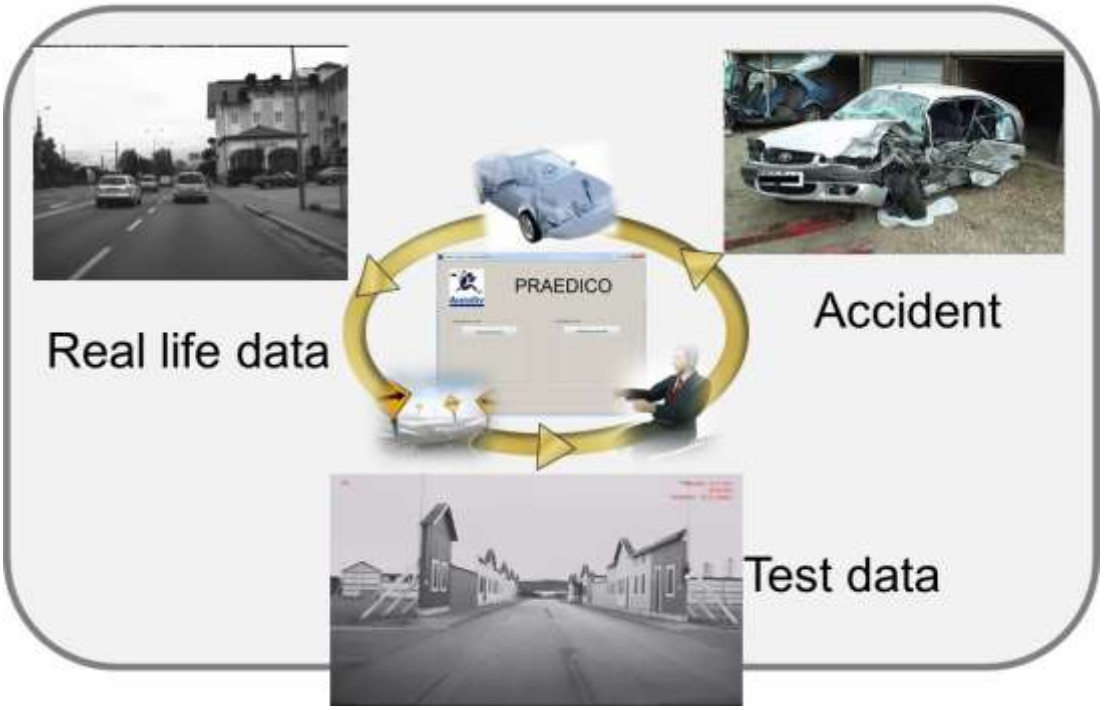
FFI

Balancing active and passive safety



Project within Vehicle and Traffic Safety

Author Ola Boström

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Content

FFI in short

FFI is a partnership between the Swedish government and automotive industry for joint funding of research, innovation and development concentrating on Climate & Environment and Safety. FFI has R&D activities worth approx. €100 million per year, of which half is governmental funding. The background to the investment is that development within road transportation and Swedish automotive industry has big impact for growth. FFI will contribute to the following main goals: Reducing the environmental impact of transport, reducing the number killed and injured in traffic and Strengthening international competitiveness. Currently there are five collaboration programs: **Vehicle Development, Transport Efficiency, Vehicle and Traffic Safety, Energy & Environment and Sustainable Production Technology.**

For more information: www.vinnova.se/ffi

1. Executive summary

The project resulted in a methodology to understand the effectiveness of safety systems to save lives. The method involved vehicle dynamics, driver behavior, infrastructure and fleet penetration. Moreover, the project resulted in a standardization collaboration with European OEMs, supplier, research institutes and universities in the project PEARS. The results is a good base for coming academic theses.

2. Background

By using a representative set of reconstructed crashes leading to injurious crashes it is possible to predict the consequence of implementation of new safety system. For example it would be possible to understand how many injurious crashes are remaining and their characterization for a particular emergency brake function in intersections.

3. Objective

The objective was to develop a methodology to estimate the benefit (avoidance and mitigation of severe injuries) of new automotive safety technologies able to be evaluated a priori. The methodology was supposed to be applied on the most prioritized crashes in an ever changing world (new technology changes the scope). The method was built on three models, the driver (at least distributions pf the ability of steering and braking, time and magnitude vice), vehicle (vehicle dynamics) and infrastructure with the help of data from real life crashes. The method was supposed to be validated with the German accident data base German In-Depth Accident Study (GIDAS) and the GIDAS based Pre-Crash Matrix (PCM). Both data bases combine pre-crash trajectories with pre-crash information, are representative and thereby scalable. Moreover it would be possible to use Field Operational Tests (FOT) and naturalistic data in the simulation model.

4. Project realization

During the project it was realized the methodology must be standardized, that is available and common for universities, industry and research organizations. This in order for conclusions about safety benefits to be accepted by governments and rating institutes. A harmonization group about pre-crash simulation have been build up with the name PEARS – Prospective Evaluation of Active Road Safety Systems. The current project results have been used both in the ongoing PEARS project as well as in a Horizon 2020

application, Mobility for Growth. The Horizon 20202 application, V3Safe, involves most European OEM incl VCC, Volvo Group, Autoliv and Chalmers and is expected to be approved or not in January 2015. As a project leader, I find the objective to be fulfilled in general with a change of focus towards harmonization. That is, the chance that the project results will support saving lives in the future increased dramatically. The academic work (the actual PhD thesis by the doctoral student) will be delayed although now with a solid base of methodology.

5. Results and deliverables

5.1 The project resulted in a methodology to understand the safety benefit of implementing new safety technology in today and future vehicle fleets. Moreover it's possible to change the boundary conditions, for example the infrastructure and road transport system to defined future scenarios. The methodology have a great chance to support a European standard and thereby drive a development towards optimally safety equipped vehicles according to today and future needs.

The results are a base in the ongoing harmonization work and will be a base in future academic thesis work.

As the student has a critical role in the global harmonization work and the methodology is already in use in Autoliv's R&D work, the project (according to the project leader view) has increased the competiveness and competence for the Swedish automotive industry, supported work opportunities in Sweden and enhanced the research environment at Chalmers. Moreover the collaboration between Chalmers, Autoliv and the Swedish Road Authorities have been reinforced and became internationally more competitive.

6. Dissemination and publications

6.1 Knowledge and results dissemination

The results of the projects have been adopted in the ongoing harmonization work with the European Automotive Industry (including VCC, Volvo and Chalmers). During the project a Horizon2020 project was applied for.

6.2 Publications

As the student has focused on the development of the methodology and to apply for a continuation with more partners, no peer reviewed scientific publications have been completed.

7. Conclusions and future research

The project built a good base in form of an international research environment with a common methodology to understand the safety benefits of new technologies in an ever changing world. The method is already in use in the development work and will both generate implemented technologies as well as scientific publications the coming years.

8. Participating parties and contact person

Autoliv	contact Ola Boström
Semcon	contact Magnus Carlsson
Volvo Cars	contact Henrik Viberg
VTI	contact Fredrik Bruzelius
Chalmers	contact Claes Tingvall