U.S. Department of Transportation

National Highway Traffic Safety Administration

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Memorandum

NHTSA-99-5218-2

Subject: Submittal of Meeting Minutes of the MVSRAC/Event Data Recorder (EDR) Working Group to Docket No. NHTSA-99-5218

Date: JUN 2 3 1999

From: Raymond P. Owings, Ph.D.
Associate Administrator for
Research and Development

Reply to Attn. of: NRD-01

To: The Docket

THRU: Frank Seales, Jr.
Chief Counsel

Attached is the meeting minutes of the Motor Vehicle Safety Research Advisory Committee, Crashworthiness Subcommittee, Event Data Recorder (EDR) Working Group meeting held on February 17, 1999.

Meeting history:

Meeting #	DATE
1	October 2, 1998
2	February 17, 1999

This working group is related to the following dockets:

NHTSA-98-3 887: Crashworthiness Subcommitte
NHTSA-98-3928: MVSRAC Full Committee

Research and Development requests that the minutes of this meeting be placed in the public docket.

Attachments

#

Get it together!
SAFETY BELTS SAVE LIVES

Motor Vehicle Safety Research Advisory Committee

Crashworthiness Subcommittee
Event Data Recorder Working Group
Meeting #2

Final Minutes
Wednesday, February 17, 1999
9:00 AM - 4:00 PM
NHTSA Headquarters
Washington, DC

The Event Data Recorder (EDR) Working Group consists of a panel of government and industry officials appointed by the Motor Vehicle Safety Research Advisory Committee's (MVSRAC) Crashworthiness Subcommittee. The second meeting of the EDR Working Group members and invited guests was held at the National Highway Traffic Safety Administration's (NHTSA) headquarters in Washington, DC. The purpose of the meeting was to: 1) refine the working group's objectives, 2) review working group member's inputs for data elements, 3) review working group member's privacy "White Papers," and 4) continue to expand the working group's knowledge through several presentations. The meeting was co-chaired by John Hinch, Research and Development, NHTSA and Vernon Roberts, NTSB. The agenda for the meeting is included as **Attachment 1.**

1.0 Welcome, Introduction, Meeting Objectives, and Approval of Previous Meeting Minutes

The meeting was called to order by John Hinch, who welcomed everyone to the meeting. Vernon Roberts was recognized as the meeting co-chair. Dr. Joseph Kanianthra, Chairman of the Crashworthiness Subcommittee of the MVSRAC, welcomed the members and guests of the working group and gave some details on the operation of a working group within the MVSRAC. Dr. Kanianthra explained that the working group was closed to the public and the meeting was only open to the members and invited guests. He also indicated that the minutes of the meeting would be made public through the Department of Transportation's (DOT) Docket Management System (DMS).

The minutes from the October 1, 1998, meeting were approved by the working group. The approved minutes and attachments for the October meeting will be placed in the DMS. You can review this information using the DMS, as follows:

*Internet address: http://dms.dot.gov/
➜click on "Search" about ½ way down the page
➜click on "Docket Search Form"
➜fill in the docket ID with "5218"
➜select "NHTSA" for the agency

➜select "1999" for the CY
➜press search.

The first submission should be available in April.

2.0 Objectives

Vernon Roberts led a discussion on the objectives of the WG. John Hinch indicated the WG needed a set of objectives so the group would know when it had accomplished its goals. The discussion followed the "Straw-Man of Objectives" handout, **see Attachment 2.**

1. *What is the status of EDR technology?*
   a. The WG should be the repository of the EDR technology information.
   b. The EDR technology should include both currently available and what's near-term.

2. *What data should be selected for recording?*
   a. Charlie Gauthier indicated that the WG should consider all vehicles, not just passenger cars.
   b. The WG supported the need for the selection of data for recording.
   c. The WG should make recommendations for data elements in its final report.
   d. Joe Marsh indicated that the ISO, WG7, Accident Investigation, is doing work in this area and that our WG should keep current on their activities.
   e. Joe Marsh also indicated that a final product of this working group could be made more formal if we teamed with SAE or ISO.

3. *How should the data be collected & stored?*
   a. Martin Hargrave indicated he strongly supported clear understanding to allow users a method of accessing the data.

4. *How should the data be retrieved?*
   a. FHWA supported retrieval needs.
   b. The WG agreed that special tools will be needed to retrieve stored data.
   c. Self readout in vehicle for anyone to read.

5. *Who should be responsible for keeping the permanent record?*
   a. Vehicle owner.
   b. NHTSA will record this data when associated with crashes it investigates.

6. *who owns the data?*
   Vehicle owner.

Besides these 6 objectives, the WG added two new ones, as follows:

7. *Who are the customers for EDR data?*

a. WG should work with State Governments to have them add EDR data to their State PAR forms.

8. Demonstration of EDR technology.

a. Vision of EDR systems for several perspectives.
b. Discussions of EDR uses.
c. Would go in the front of the final report.

Joe Marsh handed out an inside title page to a reference related to EDRs. This copyrighted book, *Validity and Reliability of Vehicle Collision Data - Crash Pulse Recorders for Impact Severity and Injury Risk Assessment in Real-Life Frontal Impacts,* author Anders Kullgren, 1998, published by Folksam Research, Stockholm, has some information related to the EDR WG's mission. NHTSA has a copy of the book and will make it available for review at the next meeting.

At the end of Vernon's discussion, WG members were solicited to select objectives in which they have interest. It was agreed that the remainder of the WG members would select one or more objectives between the February and June meetings. The following presents the selections which were made at the meeting:

1. *What is the status of EDR technology?*
All

2. What data should be selected for recording?
NTSB
Honda
FHWA
GM
inputs for all

3. How should the data be collected & stored?
No one signed up

4. How should the data be retrieved?
No one signed up

5. Who should be responsible for keeping the permanent record?
No one signed up

6. Who owns the data?
NHTSA
VW

7. Who are the customers for EDR data?
Ford
Loss Management Services, Inc.
Navistar

8. Demonstration of EDR technology.
NHTSA
Transport Canada

3.0 Discussion of EDR Data Elements

John Hinch led a discussion on selection of data elements for inclusion in an EDR system. The WG worked together to select their first cut at a "Top-Ten" list. The list is as follows:

1. Longitudinal and Lateral Acceleration and Principal Direction of Force (PDF) - Low frequency
2. Location of Crash possibly using GPS (within 10 meters)
3. Seat belt status by seating location
4. Number of occupants and location
5. Pre-crash data, such as vehicle speed and other driver inputs (brake, steer, etc.)
6. Crash Time
7. Rollover sensor possibility to determine tripped and un-tripped rollovers
8. Yaw data
9. ABS, Traction control, Stability control information
10. Air Bag data, such as deactivation status, deployment time, etc.

Several WG members provided completed Data Forms. Copies of the completed data forms are presented in **Attachment** 3. Other members indicated they would submit their Data Form between the February and June meetings. John Hinch agreed to compile the Data Forms for the June meeting.

LUNCH BREAK

4.0 Discussion of Privacy Issues:

Sharon Vaughn, NHTSA, led a discussion on data privacy and related legal issues. The discussion started with the presentation of several "White Papers." The NHTSA paper is found in **Attachment 4.** Sharon indicated that it was NHTSA's opinion that the data belonged to the vehicle owner. She also indicated that the crash location was considered private data, but agreed to work with the Federal Highway Administration's (FHWA) Office of Chief Counsel concerning the FHWA's need for crash location. Tom Mercer indicated that the WG should review the JPL recommendation concerning data ownership. For those members who are interested in reviewing

this report, the report can be found on the JPL web site:
http:/‘csmt.iol.nasa.~ov/‘airbaa:’contents.html

Robert Ferlis, FHWA, presented a paper on EDR needs, with specific information on privacy. The FHWA paper is presented in **Attachment** 5. Robert discussed data ownership, EDR data reliability and usability, and other EDR uses such as enforcement.

Tom Kowolick presented a paper titled *Information Privacy Principles for Event Data Recorder Technologies.* His paper was reviewed and edited by Jeya Padmanaban and Greg Shaw, EDR WG members. Tom mentioned some of the JPL findings, which can also be reviewed at the same web address as above. A copy of this paper is presented in **Attachment 6.** Tom’s paper references *Electronic Surveillance in a Digital Age,* Office of Technology Assessment, Congress of the United States, 1995, available from the Government Printing Office. This report will also be available fro review at the June meeting.

Tom Mercer, GM, presented a two page fact sheet, which presented GM’s policy for data ownership. A copy of this document is found in **Attachment 7.**

The WG agreed that the privacy and other legal issues would require additional work, and that we should continue this discussion at the next meeting. Other WG members indicated they would be willing to provide input for this discussion.

5.0 **Presentations:**

There were three presentations during the meeting.

5.1 EDR Validation

John Hinch made a presentation regarding an EDR validation effort which is being conducted between GM and NHTSA R&D. The briefing provided the interim results and the briefing package is found in **Attachment 8.**

5.2 NHTSA Research in Vehicle Crash Speed

Paul Tremont, NHTSA, provided a discussion of Pilot Research on the Role of Speeding in Crashes by Recording Vehicle Speed and Location. In the pilot study, NHTSA is collecting data on drivers speeding behavior using 50 vehicles. Data (including GPS) are used to determine driving speed and location. These data are sampled at 20-60 times per minute and stored on-board. Each week the data are downloaded to a central office in San Antonio. Texas Transportation Institute is the contractor and they are using off-the-shelf hardware for this program. The main purpose of the pilot project is to determine the feasibility of collecting data from a large sample of drivers (2000-3000) over a two to three year period with the objective of determining the relationship between driving speed and speed limits and likelihood of getting into a crash.

5.3 Digital Eye Witness

Chris Brogan and John Mackey made a presentation regarding their Digital Eye Witness data logger. A copy of their presentation is found in **Attachment 9.**

6.0 Working Group Activities

6.1 Member list and Attendee list: The WG added two members, Honda and Transport Canada. Their representatives are Lori Niro and Alan German, respectively. A copy of the new WG member list and February meeting attendee list is found in **Attachment 10.**

6.2 Meeting Co-Chair for next meeting: Dave Bach

6.3 Next Meeting: June 9, 1999, Washington, DC

6.4 NTSB gave a short presentation regarding their upcoming Symposium on Recorders. Information regarding this symposium is available at the NTSB web site: http://www.ntsb.gov/events/symp_rec/symp_rec.htm

6.5 The following topics were presented for discussion at the next meeting:

a. Privacy
b. Data elements
c. Use of data for advanced design
d. Small manufacturer concerns

6.6 Work assignments/action items

6.6.1 Data Elements

The working group again spent a large segment of meeting discussing data elements. Several WG members supplied completed Data Forms. Other members agreed to supply forms. These completed forms are due to John Hinch by June 1, 1999, so he can complete the computation of all data forms prior to the June meeting.

6.6.2 Ownership/Privacy

As in the first meeting, the discussion of data ownership, privacy, and other legal issues was very lively. Several WG members supplied "White Papers" concerning their respective company's position on data ownership and privacy related concerns. Other members agreed to supply similar papers. For those members who plan to present information concerning this issue at the June meeting, please forward a copy of your paper to John Hinch about one week prior to the meeting, or let John know that you will be presenting and bring about 25 copies of the paper to the meeting.

6.6.3 Objectives

NHTSA provided a set of WG objectives for discussion at the meeting. Several members indicated interest in adding two additional objectives, which were added with agreement from the WG. At the time of the meeting, only a few members selected objectives which they were interested in working on. The other members indicated they would review their company's interest and make a selection at the June meeting. For those members who did not select any topics, or those who selected but would like to change, please be prepared to make a selection at the June meeting.

Attachments

1 Agenda
2 Objectives
3 Completed Data Forms
4 NHTSA's Privacy Paper
5 FHWA's Privacy Paper
6 Tom Kowolick's Privacy Paper
7 GM's Privacy Paper
8 EDR Validation presentation
9 Eye Witness Presentation
10 Attendance list and Updated Working Group Member list

AGENDA

Event Data Recorder Meeting #2

9:oo a.m. - 4:00 p.m. Wednesday, February 17, 1999

Room 6204 NASSIF Building; 400 7th Street S.W. Washington DC 20590

Working Group Objective

Facilitate the collection & utilization of collision avoidance and crashworthiness data from on-board EDRs.

Meeting Objective

Second meeting objectives: 1) Refine Working Group Objective; 2) Review WG members' input for data elements; 3) Review of WG's privacy issue white papers; 4) Other systems & data

Welcome and Introductions (meet the real John Hinch) **9:00**

Opening Remarks (Ray Owings &/or Joe Kanianthra) 9:10

Review and Approval of October 2, 1998, Meeting Minutes (John Hinch) 9:20

Reline Working Group Objectives (Vern Roberts) 9:30

Review of WG members Inputs
Inputs for Work Plan

Break 10:30

Discussion of EDR Data Elements (John Hinch) 10:45

Review of Individual WG member Inputs
Summation of Results

Lunch 12:oo

Discussion on Privacy Issues (Sharon Vaughn) 1:oo

Presentation of White Papers (10 min each max)
Summation of Major Ideas (WG)

Break . . . . . **...2.30**

Discussion of EDR Validation Effort (John Hinch) 2:45

Discussion of Pilot Research on the Role of Speeding in Crashes by Recording Vehicle Speed and Location (Paul Tremont, NHTSA) **3:00**

Presentation on an Add On EDR System (John Mackey, Digital Eye Witness) 3:15

Committee Work 3:30

Meeting notes: Is this process working?
Meeting Co-Chair concept. Should we continue? Next meeting?
New Business
Report on NTSB Conference on Data Recorders (Vern Roberts)
Next Meeting
Objectives?; Presentations?
2 days - meeting hours (starting time for morning flights)?
Work assignments?

OBJECTIVES
for
MVSRAC Event Data Recorder WG
February 17, 1999

1. WHAT IS THE STATUS OF EDR TECHNOLOGY?
- Document OEM and aftermarket manufacturer's current capabilities

2. WHAT DATA SHOULD BE SELECTED FOR RECORDING?
- Data elements
  - > Vehicle data (acceleration, etc.)
  - > Event data (time, location, weather, etc.)
  - > Driver data (belt use, etc.)
- Pre crash, crash, & post crash data
- Determined by OEM
- Priority of elements for inclusion of EDRs
  - > Set by Manufacturer
  - > Recommendations from users

3. HOW SHOULD THE DATA BE COLLECTED & STORED?
- How much data is needed
- Minimum recommended set
- OEM determines methodology
- Data quality, what is needed
  - > Data rates
  - > Bandwidth of data
- How is the data stored

4. HOW SHOULD THE DATA BE RETRIEVED?
- Processes need to be defined
- Provided by OEM or OEM out source
- Methodology provided to end user
- Needs to be user friendly

5. WHO SHOULD BE RESPONSIBLE FOR KEEPING THE PERMANENT RECORD?
- NHTSA data bases (CIREN, FARS, NASS, & SCI)
- Other users
  - > State governments
  - > Crash Investigators
- Vehicle Owner

6. WHO OWNS THE DATA?
- Vehicle Owner
  - >What needs protecting
- NHTSA's need to collect and use and provide privacy for the data
  - > Other federal agencies needs and laws (FAA, EPA, etc.)
- Local law enforcement's needs and rights to collect crash data

GM's Data Form

Priority	Data Element	When Possible	Purpose
H	C S S presence indicator	Short term	Does this mean Child Seat Sensor? Combine with Suppression system status
H	*Suppression system status*	Short term	status of suppression systems prior to impact
H	Brake status - ABS active	Short term	Accident reconstruction, driver behavior, possible design improvements
H	Lamp status *(headlight and tail lamps on)*	Short term	Accident reconstruction, product improvement, driver behavior
H	Principal Direction of I Force	Short term	Accident reconstruction, severity of crash
H	Stability control	Short term	accident reconstruction, product design improvement
H	Steering wheel angle	Short term	accident reconstruction, product design improvement
H	Yaw rate	Short term	Accident reconstruction, design improvements
H	*Cruise control active*	Short term	Product improvement. driver behavior.
H	*Electric Steering functional*	Short term	Product improvement, driver behavior.
H	*Lateral acceleration just prior to crash*	Short term	accident reconstruction, product design improvement
H	*Service Engine Soon Lamp on*	Short term	driver behavior, accident reconstruction, product improvement
H	*Service Vehicle Soon Lamp on*	Short term	driver behavior, accident reconstruction, product improvement
H	*Throttle-by-wire*	Short term	Product design improvement, driver behavior, accident reconstruction.
H	Air bag inflation time (time from start of crash to start of air bag inflation)	Near term	Determination of late deployments, or specific accidents that may pose sensing system challenges
H	Air bag status	Near term	Determine if airbag system faults present
H	Automatic collision notification (feedback that request was acted upon)	Long term	Signal can be sent out via On-Star but we don't record that signal was responded to.
H	Delta V - longitudinal	Near term	Indicative of injury risk
H	Vehicle speed	Near term	accident reconstruction, roadway design, driver behavior.
H	*Ignition cycle counter*	Near term	Crude time stamp.
H/M	Belt status - each passenger	Near term driver	helps assess level of injuries and belt/unbelt use.

Priority	Data Element	When Possible	Purpose
		Long term front pass.	Insurance use, occupant behavior.
M	Crash pulse - longitudinal	Long term	Means acceleration samples? Help improve sensing system design, higher fidelity AV.
M	Lateral delta V due to crash	Short term	Somewhat related to injury risk
M	Seat position	Short term	crude estimate of proximity of occupant to airbag
M	Vehicle mileage	Long term	Crude time stamp. Could replace ignition cycle counter eventually.
M	*Tire pressure warning lamp on*	Short term	driver behavior, accident reconstruction.
M	Air bag on/off switch position (factory installed)	Short term	Determine if PSIR enabled/disabled, combine with Suppression status category
M	Engine throttle status	Near term	Identify driver behavior prior to impact.
M	Engine RPM	Near term	Identify engine behavior prior to impact.
L	VIN	Long term	Limited value. VIN does not directly indicate option content of vehicles.
L	Battery voltage	Long term	Determine actual voltage level?
L	Collision avoidance, braking, steering, etc.	Long term	Low penetration, not sure what to measure. Could help in determining potential design improvements
L	Number of occupants	Long term	Medical emergency teams response size
L	Roll angle	Long term	Roadway design
L	Steering wheel rate	Long term	driver behavior before impact
L	Active suspension measurements	3	Low penetration. Not sure what can be measured and/or used.
L	Environment - ice	Long term	Driver behavior in adverse weather conditions
L	Environment - wet	Long term	Driver behavior in adverse weather conditions
L	Fuel level	Long term	Fire causation, vehicle run out of gas?
L	Traction coefficient (estimated from ABS computer)	Long term	Determines if system activated during maneuver
L	Turn signal operation	Long term	driver behavior and accident causation
L	Windshield wiper status	Long term	Doesn't indicate if windshield clean of ice, snow. rain.
L	Steering wheel tilt Position	Long term	airbag inflation angle
L	Environment - other	?	What is included here?
L	Environment - temp	Long term	No obvious use but could be used with

Priority	Data Element	When Possible	Purpose
	(outside)		time/date/GPS to infer if ice was present.
L	Environment - illumination	Long term	Means street lights? Day time/night time?
L	PRNDL position	Short term	Driver behavior
L	Time/date	Long term	time of day of accident. Could indirectly determine local weather, traffic, etc.
L	Traction control	Long term	Determines if system activated during maneuver
L	*Door Lock state*	Short term	Driver behavior, product improvement
L	*Door Aiar Switch on*	Short term	Driver behavior. product improvement
L	Electronic compass heading	Long term	Accident reconstruction, vehicle dynamics prior to impact
L	Wheel speeds	Long term	Proper ABS operation?
L	*Environment - temp (inside)*	Long term	airbag inflation influence
L	Crash pulse - lateral	Long term	Mainly useful only if measured at satellite (crush zone) sensor, (B-pillar).
L	Location - GPS data	Long term	No obvious use
L	Advanced systems	Long term	There may be some items of interest but need to identify and probably longer than 4 years to develop.
L	*2 vs. 4 wheel drive*	Long term	Product design improvement

Notes

1. "when possible" indicates earliest time capability could be developed if the business need is justified. However, this does not mean a commitment to actually develop it.

2. Slight redefinition: Short term means within 4 years, not 3 years. Also, When Possible may mean it is only possible on some, not all, vehicles.

3. Text in italics are items not on the NHTSA-generated list

4. Data elements may be further classified as: prior to impact, after impact, or a combination.

Navistar's Data Form

Priority	Data Element	When Possible	Purpose
	Active Suspension		Not Applicable
Med	Airbag Inflation Time	Short	Validate Algorthms Performance and Airbag Development
High	Air-bag Status	Near	Already Have this Capability. Validate Algorithms Performance
Low	Air-bag On/off Switch Position	Short	Not Applicable
Med	Automatic Collision Notification	Long	
Low	Battery Voltage	Near	
High	Belt Status Each Passenger	Near	Already Have this Capability
Med	Brake Status - Service	Near	
Med	Brake Status - ABS	Near	
Med	Collision Avoidance, Braking, Steering	Long	
Hi	Crash Pulse - Longitudinal	Near	Already Have this Capability
Low	Crash Pulse - Lateral	Near	
High	Delta V - Longitudinal	Short	
Low	Delta V - Lateral	Short	
Low	Electronic Compass Setting	Long	
Med	Engine Throttle Status	Near	
Med	Engine Rpm	Near	
Low	Environment - Ice	Short	
Low	Environment - Wet	Short	
Low	Environment - Lumination	Long	
Med	Environment - Temp	Long	
Low	Fuel Level	Near	
Med	Lamp Status, Head Light Status	Near	Accident Reconstruction
Low	Location - GPS	Long	
Low	Number of Occupants	Long	
Low	Principle Direction of Force	Long	
Low	PRNDL Position	Near	

Priority	Data Element	When Possible	Purpose
Low	Roll Angle	Long	
Low	Seat Position	Long	
Low	Stability Control	Long	
Low	Steering Wheel Angle	Long	
Low	Steering Wheel Tilt Position	Long	
Low	Steering Wheel Rate	Long	
Med	Time/date	Short	
Low	Traction Control	Near	
Low	Traction Coefficient	Short	
Med	Turn Signal Operation	Near	
Low	Vehicle Mileage	Near	
High	Vehicle Speed	Near	
Med	Vin	Near	
Low	Wheel Speeds	Short	
Low	Windshield Wiper Status	Near	
Med	Yaw Rate	Long	
High	Supplemental Restraint Status	Near	
High	Supplemental Restraint Time	Short	
Med	Clutch Status	Near	
Med	Cruise Control Status	Near	
Med	Stop Lamp Status (School Bus)	Long	
Med	Exhaust Brake Status	Near	
Med	Trailer Status	Long	

VW

DATA FORM

PRIORITY	DATA ELEMENT	WHEN POSSIBLE	PURPOSE
L	Active suspension measurements	L	RECONSTRUCTION
	Advanced systems	NOT SURE.	WHAT YOU MEAN
M	Air bag inflation time (time from start of crash to start of air bag inflation)	L	
H	Air bag status	L	STATUS BEFORE FIRE ORDER.
H	Air Bag on/off switch position	S	
M	Automatic collision notification	L	
H	Battery Voltage	N	
H	Belt status - each passenger	S	
L	Brake status - service	L	
L	Brake Status - ABS	L	
H	Collision avoidance, braking, steering, etc	L	
H	Crash pulse - longitudinal	L	
H	Crash pulse - lateral	L	
H	CSS presence indicator	L	
H	Delta-V - longitudinal	L	
H	Delta-V - lateral	L	
L	Electronic compass heading	L	
H	Engine throttle status	L	

VW

DATA FORM

PRIORITY	DATA ELEMENT	WHEN POSSIBLE	PURPOSE
H	Engine RPM	L	RECONSTRUCTION
L	Environment - ice	L	
L	Environment - wet	L	
L	Environment - temp	L	
L	Environment - lumination	L	
L	Environment - other	L	
L	Fuel level	L	
M	Lamp status	L	
L	Location - GPS data	L	
M	Number of occupants	L	
H	Principal Direction of Force	L	
H	PRNDL position'	L	
M	Roll angle	L	
H	Seat position	L	
	Stability control		
M	Steering wheel angle	L	
M	Steering wheel tilt position	L	
M	Steering wheel rate	L	
H	Time/date	L	
	Traction Control		
M	Traction coefficient (estimated from ABS computer)	L	
M	Transmission selection	L	

VW-2

VW

DATA FORM			
PRIORITY	DATA ELEMENT	WHEN POSSIBLE	PURPOSE
M	Turn signal operation	L	RECONSTRUCTION
L	Vehicle milage	L	
H	Vehicle speed	L	
H	VIN	L	
H	Wheel speeds	L	
L	Windshield wiper status	L	
M	Yaw rate	L	
H	CRUISE CONTROL	L	
H	PHONE STATUS	L	
H	BRAKE PRESSURE	L	
H	AUTO DISTANCE CONTROL	L	
H	AUTO COLL. SYSTEM	L	

DATA FORM			
PRIORITY	DATA **ELEMENT**	**WHEN POSSIBLE**	**PURPOSE**
Low	Active suspension measurements		
Low	Advanced systems		
	Air bag inflation time (time from start of crash to start of air bag inflation)		
High	Air bag status	Now	
High	Air Bag on/off switch position	Now	
Low	Automatic collision notification		
Low	Battery Voltage		
High	Belt status - each passenger	Now	
Low	Brake status - service		
Low	Brake status - ABS		
Low	Collision avoidance, braking, steering, etc		
Low	Crash pulse - longitudinal		
Low	Crash pulse - lateral		
Low	CSS presence indicator		
Low	Delta-V - longitudinal		
Low	Delta-V - lateral		
Low	Electronic compass heading		
Low	Engine throttle status		

DATA FORM			
PRIORITY	DATA ELEMENT	WHEN POSSIBLE	PURPOSE
LOW	Engine RPM		
Low	Environment - ice		
Low	Environment - wet		
Low	Environment - temp		
Low	Environment - lumination		
Low	Environment - other		
Low	Fuel level		
Low	Lamp status		
High	Location - GPS data	Now	
High	Number of occupants	Now	
Low	Principal Direction of Force		
Low	PRNDL position		
Low	Roll angle		
Low	Seat position		
Low	Stability control		
Low	Steering wheel angle		
Low	Steering wheel tilt posit ion		
	Steering wheel rate		
High	Time/date	Now	
Low	Traction Control		
Low	Traction coefficient (estimated from *ABS* computer)		
Low	Transmission selection		

DATA FORM

PRIORITY	DATA ELEMENT	WHEN POSSIBLE	PURPOSE
Low	Turn signal operation		
Low	Vehicle milage		
High	Vehicle speed	Now	
Low	VIN		
Low	Wheel speeds		
Low	Windshield wiper status		
Low	Yaw rate		

All data elements indicated can be determined now via after-market.

Tom Kowalich

EVENT DATA RECORDER WORKING GROUP
PRIVACY CONCERNS FOR THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

What is the Privacy Act?

The Privacy Act of 1974, 5 U.S.C. §552a (the "Act"), provides that no agency shall disclose any record which is contained in a system of records by any means of communication to any person, or to another agency, except pursuant to a written request by, or with the prior written consent of, the individual to whom the record pertains, unless disclosure of the record would be pursuant to one of the exceptions outlined in section (b) of the Act.

Purpose

The purpose of the Privacy Act is to balance the government's need to maintain information about individuals with the right of individuals to be protected against unwarranted invasions of their privacy stemming from federal agencies' collection, maintenance, use, and disclosure of personal information about them. The Act focuses on four basic policy objectives:

1. To restrict disclosure of personally identifiable records maintained by agencies.

2. To grant individuals increased rights of access to agency records maintained on themselves.

3. To grant individuals the right to seek amendment of agency records maintained on themselves upon a showing that the records are not accurate, relevant, timely or complete.

4. To establish a code of "fair information practices" which requires agencies to comply with statutory norms for collection, maintenance, and dissemination of records.

Other Statutory Authority

NHTSA is authorized by Congress (15 U.S.C. §1395, 1401 and 23 U.S.C. 5403) to collect statistical data on motor vehicle traffic crashes to aid in the development, implementation and evaluation of motor vehicle and highway safety countermeasures. This also prohibits the disclosure of personal information that the agency would received as a result of crash investigations.

Exemption 6 of the Freedom of Information Act, 5 U.S.C. §552(b)(6) prohibits disclosure of personal information received by the agency that, if disclosed, would constitute a clearly unwarranted invasion of personal privacy.

HOW NHTSA HANDLES OTHER CRASH INVESTIGATIONS AND RELEASE OF INFORMATION

Some programs operated by NHTSA currently collect and analyze data from crash investigations. Some of these programs are discussed below.

National Automotive Sampling System (NASS)

The National Automotive Sampling System (NASS) is the mechanism through which NHTSA collects nationally representative data on motor vehicle traffic crashes. NASS has two major operating components: (1) The General Estimate System (GES) which collects data on a sample of police traffic crash reports; and (2) the Crashworthiness Data System (CDS) which collects additional detailed information on a sample of police reported traffic crashes.

Regardless of the mode of data collection, the agencies and individuals are assured by NASS researcher that any information obtained that identifies the individual will be held confidential. This requirement serves to ensure the public trust in the program and enhance the researcher's ability to solicit the required information.

The information solicited through the NHTSA's NASS data collection programs: (1) is not retrievable by an individual's name or other personal identifier; (2) is disseminated in conformance with the Freedom of Information Act; (3) has personal identifiers deleted from releasable files; and (4) is maintained in secured storage to guard against tampering and unauthorized release.

The NASS files are not a system of records that are subject to the Privacy Act. No names of individuals are entered into automated or hard copy case files. Reports of NASS crash data collections are made available to the public in a manner which does not identify individuals. Thus, cases are not retrievable by any unique number, symbol, or other identifying variable assigned to the individual. The safeguards for privacy which are afforded by the NASS files are greater than those afforded by the Privacy Act because the personal information which the Privacy Act is designed to protect is deleted from all NASS files.

Special Crash Investigations

Special Crash Investigations (SCI) are conducted by NHTSA on crashes that are of special interest to NHTSA such as fatal and seriously injured children and adults in minor or moderately severe crashes involving an air bag. Reports are generated from these investigations and are made available to the public.

The SCIs records are not a system of records that are subject to the Privacy Act. No names of individuals or other personal identifiable information are contained in the SCI reports release to the public.

Fatality Analysis Reporting System

Fatality Analysis Reporting System (FARS) contains data on all fatal crashes within the fifty states, the District of Columbia, and Puerto Rico. The data is collected from a variety of sources, including police accident reports. The police accident reports, and other materials pertaining to these crashes are translated into coded data elements that characterize the crash, the vehicles and the people involved. No personal identifier information is released.

Ownership of the Data from the Event Data Recorder

It is the National Highway Traffic Safety Administration's (NHTSA) position that the owner of the subject vehicle owns the data from the Event Data Recorder (EDR). In order to gain access to the data the government would have to receive a release for the data from the owner of the vehicle. In other crash investigation conducted by NHTSA, the agency assures the owner that all personal identifiable information will be held confidential because the Privacy Act and other statutory authority limits disclosure of personal information.

Some type of personal information that may be retrievable from an EDR would be name, address, age of occupant(s), location of accident (to the extent that the location of the accident would lead to personal identifiable information) and vehicle identification number. Basically, any information derived from the EDR that would lead to personal identifiable information can not be disclosed pursuant to the Act.

Conclusion

Following the same procedures that NHTSA implements with respect to operating the NASS, SCI and FARS programs, NHTSA would require a release from the owner of the vehicle in order to gain access to the data from an EDR. NHTSA would assure the owner of the vehicle that all personal information would be withheld from disclosure.

Sharon Y. Vaughn
NHTSA/OCC

EVENT DATA RECORDER TASK FORCE
Potential Legal Issues for Federal Highway Administration

A Task Force was formed through the sponsorship of NHTSA and met on October 2, 1998 to address research requirements for on-vehicle event data recorders. Participants included representatives from NHTSA, FHWA, NTSB, TRB, the major American automobile, truck, and bus manufacturers, and several other vehicle manufacturers.

Issues regarding liability and privacy were recognized by the Task Force members. The meeting included a discussion of privacy issues by a representative of NHTSA's Chief Counsel office. This paper was prepared to identify some of the potential legal issues from the perspective of FHWA Research and Development.

Task Force Objective

The objective offered by NHTSA for the Task Force was to facilitate the collection and utilization of collision avoidance and crash worthiness data from on-vehicle event data recorders (EDR). The scope was limited to research rather than regulatory initiatives.

Background

The history of EDR's began with research efforts during the 1970's, when relatively limited on-vehicle analog signal processing and storage devices were used by NHTSA to process and store crash data for about 1,000 vehicles in a research project. Data for approximately 23 crashes was obtained and used for research.

More recently, the Intelligent Vehicle Initiative (IVI) effort sponsored by the US DOT has developed a prototype Automated Collision Notification (ACN) system that , among other uses, will capture crash data for vehicles so equipped.

The NTSB has recommended that NHTSA:

> "Develop and implement, in conjunction with the domestic and international manufactures, a plan to gather better information on crash pulses and other crash parameters in actual crashes, utilizing current or augmented sensing and recording devices. (H-97- 18)"

Vehicle manufacturers have shown interest in developing and deploying proprietary EDR's in conjunction with air bags, since the data collected can be useful in understanding the circumstances of a crash. A representative system is the system developed and deployed for fleet use by General Motors, which retains vehicle speed, engine speed, brake switch status, throttle opening, and acceleration, on a continuous basis for the last five seconds, with the data recording ended when the air bag deploys. This data has been extracted by GM for several crashes in its fleet, with the full permission of the vehicle fleet owners. The other major automobile

manufacturers have similar, though somewhat more limited and mutually incompatible, systems either deployed or else under consideration for deployment.

Uses and Benefits of EDR Data

Representatives of agencies with responsibilities for collecting and analyzing vehicle crash data are firmly convinced that the use of EDR data can significantly enhance accident research. The data could potentially improve the determination of the time and location of accidents and provide objective data on the vehicle's physical state and the operation of its safety systems immediately prior to a major accident. The accident research community has been severely hampered by the inaccuracies of even the most reliable national accident databases, which must still rely on relatively inconsistent and unreliable information recorded by local authorities at the accident scene. The introduction of consistent, reliable, and pertinent data from EDR's can significantly improve national accident research efforts.

Manufacturers are similarly interested in the use of EDR data because the data will significantly assist them in analyzing accidents involving their vehicles and in designing more effective safety systems of all kinds. They also believe that the availability of EDR data will assist in defending them against unwarranted claims by motorists that the vehicle malfunctioned and so contributed to the accident.

Public agencies that are responsible for constructing and maintaining the highway system may also have important needs to access EDR data. Current directions in research, particularly through the IVI, suggest that roadway infrastructure improvements will be needed to complement the in-vehicle technologies that are being developed for vehicles. These improvements may, for example, include the provision of special roadway markings, new "sensor-friendly" tags to identify roadway features for collision avoidance systems, and new communication systems to convey warning and advisory messages to motorists electronically. The public authorities, like the vehicle manufacturers, must expect to be challenged by motorists claiming that the infrastructure improvements did not operate properly and hence contributed to the accident.

Development Strategy

The government agencies are accordingly interested in assisting the vehicle manufacturers in developing consistent and comprehensive EDR's that will serve the research needs. The manufacturers are similarly interested in supporting research, among other uses, but are concerned about the technological feasibility of capturing all pertinent safety-related data on a real-time basis in the vehicle, the cost implications, the consumer acceptance of vehicles with EDR's, and the legal issues. Some of the manufacturers may actually prefer for the federal government to require basic EDR's from all manufacturers so that others cannot obtain competitive advantages and to minimize their legal exposure.

Utilization of the EDR's will also require substantial efforts to involve state and local government agencies, who would likely be needed to extract the data from EDR devices at crash

scenes, similar to their traditional role in documenting accidents.

Lega1Issues

The potential introduction of EDR's raises several legal issues that must be addressed before the EDR's can effectively be deployed. These issues will include:

- determination of ownership of the EDR's and data
- reliability and usability requirements
- access to the data by public authorities
- uses of the data
- protection of privacy for motorists
- need for federal regulation

Ownership of the EDR and Data

The most fundamental issue relates to the ownership of the EDR and its data. Vehicles are sold to consumers without any vestigial interests retained by the manufacturers. If the EDR is treated in this way, however, the vehicle owner would presumably own the data as well. This could hamper or stymie the ability of public authorities to access the data by requiring permission from the owner. In addition to the obvious practical difficulties of obtaining permission at the accident scene, the owner would also presumably retain the ability to withhold the data if he felt this would serve his self interest.

A further level of complexity occurs when a supplier, rather than the motor vehicle manufacturer, retains ownership of the data. In Europe, for example, the suppliers essentially control access to the data by utilizing proprietary protocols that essentially prevent anyone else from accessing the data, though they do report on the results of the data extraction.

The problems related to ownership might be resolved by some sort of retention of ownership by the manufacturer, by a contractual retention of rights to access the data (perhaps similar to an easement in real property), by a provision in state motor vehicle licensing laws, or by some other federal regulation that permits public authorities to access the data regardless of ownership.

Reliability and Usability Requirements

Manufacturers are typically responsible for providing products that perform their intended functions and do so safely. The increasing use of sophisticated technology, often information-based and dependent upon complex computer processing systems, is increasing the burden and associated risks of failure and consequent liability. The issue for EDR's relates to the level of

reliability and performance that must be achieved.

Representatives of the vehicle manufacturers have stressed the technical challenges and consequent cost implications associated with obtaining and recording real-time data from the vehicle into the EDR. These challenges will likely constrain their capability to record the data that would desirably be captured to support accident analyses. The EDR's cannot necessarily be expected to operate flawlessly and continuously given the technical and cost constraints and practical issues such as the possibility of damage to the EDR in the accident, unavailability of electrical power after the accident, and the likely degree of inattention of motorists to the EDR over the life of the vehicle, among other factors.

These issues suggest that a strict standard of reliability may not be possible or practical for EDR's. But motorists' expectations are still likely to be quite high, given the potential utility of the EDR data to corroborate the circumstances of accidents. This issue is particularly dependent upon the actual designs adopted for the EDR's. However, the legal issue that might be considered is whether a government standard could be established to consider the expectations of motorists, the responsibilities of the vehicle manufacturers, and the desirability of providing a firm basis of reliability and use to avoid unnecessary legal challenges. The governmental interest will likely be well served even though only a relatively small proportion of accidents can provide reliable and complete EDR data. Perhaps the provision of a standard could allow the manufacturers sufficient latitude to provide cost-effective solutions without undue risks. Motorists' expectations would still have to be realistically set, through the use of "owners manuals", and other means, but at least all parties could have the same standard in mind.

Access to the Data by Public Authorities

The issues regarding ownership of the EDR and its data must first be established before the means of sharing access to the data can realistically be determined. However, the likely major use of the EDR will be by public authorities who routinely investigate major accidents. Public agencies such as the police are likely chartered by state statute to gather data concerning motor vehicle accidents and to disseminate this data to the courts, to state and national accident files, or to other public uses of the data. If these public authorities were given the means to extract data electronically from the EDR, their productivity and effectiveness would be greatly enhanced.

The legal issues here would seem to revolve around the definition of public authorities, their authority to access the data at the accident scene or at a later time, their flexibility to decide whether or not to extract the data (given time constraints, availability of equipment or training, difficulty, or risks of harm), and their own liabilities associated with others' expectations for their performance of this function. As noted above, the public purpose of collecting accident data would likely be well served even if EDR data was missed for many accidents, so the standards of performance should not be set unduly high for these agencies.

Uses of the Data

The preceding discussion presumes that the public authorities access the data for the purposes of collecting important data needed to support accident analyses. But public authorities are also likely to want to collect such data for purposes of enforcement. The discussion will distinguish situations where accidents have occurred from other situations.

The primary situation where public authorities can be expected to access EDR data is immediately after an accident has occurred, or within some reasonable time thereafter. This use of the EDR data is very similar to their current process, only much more reliable and effective. In essence, they are simply using electronic means to collect data that they could estimate though other means in their investigation, or theoretically have recorded themselves had they been present when the accident occurred. This data would presumably be available to the public agencies for use in enforcement or any other legal use.

Another situation where public authorities could potentially access EDR data is when an accident has not occurred, but they have some reason to question whether a motorist has violated a motor vehicle, or possibly even another, law. In this case, the public agency could potentially extract data such as vehicle speed or location from the EDR to support their investigation. While the expected performance characteristics of the early EDR's are not likely to provide much help for these uses, their capabilities might increase substantially as the technology continues to evolve. Also, motorists themselves might install devices similar to the EDR's discussed here, which might provide data that would be considerably more useful for enforcement purposes. For example, a device is currently available on the after market that retains the speed and location when a preset threshold of speed is exceeded. The legal issues here would appear to concern whether EDR's can or should be used for enforcement purposes if an accident has not occurred.

Protection of Privacy for Motorists

The availability of comprehensive, reliable, and objective data from the EDR may be beneficial or detrimental to motorists who are involved in an accident. Motorists will retain the capability to control access to this data other than for access by public authorities. Presuming that public agencies will be empowered to collect this data, motorists will also be exposed to risks of disclosure of this data by the government and potential invasion of their privacy.

The legal issue is whether the availability of EDR data to government agencies will adversely affect motorists' privacy. Given that the data is mainly more accurate and reliable than data that is currently maintained, the risk would seem to be minimal.

Need for Federal Regulation

Federal agencies have identified the need to develop and deploy EDR's to support the public purposes of performing more effective accident analyses.

The legal issue is whether federal regulations will be needed to support deployment of EDR's.

As noted in the above discussions, many questions and issues have been identified regarding the development and deployment of EDR's. Many of these must be discussed and further developed before the potential role of federal regulations can realistically be considered.

Bob **Ferlis**
HSR-10
10/15/98

FAX COVER SHEET

CLICK INC.
560 East Massachusetts Avenue
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28387
910-692-5209
Fax: 910-695-1566
e-mad kowalick@pinehurst.net

SEND TO	
Company name: NHTSA	From: Tom Kowalick
Attention: John Hinch	Date: 12/14/98
Office location:	Office location:
Fax number: 202 366 5930	Phone number:

☐ Urgent ☐ Reply ASAP ☐ Please comment ☒ Please review ☒ For your information

Total pages, including cover: 3

COMMENTS

DEAR JOHN,

AS PER ASSIGNMENT FROM THE 10/2/98 EDR MEETING I PREPARED A POSITION PAPER ENTITLED "INFORMATION PRIVACY PRINCIPLES FOR EVENT DATA RECORDER TECHNOLOGIES"

THIS PAPER WAS REVIEWED BY

1) JAYA PADMANABAN
2) GREG SHAW

GREG SHAW MADE EDITS. I ALSO SPOKE WITH JOHN CARNEY WHO WAS UNABLE TO GET INVOLVED DUE TO INTERNATIONAL TRAVEL.

P.S. I AM FORWARDING HARD COPIES TO YOUR MAILING ADDRESS.

CHEERS, TOM KOWALICK

Information Privacy Principles for Event Data Recorder (EDR's) Technologies

By Thomas Michael Kowalick
December 12, 1998

Information is defined as pre-crash, crash and post crash data elements derived from a vehicle in motion.

Privacy assures individual protection regarding access to and use of personal information in pre-crash, crash and post-crash scenarios derived from a vehicle in motion.

Event Data Recorders (EDR's) are defined as devices capable of gathering, storing, and displaying data elements from a vehicle in motion as per pre-crash, crash and post-crash.

Event Data Elements include but are not limited to active suspension measurements, advanced systems, air bag inflation time, air bag status, airbag on/off switch position, automatic collision notification, battery voltage, belt status of each passenger, brake status-service, brake status-ABS, collision avoidance, braking, steering, etc., crash pulse-longitudinal, crash pulse-lateral, CSS presence indicator, Delta-V-longitudinal, Delta-V-lateral, electronic compass heading, engine throttle status, engine RPM, environment as ice, wet, temperature, lamination & other, fuel level, lamp status, location via GPS data, number of occupants, principle direction of force, PRNDL 'position, roll angle, seat position, stability control, steering wheel angle, steering wheel tilt position, steering wheel rate, time and date, traction control, traction coefficient estimated from ABS computer, transmission selection, turn signal operation, vehicle mileage, vehicle speed, VIN, wheel speeds, windshield wiper status, yaw rate, turn-key start time, vehicle movement time, location at start, velocity at crash, trip time at collision or crash, fire in cabin, smoke in cabin, blood in cabin, broken glass in cabin, water in cabin, audio-clip at air bag deployment, etc.

The objective of this paper is to propose fair information principles in recognition of protecting individual privacy while implementing Event Data Recorder (EDR) Technologies.

These principles are advisory, intended to educate and stimulate the NHTSA EDR Working Group in developing fair information and privacy guidelines for future EDR technologies. They are not intended to supersede existing statutes of regulations

Individual motorists or others within motor vehicles have an explicit right to privacy. Although this right to privacy is not explicitly granted in the Constitution, it has been recognized that individual privacy is a basic prerequisite for the functioning of a democratic society. Indeed an individual's sense of freedom and identity depends a great deal on governmental respect for privacy. Therefore all efforts

associated with introducing future EDR technologies must recognize and respect the individuals interests in privacy and information use.

Thus, it is imperative to respect the individual's expectation of privacy and the opportunity to express choice. This requires disclosure and the opportunity for individuals to express choice, especially in regards to after-market products. OEM EDR technology limits an individual's expression of both privacy and choice. After-market value added EDR products permit free market competition and sense of ownership. Several stand-atone after market technologies can easily be combined to produce an after-market EDR virtually independent of the vehicle architecture thereby readily permitting a common standard for retrofitting to a vehicle fleet.

Who owns the data?

Since individuals will operate and occupy vehicles equipped with EDR's that record data elements, subsequently it follows that information is created regarding both individuals and vehicles. Individuals should have the means of discovering how the data flows. A visible means of the type of data collected, how it is collected, what its uses are, and how it will be distributed is basic to consumer acceptance. Consumers should also have a choice in making this data available for post-crash analysis. Numerous studies cite the number one central concern of the public as understanding the reason they are being subjected to technology up-front, candidly and directly. Responsibility for disclosure should be high priority and may be achieved through numerous methodologies via print-material formats, etc. Disclosure must be constant and consistent. Any data collected via EDR technologies should comply with state and federal laws governing privacy and information use. All data collected and stored should make use of data security technology and audit procedures appropriate to the sensitivity of the information. EDR technology data storage should include protocols that call for the purging of individual identifier information respectful of the individual's interest in privacy. Information collected should be relevant to the purpose and mission statement associated with the EDR disclosure statement. Consumers should have the reasonable assumption that they will not be ambushed by information they are providing. Information derived from EDR technologies absent personal identifiers may be used for other purposes clearly stated in the disclosure statement. Information including personal identifiers may be permissible if individuals receive effective disclosure and have a friendly means of opting out. Personal information should only be provided to organizations that agree to abide by the privacy principles stipulated in the disclosure statement. Should EDR technologies be maintained in a government database Federal and State Freedom of Information Act (FOIA) obligations require disclosure. Such databases should balance the individual's interest in privacy and the public's right to know.

Applicable Standards lor Archived Data

Permanent or temporary storage of data should preclude the possibility of identifying or tracking either individual citizens or private firms and should follow the principles suggested to

the EDR Working Group. As recommended by the ITS Archived Data User Service addendum to the ITS Program Plan (dated 18 September, 1998) archived data should be standardized to at least a minimum level by following all existing data standards. When unprocessed data (i.e. data received directly from collection sources) are archived, privacy principles should be strictly followed. Identifiers of individual citizens or private firms should be stripped from all data before archiving unless full disclosure of the intended use is made and informed consent is obtained. Data standards include, but are not limited to:

American National Standards Institute (ANSI) 16
ANSI 20
Model Medical Services (EMS) Standards
National Crime Information Center (NCIC) 2000
National Incident-Based Reporting System (NIBRS) and State Standards
National Law Enforcement Telecommunications System (NLETS)
Highway Performance Monitoring System (HPMS)
Traffic Monitoring Guide (TMG)
American Association of State Highway and Transportation Officials' (AASHTO) Guide for Traffic Data Programs
Institute of Electrical and Electronics Engineers (IEEE) Standard for Data Dictionaries for ITS (P1489)
Institute of Transportation Engineers Traffic Management Data Dictionary
National Transportation Communications for ITS Protocol (NTCIP)
Transit Communications for ITS Protocol (TCIP)
Applicable electronic data interchange standards (e.g. ANSI's ASCX.

In summary, the principles cited above are privacy, integrity of the data, quality of the data, minimization of data storage and usage, accountability, visibility to the consumer, anonymity of personal indicators, data design incorporating encryption security and overall consumer acceptance of new technology. These principles are common throughout the transportation industry and not necessarily new or novel to the technology being evaluated by the NTHSA EDR Working Group.

For additional data see:
Background Information about Crash Data (http://www.nhtsa.gov/people/ncsa/codes/Mindata/Background.html)

For additional studies see the following at (http://www.wws.princeton.edu/~ota/disk1)

Automobile Collision Data: An Assessment of Needs and Methods of Acquisition, Office of Technology Assessment, *1975.*
Electronic Record Systems and Individual Privacy, Office of Technology Assessment, 1986.
Electronic Surveillance in a Digital Age, Office of Technology Assessment, I 995.
Wireless Technologies and the National Information Infrastructure, Office of Technology Assessment, 1995.
Advanced Automotive Technology, Office of Technology Assessment, 1995.

GM Response

Summary data

⇒ Does not include VIN, accident names, location, or other data to tie data to a specific accident

⇒ Data made available to organizations with a reasonable need for it (e.g., use it for studies aimed at improving safety of the public at large, auto industry, GM. In response GM requires requesting group to provide:

- 0 copy of analysis done which includes the data
- 0 that the data is proprietary and not to be disseminated to 3rd parties
- 0 recognition of GM's contribution in any published report

⇒ To merge this data with other recognized databases (FARS, NASS) some additional accident data may be required. IF GM does cooperate with these requests, arrangements must be confirmed in writing.

Accident-specific data

Considered GM confidential and not distributed outside GM except where good reason is shown. Examples

⇒ Request of state/federal authorities with accident investigation responsibilities. Requests must be made in writing, on official stationary describing the official nature of the request

⇒ Request by vehicle owner. All inquiries may be not satisfied due to time and effort to reasonably respond and must show a demonstrated need for such data.

⇒ Request by owner's insurance company, the media, or other interested parties will be denied unless approved by the vehicle owner.

⇒ GM's response should generally be sent in writing accompanied by a letter on official stationary which contains the VIN.

GM Response

Further Privacy Considerations

- The data recorded such as seat belt use information is no different than the "monitoring" function already routinely performed from the car such as stretch in the seat belt webbing. The belt status recorded makes this information more readily available and easily retrievable. This also applies to brake status (tire tracks on road), vehicle speed (estimated by witnesses and accident reconstructionists), and other parameters.

- The recording of this data is not unlike other monitoring done today such as:

  ⇒ ATMs now routinely photograph all transactions.
  ⇒ Cameras used in retail stores located in the store's ceiling.
  ⇒ Exit detectors routinely located in, for example, book stores and libraries.
  ⇒ Providing a driver's license when cashing checks or showing a credit card when checking into hotels.

The public accepts these forms of oversight without concern because the public understands their value.

- Most automobile trips are uneventful, and most ATM transactions are accurate. Yet the photographic records gain information in the rare event of a problem. The public readily accepts this.

- Vehicle owners must understand the "monitoring" function and benefits it offers via open communications through owner's manuals and other media.

- Recording this data will be accepted when the "monitored" data is used to improve the product or improve the general cause of public safety.

EDR **Validation**

February 17, 1999

People Saving People
Http://www.nhtsa.dot.gov

John Hinch
Research & Development
National Highway Traffic Safety Administration

Method

- Selected GM vehicles tested in NHTSA test programs
- Sent EDR's to GM for downloading
- Using NHTSA crash files, obtained crash longitudinal acceleration
- Compared results

Selected Vehicles

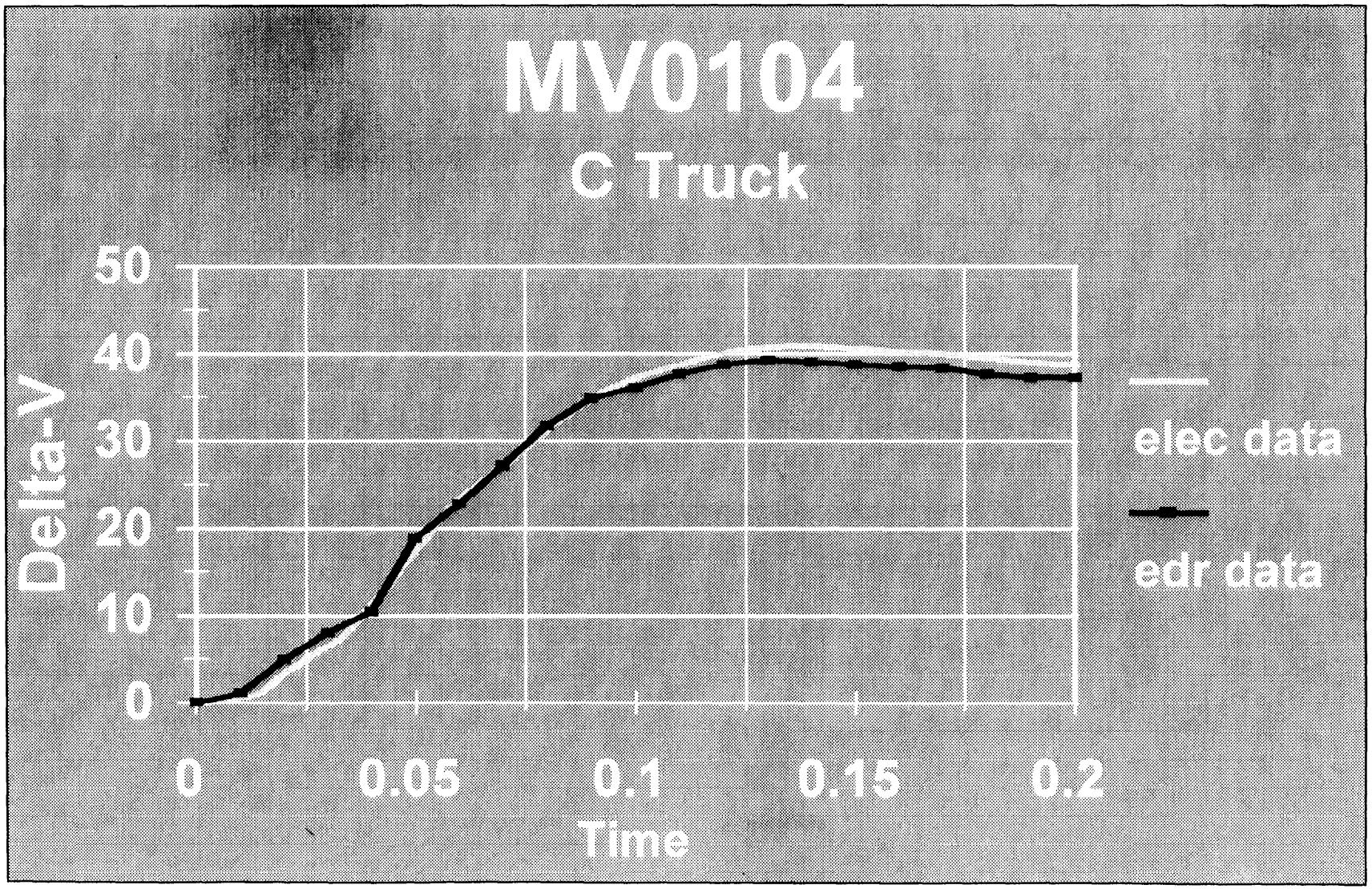
- model year
- **21 vehicles**
  - **15 cars**
  - **2 vans**
  - **2 suvs**
  - **2 pickups**

Test Types

People Saving People
http://www.nhtsa.dot.gov

- 3 - 208 Sled tests
- 13 - Frontal NCAP tests
- 5 - Side NCAP tests

Typical **Comparison**



Completed to Date

NHTSA
People Saving People
http://www.nhtsa.dot.gov

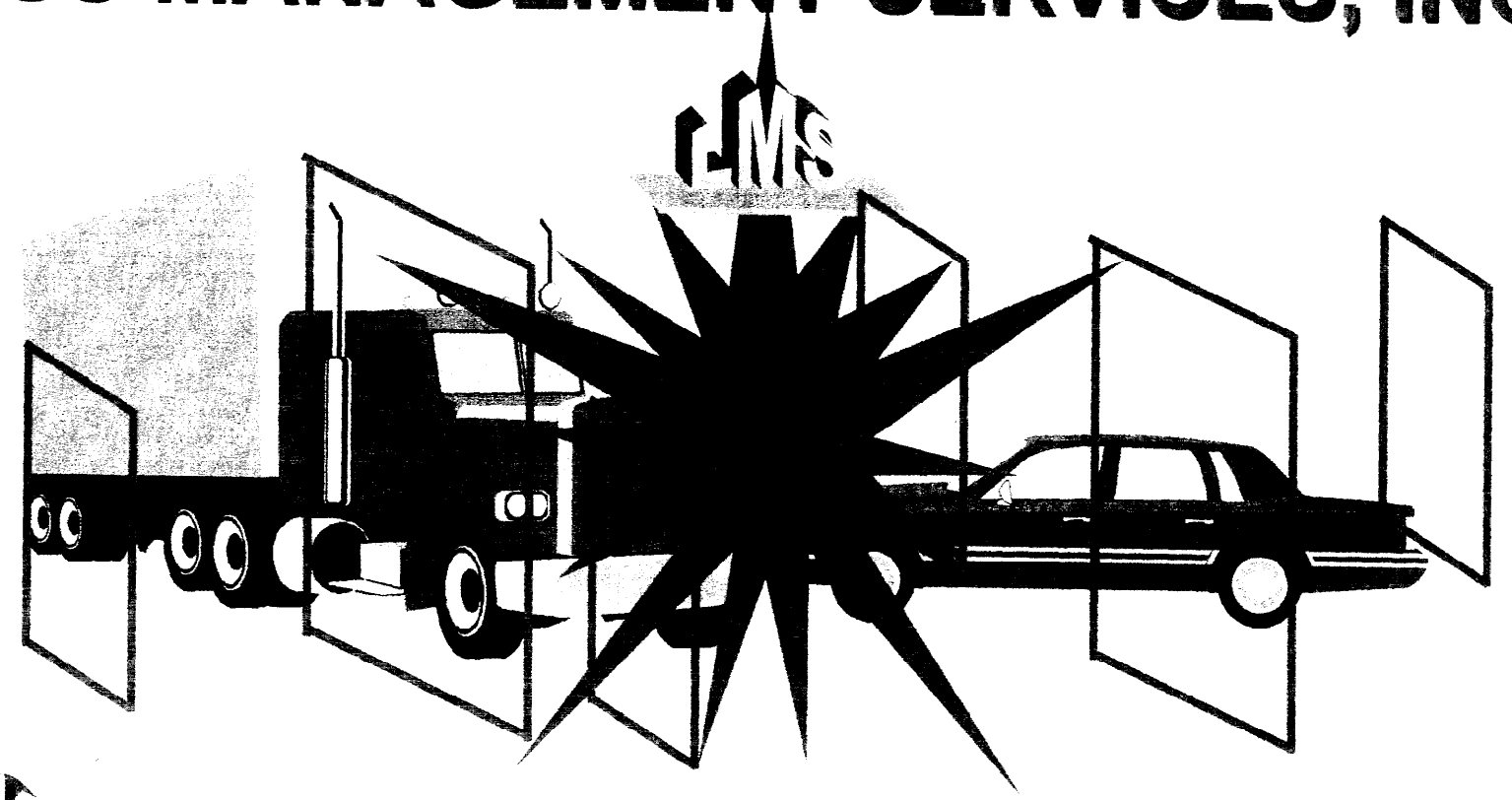
- Most of the tests have been reviewed
- Generally, the EDR data appears to be slightly lower than the electronic data (needs final verification)
- Some vehicles have incomplete or missing data

Analysis to be Completed

- **Complete comparisons**
- **Determine EDR validation metric**
- **Document in report for the NTSB Data Recorder Symposium in May 1999**
- **Present at next EDR WG meeting**

The Future is Now...

LOSS MANAGEMENT SERVICES, INC.



Loss Management Services, Inc.
36 Surf Road, Lindenhurst, New York 11757

Introduction

- For over three years, LMS has been involved in field investigation, adjusting and managing transportation insurance claims.
- LMS is dedicated in developing cost effective ways to service the insurance claims industry's investigation and litigation procedures through 21st century technology.
- By combining high-tech sensors and digital imaging, LMS could solve the most vexing question today involving automobile accidents....

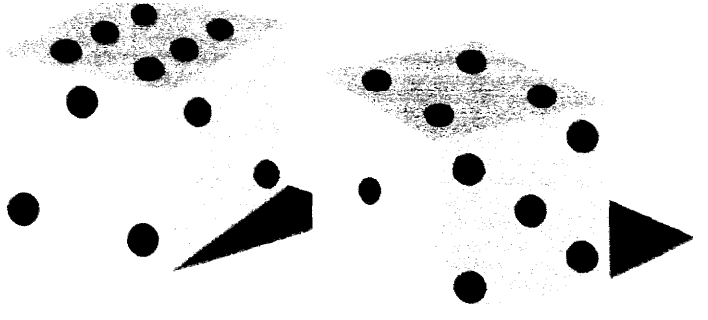
Who is at fault?

Management Services, Inc.
36 Surf Road, Lindenhurst, New York 11757

Introduction

Costs involved in discovering what happens before an accident involving bodily injury usually involve very extensive and expensive research. And, if there is no guarantee of who will be found at fault!!

Sometimes, it a roll of the dice!



Loss Management Services, Inc.
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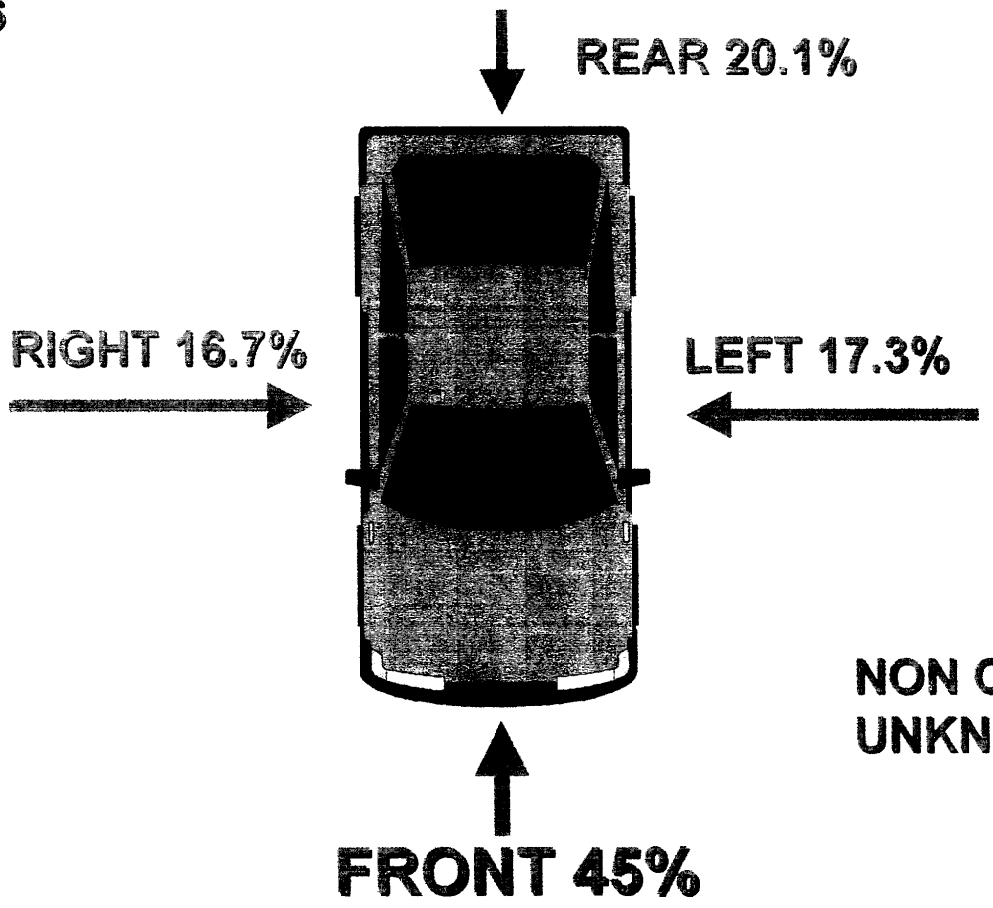
Accident Statistics

Collision point of contact percentages



NON COLLISION + UNKNOWN 0.9%

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Statistics

Total Economic loss associated with automobile accidents in the U.S. ...

$153.2 Billion

Source: NHTSA Survey 1996

Loss Management Services, Inc.
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Statistics

60% Allocated Claim Payments Total

$91,980 Billion

12% Legal Expenses

$18,040 Billion

Actual settlement pay-out for claimant not included

Loss Management Services, Inc.
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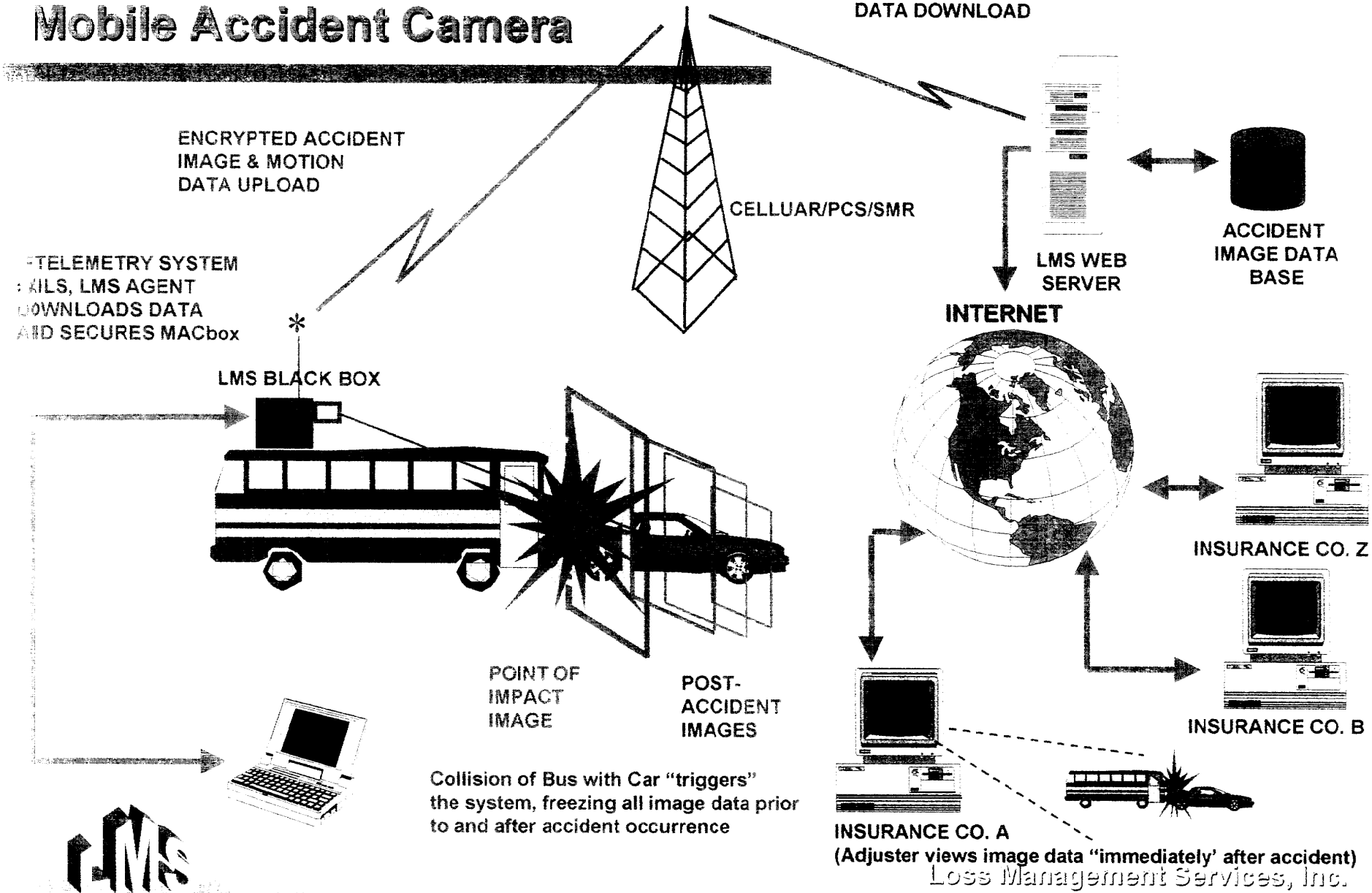
Solution

The Mobile Accident Camera, "MACbox™" will:.

- Secure a "driver's eye view" of *valuable* digital imagery.
- Provide a repository of information for customers, insurance carriers, government agencies, and auto manufactures
- Provide telemetry data.
- Better control and manage claim expenses and pay outs.

Loss Management Services, Inc.
36 Surf Road, Lindenhurst, New York 11757

MACbox™
Mobile Accident Camera



Loss Management Services, Inc.

36 Surf Road, Lindenhurst, New York 11757

Benefits

- Accurate Assessment of Liability
- Reduce the Cost of Litigation
- Reduce the Need for Expert Witnesses
- Reduce Costs Associated with Claims Investigations
- Assist with Accurate Claim Reserving
- Deter "ROAD RAGE"
- "G-Force" Comparison to the Extent of the Injury

LMS

Loss Management Services, Inc.

36 Surf Road, Lindenhurst, New York 11757

Applications

- Municipal Transportation Environment (Buses - Emergency Vehicles)
- Long Haul / Short Haul Trucking
- Taxi / Livery Services
- Commercial Passenger Transportation Fleets

Loss Management Services, Inc.
36 Surf Road, Lindenhurst, New York 11757

National Interest

- National Highway Transportation Safety Administration (NHTSA) is seeking a crash recording device for possible regulation within the transportation industry.

- The National Transportation Safety Board (NTSB) has made a similar plea and are pushing for ***immediate*** consideration for a "Black Box" in the busing environment.

Loss Management Services, Inc.
36 Surf Road, Lindenhurst, New York 11757

Business Partners

Phoenix Group Inc. (PGI), Hauppauge, NY, is a designer and manufacturer of ADVANCED RUGGED MOBILE COMPUTERS for industrial and government field applications.

PGI has designed a roster of impressive portables that feature innovative use of today's technology components. PGI products are presently are used by by industrial and military customers.

Instrumented Sensor Technology (IST), a world leader in portable PC-programmable, high speed data recorders, supplies recording systems and data analysis software for numerous applications including transportation monitoring, flight testing, crash recording, industrial package testing and accident reconstruction.

Business Affiliates

By having the PGI and IST manufacturing partnerships, LMS possesses the development and manufacturing capability that can deliver a system that addresses the needs of the insurance related risks.

Future Applications

- "Trucker's Log" Book
- Impact Generated "911" Signal
- Digital Monitoring of Retail Stores, Commercial Buildings and Homes (Security)
- Not Unlike the Air Bag and Seat Belt, if Regulated, the MACbox™ can be Utilized in Private Passenger Vehicles
- Trains and Airplane MACboxes™
- Elevators

Loss Management Services, Inc.
36 Surf Road, Lindenhurst, New York 11757

EDR MEETING # 2; February 17, 1999; Washington DC		
NAME	COMPANY	PHONE
VERNON ROBERTS	NTSB	[redacted]
Joseph Kappianthra	NHTSA R&D	[redacted]
Lori Summers	NHTSA R&D	[redacted]
ALAN GERMAN	TRANSPORT CANADA	[redacted]
RONALD VALLETTE	NAVISTAR	[redacted]
Charlie Gauthier	NASDPTS	[redacted]
Wilbur Rumph	Blue Bird Corp	[redacted]
KEN OPIELA	TRB	[redacted]
JAMES A. WENTWORTH	FHWA	[redacted]
Martin W. Hargrave	FHWA	[redacted]
Robert Ferlis	FHWA	[redacted]
Paul V. Tremont	NHTSA - TSP	[redacted]
Chris Brogan	LMS, Inc.	[redacted]
John Mackey	LMS, Inc.	[redacted]
Gerald Stewart	NHTSA NPS-33	[redacted]
Lori Niro	Honda R&D	[redacted]
KAZUO HIGUCHI	Honda	[redacted]
David Bauch	Ford	[redacted]
Joe Marsh	Ford	[redacted]
Tom Kowalich	Click Inc	[redacted]
Sharon Vaughn	NHTSA/NCC	[redacted]
KATHY GRAVINO	DaimlerChrysler	[redacted]
BOB CAMERON	VW of America Inc.	[redacted]
Dick Humphrey	GM/OC	[redacted]
Tom Mercer	GM - Detroit	[redacted]
PAT BOYD	NHTSA	[redacted]
Chip Chidester		[redacted]
Ed Jethra	" " "	[redacted]
RICHARD PANDOLFI	PHOENIX GROUP	[redacted]

MVSRAC WORKING GROUP on EVENT DATA RECORDERS
MEMBER LIST
February 2, 1999

Name	Company	Phone	Fax	Company Address	e-mail
David Bauch	Ford	[redacted]	[redacted]	Advanced Vehicle Tech #3, 2A149 Rm 2122, Mail Drop 3010, Ford Motor Company, Dearborn, MI 48121	dbauch@ford.com
Robert Cameron	VW	[redacted]	[redacted]	Volkswagen of America, 600 Sylvan Ave, Englewood Cliffs, NJ 07632	Robert.Cameron@vw.com
John Carney	Worcester	[redacted]	[redacted]	Worcester Polytech. Institute, 100 Institute Rd, Worcester, MA 01609-2280	jfc@wpi.edu
Charlie Gauthier	NASDPTS	[redacted]	[redacted]	1604 Longfellow St, McLean, VA 22101	
Alan German	Transport Canada	[redacted]	[redacted]	Road Safety and Motor Vehicle Regulation Directorate; Transport Canada; PO Box 8880; Ottawa Postal Terminal; Ottawa , Ontario, Canada K1G 3J2	GermanA@tc.gc.ca
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Thomas Kowalick	Private	[redacted]	[redacted]	560 East Massachusetts Ave, Southern Pines, NC 28387	kowalick@pinehurst.net
Tom Mercer	GM	[redacted]	[redacted]	GM Tech Center, Mail Code 480-111-S29, 30200 Mound Road, Warren, MI 48090-9010	LNUSTC1.ZZMY5T@gmeds.com
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Ray Peck	California Dept of Motor Vehicles	[redacted]	[redacted]	Department of Motor Vehicles, R&D Branch F126, 2415 First Ave, Sacramento, CA 95818	rpeck@dmv.ca.gov
Vernon Roberts	NTSB	[redacted]	[redacted]	NTSB, HS-1, 490 L'Enfant Plaza East SW, Washington, DC 20594	robertv@ntsb.gov
Wilbur C Rumph	Blue Bird Bus	[redacted]	[redacted]	Blue Bird Body Co.; PO Box 937; Fort Valley, GA 31030	
Brian Shaklik	Navistar	[redacted]	[redacted]	Navistar Technical and Engineering Center, 2911 Meyer Rd, Fort Wayne, IN 46801	Brian.Shaklik@Navistar.com
Greg Shaw	UVA	[redacted]	[redacted]	UVA Auto Safety Lab, Charlottesville, VA	cgssw@virginia.edu
Sharon Vaughn	NHTSA-NCC	[redacted]	[redacted]	NHTSA, NCC-30, 400 7th St SW, Washington, DC 20590	sharon.vaughn@nhtsa.dot.gov