory, placed in Lindholmen Science Park, with full-scale passenger cars and trucks for research purposes, particularly regarding automated driving.

In 2016 SAFER should be at the cutting edge in specific research subjects within all Focus Topics. The present position presented in the following.

Incidents & Accidents: This Focus Topic is a backbone for future safety research. In the recent (2014) Horizon 2020 EU call specifically addressing Traffic Safety Analysis, SAFER partners have been part of no less than seven project proposals that contain elements in this Focus Topic, highlighting that SAFER is a sought after research platform for international researchers. There are a number of researchers, distributed among the SAFER partners, with acknowledged international reputation and SAFER has a world leading cluster of researchers connected to naturalistic data activities. Crash data collection and analysis at SAFER is also world renowned. An example is the research collaboration with UMTRI⁴ investigating if real world safety levels for cars in Europe and the US are equivalent although their legislated test standards are different. While there are a reasonable number of senior researchers engaged in this Focus Topic, there should be more PhD activities and this would encourage more publications and analysis of the data.

Driver State and Behaviour: The topic grows in importance due to the more complex interaction with the increasing automation of vehicles. Several associated projects have started in order to address this area. Examples include AUX (Automotive User Experience), AIMMIT (Automotive integration och multi modal technologies), HATric (HMI for autonomous vehicles in Traffic), AdaptIVe (Automated Driving Applications

³ VGR = Västra Götalandsregionen

⁴ UMTRI = University of Michigan Transportation Research Institute

and Technologies for Intelligent Vehicles) and (SERET) Safe Road Trains for Efficient transport. Many projects are also closely connected to naturalistic driving studies. The SHRP2⁵ funded project “SAFER glances”, has been completed and the report and published results have been highly appreciated. Driver state estimation and complete risk management for drivers are emerging areas as well, as are VRU behaviour and elderly drivers. Projects like BikeSAFE, BikeSAFER, e-BikeSAFE, and NoRisk2Bike are examples where other road users (cyclists and pedestrians) have been the focus of behavioural issues and where SAFER researchers have achieved good recognition.

Design for Accident Prevention: This broad Focus Topic is growing and expanding due to the fast development of active safety systems, semi-automatic, fully automatic vehicles and connected traffic system research. The intention is to make use of the learning from SAFER’s expertise on why traffic accidents happen and what injuries they cause. In applied research projects the knowledge about traffic accidents is used to develop new functions to avoid accidents. The outcome of projects is taking Swedish partners to the fore-front in several important areas, which has been confirmed by international experts.

The recently finalized projects “NG-test” and QUADRA focus on testing and evaluation. NG-Test has evaluated known fault-positive scenarios in specific test environments. QUADRA is the first project ever that has developed driver behaviour models to be used in computer simulations and automated test track scenarios for evaluation active safety systems. Both projects have generated deeper knowledge about the driver’s behaviors, accidents scenarios and also generated patents. This new types of evaluation tools are essential to go towards virtual verification and validation of active safety systems and semi-automation thus making it more efficient and effective.

There are several new projects that address the design of the more complex assistance functions and even fully automated functions aiming to prevent critical situations from occurring. Examples include AdaptIVe (Automated Driving Applications and Technologies for Intelligent Vehicles), SERET (Safe Road Trains for Efficient transport) and SARPA (Safe and Robust Platforms for Automated vehicles). With these projects we see that “Design for Accident Prevention” is evolving and addressing the new challenges that are emerging as the active safety systems are starting to reach higher maturity.

Methods for evaluation of vehicle and traffic safety: SAFER has taken some vital steps to pro-actively promote method development for infrastructure (Gulliver, “Scenario-Based Testing of Pre-Crash Systems”, “Research at AstaZero”, “Simulator Lab at SAFER” etc.). As project activities escalate, it is obvious that there is world leading expertise and infrastructure available within the SAFER partners. During the spring of 2014, a number of new projects have been started at SAFER with the aim to develop infrastructure for novel vehicle dynamics and self-driving cars. A central element is a vehicle laboratory that is open to academic researchers beyond existing industrial facilities. Analytical assessment and prediction of safety benefits is also underway in projects like EFRAME (Evaluation Framework for Commercial Vehicle Safety Systems and Services) and is a key requirement

⁵ SHRP2 = Strategic Highway Research Programme 2; Transport Research Board (TRB), USA

for the rapidly developing technologies and faster design cycles in industry. Retrospective evaluation techniques are not sufficient and the integration of real world and experimental techniques is crucial for future safety systems. Several of these efforts are expected to result in world leading capabilities for evaluation of safety systems.

Safety for novel vehicles and vehicle combinations: This Focus Topic contains a variety of activities, which in several cases address the need to up-front integrate a safety perspective in new green and efficient mobility solutions.

Based on the SEVS2⁶ project, which ended in year 8, a handbook was written during year 9 summarizing the unique methodology developed within the project and making it available for the partners.

The Programme Safety for High Capacity Transport (HCT) encompass research on vehicle dynamics for long vehicle combinations.

The pre-study “Urban Personal Vehicles” (UPV) has resulted in development and evaluation of three different UPV concepts’ from different societal and technical perspectives. A project application to Vinnova’s call “Utmaningsdriven Innovation” was submitted and if granted in May 2015, more research will be performed in this area.

The development in the area of CAE tools for composite body concept assessment is of high importance for effective composite development in vehicle design and also exemplifies SAFER's strength at combining large and small projects to address the different needs of the partners. Several ongoing projects address this important field. During year 9 the “CompMethGlass” project was started, thanks to collaboration with partners in Germany. Together with research institute Fraunhofer and their partners in this area, five SAFER partners have taken on the challenging task of developing CAE glass models. This project not only provides realization of optimal benefits for CAE full-scale vehicle testing, but provides also new strategic connections for SAFER.

Human Body Protection: SAFER has a strong core group of activities in the area of human body modelling, involving researchers in several major projects. Becoming more important with increased penetration of e.g. pre-crash braking systems, the low-g activities on adult sized models -THUMS⁷, A-HBM⁸ project step 2 - resulted in a working model of pre-braking with following crash. A-HBM project step 3 continued which will further refine the model to include lateral movements as well. Additionally, developments in child human body model implementation of active muscles were also successful, resulting in a working rigid body human model.

Whiplash continues to be an important area. SAFER has devoted attention to the under-researched aspects of female whiplash injury occurrence. The national partners within the successful EU project “ADSEAT”⁹ (finalized year 8) continued on in a new project “ViVA” focusing continued application of the whiplash research results from ADSEAT together with human body model development of a mid-size female.

In the area of Child Safety, SAFER research and activity continues to influence international research and standards. The outcomes of the successful international workshop in

⁶ SEVS = Safe and Efficient Vehicle Systems

⁷ THUMS = Scaleable and tuneable human body models

⁸ HBM = Human body model

⁹ ADSEAT = Adaptive seat to reduce neck injuries for female and male occupants

September 2013 resulted in the first international Child Safety Conference in China in October 2014. The good progress and the world-class level of research was manifested when visiting professor Kristy Arbogast was appointed Honorary Doctor at Chalmers in May 2014.

Care & Rescue: This new Focus Topic covers cross-disciplinary triple-helix research and development. It addresses methods and solutions to reduce casualties as well as the severity of short and long-time injuries occurring after a traffic accident is a fact. The stakeholders include SAFERs existing partners but also actors representing areas like rescue services and healthcare, ICT¹⁰ and MedTech industry.

The Focus Topic involves areas like quick and correct response to an accident (“eCall” and “on-call” applications, dispatch prioritizing, etc.), care and prioritizing of victims at scene and in transport (prehospital/ambulance/emergency care and processes), quick and safe rescue service operations “on-scene” (extrication, handling of vehicles and accident scene, etc.) and secondary effects of a traffic accident with potential to result in additional incidents and accidents involving humans.

During the year the Vinnova founded project *Via Appia - ICT, apps and smart dispatching for improved traffic safety, reduced injuries and mortality* was started. It has a wide partner group and addresses ICT as a tool to improve road safety. It aims at reducing fatalities and injuries, as well as societal costs resulting from road traffic accidents, by enabling smarter handling of various eCall solutions. Road users like bicycles, motorbikes, ATV¹¹ and horse-riders are also included. Via Appia is a concept aiming at efficient handling of road user alarms, using smartphones to improve road safety at a broader scale, and facilitating the packaging of new offerings containing alerts.

Within Care & Rescue, projects aiming at developing sophisticated algorithms for “Severity Injury Prediction” (SIP) were launched and resulted in articles and conference abstracts expected to be published during the upcoming year. On-scene prediction as part of computerized clinical decision support systems for ambulance crews as well as dispatching centre applications are targeted. The collaboration projects targeting occult trauma injuries like traumatic brain and thorax injuries continued, and also found new additional funding. One project was selected as best poster at the London Trauma Conference. The project dealing with ATV eCall functionality continued.

WP 4. A broad set of partners and collaborations in order to ensure the strategy and explore new needs and countermeasures

During year 9 SAFER has held discussions with several prospect partners. As a result the Shareholder meeting in May 2015 will welcome Cycleurope (SAFER partner), and new associated partners Trivector and Umeå University. Earlier during the year University West was accepted as associated partner.

¹⁰ ICT = Information and Communication Technology

¹¹ ATV = All Terrain Vehicles

The intensified focus on bicycles and automated driving has resulted in a number of activities driven by SAFER partners but also several other actors. In February 2015 an application for a strategic innovation program on automated transportation (SIP-ATS) was submitted. SAFER takes on a role in the program office of this national program, which was granted in May 2015 and is led by Lindholmen Science Park. Since the SIP-ATS spans beyond road transport it gives access to new contacts and insights into a wider field of research needs.

In November 2014 SAFER hosted the third international cycling safety conference. A high level cycling expert meeting was held in conjunction with the conference in order to broaden the views of cycling safety research needs to an international perspective. Furthermore regarding bikes, SAFER has been involved in a collaboration with City of Gothenburg and Göteborg & Co resulting in a bid for the world's largest bicycle conference. This has led to contacts with European Cyclist Federation and continued involvement with Gothenburg regarding the city's ambitions for bicycling.

International partners and collaborations are detailed in the Internationalization section of Chapter 6. Continued efforts have been made during the year to support the China-Sweden research centre for Traffic Safety (CTS) inaugurated in 2012. Collaboration partners are Volvo, Volvo Cars, RIOH¹² and Tongji University, with SAFER as the Swedish platform.

National and regional efforts for developing test beds have continued. AstaZero was inaugurated in August 2014, and is one of the arenas allowing additional opportunities for collaboration. SAFER is also leading the establishment of a research vehicle at Chalmers which will open up for additional explorations.

WP 5. A balanced project portfolio and a long term financing of the core operations

The project portfolio reflects developments in the traffic safety area as well as the dynamics of projects and available funding.

Research on automated vehicles, driver behaviour and vulnerable road users are growing which is explaining the growth of pre-crash projects. At the end of year 9 the ongoing Pre-Crash portfolio corresponds to 70 % of the total which is an increase of 12% since last year. Crash represents 19 % while Traffic Safety Analysis has dropped to 10%, reflecting the completion of data collection projects. Post-Crash is still less than 1% but growing in activities.

Most of the funding of SAFER projects is external, actually SAFER own funding (cash + inkind) is less than 5 % of the total project portfolio. The distribution of own and external funding varies between the different portfolios due to the availability of research grants for

¹² RIOH = Research Institute of Highways, China

different topics. The internal SAFER “call” launched late 2013 resulted in 10 projects during 2014 ensuring good use of all SAFER funding for stage 3.

Long term financing options for SAFER beyond stage 3 have gained in attention during year 9. SAFER coordinated a Vinnova application for a Strategic innovation area (SIO) which however was not granted. The development of alternative strategies continues and has been addressed in the board’s strategy meetings in August 2014 and January 2015.

4. RESEARCH PROGRAMME

Research projects belong to one of the four project portfolios that together make up the research programme. They support one or several of the Focus Topics.

A project present at SAFER can be initiated at SAFER or be started by SAFER partners in another context and brought in to the SAFER environment where it can thrive and benefit from the presence of other projects and researchers. The portfolios typically build on mixed financing, where SAFER finances a pre-study which evolves into a pre-project, partly SAFER funded, and eventually a full project with external financing.

SAFER keeps track of all projects by monitoring their progress and turn-over. SAFER takes the full project responsibility for projects with SAFER financing as well as for projects where SAFER is project manager towards an external funder. This is the case for instance when SAFER acts as Joint Research Unit (JRU) in EU programmes but also in several national projects. Projects, for which SAFER takes full responsibility, are named “own” while all other projects are named “associated”. A list of all projects is continuously updated and presented to the SAFER board at each meeting.

In March 2015, 58 projects and pre-studies were ongoing in the four portfolios, out of which 28 are “own” projects and 30 are “associated” (see Enclosure 3).

5. FOCUS TOPICS – SCOPE AND OBJECTIVES

The Focus Topics together form a framework for project content and for development of competences and collaborations. During year 9 it was decided to enhance the pro-active work with roadmaps and as a first step the Focus Topic names were updated to better reflect the content. The road maps for the Focus Topics are currently under revision and will therefore not be presented in this report.

Incidents and Accidents – Priorities and effect analysis

Projects addressing the collection, processing, and analysis of traffic safety data contribute to the Focus Topic *Incidents and Accidents – priorities and effect analysis*. The areas that are covered include:

- Methods to collect and document road incidents and accidents such as vehicle instrumentation, interview techniques, accident reconstructions, etc.
- Processing and preparing data for analyses. This includes linking map data with vehicle usage, identifying safety critical events in naturalistic driving data, or extracting information from video records.
- Developing and conducting different analytical approaches to establish the relationships between variables describing the traffic system and the parameters defining an incident or accident outcome.

Information regarding incidents and accidents is a critical component of the research activities at SAFER, both in terms of infrastructure – databases, data collection experts, data processing tools – as well as analysis activities. The area of accident investigation has been a high priority activity in Sweden for many years and the expansion into collecting naturalistic driving data, with a focus on active safety and driving behaviour became a natural extension, of this expertise. All projects in this Focus Topic deal with real world data to some degree although the data and its associated analyses may not be the main topic of the individual project. Many projects have an element of accident or incident analysis for identifying priorities for a new countermeasure but this may be only a small part of the total project activity. Conversely, some projects in the Focus Topic only deal with the collection of field data.

Research activities addressed in Incidents and Accidents are well established in many SAFER partners. While classic passive safety research represents the main area of expertise, active safety and driver behaviour research have been investigated and are becoming more developed in new research initiatives. The focus topic enables SAFER to address the full chain of system evaluation activities by maintaining both research expertise and quality - a unique feature of SAFER. Data collection activities provide insight into variable definitions and data limitations of internal and external database. This knowledge leads to identification of new procedures to derive information from existing data and is a driving factor for SAFER to access and integrate more databases. This expertise is critical for integrating other data sources when evaluating safety systems and

is an interface for research in the Focus Topic Methods of evaluation of vehicle and traffic safety.

Driver State and Behaviour

This Focus Topic covers how drivers of vehicles (ranging from bikes to trucks) and Vulnerable Road Users (VRUs) actually behave in traffic, not just how we are supposed to behave. It covers permanent and temporary states of the driver, such as fitness for driving (including impaired drivers), why and how we take risks and what we do to compensate for risks. It also covers the driver's interaction with in-vehicle information systems (including nomadic devices) and interaction with advanced driver assistance systems, how the driver reacts to and accepts warnings as well as automatic interventions of active safety systems such as emergency braking. An emerging area affecting *Driver state and Behaviour* is automation. Risk management is another emergent area within the Focus Topic. It implies that SAFER's research is not limited to vehicle on-board systems but also addresses planning before the trip, back office support during the trip and feedback for improvement after the trip.

Important research questions for the Focus Topic are:

- How do drivers behave in traffic?
- How can driver distraction and inattention be minimised?
- How can semi- and fully autonomous driving prevent driver mistakes?
- How should the handover between automated vehicle functions and the driver be conducted?

Design for Accident Prevention

This Focus Topic covers how different systems can predict a potential crash, and give input to the control of the vehicle to avoid it. Technologies concerned are, for instance, real-time wireless communication (V2V and V2I), sensing of own vehicle's motion and behaviour and sensing of the surrounding traffic, signal/image processing and algorithms, functional safety, vehicle dynamics control systems, and the vehicle dynamics during automatic intervention of a crash avoidance system.

Important research questions for the Focus Topic are:

- How can different systems predict a potential crash, and give input to the control of the vehicle to avoid it.
- How can vehicles be partially or fully automated to eliminate driver mistakes that causes accidents?
- How can a potential crash be predicted early enough in a reliable way to permit automatic avoidance of the crash?
- How can potential hazardous situations be avoided by automation?
- How can infrastructure, vehicles and VRUs interact to improve performance of active safety systems?

The naming of this topic has changed from “Prediction for Accident Prevention” since the intention is to cover research for technologies that can prevent an accident. Nine years ago, when the topic was established, the focus was on active safety systems and their main challenge in the threat assessment. The longitudinal threats were first addressed and later also a next generation of V2X communication and lateral support (i.e. keep the vehicle in its intended lane). However, the insight of working with lateral support have shown that it will be improved by continuous support – automation rather than active safety intervention. The area has thus evolved and is now also addressing how potential hazardous situations can be avoided both by vehicle automation and functional safety. Interest in automation has grown due to the potential of transport efficiency but even more because of the potential to eliminate tedious tasks of driving that lead to fatigue and distraction, common root causes for traffic accidents. Functional safety is a key requirement when designing these active and automated systems that should fulfil the new safety functions. Research in these areas therefore has high importance for SAFER partners.

Methods for Evaluation of Vehicle and Traffic Safety

This Focus Topic is complementary to *Incidents and Accidents* as it should both develop methods to process and analyse field data, in new and innovative ways, as well as identify other assessment procedures using data from both real and virtual environments. The Focus Topic addresses: methods to be used in active safety test areas (e.g. AstaZero proving ground); methods for driving simulators including human behaviour simulation models; development of improved passive safety analyses using physical and numerical methods; evaluation of various accident avoidance systems (vehicle as well as infrastructure based) in real traffic environments; and evaluation of in-vehicle information systems and nomadic devices. This topic is integrated in all other Focus Topics.

The questions that projects are trying to answer are: What parameters describe system performance?; and How do we collect the information?. The priorities for new project areas include:

- Effect analyses using different research platforms (AstaZero, driving simulators, FOT/NDS, etc.).
- Transfer data across research platforms (simulator, tests, etc.).
- Develop predictive evaluation tools for new safety systems.

These priorities are critical for securing the utility of new safety systems and providing confidence in their market introduction. SAFER is uniquely positioned as it has experimental, field, and simulation data sources that complement each other and can provide comprehensive system evaluations. The key challenge lies in the data integration and quality assessment and this focus topic is supported by parallel activities in *Incidents and Accidents*.

Safety for Novel Vehicles and Vehicle Combinations

This Focus Topic covers the safety challenges and opportunities due to new vehicle designs. It includes vehicle dynamics and energy management; structural requirements and design guidelines regarding crashworthiness (self and opponent protection) for new safe lightweight designs, including protection of batteries/capacitors; adaptive structures for improved crashworthiness at lowered or maintained weight; development of design and crashworthiness assessment tools (mathematical models and virtual testing) and system design optimisation for novel vehicles. Also, the area of hazards related to new vehicle concepts (e.g. fire and electrical safety incl. post-crash rescue and extrication) is included. SAFER has the ambition to be a major actor identifying safety aspects of future vehicle strategies, mainly by understanding consequences of future transportation scenarios.

Prioritised areas within the Focus Topic address the question “How to proactively develop principles and prerequisites for dynamics and crashworthiness of novel vehicles and vehicle combinations put in a real-world context?”. This is to be handled by focused activities within:

- Improved manoeuvrability through distribution of propulsion between wheels and axles, passenger cars and Urban Personal Vehicles (UPV)
- Towed units/dollies in long heavy truck combinations
- Material and structural models and methods to model failure in structural composites and laminated safety glass
- CAE tools for assessing the crashworthiness of structural joints between 'new' lightweight materials (e.g. Composite-Composite, Composite-Metal)
- Methods to assess fire resistance of composite automotive structures and means to improve fire resistance of the same
- Development of concepts for structures for maintained (or improved) safety of new lightweight vehicle structure solutions
- Material test data for development and calibration of material models for progressive damage development in fibre reinforced composites

Human Body Protection

The Focus Topic covers biomechanical injury mechanisms, responses and consequences, the principles for protection including safety system usage and pre-sensing input as well as mechanical and mathematical occupant and unprotected road user models for complete crash sequences. In addition, effect models for continuous multiple spectrum real world safety developments is an important area for development of future active, integrated and passive safety systems.

The Focus Topic also encompasses research needed to understand and develop safety measures (including active safety technology) throughout the whole sequence, aiming at injury prevention. Additionally, important aspects on future research comprise occupant kinematics, behaviour and other influencing factors in the pre-crash events. In this area, SAFER has pioneered, and will continue the journey.

The developments of active safety systems will call for decisions on different impact direction and severity in combination, which is beyond what traditional passive safety systems require.

Examples of future prioritised questions within the Focus Topic are; “How to model and measure injury consequences for humans in a crash, including preceding events?” and “How do pre-crash factors and individual differences influence injury outcome?”. This is to be addressed by focused activities within:

- Pre-crash factors’ influence on injury outcome
- Injury mechanisms and consequences, including a special focus on long term consequences
- HBM developments (occupants/VRU) including scaling and tuning, variety of acceleration levels and omnidirectional injury risk prediction
- Biomechanical research supporting HBM validation data and injury prediction, focus on gender, age and other individual differences

The limited funding available for fundamental biomechanics research is however a major threat. This is critical, since fundamental biomechanics research is essential for reaching a high level of applied research. Especially this is pronounced in the development of collision mitigation systems (pre-braking, pre-steering), which requires expanded knowledge on biomechanics and development of tools to enable decisions from an omni-directional loading perspective.

Care and Rescue

This Focus Topic was introduced in the SAFER portfolio 2014, and it covers cross-disciplinary triple-helix research and development involving a broad spectrum of stakeholders. It focuses on methods and solutions to reduce casualties as well as the severity of short and long-time injuries occurring after a traffic accident is a fact. The stakeholders include SAFER’s existing partners and the area is also attracting new actors representing various aspects of areas like rescue services, healthcare and insurance as well as ICT and Medtech industry.

The Care & Rescue Focus Topic involves areas like quick and correct response to an accident (“eCall” and “on-call” applications, dispatch prioritizing, etc.), care and prioritizing of victims at scene and in transport (prehospital/ambulance/emergency care and processes), quick and safe rescue service operations “on-scene” (extrication, handling of vehicles and accident scene, etc.) and secondary effects of a traffic accident with potential to result in additional incidents and accidents involving humans. This Focus Topic is primarily connected to research within the Post-Crash area, but also Traffic Safety Analysis. Several competence areas are addressed including the new (2014) competence area “Human Monitoring”.

The objective is to become a significant international player in the forefront within research and development of methods and solutions aiming at traffic accident related care and rescue. Particular focus shall be given on establishing a multi-stakeholder cross-disciplinary collaboration environment and a platform for real-life/“living lab” development and evaluation, since this will be a unique selling point (USP) for participation in various national and international collaboration projects.

The activities within Care & Rescue are to a large extent equal to the present initiatives and strategy of the Post-Crash reference group. Therefore the main focus now is to establish a relevant project portfolio, involve further SAFER partners and other stakeholders in the on-going activities, “marketing” of the Focus Area and the SAFER “offerings” as such to relevant stakeholders, and preparations and start-up of a more active internationalization process. Basis for these activities are primarily on-going Post-Crash projects, an existing strong and unique regional and national network involving all relevant stakeholders including academia (technology, medicine, nursing etc.), institutes, complementary triple-helix organizations, industry and public services like health and rescue.

6. THE RESEARCH ENVIRONMENT

SAFER is a meeting place with a physical work area of 1500 sqm situated on the 2nd floor in the main building of Lindholmen Science Park. It is connected to other open innovation activities such as Security Arena, Prehospital ICT Arena, Closer, Vehicle ICT Arena, Visual arena and Test Site Sweden (TSS). The space is a mix of workplaces (approx. 100), small meeting/dialogue rooms, conference rooms and project areas. 45 persons have this as their permanent work place while all other SAFER people use the facilities temporarily. Reference group meetings and project meetings are taking place within the facility as well as informal lunch seminars. This makes SAFER a multidisciplinary and diverse meeting place.

Each person belonging to SAFER is employed by a partner. People who need access to SAFER environment on a more regular basis may get a key to the facilities. Presently SAFER has 294 “key people”. Of this 37% are employed at Chalmers, and 63% are from other partners. Of these “key-people” 11 are academic PhD students and 11 are industrial PhD students. 30% the key people are women. The number of master students is currently 28.

The open innovation aspect of SAFER is a strong asset. Several project applications that have been submitted during year 9 are based on partner constellations with quite complex set ups. It is evident that the prerequisites and capability to organise strong consortia have grown and it has also been possible to respond quickly to proposals from international research groups that look for Swedish partners.

Researchers in the field of “open Innovation” have followed the development of SAFER over the years. A general finding has been that partners value the partnership and SAFER as such, but want to more actively utilize SAFER's full potential. SAFER is said to give an increased credibility for the partner through its affiliation. Although several of the partners meet in other constellations, they find that SAFER has a unique value and an important role to play as an open innovation centre where collaborative multi-stakeholder research enhances the partner organisation's competitiveness and ability to contribute to a transport system with “near zero” fatalities and serious injuries. Furthermore, many partners appreciate the possibility to influence the perspectives on future transport systems and also find it politically important to be able to influence and have insight into the “safety agenda”.

To further understand partner expectations a survey via a questionnaire to all 27 large and normal partners was undertaken in December 2014. There were three groups of questions: the partners' perception of added value, relationships and involvement with SAFER; use of SAFER competence and knowledge and a part focusing the scope of road safety. Typically the answers were to be provided using a 5 step scale, where 5 was the highest/best score. Ample room was given for free text and additional comments.

Partners have a variety of reasons for being partners. A couple of more commonly mentioned reasons are:

- Safety is an important part of the partner's business

- Contribute research, knowledge, testing, support to SAFER
- Competence, SAFER is a competence platform, access to network and/or researchers
- Get benefits from competence and involvement, gain and use generated knowledge
- Opportunities to get research projects (and/or collaborations)

Among key strengths to build upon and nurture in Next SAFER are:

- SAFER's strength as a network
- Delivering research results for partner use, e.g. in their own knowledge building and projects
- The broad set of partners and their engagement enables a fruitful research network and broadened competence base
- Engaged partners at all levels – partners with higher involvement experience higher satisfaction

An important area to improve is the ability to involve partners with main location far from SAFERs physical base. This has a potential to further strengthen the network as well as increase all partners involvement in projects.

The survey results are in-line with the earlier research studies of partners' relations to SAFER and will be a tool for a dialogue with each partner.

The findings in the survey and in the earlier presented research thesis work (Dr Anna Yström) also show that achieving collaborative advantage in open innovation collaboration is not easy, due to a number of contextual challenges that needs to be managed. All the gained experience should be used as input to the design of Next SAFER.

Internationalisation

SAFER has a strategy for creating global links. The basic idea is that by creating strong connections to world class research environments, and nurturing an international reputation for outstanding collaboration between industry and academy, it should be possible to influence the international research agenda. These ambitions are given regular attention by being a standing point on every extended management meeting. Three persons in SAFER's management team dedicate part of their time to international strategies and/or coordination.

The European scene continues to be very much dominated by Horizon 2020. In year 9 the EU-project "PROS – Priorities for Road Safety Research in Europe" was finalized and reported to the European Commission. The aim of the project was to influence that an adequate amount of traffic safety content would be present in upcoming Horizon 2020 calls. SAFER was a work package leader and a vocal member of the steering committee.

A number of the SAFER partners have been engaged in project crafting in several H2020 call areas, both in 2014 and 2015, and two of the project proposals have already been approved. SAFER also leads TS-Europe, a national advocacy platform towards Horizon 2020 (further detailed in section 3 above).

In December 2014 the Italian Presidency of EC held a Transport Safety Research Conference in Genoa, Italy. This event aimed at establishing a foundation for Horizon 2020's next work programmes. SAFER was appointed to be the road safety panelist at the closing round table discussion.

During year 9 SAFER was approached by the UNCRD, United Nations Centre for Regional Development, and asked to prepare a background paper on road safety for the 8th ESTBAQ¹³. This conference is a well-established intergovernmental forum with high-level policy makers addressing issues regarding environmentally sustainable transport issues. In 2014 the conference aimed at adding road safety to their sustainability scope, and SAFER prepared an appreciated report with significant input from SAFER partner TÖI. The paper's scope included societal and economic consequences of road crashes in a variety of countries, and potential solutions. Following the presentation at the conference several other channels are used for further dissemination of the material. One example is that SAFER was invited to be on the panel at a road safety seminar in Cape Town, South Africa, arranged by Volvo Group in September 2014.

SAFER has continued to develop its ongoing collaborations in Asia. The China Sweden Research Centre for Traffic Safety (CTS), with Swedish partners Chalmers, Volvo Cars and Volvo and Chinese partners Tongji University and RIOH Institute for Highway Safety has five research projects running, one just finalized (HMI research) and several in preparation. SAFER constitutes the Swedish research platform in this collaboration.

The University of Nagoya Green Mobility Centre (GREMO) has research in several areas of interest to SAFER, e.g. driver modelling, signal processing, human models and biomechanics but also autonomous small vehicles and sensors. Projects for materialization of the MoU are in planning and one recently started, focusing on driver modelling and cross-cultural analysis of driving styles based on large-scale driving data.

Projects in US with SAFER leadership or involvement are progressing well. During 2014 results from the SAFER-lead project on driver distraction research ("Safer glances") were published. This program, SHRP2, has been funded by federal strategic highway research program. The collaboration with the Children's Hospital of Philadelphia (CHOP) and its collaborative Centre for Child Injury Protection (CChips) received acclaim in May 2014, when Kristy Arbogast, co-director of CChips, was recognized honorary doctor at Chalmers. Following initial contacts with Stanford and Berkeley SAFER year 9 has seen e.g. a seminar on automated driving in Gothenburg by Prof. Chris Gerdes, Stanford. This was followed up by a study visit to Stanford in February-March 2014 by four SAFER researchers.

¹³ ESTBAQ = Environmentally Sustainable Transport, Better Air Quality – UNCRD conference, Indonesia 2014

SAFER continues to be an active member in EARPA¹⁴, both in the safety group and in the board via prof. Per Lövsund. In addition, efforts are being made to cover other task forces with relation to safety (electronics, materials, modelling, urban mobility).

SAFER and its partners also actively participate in EUCAR¹⁵, ERTRAC¹⁶ and ERTICO¹⁷. An increased engagement has been enabled through TS-Europe (see above). The aim is to continue activities related to both influencing and participating in order to promote SAFER's research agenda and thereby its scientific level and partners' success.

¹⁴ EARPA = European association of automotive R&D organisations

¹⁵ EUCAR = European Council for automotive R&D

¹⁶ ERTRAC = European Road Transport Research Advisory Council

¹⁷ ERTICO -ITS Europe is a partnership of around 100 companies and institutions involved in the production of Intelligent Transport Systems (ITS)

7. EDUCATION, COURSES, SEMINARS AND CONFERENCES

Chalmers Area of Advance

SAFER is related to the Chalmers Transport Area of Advance (AoA) and the director is part of the AoA Transport management team. Chalmers researchers within traffic safety are encouraged to contribute to SAFER. Presently some 68 senior researchers at Chalmers are active within Traffic Safety and get strategic research funding. All together more than 140 researchers and PhD students from at least eight departments engage in traffic safety related research.

Education is primarily the responsibility of the universities involved in SAFER. On average 15 Master students work and study at SAFER every year, and the number of PhD Students is on average 25. Seven dissertation theses and four licentiate theses were written during SAFER's operational year 9. These are listed in Enclosure 2.

SAFER Insight

SAFER Insight is the first comprehensive web-based portal in advanced traffic safety education on an international level (www.saferinsight.se). The purpose of SAFER Insight is to provide students and professionals with courses and seminars in vehicle and traffic safety. Currently, the portal encompasses ten training providers and the number of courses varies between 15 and 45 depending on time of year.

The training providers are the SAFER partners, or MOU partners to SAFER, which are providing courses or seminars. The extended management group at SAFER functions as a guarantee for quality of the courses.

Guest researchers

During year 9, SAFER has had several guest researchers and visitors from all over the world; USA, Asia, Europe. Most of these researchers have given an open SAFER seminar (listed in Enclosure 1), which is excellent knowledge sharing.

Dr Jac Wismans is continuously a part-time guest professor and active within biomechanics and novel vehicles.

Dr Kristy Arbogast from Children's Hospital of Philadelphia (CHOP) has visited SAFER eight times in total, one time during SAFER year 9, when she was appointed Honorary Doctor at Chalmers University for her important contribution to SAFER's child safety research.

Professor Tim Gordon, UK, is strongly connected to the vehicle dynamics competence area and visits SAFER regularly. Dr John Lee, University of Wisconsin-Madison, USA, has visited SAFER one time during year 9. Also, Dr Carol Flannagan from UMTRI has visited SAFER during the past year. Dr. Susumu Ejima from Japan Automobile Research Institute (JARI) visited SAFER in April 2014 Associate Prof. Robert Andersson, University of Adelaide, Australia, Dr. Baptiste Sandoz, Laboratoire de biomécanique (LBM), Arts et Métiers ParisTech, France, and Dr. Wolfgang Sinz, TU Graz have also been at SAFER. Dr Dan McGehee, University of Iowa, was at SAFER in June 2014. Several Chinese researchers visit SAFER regularly.

Seminars and conferences

Internal

SAFER has arranged Thursday seminars every second week for internal cross-fertilization and exchange of knowledge and ideas. The SAFER Competence Leaders and Reference Group Leaders are responsible for the content. During operational year 9, 24 seminars with 45 speakers were conducted.

External

SAFER organises a vast amount of seminars and workshops. They are appreciated as efficient means to enhance knowledge and offer a great opportunity to network. SAFER is now acknowledged as a meeting place for competence and knowledge and serves as a centre for sharing competence.

A list of conducted seminars and conferences can be found in Enclosure 1.

Annual Report #9 – Enclosure 1

Seminars & Conferences

Conducted external SAFER seminars during year #9 include:

- Docent lecture: Analyzing Road-User Behavior for Active Safety, by Marco Dozza, Vehicle Safety.
- SAFER Seminar: Assessment of a Pre-crash Seatbelt Technology in Frontal Impacts by Using a New Crash Test Sled System - Dr. Susumu Ejima, field manager of safety research division at Japan Automobile Research Institute (JARI).
- SAFER-NTF West Seminar: Kan appar göra cyklingen säkrare?
- Seminar at Gothenburg Science Festival: Kan appar göra cyklingen säkrare?
- SAFER Seminar: Connectivity and Autonomy - Its Potential for Achieving Total Safety - Joseph Kaniathra, President of Active Safety Engineering LLC and Former Associate Administrator for Vehicle Safety Research (Retired) at the National Highway Traffic Safety Administration, U.S. Department of Transportation, USA
- SAFER Seminar: Use of Driver Gaze Information for Detecting Risky Lane Changes - Prof. Kazuya Takeda, Professor at Graduate School of Information Science, Green Mobility Collaborative Research Center, Nagoya University, Japan
- SAFER Project Day 2014
- SAFER-SVEA Seminar: Vehicle Dynamics in a Cooperative Environment
- SAFER seminarium: e-fordon i trafikskadehändelse
- SAFER seminar: Beaming crashes into the trauma room: Crash injury assessment in the field - Dr. Dan McGehee, director of the Human Factors and Vehicle Safety Research Division at the University of Iowa Public Policy Center, USA
- SAFER Seminar: Hazard classification according to ISO 26262
- SAFER seminar: Toward Overtrust-Free Autonomous Driving Systems - Prof. Makoto Itoh, University of Tsukuba, Japan
- Inauguration Lecture for adjunct professorship: Evaluations of vehicle safety systems today and tomorrow, by Anders Lie, Swedish Transport Administration and Division of Vehicle Safety, Department of Applied Mechanics, Chalmers University of Technology
- Docent Lecture: Traffic Safety and Whiplash Injury Prevention - Astrid Linder, VTI and Division of Vehicle Safety, Department of Applied Mechanics, Chalmers University of Technology
- Chalmers Initiative Seminar 2014: Green, Safe, and Efficient Transports
- SAFER-NTF West Seminar: Självkörande bilar = framtid utan körkort? (Halmstad)
- SAFER-NTF West Seminar: Självkörande bilar = framtid utan körkort? (Göteborg)
- SAFER Seminar: Contribution to the geometrical and mechanical modeling of the child trunk - Dr. Baptiste Sandoz from Laboratoire de biomécanique (LBM) at Arts et Métiers ParisTech, France
- Docent Lecture: Traffic Safety - by a System Approach with focus on long-term medical consequences, by Helena Stigson, Folksam and Division of Vehicle Safety, Department of Applied Mechanics, Chalmers University of Technology

- SAFER Seminar: Attempts to take progressive inter disciplinary research initiatives for enhancing the safety and resilience of a more and more complex society - Associate Prof. Johan Bergström, Division of Risk Management and Societal Safety at Lund University.
- SAFER Seminar: The ERROR with HUMAN ERROR - SAFER Competence Area "Design and Human Factors" and "Human Factors Collegium" co-arrange a seminar on The ERROR with HUMAN ERROR.

Conferences

- IAVSD Workshop on Automated Driving and Autonomous Functions on Road Vehicles, August 27-29.
- 3rd International Cycling Safety Conference (ICSC2014 Gothenburg, Sweden, November 18-19, 2014. Organized by SAFER.
- “Transportforum” in January 2015. SAFER led a session on FOT/NDS methodology.
- Tung trafik och säkerhetskultur – One day seminar together with NTF Väst, Volvo Group and Sveriges Åkeriföretag.

Annual Report #9 – Enclosure 2

The following PhD Students working in the SAFER environment have written their dissertation thesis during operational year 9 (April 1, 2014 – March 31, 2015):

Markkula, Gustav (2015) [Driver behavior models for evaluating automotive active safety: : From neural dynamics to vehicle dynamics](#). Dissertation thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 212952

Strandroth, Johan (2015) [Identifying Potentials of Combined Road Safety Interventions](#). Dissertation thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 211505

Benderius, Ola (2014) [Modelling driver steering and neuromuscular behaviour](#). Dissertation thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 205699

Mendoza-Vazquez, Manuel (2014) [Thoracic injuries in frontal car crashes: risk assessment using a finite element human body model](#). Dissertation thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 205139

Davisson, Staffan (2014) [Adaptive Driver Information](#). Dissertation thesis, Department of Business Administration, Technology and Social Sciences, Luleå University of Technology, Luleå.

Tivesten, Emma (2014) [Field Data Acquisition and Analysis Methods for Car Safety Development](#). Dissertation thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 201745

Östh, Jonas (2014) [Muscle Responses of Car Occupants: Numerical Modeling and Volunteer Experiments under Pre-Crash Braking Conditions](#). Dissertation thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 194443

The following PhD Students working in the SAFER environment have written their licentiate thesis during operational year 9 (April 1, 2014 – March 31, 2015):

Bärgman, Jonas (2015) [On the Analysis of Naturalistic Driving Data](#). Licentiate thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 210436

Rizzi, Matteo (2014) [Health Losses in Motorcycle Crashes - Injury Analysis of Crashes into Road Barriers and Evaluation of Antilock Braking Systems](#). Licentiate thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 205150

Lübbe, Nils (2014) [Integrated pedestrian safety assessment methodology](#). Licentiate thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 205463

Ólafsdóttir, Jóna Marín (2014) [Volunteer Muscle Activity in Dynamic Events. Input Data for Human Body Models](#). Licentiate thesis, Department of Applied Mechanics, Chalmers University of Technology, Gothenburg. No. 202600

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CRASH																													
Proj nr		Projektbenämning		Finansiär		Period		Totalbelopp (i TSEK)		Partners		Projektleddare		hD students and/or		Competence Area					Focus Area								
								SAFER		ASSOC. Övr finansiärer						Field Data Behavior in Human Fall Driving Sim Sensors and Functional Vehicle Dynamics Structures Road Infrastructure Biomechanics Traffic Systems Human Modelling Incidents and Driver state Design for accident Methods for safety (Safety for) Human modelling Care and research													
Avslutade egna projekt																													
B1	Multiple events		SAFER	2007-2008	536					Autoliv, VCC, Saab, Folksam, Chalmers	Rikard Fredriksson (Autoliv)	0		x											x				
B2	Gemensamma simuleringsmodeller		SAFER	2007	451					Epsilon, Chalmers, Autoliv, Saab	Johan Iraeus (Epsilon)	0																	
B4	Load carrying capacitors for crash-worthy applications		SAFAER	2007-2008	110					Sicompc, VCC, Saab	Maciej Wysocki (Sicompc)	110		x															
B6	Understanding factors influencing WAD outcome		SAFER	2008-2009	216					Epsilon, Autoliv, VCC, Saab, VTI, Folksam, GU, Chalmers, SP	Johan Iraeus (Epsilon)	0		x												x			
B12	SEVS - Safe, Efficient Vehicle Solutions		SAFER + FFI	2009-2010	1 125	5 198	6 323			SAFER, SHC, Autoliv, VCC, Saab, Swerea-Sicompc, Volvo Technology, Scania, SP, VTI, KTH, LU	Elise-Marie Malmek (Malmeken AB)	0			x											x			
B15	CAE Tools for Composite Body Concept Assessment		SAFER	2010-04-01 - 2010-12-31	1 225					Sicompc, VCC, Chalmers, Volvo Technology, SP, Epsilon, Saab	Magnus Oldenbo (Swerea)	0/1														x			
B3	Visiting professor J. Wismans		SAFER	2007-2010	600						Anna Nilsson-Ehle (SAFER)	0														x			
B16	Pre-study SEVS2		SAFER	2011-05-15 - 2011-10-15	600					SAFER	Elise-Marie Malmek (Malmeken AB)	0/0														x			
B5	Rear Seat Safety for Short Occupants		SAFER + FFI	2008 05 01 - 2012 03 31	2 629	14 427	17 056			Autoliv, VCC, Saab, Chalmers	Katarina Bohman (Autoliv)	3/0		x												x			
B8	Development of Active HBM in Frontal Impact Situations		SAFER	2009-2011	3 492					Autoliv, VCC, Saab, AB Volvo, Chalmers	Bengt Pipkorn (Autoliv)	1														x			
B17	Humanmodellering för skadeprevention		SAFER	2011-10-01 - 2011-12-31	200					Chalmers	Karin Brolin (Chalmers)	0/0														x			
B10	FIMCAR - Frontal Impact and Compatibility Assessment Research (EU)		EU	2009-10-01 - 2012-09-30		7 378				SAFER JRU (VTI, Chalmers), VCC	Robert Thomson (SAFER)	1		x												x			
B19	CompMethGlass (pre-study)		SAFER	2012-02-01 - 2012-09-30	491					Chalmers, VTI, Volvo AB, VCC, SP, Swerea	Martin Lagerström (Chalmers)	0														x			
B21	Pre-study, Active HBM EU project application - VIRTRIS		SAFER	2012-05-01 - 2012-11-14	171					VCC, Chalmers, Autoliv, VTI	Jonas Östh (Chalmers)	0/0																	
B7	Improved Injury Prediction Using HBM		SAFER	2009-06-01 - 2013-03-31	3 218					Autoliv, VCC, AB Volvo, Chalmers	Karin Brolin (Chalmers)	1/0														x			
B14	ELVA - Advanced Electric Vehicle Architectures (EU)		EU	2010-12-01 - 2013-05-31		4 677				SAFER JRU (VCC, Volvo Technology, Sicompc, SP, Chalmers)	Jac Wismans (SAFER/Chalmers)	0														x			
B18	SEVS (Safe Efficient Vehicle Solutions), Phase 2		FFI	2012-01-01 - 2013-12-31		15 254				SAFER, Chalmers, GU, KTH, Scania, AB Volvo, VCC, VTI, SP, Autoliv, Trafikkontoret, JSP, Bisek	Elise-Marie Malmek (Malmeken AB)	0/0														x			
B9	Scalable and Tuneable Human Body Models, THUMS		SAFER	2009-04-01 - 2013-06-30	1 674	5 905	6 755			Autoliv, Chalmers	Bengt Pipkorn (Autoliv)	1														x			
B13	Pedestrian		SAFER, FFI	2011-01-01 - 2013-12-31	850					Autoliv, VCC, Chalmers, KTH	Johan Davidsson (Chalmers)	1														x			
B24	Female Impact Biomechanics – Pre-study		SAFER	2013-04-01 - 2014-05-31	544					Autoliv, Chalmers, Folksam, Volvo Cars, VTI, GU	Mats Svensson (Chalmers)	0														x			
					18 032				52 839																				
Avslutade associerade projekt																													
	Krockdocka för sneda kollisioner	PFF	2005-2007	2 000						Autoliv, VCC, Chalmers	Yngve Håland	1														x			
	Matematiska åkändmodeller i sidokollision	I/VSS	2006-2007	2 900						Autoliv, VCC, Saab, Chalmers, KTH	Bengt Pipkorn	0														x			
	CHICC	PFF	2003-2007	2 000						Autoliv, VCC, Saab, Chalmers	Magnus Holmquist (Saab)	1		x												x			
	IMPROVER	EU	2004-2006	233						Chalmers	Robert Thomson (Chalmers)	0														x			
	RANKERS - Ranking for European road safety	EU	2005-2008	2 057						Trafikverket	Robert Thomson (Chalmers)	1		X												x			
	RAPSS	Nationellt	2005-2008	23 060						Saab, Autoliv, Chalmers	Jikuang Yang (Chalmers)	1														x			
	APROSYS - Integrated Project on Advanced Protection Systems (EU)	EU	2004-2008	3 300						Chalmers	Jikuang Yang (Chalmers)	1														x			
	VC COMPAT	EU	2003-2006	235						Volvo AB, Scania	Robert Thomson (Chalmers)	1														x			
	Compatibility between Vehicles	PFF	2006-2009	8 000						Autoliv, Saab, Scania, Chalmers, VCC, AB Volvo	Anders Kling (VCC)	1														x			
	Förutsättningar för förbättrat sidoskydd i framtidens trafik - bil mot bil krockar med WorldSID	FFI	2009-2010	9 533						Chalmers, Volvo, Autoliv, Folksam	Cecilia Sunnevang (Autoliv)	0		x												x			
	CASPER - Child Advanced Safety Project for European Roads (EU)	EU	2009-2012	3 116						Chalmers	Jikuang Yang (Chalmers)	1		x												x			
	Heavy Vehicle Biomechanics	FFI	2006-2012	2 900						AB Volvo, Chalmers	Fredrik Törnvall (AB Volvo)	1/0														x			
	THORAX - Thoracic Injury Assessment for Improved Vehicle Safety (EU)	EU	2009-2013	7 930						Chalmers, Autoliv	Johan Davidsson (Chalmers)	(1)		x												x			
	ADSEAT - Adaptive Seat to Reduce Neck Injuries for Female and Male Occupants (EU)	EU	2009-2013	11 768						VTI, VCC, Chalmers, Folksam	Astrid Linder (VTI)	1		x												x			
	Active human body models for virtual occupant response, step 2	FFI	2011-2014	11 281						Autoliv, VCC, AB Volvo, Chalmers, Umeå Universitet	Bengt Pipkorn (Autoliv)	2/0														x			
	Whiplash - "Kapsylen"	Folksam Forsknings Skyttefonden	2013-2014	300						Chalmers, Folksam	Mats Svensson (Chalmers)	0/0		x												x			
	Krockdocka som testar whiplashskyddet för kvinnor		2013-2014	350						Chalmers	Mats Svensson (Chalmers)	0/0														x			
	Improved injury prediction using HBM, step 2	FFI	2013-2014	3 250						Chalmers, VCC, GTT Volvo, Autoliv	Karin Brolin, CTH	0/1		x												x			
	Active child models for traffic safety research	sams forskningsforc	2012-2014	850						Chalmers	Karin Brolin (Chalmers)	0/1														x			
					95 063				43 318																				
Egna projekt																													
B11	Injury Criterion for Rotational Acceleration and Moderate Brain Injury		SAFER, KI	2009-06-01 - 2015-03-31	546	450	996			Chalmers	Johan Davidsson (Chalmers)	0/0														x			
B20	Rear Seat Safety for Short Occupants, phase 1		SAFER	2012-04-01 - 2015-11-30	2 166					Chalmers, Autoliv, VCC	Katarina Bohman (Autoliv)	2/0														x			
B22	Vehicle model development for validation of pedestrian Human Body Models		SAFER	2013-07-01 - 2015-03-31	266					Chalmers, Autoliv	Johan Davidsson (Chalmers)	0/0														x			
B23	CompMethGlass		Vinnova	2014-05-01 - 2016-06-30		3 868				Autoliv, Chalmers, GLAFO (SP), VCC, Swerea IWF, and additional non-SAF	Jerry Eriksson (Glafo/SP)	0														x			
B25	Oblique loadings thorax		SAFER	2014-04-01 - 2015-06-30	1 430					Autoliv, Chalmers, UNIZAR	Cecilia Sunnevang (Autoliv)	0/0														x			
B26	Composite Material Optimization Toward Maximizing Crash Behaviour		SAFER	2014-04-01 - 2016-01-31	1 520					Swerea SICOMP, Chalmers, VCC, ÄF	Mohammad Routhi (Chalmers)	0																	
B27	Injury prediction using HBM		SAFER	2014-04-01 - 2016-03-31	1 227					VCC, Autoliv, Chalmers, VTI, SU, Folksam, KTH, ÄF, Umeå University, Univ Lotta Jakobsson (VCC)		0																	
					7 155				4 318																				
Associerade projekt																													
	Compcrash	Energimyndigheten	2011-2016	4 511						Swerea SICOMP, Chalmers	Robin Olsson (Swerea SICOMP)	1/0														x			
	ENLIGHT - Enhanced lightweight design	EU	2012-2016	9 540						AB Volvo, Swerea SICOMP	Angelika Bachinger (SICOMP)	0/0														x			
	MATISSE - Modelling And Testing for Improved Safety of key composite Structures in alte	EU	2012-2015	5 650						Autoliv, Chalmers	Martin Lagerström (Chalmers)	0/1														x			
	SafeEV - Safe Small Electric Vehicles through Advanced Simulation Methodologies	EU	2012-2015	3 212						Chalmers	Mats Svensson (Chalmers)	0/1														x			
	Småbilok, part 2 (FFI)		2013-2016	5 563						VCC, Chalmers, Autoliv	Lotta Jakobsson (VCC)	2/0		x												x			
	Child Safety in Cars - 2011 ARC Linage Project - 110200334	Italian Research Cox	2012-2016	103						Chalmers, Autoliv (inkl. parter i Australien, USA och Canada)	Mats Svensson (Chalmers)	1/0														x			
	Composite Crash Behavior	FFI	2013-2016	10 083						Chalmers, Autoliv, AB Volvo, VCC, ÄF, Semcon, Escenda, Altair, DYNAmor, Ragnar Larsson (Chalmers)		1/0													x				
	Experimentell whiplash studie länkad till kliniska fynd - PET och MRI undersökning	Folksam Forsknings	2013 - 2015	300						Chalmers, Karolinska Institutet, Akademiska Sjukhuset/Uppsala Universitet	Mats Svensson (Chalmers)	0/0														x			
	FFI-Lateral THUMS	FFI	2013-2015	8 593						Autoliv, VCC, Umeå Univ, Univ of Virginia	Cecilia Sunnevang, Autoliv	2/0		x												x			
	VIVA - Virtual Vehicle - Safety Assessment: Open source HBM addressing gender diversity	Vinnova	2014-2016	4 992						VTI, Chalmers, VCC, Folksam	Astrid Linder/Susanne Gustafsson/K	0/0													x				
	FFI THOR project 2013-02643	FFI	2013 - 2015	3 369						Autoliv, VCC, Chalmers	Cecilia Sunnevang (Autoliv)	0/0														x			
	FFI Pedestrian - head and neck, part 2	FFI	2014 - 2016	7 350						Autoliv, VCC, KTH	Bengt Pipkorn (Autoliv)	2/0		x												x			
	Active human body models for virtual occupant response, step 3 (A-HBM, step 3)	FFI	2014-10-01 - 2017-12-31	11 369						Volvo Cars, Autoliv, Chalmers	Lotta Jakobsson (VCC)	2/0														x			
					66 666																								
					25 187				161 729																		57 157		
					82 344				244 074																				

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Proj nr		Projektbenämning	Finansiär	Period	Totalbelopp (i TSEK)		Partners	Projektleadare	D students and/or	Competence Area	Focus Area
					SAFER	ASSOC. övr finansiärer					
Avslutade egna projekt											
E1	Sensor Assisted Situational Awareness	SAFER, Security	2008		186		Viktorias, LSP, Vägverket, VGR	Jonas Landgren (Viktoriasinstitutet)			
E2	Sensor Assisted Situational Awareness: A Study of Traffic Accident Response Work, Liverespor	SAFER, Security	2008-2009		690		Viktorias, LSP, Vägverket, VGR	Jonas Landgren (Viktoriasinstitutet)	0		
E3	Sensor Assisted Situational Awareness: A Study of Traffic Accident Response Work 2, Liveresp	SAFER, Security	2009		185		Viktorias, LSP, Vägverket, VGR	Jonas Landgren (Viktoriasinstitutet)	0		
E4	Liveresponse 3	SAFER, Security	2009-2010		512		Viktorias, LSP, Vägverket, VGR	Jonas Landgren (Viktoriasinstitutet)	0		
E6	Improving the pre-hospital care process for victims in road traffic accidents	SAFER	2011-06-13 - 2013-08-31		1 595		Chalmers, SAFER	Stefan Candefjord (Chalmers & MedTech West/Sahlgrenska Universitetssjukh)	0/1		
E7	Strategies and methods for increased traffic flow at traffic-accident sites	SAFER	2012-02-02 - 2012-06-15			0	Chalmers, VGR, Trafikverket	Jonas Landgren (Chalmers)	0		
E9	Vulnerable Road Users: An eCall service for two-wheel vehicle users	SAFER	2013-02-01 - 2013-11-30		134	128	262	Chalmers, SAFER	Leif Sandsjö (MedTechWest/Chalmers)	0/0	
E8	Volvo Acute - Algorithm for enhanced automatic crash notification system	SAFER	2012-09-18 - 2013-12-01		959	28	987	Chalmers, VCC	Anders Westerlund (VCC)	0	
E11	Care & Rescue - pre-study on international strategy for new SAFER focus topic	SAFER	2013-10-01 - 2014-05-31		221			Stefan Candefjord (Chalmers)	0		
E10	IPCaR-TBI/SAFER (Traumatic brain injury)	SAFER	2013-10-01 - 2014-12-31		349	40	389	Chalmers, Sahlgrenska University Hospital, Stefan Candefjord (Chalmers)	0		
					4 831		196				
Avslutade associerade projekt											
Metis 1		Vinnova, VGR	2012-11-01 - 2014-04-30			2 670		VGR, LSP, SAFER, GU, University of Borås Bengt Arne Sjöqvist	0		
						2 670					
Egna projekt											
E5	Rescue principles collaboration with INDIA	VGR, TRIPP	yymmdd - 2012-12-31		NA		VGR, TRIPP	Per Örtengwall (SAFER)	0		
E12	Via Appia - ICT, appar och smart larmhantering för ökad trafiksäkerhet, reducerade personskad	Vinnova UDI	2015-01-01 - 2015-06-30			498		CTH, iRezQ, Volvo AB (w-car), SOS int, SO Bengt Arne Sjöqvist (Chalmers)			
E13	Prehospital occult trauma detection and monitoring of traffic accident victims	sams forskningsstift	2014-12-01 - 2015-08-31			350		SAFER/Chalmers, Sahlgrenska University F Ruben Buendia (Chalmers)	0/1		
					0		848				
Associerade projekt											
IPCaR-TBI/Vinnova		Vinnova	2013-11-01 - 2014-12-31			750		CTH, SA/GU	Stefan Candefjord (Chalmers)		
IPCaR-TBI/IKV		IKV	2014-04-01 - 2014-12-31			200		CTH, SA/GU	Stefan Candefjord (Chalmers)		
4-wheelers		Länsförsäkringar	2014-04-01 - 2014-12-31			724		CTH, HB	Stefan Candefjord (Chalmers)		
							1 674				
					4 831	4 344	1 044				
					5 875	10 219					

Projektöversikt_150331_årsrapport