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“Traffic Safe Young Car Drivers” – Experiments with Intelligent Speed Adaptation

Background

Most European countries have experienced an almost constant decline in the number of persons killed and injured in road accidents in the last 25 years. However, in recent years the decline has become smaller, and in some countries it has even changed to an increase. There are strong reasons to believe that if the reduction in the number of accidents is to continue, it will be necessary to use new measures. Intelligent Speed Adaptation (ISA) and other ITS-systems will certainly be a key factor in the road safety work in the future.

ISA is a general term for systems which establish the position of the car, compare the current position and speed with a digital road map which includes the local speed limits, and it responds if the speed limit is exceeded. The response can take various forms; it can be a light and sound response; the exceeding can be registered in a car computer; there can be a built in resistance in the accelerator when the speed limit is exceeded; or in the ultimate edition, it can be made impossible to drive faster than the speed limit. The different ISA-systems can be classified as either informative, controlling, or intervening systems.

The INFATI project was the first ISA project in Denmark and was a project with informative ISA carried out at Aalborg University from 1 July 1998 to 31 June 2001. The project was small with only 24 testdrivers in 6 weeks, but the results from INFATI were promising. The INFATI pilot project result in general speed reductions of about 5 to 6 km(s) per hour. This speed reduction corresponds approximately to a 25 % reduction in the risk of road accidents.

“Traffic safe young car drivers”

The target group for this project is young people aged between 18 and 21 years of age. This group is the most dangerous group when let out into the traffic because they show no respect for speed limits and they are inexperienced drivers.

The overall purpose of the project is to examine whether equipment for Intelligent Speed Adaptation installed in young drivers’ cars, in combination with discounts on insurance fees, can motivate young road users to reduce their speeds and thus possibly save lives.

The project is designed to conduct research into the field of economic motivational factors in traffic behaviour and also into the field of GPS-based digital speed maps.

This actual project consists of several parts;

1. The development of a second generation of equipment and software to be installed in the young drivers' cars
2. The development of digital speed maps and a web application for local authorities to update the position of signs.
3. A 3 year period of testing with 300 young car drivers as participants in our project
4. Research, evaluation and reporting of the research will be documented in two PhD dissertations

1. The development of a second generation of equipment and software to be installed in the young drivers' cars

The first generation of equipment was an "On Board Unit" that matched GPS-positions with a digital speed map stored on a database in the car. The actual positions and speeds were written in a log, which at the end of the short test period was analyzed by the researchers. The equipment also consisted of a display showing the actual speed limits and a device using an artificial voice for warning the drivers when the actual speed limit was being exceeded.

The second generation will use GSM and GPRS-communication devices for daily export of the logs to a server as well as for the importation of updates to the speed map on a regular basis.

This generation also must develop a security module to secure against cheating with the positions and the speeds.

2. The development of digital speed maps and a web application for local authorities to update the position of signs

The digital speed map is based on the registration of road signs regarding speed restrictions on the roads for the whole county of North Jutland, about 10.000 km of roads. The local road authorities are supposed to update the speed maps via a new web application when they are putting up new signs, deleting existing ones, making changes to speed limits or changing the positions of the road signs. In this way we aim to always have a correctly updated digital speed map.

3. A 3 year period of testing with 300 young car drivers as participants in our project

The aim is to run this project over a 3 year period of testing to ensure a large amount of empirical data is collected and to be able to generate new knowledge about possible changes in traffic behaviour related to the technical effect of the speed map, the displays and the use of artificial speech.

Another very important aim is to focus on motivation; what behavioural changes will happen as a result of the possibility of achieving a considerable amount of discounts in insurance fees? Insurance fees in Denmark are extremely high for new car owners - about 2400 €/year. The level of insurance fees added to the price of a midrange second hand car, makes it expensive for youngsters to buy and own a new car.

We expect about 300 young people to participate in our project over a 3 year period. The criteria for participating are that they are aged between 18 and 21 years of age, that they must be car owners and be insured with the same insurance company.

4. Research, evaluation and reporting of the research will be documented in two PhD dissertations

Evaluation and reporting will continuously be carried out and communicated to the public and to the ITS-community. Special presentations on the results so far will be held at the European ITS-conference held in Aalborg in June 2007. The intention is also to present papers to other relevant ITS conferences and articles in scientific periodicals.

The research will be carried out by two PhD-students with different focuses; one with a technological focus and the other with a motivational, psychological focus. The research will be presented in two PhD dissertations.

Special efforts will be made to keep the young drivers updated about the project and its environment, to keep them motivated to continue as participants in the project.

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