INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

January 13, 2003

The Honorable Jeffrey W. Runge, M.D.
Administrator
National Highway Traffic Safety Administration
400 Seventh Street, S.W
Washington, D.C. 20590

**Event Data Recorders**
**Docket No. NHTSA-02-13546, Notice 1**

Dear Dr. Runge:

The Insurance Institute for Highway Safety welcomes the opportunity to comment on the role of the National Highway Traffic Safety Administration (NHTSA) regarding the continued development and installation of event data recorders (EDRs) in motor vehicles. Manufacturers increasingly are installing EDRs in passenger vehicles. NHTSA estimates that all 2002 and newer models will have some recording capability. These devices are becoming more sophisticated in the amount and type of data they record. EDRs have enormous potential to aid researchers in understanding the circumstances and precursors of crashes as well as in providing more reliable information on crash severities. A better understanding of these issues ultimately could lead to improved vehicle safety.

Although automobile manufacturers now have incorporated EDRs widely into their vehicles, there is considerable variation in the amount and type of data these devices capture. Unless there is a standard set of key data elements, EDRs will have limited usefulness. NHTSA should take a central role in establishing minimum data requirements. Manufacturers may choose to record additional data, but at a minimum all EDRs should record a common set of data elements. The Institute recommends the following data elements for routine recordation by all EDRs for all impact directions:

- 5 seconds prior to crash
  - belt use
  - throttle position
  - whether driver was braking, whether antilock feature was activated
  - vehicle speed

- During the crash
  - longitudinal and lateral vehicle acceleration (1,000 data points/second)

1005 N. GLEBE RD., ARLINGTON, VA 22201 TEL. 703/247-1500 FAX 703/247-1678 www.highwaysafety.org

- delta V by time (100 data points/second)
- delta V and delta T for the crash event, if delta V by time is not feasible
- time of airbag deployment (including time of different stages of deployment)

Objective data for these variables could lead to improvements in vehicle design, in both crash avoidance and crashworthiness technologies.

When investigating real-world crashes researchers and crash investigators estimate parameters related to crash severity (such as velocity change) using information about vehicle damage, mass, stiffness, and principal direction of force. Crash severity estimates derived from these data are subject to considerable error. The current methodology by which delta Vs are estimated (for example, the methodology used in the National Automotive Sampling System/ Crashworthiness Data System (NASS/CDS)) relies on physical models that are very simplified representations of vehicle crashes; in reality crashes are very complex events. More problematic is that the principal parameter currently available to characterize crash severity (or velocity change, estimated delta V) is only a partial measure of severity; there is no information available on the time (delta T) over which the velocity change occurred. For example, in a crash into a rigid barrier at 30 mph, the delta T will be much shorter than in a 30 mph crash into a roadside impact attenuator (the latter involves a greater deceleration distance equal to the crush of the attenuator plus the crush of the vehicle). Thus, these two crashes with the same delta V differ quite a lot in terms of severity; the decelerations experienced by occupants in the crash into a rigid barrier will be much greater because of the much shorter delta T.

Another important factor in understanding crash outcomes for occupants is whether a person was using a seat belt. Currently, we have to rely on the opinions of crash investigators or on self-reports of vehicle occupants to determine whether belts were used. Crash investigators can examine a seat belt for signs of routine wear or look for evidence such as D-ring scuffing or striations on the belt webbing for indications of use during the crash. Other indicators include evidence of occupant contacts throughout the vehicle, which may indicate an occupant was unbelted. But in many crashes, particularly those of lower severity, such evidence is not reliable. And because of reduced forces on seat belts since the introduction of airbags, evidence of belt use often is not as available in even severe crashes. One result of the unreliability of seat belt use information in crash databases is that, despite the fact that seat belts have been standard

equipment in vehicles for more than 30 years, there still is an ongoing debate in the research literature about their effectiveness (Robertson, L.S., 2002, Bias in estimates of seat belt effectiveness, *Injury Prevention* 8:263). Early research on the effectiveness of seat belts estimated they reduce injury and death by about 40-45 percent. This was prior to laws in the United States that mandate belt use. More recent research has estimated belts to be 60-65 percent effective. These likely are overestimates because of overreporting of belt use by vehicle occupants (as a result of laws requiring use). For the spectrum of crash types and severities, the only way to know reliably about belt use is through EDRs.

The availability of information from EDRs raises a number of potential privacy issues. These include data ownership, for example how and by whom the data may be used. The critical issue for highway safety is how the government can encourage the availability of such information for legitimate use by highway safety researchers without compromising individuals' rights to privacy. The Privacy Act of 1974 recognizes the government's need to maintain information about individuals; at the same time the Act requires that individuals be protected against unwarranted invasion of their privacy arising from use of information. To this end, NHTSA maintains national crash databases that provide valuable and detailed information about vehicle crashes without disclosing personal information to indicate the identities of the occupants involved. This policy should be continued with data obtained from EDRs to keep the identity of crash victims confidential.

It is important for NHTSA to continue to collect and expand the information available from EDRs in the agency's crash databases. NHTSA already is collecting EDR information for some crash investigations on a limited set of vehicles (Special Crash Investigation program and NASS/CDS). These efforts should be expanded as soon as vehicle and data availability will allow. Furthermore, NHTSA should begin collecting EDR-related information as a routine part of the Fatality Analysis Reporting System (FARS). FARS provides detailed information, derived from police crash reports, on almost every crash that occurs on public roads in the United States. FARS data are invaluable in estimating the safety benefits of many vehicle, driver, and environmental countermeasures, but some critical information such as belt use and crash severity is either unavailable or unreliable. NHTSA should encourage police departments, through the use of grant monies, to explore the possibility of downloading EDR data as a routine part of fatal crash investigations.

One stumbling block to widespread use of EDR information for research purposes is that accessing such information from a crashed vehicle can require different approaches, depending on the vehicle manufacturer.

In some cases data can be collected directly from a vehicle using either a device provided by the manufacturer or a commercially available device; in other cases the EDR must be sent to the manufacturer in order to access the information. NHTSA should encourage manufacturers to develop and establish standard practices to download and interpret information from EDRs so it is readily and easily available.

In summary, EDR technology holds tremendous potential to improve our understanding of how vehicle crashes happen, how injuries are sustained, and how well occupant protection features are working. In turn, this should lead to significant improvements in occupant protection in future vehicles. But there is a lack of standardization across manufacturers in the type and amount of information stored and the way data are accessed and retrieved. NHTSA needs to develop standards for the types of data that are being recorded and require standard means of accessing these data. In the short term, NHTSA should work with manufacturers to increase the availability of data that currently are recorded and include this information in NASS/CDS and FARS databases.

Sincerely,

Susan A Ferguson

Susan A. Ferguson, Ph.D.
Senior Vice President, Research

cc: Docket Clerk, Docket No. NHTSA-02-13546