Evaluation of an on-board driver support system -the IN-ARTE project

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Abstract

IN-ARTE is a European Project whose main objective is to develop a system that supports the driver while driving on motorways, extra-urban, and rural roads. In this paper the evaluation tests performed in this project are presented: system functionality, system impact on the user's driving behaviour and effect on the road safety in general (short-time effects), and user's acceptance and willingness to pay.

Results show that an IN-ARTE system has a positive effect on traffic safety: the use of IN-ARTE reduces maximum and average speed, it has in particular a positive effect on users with a bad driving style. Moreover, the system increased average TTC (Time To Collision). The false alarms rate is less than 5% for frontal obstacles (caused by reflections) and around 10% for curves (due to the use of the indicator status as criterion for curve entrance).Finally, users' acceptance of the system is rather positive, especially for those who have tested the system in heavy traffic. The use two levels of warnings has also been suggested, a caution level, and an imminent danger level.

Introduction

IN-ARTE (*Integration of Navigation and Anticollision for Rural Traffic Environment*) is a European Project (DG XIII, TR 4014) whose main objective is to develop a system that supports the driver while driving on motorways, extra-urban and rural roads, and to increase in this way traffic safety. This encompasses:

- extension of the operative scenarios of driver support systems, by generation of an "extended view" of the environment;
- better performances of the single systems;
- enhanced usability and better user acceptance through unified HMI.

In order to achieve its goals, the IN-ARTE system uses a microwave long range frontal radar, a navigation system and an enhanced digital map, specifically developed inside the project. The system provides information to the driver about:

In D. de Waard, K.A. Brookhuis, J. Moraal, and A. Toffetti (2002), *Human Factors in Transportation, Communication, Health, and the Workplace* (pp. 99 - 112). Maastricht, the Netherlands: Shaker.