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POLICY DEPARTMENT B: STRUCTURAL AND COHESION POLICIES

TRANSPORT AND TOURISM

TECHNICAL DEVELOPMENT AND IMPLEMENTATION OF EVENT DATA RECORDING IN THE ROAD SAFETY POLICY

EXECUTIVE SUMMARY

Abstract

The study provides an analysis of the technical developments and implementation of Event Data Recorders (EDRs) in cars or commercial transport vehicles. EDRs are devices able to record information related to vehicle crashes or accidents. They have been used since the 1970s by US car manufacturers to investigate accident causation and to improve vehicle design; at present, increasing applications in the insurance market and public and private fleet management are emerging. The EU is giving increasing attention to these and other Intelligent Transport System devices as they could help meet road safety targets set in the 2011 Transport White Paper. This study provides an overview of existing application of EDRs in the EU, Switzerland and the US, presenting evidence on their scope of application, technical features, data processing system and outcomes achieved. It concludes with recommendations on factors that should be considered when shaping policies to sustain effective implementation of EDRs in the EU.

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DISCLAIMER

EXECUTIVE SUMMARY

This research study is intended to inform the parliamentary debate with a clear and comprehensive overview of the technical development and implementation of EDR devices in cars and commercial transport vehicles. Particular attention is given to the contribution these devices can give to improving safety on EU roads.

ROAD SAFETY

Road Safety in Europe has been improving constantly over recent decades. The number of fatalities in the EU-27 in 2010 was almost 31,000, against 54,302 registered in 2001. Notwithstanding the substantial decline, the EU did not achieve the target, set in 2003, of a 50% decrease road fatalities between 2001 and 2010.

Data on road accidents at European level are collected in CARE, the European centralised database on road accidents. Although significant steps have been made to improve the quality of the statistical information provided, the CARE database has limitations regarding both the reliability of data and the lack of information about accident causation factors.

Over the past decade, efforts have been made at the EU level to investigate better the circumstances leading to fatal accidents, and a number of studies state that driver error is the main cause of road accidents. These investigations show how Intelligent Transport Systems (ITS), Driver Assistance Systems, Event Data Recorders and eCall could all be relevant to improving road safety through reducing driver error and providing more accurate data collection about factors causing accidents.

TECHNOLOGY, POTENTIAL BENEFITS AND ISSUES

There are currently a number of different vehicle data recorder models on the market. These can be can be classified as either Journey Data Recorders (JDR), tools that record vehicle status parameters throughout the entire trip, or Event Data Recorders (EDR) that record only in the case of an event exceeding certain threshold parameters and triggering a sensor. In addition there are Video Event Data Recorders (VEDRs), which allow the system to add video recording of the environment surrounding the vehicle.

The drive to encourage the deployment of these devices comes from both the EU and the private sector. The EU seeks their implementation to increase road safety through improved road safety research and the effects that EDRs have on driver behaviour. The private sector sees the benefits related to improved legal certainty in litigation, more transparent insurance procedures, and improved monitoring of public transport and fleet operations.

The main issue regarding the development of EDRs relates to the privacy of collected data. Without appropriate privacy safeguards, drivers and passengers of smart vehicles might be unable to monitor and control the data being processed; or even unaware that data is being processed. This issue has yet to be addressed fully in the EU, as different national legislative provisions account for it in different ways, and EDR data is not regulated consistently.

EXISTING IMPLEMENTATION

EDR device implementation and expansion has developed differently across the globe. The country with the most widespread use of EDR devices among public and private vehicles is the United States, which can therefore be considered a reference case. In Europe the development of this technology has been less diffuse and it varies between different countries.

The type of vehicles in which EDRs are installed also varies between states. In the United States and Sweden, EDRs have been installed in private cars mainly by car manufacturers; in Switzerland, Germany and Austria they have been installed on some emergency and police vehicles; in Italy, Germany and Austria EDRs have been installed on public transport vehicles; while in the UK, Switzerland and Germany some companies use EDRs to improve commercial car fleet management. In addition, EDR insurance-based contracts for both private cars and commercial vehicles are available in Italy, UK, Switzerland and US. EDRs have different technical specifications in different countries though.

POSSIBLE COSTS AND BENEFITS

The cost of installing EDRs can range from EUR20 to EUR100 per device. To this should be added the cost of collecting, processing and managing data, though this will vary depending on their use, and unit costs will fall as the network grows.

EDR data has been useful in crash reconstruction and vehicle design, providing information on accident reconstruction parameters and the causes of injuries. Furthermore, installation on public or commercial vehicle fleets can result in a reduction in the number of accidents and related costs in the range of 20-30%.

In the insurance market, the unbiased information gathered by EDRs can be a fundamental tool for insurance companies assessing in more detail road safety risks, and drafting more accurate risk profiles of their clients. EDR devices can also benefit cautious drivers, who can get cheaper premia.

Another benefit of EDRs is the ability, when they are associated with emergency call functions, to improve emergency or recovery interventions: this can lead to a reduction of fatalities, the seriousness of injuries and the congestion costs caused by traffic accidents.

Once the costs and benefits of installing EDRs in vehicles and developing the infrastructure network needed to process the recorded data are considered, the overall economic case for a large scale introduction of these devices seems greater for public transport, coaches, HGVs and other public or private vehicle fleets such as logistics vehicles. This is confirmed by a recent study in Germany assessing the costs and benefits of a wide scale introduction of EDRs in the different types of vehicles in the country[1].

As yet, however, there is no statistical evidence on the link between EDRs and road safety improvements to support the case for their wide scale introduction in private vehicles. Further research would be required to in this area.

[1] E. Petersen, J. Ahlgrimm,(2014): Benefit/Cost-Analysis of mandatory Event Data Recorder Applications, Approach and Results). Published in: ZVS-Zeitschrift für Verkehrssicherheit, Issue 2/2014, Kirschbaum Verlag, Bonn.

A preliminary assessment of the cost of the EU-wide installation of EDR devices on private cars undertaken as part of this study, showed that a decline in the serious accidents rate, from a 2011 baseline, by around 0.7-1.5% annually for 20 years, would be sufficient to cover the cost of installing EDR devices on all vehicles.

CONCLUSIONS

Significant evidence suggests that the installation of EDRs or similar devices (such as VEDRs) on buses, coaches and HGVs has the potential to return high positive benefits in terms of improved economic efficiency and reduced costs of use of these fleets. It would also have social benefits from a reduction in accident rates and risks.

For private cars, while the installation of these devices as part of insurance policy contracts has often led to a reduction in the insurance premium paid by drivers, as yet no evidence has been found on the presence of a clear, causal relationship between the use of EDRs and an improvement in road safety. Nevertheless, this study shows that, given the limited unit cost of installing EDRs, even a marginal positive impact on road safety from their widespread introduction in private cars would be cost-effective. However, the approach adopted has a number of limitations, and a full impact assessment is recommended, to evaluate the effects of policy options that require a wider introduction of EDRs on EU vehicles.

The policy options to be considered should include building on existing private interest in the introduction of EDRs, and should be differentiated by vehicle type, giving priority to those where higher benefits are expected. Among other options, mandatory introduction of the devices in new vehicles should be considered and evaluated.

When deciding what approach to adopt, it will be important to understand who should bear the cost of the installation of the devices. Adoption would be facilitated if the ultimate user was not required to pay for the device, or if the long-term benefit led to a monetary saving for the user.

Data privacy issues remain a concern for a number of parties. While the use of EDR data for research purposes does not seem to generate concerns, provided that they are treated as anonymous, further potential uses - linked to insurance-based contracts, fleet management or other applications - would need to be treated carefully and in some cases be subject to individual formal expression of consent regarding the treatment of data. In any case, the collection and processing of EDR data would need to fulfil the provisions included in the revised text of Directive 95/46/EC currently under discussion.

A consistent approach should be adopted in determining which devices are made compulsory in new vehicles and how they communicate with each other. Current policy is moving towards having an eCall, an EDR and an EETS device. Before any are made compulsory, the EU should consider how to integrate their functions into one device, to ensure that the benefits of increased interoperability within single devices are not lost due to a lack of integrated functionality. This can either be legislated by the EU or developed by the industry through processes such as standards setting.