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PROMISE, COMPLICATIONS ARE ASSOCIATED WITH 'BLACK BOXES' IN CARS

Modern passenger vehicles have extensive computing capabilities to operate airbags, antilock brakes, emission controls, and other systems. This growth of on-board computing power and the decreasing cost of electronics mean it's now feasible and affordable to equip private passenger vehicles with so-called black boxes, or electronic data recorders (EDRs), that can capture and store information about what happens immediately before and during crashes.

The EDRs already in some cars can capture a few seconds of information before a crash including travel speed; safety belt use; whether the brakes were applied and, if so, whether the antilock feature activated; and steering movements. Such information is updated continuously during normal driving and, in the event of a crash, it's recorded. During impact, an EDR can record occupant compartment deceleration over time; when the airbag deployed; and for advanced airbags, the type of deployment.

EDRs will be valuable for research because they can provide objective information about vehicle operation before and during crashes. Researchers today must rely on data from in-depth crash investigations or police investigations. The in-depth data include extensive detail, but the samples are small. Police data samples are larger, but there's not much detail. Either way, the reliability of data such as vehicle speed before impact and crash severity is questionable. With the potential availability of large samples of reliable crash data from EDRs, researchers could do a better job of identifying the role of vehicle speeds in crash causation, evaluating new occupant protection technologies including advanced airbags, and answering other crashworthiness questions.

EDR data also could help establish culpability and address other issues in individual crashes — for example, how fast a vehicle was going before the crash or whether safety belts were buckled during the impact. Disputes that now rest on often conflicting

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"expert" opinions could be resolved more reliably. Insurers might find EDR data useful to resolve some claims — for example, by relating crash severities to claims of soft tissue injuries. However, this potential use of EDR data to help resolve disputes about individual crashes raises privacy questions. Key among these is, who will have access to the data? Obvious interest by police, insurers, lawyers, and others may conflict with the interests of crash-involved drivers, especially those at fault in some sense. For crashes that result in litigation, access could be ordered by the courts. But access may be problematic for the more numerous crashes that don't involve litigation — crashes for which police or insurers could be interested in objectively assessing fault. Insurers might be able to include provisions in their policies to "guarantee" access to the EDR data in policyholders' vehicles. However, this typically wouldn't cover access to EDR data in the other vehicles involved in two-vehicle collisions.

To address EDR topics including the development of a standard dataset, assessment of potential uses of the data, and privacy/data ownership issues, the National Highway Traffic Safety Administration (NHTSA) has convened an Event Data Recorder Group. Members include representatives from Chrysler, Honda, Ford, General Motors, and Volkswagen as well as the Association for the Advancement of Automotive Medicine, National Transportation Safety Board, Transport Canada, and the University of Virginia. The Insurance Institute for Highway Safety also will participate.

A petition is before NHTSA to require EDRs. The agency says a decision about whether to open rulemaking is expected in the near future.

EDRs are in wide use in 1994 and later General Motors models. The recorder, incorporated in the airbag sensor system, captures information about crash severity and whether the driver belt was buckled. Beginning with some 1999 models, GM has introduced improved EDRs that also collect information about vehicle speed, braking, and acceleration before crashes. These data are recorded at 1-second intervals for about 5 seconds before crashes. For the duration of most crashes (about 0.15 second), GM's EDRs record velocity changes in 0.01-second intervals. Also captured is information about airbag deployment and driver belt status.

General Motors expects to install EDRs in millions of passenger vehicles during the next few model years. Ford has installed recorders in some models, beginning with 1997s, and wider proliferation of EDRs from automakers and other suppliers is expected. Highway safety researchers hope the obvious value of the data for study purposes may help prevent privacy concerns from blocking this technology.

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