

Crucial passive safety measures to save lives

October 9 2013



Credit: Alexander Grigorian from Pexels

The mandatory use of seat belts and innovative vehicle designs have done much to reduce injury and death from road accidents. Such 'passive' safety measures are an important part of any strategy to reduce the number of road accident victims.

The goal of the EU project APROSYS ('Advanced protection systems') was to develop and introduce passive [safety](#) technologies for all European [road users](#). Project researchers, led by the Netherlands Organisation for Applied Scientific Research (TNO), also wanted to increase the competitiveness of the European road transport industry, developing new safety technologies, design approaches and evaluation methods to help boost the efficiency of development processes.

APROSYS received 18 million in EU funding, making it a flagship European initiative in the area of road safety research. The team brought together research and scientific and technological expertise from across Europe and encompassed a wide swath of safety-related issues, including human biomechanics, vehicle and infrastructure crashworthiness, sensing and control, and occupant and road user protection systems.

Researchers conducted a number of human-body, mathematical-modelling analyses, assessing the pre-crash phase and the effects of age and gender on the behaviour of the human body in an accident.

The project also developed a new model of crash test dummy, representing a small female individual, to help assess side-impact accidents. In addition, a new side-impact protection system for car occupants was developed, including a sensor system that combines radar and stereo vision, and active mechanical components.

APROSYS researchers proposed a four-part suite of test procedures, which will contribute to harmonised world-wide side-impact standards. Other results included:

- new injury criteria and injury tolerances for car design;
- new knowledge and tools for intelligent [safety systems](#);
- improving virtual testing technology;
- advanced protection systems for injury reduction in most

relevant accident types.

The choice of topics was based on the Passive Safety Network roadmap, as well as reviews of state-of-the-art technology, along with extensive discussions with stakeholders. The team selected objectives in line with reducing the greatest number of fatalities and injuries.

The APROSYS team also developed a generic assessment methodology for adaptive safety systems, taking into account accident scenarios, sensor types and other factors.

A set of generic vehicles models representing various vehicle classes was developed, which can be used by industry to assess a range of accident conditions and scenarios, including vehicle-to-vehicle, truck-to-vehicle, vehicle-to-pedestrian and vehicle-to-cyclist/motorcyclist impacts.

New evaluation methods and protection systems for vulnerable [road](#) users - such as pedestrians, cyclists and motorcyclists - were also developed. Examples of recommendations in this area included a new safety bar add-on for trucks, active bumper strategies and pedestrian airbags on windshields, and an improved helmet design and thorax protector for motorcyclists.

Development of new passive safety features translates directly into saved lives. For example, estimates indicate a potential 50 percent reduction in frontal impact fatalities when new passive and integrated [safety measures](#) are in place.

For side impacts, fatality reductions of up to 40 percent are expected, and for cyclists and pedestrians, 25 and 30 percent respectively.

APROSYS has gone a long way towards making these goals a reality and the roads a safer place. The project was completed in March 2009.

More information: APROSYS www.tno.nl/content.cfm?context...1&item_id=464&Taal=2

Provided by CORDIS

Citation: Crucial passive safety measures to save lives (2013, October 9) retrieved 20 March 2024 from <https://phys.org/news/2013-10-crucial-passive-safety.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.