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Status: Complete with results

Background & policy context:

Road traffic in Europe is steadily increasing and so is the total number of accidents on Europe's roads. As an example the number of passenger kilometres in car transport has more than doubled from 1,700 million kilometres in 1970 to nearly 4,000 million kilometres in 1998. At the same time, however, the number of fatal accidents decreased from 80,000 to 40,000 in the same time span. This decrease can be attributed to passive safety devices such as air-bags, improved braking systems and improved car structures, etc. On the other hand it is obvious that passive safety systems alone cannot reach this goal.

A new dimension of active safety systems to avoid and prevent accidents is needed, i.e. active and intervening systems that may take over control from the driver in critical situations. This is especially true by the fact that about 95% of all road accidents are caused by human errors. Achieving promising research results and putting proof-of-concept vehicles on test tracks, however, is just the technical challenge, which has to be mastered. To bring these systems on the market and to use by everybody also other questions on legal and liability issues, certification and homologation as well as their benefits and risks have to be answered.

The project RESPONSE 1 delivered ground breaking work on an integrated approach towards user, system, and legal perspectives. It was thus able to address some of the issues described above. In its final report the RESPONSE consortium concluded as key messages that ADAS systems remain manageable from the legal and the user's viewpoint only as long as they can be controlled and/or overruled by the driver at any time.

However, problems regarding licensing and (product) liability law are likely to occur with assistance systems, which can not be overruled by the driver or which intervene beyond human psychomotor performance limits (e.g. anti collision systems). Here the driver can't be held liable if he can't control the system. This is accompanied by a shift from liability to product liability. How can a manufacturer manage his liability risks? All legal analysis carried out within RESPONSE shows the high relevance of a clearly defined technical and user centred development and testing to reduce the risks for manufacturer and user. This is true for controllable and also for non-controllable systems.

A first step towards this objective was carried out by outlining risk identification and ris

Objectives:

RESPONSE 2 contributes to a fast and 'safe' market introduction of Advanced Driver Assistance Systems using its integrated perspective on human, system, and legal aspects. Based on market introduction scenario analyses, a transformation into methods for risk-benefit-analysis leads to requirements definition for a Code of Practice for development and testing of ADAS. RESPONSE 2 is a necessary step to come to a commonly agreed Code of Practice for development and testing of ADAS, which will result from the follow-up project Prevent - RESPONSE 3 (https://www.howtogosolar.org/). This Code of Practice will contribute to ensure a state-of-the-art development process for ADAS systems in order to accelerate market introduction.

Methodology:

In a first step (WP 2 Market Introduction Scenarios) RESPONSE 2 described market introduction...
In a first step (WP 2 Market Introduction Scenarios) RESPONSE 2 described market introduction scenarios analysing the gap between technological possibilities and market introduction benefits and risks using typical scenario technique procedures. Enabling and disabling factors concerning market introduction have been identified and their interactions clarified. The in-principal technological possibilities of modern ADAS implying technical, human factors, and legal risks were outlined.

In a second step (WP 3 Risk Benefit Analysis) this deeper understanding of enabling and disabling factors was used for the definition of risk/benefit-assessment methodologies. This was done on a 'microscopic' perspective, where the risks for the whole Human-Machine-System had to be evaluated. Further a macro-economic approach for a combined risk-benefit analysis was developed. In a third step (WP 4 Towards a Code of Practice) these risk identification and assessment strategies were translated into a requirements definition for a Code of Practice for development and testing of ADAS. This included the analysis of already existing procedures and standards as well as the derivation of need for additional ADAS-specific procedures. Content, structure and formal aspects of a future CoP was defined.

The approach was to translate the legal terms 'reasonable safety' and 'duty of care' into requirements for a Code of Practice by:

- analysing existing automotive and non-automotive regulations, standards, rules, technical papers, guidelines and other relevant provisions as well as;
- deriving the relevant design, performance and process aspects/elements by selecting, adapting and completing these requirements to special ADAS needs.

Related Projects:
- Previous project RESPONSE 1 ([http://docs.adase2.net/response/](http://docs.adase2.net/response/))
- Follow-up project Prevent - RESPONSE 3 ([https://www.howtogosolar.org/](https://www.howtogosolar.org/))

Parent Programmes:
- FP5-IST KA1 - Systems and services for the citizens

Institute type: Public institution
Institute name: European Comission, DG Information Society
Funding type: Public (EU)

Partners:

Belgium:
ERTICO, European Road Transport Telematics Implementation Coordination Organisation S.C.R.L.

France:
Peugeot Citroen Automobiles SA

Germany:
Ford Werke GmbH - Audi AG - BMW Forschung und Technik GmbH - Robert Bosch GmbH - DaimlerChrysler AG

Italy:
C.R.F. Societa Consortile per Azioni

The Netherlands:
TNO - Netherlands Organisation for Applied Scientific Research

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Key Results:

Financial risk, liability risks and risks related with brand image are preventing a successful market introduction of preventive and active safety systems. The RESPONSE 2 elaborated steps towards a European Code of Practice for development and validation for an accelerated market introduction of ADAS. This implies to establish 'principles' for the development and evaluation of ADAS on a voluntary basis as a result of a common agreement between all involved partners and stakeholders.

The number of participants at the final workshop of Response 2 as well as the reaction to the dissemination activities (e.g. at ITS congress) showed again the great interest and the importance of the project. With the implementation of Response, Response 2 and the follow-up project Response 3, the European Union, its Member States together with the automotive industry and the equipment providers demonstrate their responsibility by addressing and finding solutions to the current problems of ADAS market introduction.

All in all the voluntary agreement towards a Human Factors based Code of Practice shall:

- give guidance in the user centred ADAS design process, helping to accelerate safe ADAS development on a 'state of the art' level;
- promote positive public opinion concerning ADAS technology and its corresponding safety benefits as well as;
- provide the basis for market introduction of ADAS and therewith a significant reduction of accident rates in Europe.

Policy implications

RESPONSE 2 results represent the necessary basis for the future realisation of a European Code of Practice.

In a consensus formation process between project partners it was defined:

- what is content and scope of the future CoP;
- what are the formal requirements of the future CoP;
- which are the steps towards a Code of Practice. Due to its horizontal project status, RESPONSE 2 contributed to other European vertical projects too, which were developing ADAS applications (e.g. CarTALK 2000).

Road

Key Findings

No results directly relevant to this theme. However, please note that some findings relevant to the project's key theme (User Aspects) are generically applicable.

Policy Implications

No policy implications directly relevant to this theme. However, please note that some policy implications relevant to the project's key theme (User Aspects) are generically applicable.

Efficiency
Key Findings

No results directly relevant to this theme. However, please note that some findings relevant to the project’s key theme (User Aspects) are generically applicable.

Policy Implications

No policy implications directly relevant to this theme. However, please note that some policy implications

Documents:
- Response2_final_report.pdf (Final report)

**STRIA Roadmaps:** Cooperative, connected and automated transport

**Transport mode:** Road transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:** Digitalisation, Safety/Security, Decarbonisation, Societal/Economic issues

**Geo-spatial type:** Other