BLACK BOX RECOMMENDATIONS

The use of black boxes to reduce road death and injury and cut carbon emissions should be a priority for the international community and all national governments.

International governments should introduce legislation to require and regulate their use. Early action is required, in order to ensure that the opportunity offered by the proliferation of electronic devices in motor vehicles is not lost.

All devices should meet the minimum technological standards required to achieve the benefits set out above. As a first priority, black boxes should be required in vehicles driven by:

- young drivers
- all public sector agencies, including emergency services and police services
- businesses driving commercial vehicles, public transport vehicles, company cars and by individual employees while at work
- international and private drivers

Like the vast majority of other road safety measures, black boxes are not self-enforcing (speed humps are a case example). To be effective, drivers need to know the recorded data will be used to assist in the safety of their driving, the need for the trip, and a reign of the stakeholder. Transport supervisors and parents have a key role to play in ensuring black boxes are effective.

In 2005, 1.3 million people were killed in road crashes, more than 3,500 each day. Over 40% of those killed will have been under the age of 30 and will only have lived half of their life at most. Road deaths are predicted to increase further by 60% between 2005 and 2020, with 60% of this increase occurring in low and middle income countries. A complex, deep and growing problem resulting from the spread of electronic devices in motor vehicles. Black box evidence of extreme speed helped to secure the conviction of the young driver for the serious charge of ‘Causing Death by Dangerous Driving’. The company reduced the annual costs of incidents by $100,000 and maintenance costs by $30,000, saving $150,000 over four years. The net saving to the company of $115,000 a year.

What are black boxes?

Black boxes or EDRs are used to improve safety by monitoring how cars are being driven. There are different types of black boxes and they are used for different purposes. At their most basic, they record changes in speed, acceleration and direction of travel. Some are the information to calculate safety devices, in which accidents and events can be triggered automatically. The data can be used to calculate potential consequences of any accident, such as the force applied to occupants and the severity of injury. The data can be used to calculate potential consequences of any accident, such as the force applied to occupants and the severity of injury. The data can be used to calculate potential consequences of any accident, such as the force applied to occupants and the severity of injury. The data can be used to calculate potential consequences of any accident, such as the force applied to occupants and the severity of injury.

What gets measured gets improved

Over a four year period IVMS with driver training reduced incidents by 96%, from 46 in 2001 to only 2 in 2005. The company reduced the annual costs of incidents by $100,000 and maintenance costs by $30,000, saving $150,000 over four years.

Useful websites

VERONICA project:  http://www.siemensvdo.com/aboutus/projects/veronica/documentation/documentation.htm
DriveCam: http://www.drivecam.com
Road Safety International: http://www.roadsafety.com/

(1) VDO Kienzle (1998) The Accident Data Recorder - A Contribution to Road Safety; VDO Kienzle Sales and Services GmbH
(2) Vehicle Event Data Recorders - Summary of Findings by the NHTSA EDR W Group; NHTSA National Highway Traffic Safety Administration
(5) European Federation of Road Traffic Victims www.roadsafety.com/teen.php
(10) ECMT/OECD (2006) Speed Management OECD
(11) IIHS (Insurance Institute Highway Safety) (2006) Q&A: Event Data Recorders

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What are the benefits?

1. Reducing road crashes

There is evidence that drivers who know that their cars have black boxes drive more cautiously. Case studies from Europe and the US show that the number of crashes can be reduced by 20 to 30 percent (2). Crash severity is also reduced.

The evidence for black boxes

- The Berlin Police Department reduced crashes by 20%/overall and by 36% during rescue trips. As a result, all Berlin Police patrol cars use EDRs. A similar initiative for the use of EDRs is planned by the police cars.
- In the UK, in police black box trials, different types of EDRs have led to a reduction of between 25 and 50 percent.

In addition to reducing casualties and costs, data from black boxes help to eliminate disagreements with employees. EDRs used in connection with fleet management have helped fleet operators or their insurers to identify unrealistic claims or to redetermine real road misuse (3). Black boxes could also prevent crashes by helping mechanics to identify vehicle damage or malfunctions during regular maintenance.

In the UK black boxes are part of a new type of insurance targeted at young drivers. A large component of the premium costs varies according to the time of day and type of road, reflecting the especially high risk of road crashes at night. The best studies show that the use of black boxes reduces crashes among participating young drivers by 80% (3). Part of the crash prevention effect of EDRs comes from encouraging more careful and smoother driving.

2. Proving responsibility for crashes and crash damage

EDRs can provide accurate, objective and reliable data about what happened during a crash. Such data would reduce arguments over facts and enable faster trials, protecting the interests of crash victims, vehicle owners and drivers. It would help to speed up court and insurance proceedings.

In several North American court cases, EDR evidence has been decisive in establishing innocence or guilt. It has been used to secure convictions in cases of dangerous driving and subsequent insurance, and to prove actual speeds contrary to witness testimony. In an important recent case, the black box showed that a driver who died in a traffic accident had been travelling at 105 mph. A police speed limit was exceeded before the crash occurred, but four seconds before. A defence expert has testified that the defendant had been travelling at 90 mph and that the police expert had estimated a minimum speed of 60 mph (4). In another case, EDR evidence was used to establish a driver whose vehicle had caused the crash. EDR data also helped to prove insurance fraud, benefiting all insured drivers.

3. Reducing distances travelled and thus climate change

Fleet management and insurance policies using black box data potentially help to reduce distances travelled, which also reduces carbon emissions. Black boxes could also reduce congestion and emissions. A study of the potential effect of distance-based passenger car insurance in Los Angeles, USA, estimated that the distance driven could be reduced by nearly 5% and congestion by nearly 10% partly by discouraging unnecessary driving and the use of cars when they are not needed (5). Smoother driving improves vehicle fuel consumption and reduces CO2 emissions.

4. Improving medical response and rescue time

EDRs could be used with an automatic crash notification system, such as the proposed e-Call. This would reduce emergency response times and improve outcomes for crash victims. Medical and police services could improve their efficiency, minimising their costs. It has been estimated that automatic crash notification on its own could reduce deaths in Europe by 10% (6). Black box data could help rescue teams and medical staff to more accurately assess injury severities by knowing what happened during a crash. This is especially important where victims are unconscious. A study in Germany showed that about 5% of urban crashes and 12% of rural crashes resulted in victims being trapped and/or unconscious and unable to call for help (7).

5. Improving the evidence base for road safety

Black boxes could increase the quantity, accuracy, and reliability of evidence for crash investigations and make it available more quickly. In an appropriate regulatory framework, black box data could be used by police crash investigators, car manufacturers, road safety researchers, and insurance claim assessors.

Who uses them/where are they in use?

64% of 2005 model passenger cars sold in North America have a black box. This will increase to 85% by 2010 (10). After-market black boxes are being introduced through the car insurance market.

Why are they not used more?

A legal framework is needed to encourage the use of black boxes and ensure legitimate access to the data. This in turn requires standards for the technology. North America is ahead of Europe in this regard. By 2010, almost all new cars sold in Europe will have some form of EDR equipment built in. Some manufacturers, mainly German and European, but some Japanese, do not put EDRs in recent passenger vehicles (11).

Vehicles made by General Motors, Ford, BMW, Honda, Mitsubishi, Subaru, and about half of Toyota have EDR equipment built in. Some automakers, mainly German and European, but some Japanese, do not put EDRs in their passenger vehicles. (11)