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Black box study shows a reduction in the number of accidents

Human behaviour is a determining factor in road safety. For this reason, it is of crucial importance to encourage people to behave safely in traffic. It is known that people aware of being observed tend to modify their behaviour. By observing and recording the behaviours of drivers, it might then be possible to confront them with their behaviour. This could mean that drivers who realise that this can happen will adjust their behaviour ahead of time. They can also react this way as a result of an actual confrontation. For this form of behaviour influence to prove effective, it would ultimately have to result in fewer road traffic accidents.

Within this context, then, the goal of the study (R-97-8) was to investigate if road safety could actually be increased by creating the possibility of confronting drivers when necessary with objective data about their own driving behaviour being recorded by telematic monitoring devices mounted inside their vehicles. For this purpose, a study would monitor whether using this feedback mechanism would result in fewer and/or less severe road traffic accidents in actual everyday experience.

The first phase of this study was carried out within the framework of SAMOVAR, a project within the European Union Commission's research programme known as 'DRIVE 2'. Implementing the follow-up phase was made possible by the cooperation of the Association of Dutch Insurers.

Field trial

To be able to establish the effect on the number and severity of road traffic accidents, it was decided to implement a quasi-experimental field trial, the general design of which was a pre-test and post-test applied to both the experimental and control groups.

The design's specific implementation construction formed an independent subject within the study. Partially due to the time period over which a study of this nature had to extend, one of the assessments done beforehand was the number of vehicles that would be fitted with monitoring devices as well as the number of other vehicles.

The theoretical design was then modified to fit the actual research conditions, because these were ultimately determined partly by the fact that various fleet owners were included in the study (on a volunteer basis and at their own expense). As a result, it turned out that the vehicles available for the study displayed a great degree of variety in character and use.

Ultimately, 840 vehicles were involved in the study, 270 of which were fitted with monitoring devices already available on the market, the majority being 'accident reconstruction recorders', whilst some could generally be described as 'trip recorders' or 'journey recorders'.

The numbers of vehicles involved a diversity of fleets and for this reason created a non-homogeneous sample. Seven experimental groups of vehicles were equipped with recorders, for which twelve matched control groups could be selected. The advantage of this diversity, however, was that some insight could be gained into the distribution among such fleets as to the effect on accident occurrence.

The accident records of the vehicles involved in the study were recorded for a period of at least one year previous to the date on which the recorder was built into the vehicle as well as during at least one year following installation. Also recorded for these time periods were use, exposure and accident damage, with a separate data collection format being developed for this objective.

Results

This study established a statistically significant reduction in the number of accidents for several fleets in which the behaviour of the drivers was monitored in such a way that the drivers could

also be confronted with their behaviour. As yet, these positive results can be given only within rather wide confidence intervals, this being due chiefly to the small sample size.

When viewing the total group of fleets involved in the study, it is possible to estimate an accident reduction of some 20%.

In the case of the only fleet for which the costs of its own accident damage were known, there was also a favourable development in terms of accident reduction. In this respect, accident damage can also be considered a measure for the severity of the accidents outcomes.

It can be concluded that the methodology developed in the study is more generally applicable, especially when investigating the safety effects of virtually any in-car system that may influence driving behaviour.

Recommendations

In view of the results obtained, applying behaviour influence by driver monitoring is recommended. Further research is worthwhile, in particular in order to optimise its effects. This research might focus on subjects like the implementation of the feedback and its most effective use, improved equipment, and ways to sustain lasting effectiveness of the measure.