SEATBELT SAFETY: NHTSA OVERSIGHT

HEARING

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON GOVERNMENT OPERATIONS HOUSE OF REPRESENTATIVES

ONE HUNDREDTH CONGRESS

SECOND SESSION

JUNE 23, 1988

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SEATBELT SAFETY: NHTSA OVERSIGHT

THURSDAY, JUNE 23, 1988

HOUSE OF REPRESENTATIVES,
GOVERNMENT ACTIVITIES AND
TRANSPORTATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:05 a.m., in room 2203, Rayburn House Office Building, Hon. Cardiss Collins (chairwoman of the subcommittee) presiding.

Present: Representatives Cardiss Collins, Gerald D. Kleczka, and Howard C. Nielson.

Also present: John Galloway, staff director; Michael Skrak, professional staff member; Cecelia Morton, clerk; and Ken Salaets, minority professional staff, Committee on Government Operations.

OPENING STATEMENT OF CHAIRWOMAN COLLINS

Mrs. COLLINS. Good morning. This hearing of the Government Activities and Transportation Subcommittee will come to order. Although most consumers are not aware of it, all cars manufactured since 1973 are equipped with anchor points to permit the installation of rear seat shoulder belts.

Also, unknown to most consumers, shoulder belts in combination with lapbelts offer twice the protection of lapbelts alone. Annually almost 2,000 rear seat automobile passengers are killed and 200,000 are injured in this country. Many of those deaths and injuries could have been prevented through the use of rear seat lap and shoulder belts.

Federal regulations on rear seat safety are ambiguous. They do not require manufacturers to install shoulder belts. Simple lapbelts in both new and old cars are sufficient. On the other hand, fittings are required on all cars manufactured since 1973 to permit the installation of rear seat shoulder straps to supplement federally required lapbelts.

Those regulations do not, however, require manufacturers to provide nor install such shoulder straps. That, in turn, has rendered it all but impossible for consumers in many cases to purchase and have installed that life-saving feature. To further compound matters, the shoulder strap fittings are frequently placed behind the car's molding and trim which contributes to the high cost of installing rear seat shoulder straps, assuming their availability. On the brighter side, during the past year, most car companies have announced that they will voluntarily install rear seat shoulder belts in new cars.

Clearly, the superiority of shoulder straps over lap-only type belts is no longer at issue. Our hearing today has been called to consider means to encourage the greater availability of rear seat shoulder belts for cars already on the road. In particular, we will consider: (1) The failure of car companies to educate consumers on the need for rear seat shoulder belts; (2) the failure of certain car companies, such as Volkswagen and Ford, to provide rear seat shoulder straps for certain models; and (3) the refusal of new car dealers throughout the country to install back seat shoulder belts when available.

To help assess these issues we will receive testimony from the Center for Automobile Safety, the Institute for Injury Reduction and Mr. Harold Sakayan, an attorney familiar with the rear seat, lapbelt injury cases.

Following that testimony, we will hear from the Motor Vehicle Manufacturer Association and DOT's National Highway Traffic Safety Administration.

Mr. Nielson.

Mr. NIELSON. Thank you, Madam Chairwoman. Good morning. After reviewing the materials for this hearing, I am concerned that we may unintentionally be sending out the wrong message regarding seatbelt use. I have a little scar right here on my forehead which I sustained during an accident when not wearing a seatbelt. So I for one want to go on record in support of seatbelt usage. Back seat lapbelts may not be ideal and may even present problems of their own, as we will hear, but in the majority of cases, they're certainly better than nothing and are very effective in preventing a passenger from being thrown from a car during a collision.

No one can question the potential severity of injuries a person could sustain if thrown through a windshield. With that said, I welcome our witnesses and thank them for coming. I'm very interested in hearing your testimony.

Mrs. COLLINS. Thank you, Mr. Nielson. Our first panel this morning will be Mr. A. Benjamin Kelley, Mr. Larry Coben, and Mr. Harold A. Sakayan, all from the Institute for Injury Reduction and Mr. Robert Dewey who is from the Center for Automobile Safety. Why don't we begin with you, Mr. Kelley?

STATEMENT OF A. BENJAMIN KELLEY, PRESIDENT, INSTITUTE FOR INJURY REDUCTION

Mr. KELLEY. Thank you, Madame Chairwoman. I'm Albert Benjamin Kelley, president of the Institute for Injury Reduction. As you said, with me today is Larry Coben, our chairman, and Harold Sakayan, a founding member of the Institute. Mr. Coben will make an opening remark and then I will describe for you the test and research results we wish to present today to the subcommittee.

STATEMENT OF LARRY COBEN, CHAIRMAN, INSTITUTE FOR INJURY REDUCTION

Mr. COBEN. Good morning, Madam Chairman, members. I am Larry Coben. I'm a trial attorney from Philadelphia and the chairman of the Institute for Injury Reduction. I'm appearing here today at your invitation to discuss the issue of rear seatbelt sys-

tems in American automobiles, an issue which presently involves needless exposure to harm for millions of American consumers.

The Institute for Injury Reduction was organized to carry out research, investigation and public education involving the product design, performance and use which contributes needlessly to deaths and injuries. Product related injuries including those sustained in highway crashes are a wide, leading cause of death and serious injury. Unfortunately though, most consumers and most folks that ride in cars are unaware of those risks.

It is the job of the Government regulatory agencies such as the National Highway Traffic Safety Administration which you are oversighting today, to promulgate and enforce vehicle performance regulations which will assist in developing minimum basic performance standards to assure a minimum level of safety in all motor vehicles.

The institute is committed to reducing the mayhem on the highways that may be indirectly caused by product design. It is our thought that better product design can reduce injury and lessen the need for the costs imposed upon society by these injuries and deaths.

In a moment, Mr. Kelley will describe to you our work involving rear seat lap-only performance as compared to shoulder harness performance in the rear seat of automobiles. Also today we will present to you the testimony of Mr. Sakayan dealing with some very real incidents to demonstrate the effectiveness or lack of effectiveness of the safety systems provided in automobiles in America.

The immediate need to take steps to rectify a very serious safety design flaw in vehicles manufactured and sold in this country was highlighted by the report of the NTSB in 1986 which accounted for a number of lapbelt-only serious injuries and deaths in cars being used in this country.

A review of the history of automobile safety technology and regulation clearly shows that Americans are exposed to an unnecessary risk which we all take when we buckle up for safety with only lapbelts.

While it is true, as Mr. Nielson mentioned, that wearing a lapbelt is better than none at all in most occasions, and it is clearly a correct statement in the front seats of automobiles to prevent running into the windshield in a crash, the dynamics of what occurs in the rear seat of automobiles is different and the injuries that we're seeing are not a result of being ejected and not a result of striking a windshield, but are a result of people in those cars wearing lapbelts and being injured by the lapbelt system that they're wearing.

From the outset of its regulatory activity in the late sixties, NHTSA intended that its standards would require lap/shoulder belt protection for rear seat outboard occupants as well as front seat outboard occupants. This initial thought had its foundation in research that goes back to at least 1964. In some attachments that I've included with the statement today, there is a report from Dr. Horace Campbell who was associated with the Cornell Institute in which he pleaded in 1964 that manufacturers include lap and shoulder harness belt systems in all automobiles, in the front as well as the back of those vehicles.

Not surprisingly, the manufacturers have known about the value of those systems at least since the midsixties. Also attached to the material are some internal documents from some Ford engineers responsible for studying injury in crashes and their conclusion, obvious as it is to us sitting here today, is that wearing a lap and shoulder harness system provides superior protection to lap only, and it was recommended by the Ford engineers that lap and shoulder harness systems be included in all outboard positions.

In the late sixties in Europe, Governments passed regulations requiring that manufacturers install lap and shoulder harness systems in the rear as well as the front seats of automobiles. Attached to the material are regulations from the Swedish Government from 1968 dealing with that very issue. Also attached and interestingly, are the design standards of the Ford Motor Co. which manufactured and sold automobiles in Europe with lap and shoulder harness systems because the Government required those systems.

For those reasons, the institute recommends the following: That initially and immediately, a statement be made to the public dealing with the danger imposed upon the users of lap-only systems in the rear of automobiles. Second, that automobile manufacturers specifically send to their consumers warnings dealing with the risk of harm resulting from wearing lap-only systems in the rear of automobiles. Third, that manufacturers immediately notify all consumers directly that retrofit kits will be made available, and are available, and will be installed in vehicles at no cost to the consumer.

Fourth, that NHTSA immediately issue a regulation requiring retrofit kits be made readily available, and I emphasize "readily available." Fifth, that a three-point rear seatbelt system regulation be immediately imposed upon manufacturers for the rear seats of automobiles. While automobile manufacturers have said they will voluntarily install these systems, they are slow to do so. As of this year, perhaps four or five model cars out of perhaps 200 sold in the United States have rear lap and shoulder systems.

We implore the committee to make these recommendations to NHTSA to in turn make these recommendations and these regulations to the industry immediately.

Mr. COBEN. Thank you.

Mr. KLECZKA [presiding]. Thank you, Mr. Coben, for your testimony.

[The prepared statement of Mr. Coben follows:]

TESTIMONY OF LARRY E. COBEN
CHAIRMAN, INSTITUTE FOR INJURY REDUCTION
BEFORE A HEARING OF THE
GOVERNMENT ACTIVITIES AND TRANSPORTATION SUBCOMMITTEE,
HOUSE GOVERNMENT OPERATIONS COMMITTEE
INTO
'SEAT BELT SAFETY: NHTSA OVERSIGHT'
JUNE 23, 1988

Madam Chairwoman, Members:

I am Larry E. Coben, a trial attorney from Philadelphia, Pennsylvania, and the chairman of the Institute for Injury Reduction. I am appearing today at your invitation to discuss the issue of rear-seat belt systems in American automobiles -- an issue which presently involves needless exposure to harm for millions of Americans.

The Institute for Injury Reduction was formed early this year to carry out research, investigation and public education involving product design, performance and use which may contribute needlessly to deaths and injuries.

Product-related injuries, including those sustained in highway crashes, are a leading cause of death in the United States -- a fact which is not widely understood by the public. It is the job of government regulatory agencies, such as the National Highway Traffic Safety Administration, which you are oversighting today, to promulgate and enforce vehicle performance standards which will, at least, provide minimum basic protection for vehicle users, and thereby effectively reduce the high number of injuries and deaths on our highways.

IIR seeks to build an improved base of knowledge and public awareness of product failures and needed improvements in support of this safety mission. Our founders are trial attorneys who through their practices have learned the extent to which defective products, inadequate user instructions and lack of warnings hurt and kill people. They are committed to seeing the mayhem reduced. The integrity of our common law products liability system must be preserved, because it constitutes one of the few remaining individual liberties in this complex society, and allows for the fair compensation of persons injured by product design. Our common law system and the federal regulation of product safety have complemented each other when each has functioned as intended. However, we at the Institute realize that a more aggressive approach to safety can reduce this national epidemic. In reality, therefore, the IIR was created with the thought that better product design can reduce injury and lessen the need for product liability claims. IIR membership is open to everyone -- attorneys, engineers, students, and the general public -- who supports our public-health objective. Our information and research results are available to any organization or person who requests them. (Attachment "A" to my testimony is a detailed description of IIR's structure and mission.)

In a moment Mr. Kelley will describe in detail our work involving rear-seat, lap-only belt performance -- work that reflects our concern at the extent to which these belt systems, unlike properly designed lap-shoulder belt systems, present a potential for serious or fatal injury to their wearers in crashes. Since the vast majority of American cars on the roads and in the dealer showrooms today do not have rear-seat lap shoulder belts, that potential already has become a grim reality for many rear-seat occupants -- including children wearing

lap-only belts. Several tragic examples of injury and death to our children will be described by Mr. Sakayan this morning.

The initial research project undertaken by the Institute was borne out of frustration emanating from the failure of the American Automobile Industry to voluntarily design and sell their products with necessary rear seat 3 Point seat belt systems. This frustration has been compounded by the National Highway Traffic Safety Administration's refusal to promulgate regulations making 3 Point seat belt systems mandatory in the rear seats of motor vehicles sold in the United States. The immediate need to take steps to rectify a very serious safety design flaw was highlighted by the July 28, 1986 report of the National Transportation Safety Board, in which it reviewed the dilemma motorists face today because all American-made vehicles include lap belts without shoulder harnesses in the rear seats.

A review of the history of automobile safety belt technology and regulation makes clear a number of basic points that bear directly on the concern of this hearing, and which are covered in detail in Attachment "B":

-- Automotive engineers and physicians have long recognized the hazards associated with lap-belt-only systems and the superior protection afforded by lap-shoulder belt systems. As early as the mid-1960's the car companies were being put on notice of the need for lap-shoulder belt systems in all outboard seating positions, both front and rear.

-- From the outset of its regulatory activity in the late 1960's, NHTSA intended that its standards would require lap-shoulder belt protection for rear-seat outboard occupants, as well as front-seat outboard occupants.

In July, 1969, a position paper prepared by the agency stressed that even if air bags were introduced to protect front-seat occupants, "both lap and shoulder belts will be required in rear seat positions for the foreseeable future." Proposed rulemaking of the period reflected the same intention. Yet, because of manufacturer resistance, agency indifference, or a combination of the two, the final rule was never put into place. The resistance offered by the industry is difficult to understand in light of certain internal documents which prove that the manufacturers were well aware of the need for 3 Point belt systems. As Attachment "C" reveals, as early as 1967, Ford Motor Company's top engineers recommended properly designed 3 Point seat belt systems to replace lap belts.

In 1968, the National Swedish Road Safety Board announced safety belt regulations which required the installation of 3 Point belts in all positions except the middle seat position. [An example of the Ford Motor Company's compliance with this regulation, along with the regulation itself is appended as Attachment "D".]

American manufacturers have told NHTSA that in the future they will voluntarily provide standard-equipment rear lap-shoulder belts in an increasing share of their new-car production, and some already have begun to do so in a few cars. Yet the agency, despite decades of research showing the hazards of lap-only belt systems and despite the demonstrated ability of the companies to install them, still has not proceeded to set a Federal Motor Vehicle Safety Standard requiring rear-seat lap-shoulder belt systems. Its only move in that direction has been noncommittal "advance notice of proposed rulemaking" issued more than a year ago. (Attachment "E")

Until NHTSA puts a standard in place, of course, Americans will have to rely solely on the good faith of the car companies for adequate rear-seat restraint protection in crashes. If the companies decide to discontinue plans for putting rear-seat lap-shoulder belts in new cars tomorrow morning, they will be entirely free to do so -- just as General Motors and Ford discontinued their promised air bag programs in the 1970's because NHTSA had not put a "passive restraint" standard in place.

Thus the industry, not the regulatory agency, has effectively taken control of providing or denying adequate crash protection to rear-seat occupants. This defies the intent of the National Traffic and Motor Vehicle Safety Act of 1966 since in effect it turns the regulatory reins over to the manufacturer.

The only recourse available to people injured in crashes due to hazardous rear-seat lap-only belts is common-law action against the derelict manufacturer. But, here too, the manufacturers have made legal manuevers to thwart these claims on the basis that their only obligation is to meet the minimum standard set by NHTSA -- in this instance, the rear-seat lap-belt-only standard. This ignores the Act's crystal-clear injunction that compliance with a minimum standard does not protect a manufacturer from common-law action when the manufacturer could have prevented or lessened the severity of a crash injury by providing a better alternative safety system. In fact, a central purpose of the Act and the standards is to encourage manufacturers to exceed the minimums with improved technologies whenever possible. (See Attachment "F" for a full discussion of this issue.)

There is no excuse for NHTSA's continued failure to set a Federal Motor Vehicle Safety Standard requiring that at a minimum, rear-seat outboard occupants of future new cars be given lap-shoulder belt systems to protect them in crashes. Anything less makes a mockery of the Act's intentions and NHTSA's mission.

The NHTSA should issue regulations regarding the manufacture and sale of retrofit 3 Point rear seat belt systems, and the installation of factory-built, 3 Point belt systems in all new vehicles.

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Attachment A

3/20/88

QUESTIONS AND ANSWERS ABOUT
THE INSTITUTE FOR INJURY REDUCTION

The Institute for Injury Reduction was established in March, 1988 to carry out and support research and educational programs dealing with product-related injuries.

Its underlying premise is that if Americans are better informed about the nature of deaths and injuries involving product hazards, they will be better able to make judgments and decisions that lead to reducing or eliminating those hazards.

The following "questions and answers" about IIR are to assist prospective members and supporters in understanding the organization's purposes, programs and structure.

* * *

Why Is IIR Needed?

Accidents involving products account for the vast majority of deaths and seriously disabling injuries to Americans from birth to retirement age. The design, manufacture and use of products play a pervasive role in generating severe and fatal damage to human health - a role larger than illnesses for most age groups.

Yet the public is largely uneducated about that role, and unaware that product-related trauma would be much less frequent and much less severe if product design and manufacturing defects were reduced and adequate instructions and warnings were provided to product users.

IIR's mission is to design and carry out programs of information, education, research and notification that will improve society's knowledge of product-injury interactions and countermeasures. Its goal is to help reduce product-related trauma in America; its premise is that better, more widely available information about such injuries and their causes will contribute to achieving that goal.

Aren't Other Groups Doing This Already?

No. A number of organizations in government and the private sector are involved in aspects of injury reduction, but none works to carry out or support programs of education and research specifically involving product-related injuries.

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Attachment A

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No. A number of organizations in government and the private sector are involved in aspects of injury reduction, but none works to carry out or support programs of education and research specifically involving product-related injuries.

IIR will make the results of its programs available to all agencies and groups whose activities involve injury causation and control, and is prepared to collaborate with such organizations on specific projects where appropriate.

Who Started IIR?

IIR has been formed by a group of leading plaintiff's attorneys experienced in litigation involving injuries stemming from the design, manufacture and use of products.

Their concern is that not enough has been done to inform the public, government policymakers, manufacturers, and the research community as to the nature, causes, extent and severity of deaths and injuries involving or generated by products of all kinds, or to promote research in those areas.

Their commitment is to encourage attorneys, research scientists, engineers, health professionals, and injured people themselves to become active in contributing both information and support toward that end.

Is Membership Confined to Attorneys?

Not at all. Membership is open to all individuals and organizations committed to IIR's goals, whether professionals, laypeople or students.

How May I Join?

Applications for membership are approved by the Board of Directors. Anyone may apply simply by writing to: IIR, P.O. Box 375, Dunkirk, Maryland, 20754. A brief letter or postcard or the completed form below is all that is needed.

How Much Does Membership Cost?

Annual dues vary by class of membership, as follows:

--Founding Member, $5,000.

--Organizational Member, $5,000

--Sustaining Member, $1,000

--Regular Member, $100

--Associate (Students and Retired) Member, $25

All members receive IIR's quarterly newsletter summarizing its activities and research results. In addition, Founding, Sustaining and Organizational members receive copies of all reports, studies and films published by IIR without separate charge.

How Is IIR Run?

IIR's policymaking body is its Board of Directors. Board members are elected annually by members with voting rights, which include all Founding, Sustaining and Regular members, on an annual basis. Current board chairman is Larry E. Coben. Other members include Wayne Fisher, Bertram M. Goldstein, John R. Overchuck and David L. Perry.

The day-to-day management of IIR is carried out under the direction of its president, A. Benjamin Kelley, a leading authority on motor vehicle-related injury causation and prevention. Mr. Kelley, formerly senior vice president of the Insurance Institute for Highway Safety and an official of the U.S. Department of Transportation, has been active in the injury control field for more than two decades.

Describe IIR's Program.

In general, IIR's concern extends to products in the automotive, aviation, medical, occupational, farm, home and all other categories in which product-injury relationships are found. Its developing emphasis in each of these is in the following areas of work:

--Collecting, analyzing and distributing data concerning the nature, severity, and frequency of product-related injuries, and relating them to design, manufacture and use causation.

Sources for such information will include research published by government, private-sector and academic groups; completed product-injury litigation; regulatory and legislative proceedings concerned with product injury issues, and special research and fact-finding projects undertaken or sponsored by IIR.

--Providing notice to manufacturers, the medical community, government regulatory agencies and the general public of product hazard and injury-causation information.

--Conducting or sponsoring special research, testing, demonstration and analytical projects to examine specific types and patterns of injury generated by the design, manufacture and use of products.

--Supporting outside research to increase knowledge of product hazard-injury relationships.

Who Determines The Direction Of IIR Research?

A Technical Advisory Committee, appointed by the Board of Directors, evaluates and approves proposals for IIR research, testing and data analysis. Members must be accredited experts in scientific or engineering fields related to injury causation and control.

How Can I Advance IIR's Work?

By applying for membership or contribing now!

If you are able, apply to become a Founding, Organizational or Sustaining member. Your dues will go far toward helping IIR to bring about important improvements in the public's awareness of product-related injuries, as well as in the breadth and quality of research, analysis and notification concerned with product hazards that result in injuries.

Or, you may wish to make a substantial one-time contribution toward IIR's start-up effort while joining at a lower dues level.

Whether you are interested in Founding, Organizational, Sustaining, Regular or Associate membership, with or without a separate contribution, it takes only a moment to apply using the attached form or a letter or card to: IIR, P.O. Box 375, Dunkirk, Md. You'll receive a prompt response and be billed for your first-year dues at that time.

* * *

(The Institute for Injury Reduction is a non-profit organization incorporated in the State of Maryland to meet the objectives described above. IIR is in the process of applying for an advance determination of its compliance with provisions of the Internal Revenue code and regulations that permit "charitable" tax deductions for membership dues and contributions to the organization. That determination, if favorable, will apply to all membership dues and contributions received from the time of the organization's

incorporation. However, until it is received, prospective members and contributors are cautioned that no guarantee may be made as to the deductibility of dues and contributions received at this time.)

TO: Institute for Injury Reduction
Post Office Box 375
Dunkirk, Maryland 20754

1. This is my/our application to become a (Founding) (Organizational) (Sustaining) (Regular) (Associate) member of the Institute for Injury Reduction. Please notify me of approval of this application and bill me for my first-year dues.

2. I wish to make a contribution to IIR's start-up effort in the amount of $_____. (It is enclosed.) (Bill me, please.)

Name_____

Address_____

_____

Phone_____

_____ Date:_____
(signature)

Attachment B Excerpted From: National Transportation Safety Board, "Performance of Lapbelts in 26 Frontal Crashes", July 26, 1986.

REPERENCES

1. Adomeit, Dieter. Seat Design -- A Significant Factor for Safety Belt Effectiveness (SAE 791004).
2. _____ and Appel, H. Influence of Seat Design on the Kinematics and Loadings of the Belted Dummy. IRCOBI (1979).
3. Aiken, D.W. Intestinal perforation and facial fractures in an automobile accident victim wearing a seat belt. J. Louisiana State Med. Soc. 115:235, 1963.
4. Aldman, Bertil. The Value of the Automobile Safety Belt. International Road Safety and Traffic Review, Vol. IX, No. 2, Spring 1961.
5. Almqvist, Rune et al. Frontal Crash Protection in a Modern Car Concept. IXth Experimental Safety Vehicle Conference, Kyoto (1982).
6. American Academy of Pediatrics. Lap belts for youngsters: implications for counseling and legislation. Safe Ride News, Vol. II, No. 1 (October 1982).
7. Arkoino, F.L. Dynamics of the Belted Occupant, Implications for Protection. In, Aldman, B. and Chapon, A. (eds): The Biomechanics of Impact Trauma. International Center for Transportation Studies (Elsevier Science Publishers, Amsterdam: 1984).
8. Avery, J.G. Seat belt success: where next? Br. Med. J. 288:662, 1984.
9. Backwinkel, K.D. Injuries from seat belts. J. Am. Med. Assn. (JAMA) 205:305, 1968.
10. Baker, Susan et al. Traffic Deaths Due to Blunt Abdominal Trauma. Proceedings, 14th Annual Conference of the American Association for Automotive Medicine (AAAM), Ann Arbor (1970).
11. Barancik, Jerome I. and Fife, Daniel. Discrepancies in Vehicular Crash Injury Reporting: Northeastern Ohio Trauma Study IV (1984).
12. Birrell, J.H.W. Med. J. Aust. Vol 1, No. 3.
13. Blumenberg, R.M. The seat belt syndrome: sigmoid colon perforation. Ann. Surg. 165:637, 1967.
14. Bohlin, Nils I. A Statistical Analysis of 28,000 Accident Cases with Emphasis on Occupant Restraint Value. Proceedings, 11th Stapp Car Crash Conference, Society for Automotive Engineering (SAE), New York (1967).
15. _____. Refinements of Restraint System Design -- A Primary Contribution to Seat Belt *Effectiveness* in Sweden. International Symposium on Occupant Restraints, Toronto (AAAM, 1981).
16. Bondy, Nancy. Abdominal Injuries in the National Crash Severity Study. In, Collected Technical Studies, Vol. II: Accident Data Analysis of Occupant Injuries and Crash Characteristics — Eight Papers, National Center for Statistics and Analysis, U.S. DOT (1981).
17. Brink, D.C. Spinal cord injuries and seat belts. Med. J. Aust. 2:801 (1973).
18. Cameron, H.M. and Nelson, P.G. Injury Patterns With or Without Seat Belts. Proceedings, 6th International Conference of the Association for Accident and Traffic Medicine (1977).
19. Campbell, B.J. Seat Belt Effectiveness. International Symposium on Seat Belts, Tokyo (1979).
20. _____. The automotive crash injury research program of Cornell University. J. Iowa Med. Soc. 51:760 (1961).

21. _____ and Kihlberg, Jaakko K. Seat Belt Effectiveness in the Non-Ejection Situation. Proceedings, 7th Stapp Car Crash Conference (1965).
22. Campbell, H.E. Role of the safety belt in nineteen auto crashes. Bull. Am. Coll. Surg. 40: 155 (1955).
23. _____. The automobile seat belt and abdominal injury. Surg. Gynec. Obstet. 119:591 (1964).
24. Christian, M.S. Non-fatal injuries sustained by seat belt wearers: a comparative study. Br. Med. J. 2:1310 (1976).
25. Cocke, W.M., Jr., and Meyer, K.K. Splenic rupture due to improper placement of automobile safety belt. JAMA 183:693 (1963).
26. Dajee, H. and MacDonald, A.C. Gastric rupture due to seat belt injury, Br. J. Surg. 69:436 (1982).
27. _____ et al. Seat belt aorta: acute dissection and thrombosis of the abdominal aorta. Surgery 85:263 (1979).
28. Dalmotas, D.J. et al. Current Activities in Canada Relating to the Protection of Children in Automobile Accidents (SAE 840529). In, Advances in Belt Restraint Systems: Design, Performance and Usage, Detroit (1984).
29. Dance, M. et al. An In-Depth Analysis of a Multiple-Fatal, Head-On Motor-Vehicle Collision. Proceedings, 25th AAAM conference, San Francisco (1981).
30. DeRosa, D. and Larsonneur, J.F. Seat Belt Improvements (SAE 840400). In, Advances in Belt Restraint Systems: Design, Performance and Usage, Detroit (1984).
31. Desjeammes, Maryvonne et al. Exploration of Biomechanical Data Towards a Better Evaluation of Tolerance for Children Involved in Automotive Accidents (SAE 840530). In, Advances in Belt Restraint Systems: Design, Performance and Usage, Detroit (1984).
32. Doersch, K.B. and Dozier, W.E. The seat belt syndrome: the seat belt sign, intestinal and mesenteric injuries. Amer. J. Surg. 116:831 (1968).
33. DuBois, E.F. Safety belts are not dangerous. Br. Med. J. 2:685 (1952).
34. Finch, D.M. and Palmer, J.D. Dynamic Testing of Seat Belts. Preprint No. 48, for presentation at SAE Summer Meeting, Atlantic City (1956).
35. Fish, J. and Wright, R.H. The seat belt syndrome — does it exist? J. Trauma 5:746 (1965).
36. Fisher, P. Injury produced by seat belts: report of two cases. J. Occupat. Med. 7:211 (1965).
37. Flamboe, Eugene E. A Comparison of Injuries Between Lap-Belted and Non-Restrained Automobile Occupants According to Seated Position and Vehicle Size (DOT-HS-801-350), January 1975.
38. Fletcher, B.D. and Brogdon, B.G. Seat-belt fractures of the spine and sternum. JAMA 200:177 (1967).
39. Frazier, R.G. Effectiveness of seat belts in preventing motor vehicle injuries. N. Eng. J. Med. 264:1254 (1961).
40. Fulton, J.L. Seat Belts Versus Shoulder Harness (SAE 660536).
41. Gallup, B.M. et al. Abdominal Injuries to Restrained Front Seat Occupants in Frontal Collisions. Proceedings, 26th AAAM conference, Ottawa (1982).
42. _____ et al. The Development of Two Prototype Seat Belt Systems for Improved Lap Belt Fit. Proceedings, 28th AAAM conference, Denver (1984).

43. _____ et al. The Relationship Between Belt Fit and Abdominal Injuries to Rear Seat Occupants. Proceedings, 4th Canadian Multidisciplinary Highway Safety Conference, Montreal (1985).
44. _____ et al. Untitled. "Preprint" for 1985 SAE Conference.
45. Garrett, J.W. and Braunstein, P.W. The seat belt syndrome. J. Trauma 2:220 (1962).
46. Garvin, G. Children in Injury Level Accidents. Proceedings, 20th AAAM conference, Atlanta (1976).
47. Gerritsen, R. et al. Unusual abdominal injuries due to seat belts. J. Albert Einstein Med. Ctr. 14:63 (1966).
48. Grattan, E. and Hobbs, J.A. Some Patterns and Causes of Injury in Car Occupants. Proceedings, 5th International Technical Conference on Experimental Safety Vehicles (1974).
49. Green, R.N. et al. Investigation of Injury Mechanisms Associated with Fully Restrained Passenger Vehicle Occupants in London, Ontario. Proceedings, 21st AAAM conference (1977).
50. Grime, G. Information on Injuries Obtained from Reports of Accidents to Car Occupants Wearing Safety Belts. Proceedings, Conference on Road Safety, Foundation for Road Safety Research, Brussels (1968).
51. Haddad, G.H. and Zickel, R.E. Intestinal perforation and fracture of lumbar vertebra caused by lap-type seat belt. N.Y. State J. Med. 67:930 (1967).
52. Hartemann, F. and Tarriere, C. How to Further Improve the Protection of Occupants Wearing Seat Belts. Proceedings, 19th AAAM conference (1975).
53. Henderson, J.M. and Freedman, K. The Effect of Mandatory Seat Belt Use in New South Wales, Australia. Proceedings, 17th AAAM conference, Oklahoma City (1973).
54. _____ et al. Performance of Child Restraints in Crashes and in Laboratory Tests. Proceedings, Seat Belt Seminar, Melbourne (1976).
55. _____ et al. The Effect of Seat Belt Design and Anchorage Geometry on Injury Patterns. Proceedings, 6th International Conference of IAATM, Melbourne (1977).
56. Herbert, D.C. Injury reduction by diagonal and other vehicle safety belts. Med. J. Aust. 1:61 (1964).
57. _____ and Cutting, D. Crash Protection for Children After Their Third Birthday. Dept. of Motor Transport, New South Wales (1978).
58. Hobbs, C.A. Car Occupant Injury Patterns and Mechanisms. Proceedings, 8th International Technical Conference on Experimental Safety Vehicles. Wolfsburg (1980).
59. Howland, W.J. et al. Fulcrum fractures of the lumbar spine. JAMA 193:240 (1965).
60. Huelke, D.F. Effectiveness of Occupant Restraints in Reducing Serious Injuries and Fatalities. International Symposium on Occupant Restraint, Toronto (AAAM, 1981).
61. _____. Study of 139 Accidents Involving 177 Fatalities. Highway Safety Research Institute, University of Michigan (1961).
62. _____. The Effectiveness of Belt Systems in Frontal and Rollover Crashes (SAE 770143).
63. _____. The Rear Seat Automobile Passenger in Frontal Crashes. Proceedings, 22d AAAM conference (1978).
64. _____ and Chewning, W.A. Comparison of Occupant Injuries With and Without Seat Belts (SAE 690244).

65. _____ et al. Injury Causation in Rollover Accidents. Proceedings, 17th AAAM conference, Oklahoma City (1973).
66. _____ and Lawson, Thomas E. Injuries to Rear-Seat Passengers in Frontal Automotive Crashes. The HSRI Research Review, Vol. 9, No. 1 (1978).
67. _____. Lower Torso Injuries and Automobile Seat Belts (SAE 760370). SAE Automotive Engineering Congress and Exposition, Detroit (1976).
68. _____. The Rear Seat Automobile Passenger in Frontal Crashes. Proceedings (Vol. 1), 22d AAAM conference (1978).
69. Hurwitt, E.S. and Silver, C.E. Seat belt hernia: a ventral hernia following an automobile crash. JAMA 194:829 (1965).
70. Johannessen, H. George. Historical Perspective on Seat Belt Restraint Systems (SAE 840392). In, Advances in Belt Restraint Systems: Design, Performance and Usage, Detroit (1984).
71. _____ and Pilarski, Regis V. Rear Seat Occupant Protection (SAE 810797).
72. _____ and Vos, Thomas H. The Changing Shape of Seat Belt Systems (SAE 820796).
73. Kahane, Charles. Remarks at meeting sponsored by U.S. Department of Transportation and OECD, The Effectiveness of Safety Belt Use Laws: A Multi-National Examination, Washington, D.C. (1985).
74. Kihlberg, J.K. Efficacy of Seat Belts in Injury and Non-Injury Crashes in Rural Utah. Report VJ-2721-R3, Calspan Corporation, Buffalo (1969).
75. Knoop, J.C. et al. Statistical Evaluation of the Effectiveness of Child Restraints (DOT-HS-805-660), September 1980.
76. Kulowski, J. and Rost, W.B. Intra-abdominal injury from safety belt in auto accident: report of a case. Arch. Surg. 73:970 (1956).
77. Lane, J.M. et al. Evaluation of the 1981-82 Rear Seat Belt Campaign. Road Safety and Traffic Authority (ROSTA) Report No. 4, Victoria (1983).
78. "Lap seat belt useful but can injure children," JAMA 245:2281 (1981). See also, "Lumbar injuries seen as possible result of auto seat belt use," Orthopedics Today 1:1 (1981).
79. Lawson, J.J. and Dalmotas, D.J. An Assessment of the Potential Cost-Effectiveness of a Regulation Requiring Three-Point Rear Seat Belts in Passenger Cars. Proceedings, 3d Canadian Multidisciplinary Highway Safety Conference, London, Ontario (1984).
80. LeMire et al. Intra-abdominal injuries caused by automobile seat belts. JAMA 201:109 (1967).
81. Leung, Y.C. et al. Submarining Injuries of Three-Point Belted Occupants in Frontal Collisions — Description, Mechanisms, and Protection. Proceedings, 26th Stapp Car Crash Conference, Ann Arbor (1982).
82. Levine, Donald N. and Campbell, B.J. Effectiveness of Lap Seat Belts and the Energy-Absorbing Steering System in the Reduction of Injuries. Highway Safety Research Center, University of North Carolina (1971).
83. Lhotka, Donald C. Motor Vehicle Occupant Protection — A Historical Perspective. Proceedings, 19th AAAM conference (1975).
84. Lindgren, S. and Warg, E. Seat belts and accident prevention. Practitioner 188:467 (1962).
85. Lister, R.D. and Milson, B.M. Car seat belts: an analysis of the injuries sustained by car occupants. Practitioner, 191:332 (1963).

86. Louton, J.C. and Ruster, T.W. Restraint Systems, Design and Performance Parameters. Proceedings, GMC Automotive Safety Seminar (1968).

87. Lowne, R. et al. The Effect of the UK Seat Belt Legislation on Restraint Usage by Children. In, Advances in Belt Restraint Systems: Design, Performance and Usage, Detroit (1984).

88. Lundell, B. et al. Safety Performance of a Rear Seat Belt System with Optimized Seat Cushion Design (SAE 810796). SAE Passenger Car Meeting (1981).

89. Mackay, G.M. Belted Occupants in Frontal Crashes. Proceedings, 6th International Conference of the IAATM, Melbourne (1977).

90. _____. Seat Belts in Europe -- Their Use and Performance in Collisions. International Symposium on Occupant Restraint, Toronto (AAAM, 1981).

91. _____. Two Years' Experience with the Seat Belt Law in Britain (SAE 851234).

92. _____ et al. Serious Trauma to Car Occupants Wearing Seat Belts. SAE International Automotive Engineering Congress, Detroit (1973). (Also presented at IRCOBI conference, Birmingham, England, 1975.)

93. MacLeod, J.H. and Nicholson, D.M. Seat belt trauma of the abdomen. Canad. J. Surg. 12:202 (1969).

94. Marsh, Joseph C. et al. Injury Patterns by Restraint Usage in 1973 and 1974 Passenger Cars. Proceedings, 19th Stapp Car Crash Conference, San Diego (1975).

95. McPherson, D. and Oversby, M. Investigations of Injury Mechanisms in Fully Restrained Vehicle Occupants. Proceedings, 6th International Conference of the IAATM, Melbourne (1977).

96. McRoberts, J.R. Seat belt injuries and legal aspects. Industrial Med. Surg. 34:866 (1965).

97. Mellbring, G. et al. The hospital experience of seat belt legislation in the County of Skaraborg, Sweden. Injury 12(6):506 (1981).

98. Mills, P.J. and Hobbs, C.A. The Probability of Injury to Car Occupants in Frontal and Side Impacts (SAE 841652). Proceedings, 18th Stapp Car Crash Conference (1985).

99. Milne, Peter W. Fitting and Wearing of Seat Belts in Australia: The History of a Successful Countermeasure. Australian Dept. of Transport, Office of Road Safety (1979).

100 Moffatt, Charles A. et al. Diagnosis of Seat Belt Usage in Accidents (SAE 840396). In, Advances in Belt Restraint Systems: Design, Performance and Usage, Detroit (1984).

101 Mukerjea, S.K. and Nair, K.K. Seat belt injury causing pneumothorax with rupture of diaphragm, stomach and spleen. Lancet 2:1044 (1978).

102 Najjar, Daniel. Restraint Usage and Effectiveness for Rear Seat Occupants. In, Collected Technical Studies, Vol II: Accident Data Analysis of Occupant Injuries and Crash Characteristics -- Eight Papers, National Center for Statistics and Analysis, U.S. DOT (1981).

103 Nelson, P.G. Aspects of injury patterns in automobile accidents. Aust. N.Z. J. Surg. 47:162 (1977).

104 Newman, James A. et al. Development of a Belt Configuration Test Device (SAE 840402).

105 Niederer, P. et al. Adverse Effects of Seat Belts and Causes of Belt Failures in Severe Car Accidents in Switzerland (SAE 770916). Proceedings, 21st Stapp Car Crash Conference, New York (1977).

106 Norin, Hans and Andersson, Britta. The Adult Belt--A Hazard to the Child? Proceedings, 6th International Association for Automotive and Traffic Medicine (IAATM) International Conference, Melbourne (1977).
107 _____ et al. Children in Cars. (Internal survey performed by Volvo; no date, but not later than 1979).
108 _____ et al. Child Restraints in Cars -- An Approach to Safe Family Transportation (SAE 790320).
109 _____ et al. Seat Belt Usage in Sweden and its Injury Reducing Effect. In, Advances in Belt Restraint Systems: Design, Performance and Usage, Detroit (1984).
110 O'Day, James and Kaplan, Richard. Fatal Injuries to Restrained Passenger Car Occupants. The HSRI Research Review, Vol. 9, No. 1, University of Michigan (1978).
111 O'Neill, Brian. Presentation, SAE Panel on the Political and Technical Considerations of Inflatable Restraints, Detroit (1984).
112 Patrick, L.M. et al. Impact Dynamics of Unrestrained, Lap Belted and Lap and Diagonal Chest Belted Vehicle Occupants (SAE 660788). Proceedings, 10th Stapp Car Crash Conference (1966).
113 Physicians for Automotive Safety. Shoulder belts in rear seats. PAS News (Summer/Fall 1981).
114 Porter, S.E. and Green, E.W. Seat belt injuries. Arch. Surg. 96:242 (1968).
115 Prentice, H.A.J. Seat Belt Effectiveness: Possible Benefits and Advertising. International Symposium on Seat Belts, Tokyo (1979).
116 Preston, Fred. A Comparison of Contacts for Unrestrained and Lap Belted Occupants in Automobile Accidents. Proceedings, 17th AAAM conference, Oklahoma City (1973).
117 Quinn, F.R., Jr. Are seat belts enough? Gen. Pract. 26:101 (1962).
118 Rattenbury, S.J. et al. The Biomechanical Limits of Seat Belt Protection. Proceedings, 23d AAAM conference (1979).
119 Reinfurt, D.W. et al. A Statistical Analysis of Seat Belt Effectiveness in 1973-75 Model Cars Involved in Towaway Crashes. National Highway Traffic Safety Administration, U.S. DOT (1976).
120 Ritchie, W.P., Jr. et al. Combined visceral and vertebral injuries from lap seat belts. Surg. Gynecol. Obstet. 131:431 (1970).
121 Roberts, A.K. The Effects of Rear Seat Passengers on Front Seat Occupants in Front Impacts, TRRL Report LR 1979, Dept. of Transport (UK), London (1983).
122 Roberts, Verne L. et al. Biomechanics of Seat Belt Design. Proceedings, 16th Stapp Car Crash Conference, Detroit (1972).
123 Root, H.D. et al. Peritoneal trauma: experimental and clinical studies. Arch. Surg. 95:531 (1967).
124 Ryan, P. and Ragazzon, R. Abdominal injuries in survivors of road trauma before and since seat belt legislation in Victoria. Aust. N.Z. J. Surg. 49:200 (1979).
125 Scherz, R.G. Fatal motor vehicle accidents of children passengers from birth through 4 years of age in Washington State. Pediatrics, Vol. 68, No. 4 (1981).
126 Schneider, R.C. et al. Lap seat belt injuries: the treatment of the fortunate survivor. Mich. Med. 67:171 (year not legible).
127 Scott, R.E. et al. An Evaluation of the 1974 and 1975 Restraint Systems. Highway Safety Research Institute, University of Michigan (1976).

128 Severy, D.M. et al. Passenger Protection from Front-End Impacts. International Automotive Engineering Congress, Detroit (1969).
129 Sharp, J.E. et al. Analysis of Lap Shoulder Belt Effectiveness in Accidents. Proceedings, 9th Stapp Car Crash Conference (1965).
130 Shortridge, Ray M. A Comparison of Injury Severity Patterns for Unrestrained, Lap Belted, and Torso Restrained Occupants in Automobile Accidents. Proceedings, 17th AAAM conference, Oklahoma City (1973).
131 Smith, W.S. and Kaufer, H. Patterns and mechanisms of lumbar injuries associated with lap seat belts. J. Bone Jt. Surg. 51A:239 (1969).
132 Snyder, R.G. Survey of Automotive Occupant Restraint Systems: Where We've Been, Where We Are, and Our Current Problems (SAE 690243).
133 _____ et al. A new pattern of spine injuries associated with lap type seat belts. U. Mich. Med. Ctr. J. 33 (May-June, 1967).
134 _____ et al. Pathology of trauma attributed to restraint systems in crash impacts. Aerospace Med. 39:812 (1968).
135 _____ et al. Seat Belt Injuries in Impact. Highway Safety Research Institute, University of Michigan (1967).
136 Stapp, Col. John P. and Enfield, Lieut. D.L. Evaluation of the Lap-Type Automobile Safety Belt with Reference to Human Tolerance. Presented at SAE Summer Meeting, Atlantic City (1958).
137 States, J.D. et al. The Medical Aspects of Driver Protection Systems and Devices Developed Through Automobile Racing (SAE 700660).
138 Steckler, R.M. et al. Seat belt trauma to the lumbar spine: an unusual manifestation of the seat belt syndrome. J. Trauma 9:508 (1969).
139 Stevenson, J.H. Severe thoracic, intra-abdominal and vertebral injury occurring in combination in a patient wearing a seat belt. Injury 10: 321 (1979).
140 Straith, C.L. Guest passenger injuries. JAMA 137:348 (1937).
141 Sube, J. et al. Seat belt trauma to the abdomen. Amer. J. Surg. 113:346 (1967).
142 Tarriere, C.H. Proposal for a Protection Criterion as Regards Abdominal Internal Organs. Proceedings, 17th AAAM conference, Oklahoma City (1973).
143 Taylor, T.F.K. et al. Seat belt fractures of the cervical spine. J. Bone Jt. Surg. 58:328 (1976).
144 Thomas, C. et al. The Main Causes of Risk Differences for Restrained Drivers and their Restrained Front Passenger in Frontal Collisions. Proceedings, 9th International Technical Conference on Experimental Safety Vehicles, Kyoto (1982).
145 Tolins, S.H. An unusual injury due to the seat belt. J. Trauma 4:397 (1964).
146 Transport Canada, unpublished data (1985).
147 Trinca, Gordon W. Medical Aspects of Seat Belt Usage. International Symposium on Seat Belts. Tokyo (1979).
148 _____. the Medical Significance of Occupant Restraint on Road Crash Victims and Those Who Treat Them. International Symposium on Occupant Restraint. Toronto (AAAM, 1981).
149 U.S. Department of Transportation. Denial of Petition for Rulemaking (49 F.R. 15241, April 18, 1984).
150 _____. Docket No. 74-14; Notice 17 (44 F.R. 77210, December 31, 1979).
151 _____. Docket No. 74-14 (44 F.R. 2060, December 1980).

152 _____. Docket No. 74-14; Notice 19 (46 F.R. 2064, January 8, 1981).

153 _____. Docket No. 74-14; Notice 37 (50 F.R. 14580, April 12, 1985).

154 _____. Docket No. 74-14; Notice 38 (50 F.R. 14589, April 12, 1985).

155 _____. Docket No. 74-14; Notice 39 (50 F.R. 14602, April 12, 1985).

156 _____. Docket No. 74-14 (50 F.R. 34152, August 23, 1985).

157 _____. Docket No. 74-14; Notice 42 (50 F.R. 46056, November 6, 1985).

158 _____. Final Regulatory Impact Analysis of the amendment to FMVSS 208: Passenger Car Front Seat Occupant Protection, July 11, 1984.

159 Vellar, I.D. et al. Rupture of the bowel due to road trauma: the emergence of the seat belt syndrome. Med. J. Aust. 1:694 (1976).

160 Volvo Car Corporation and Swedish Road Safety Office. Injury-Reducing Effect of Seatbelts on Rear Seat Passengers (1979).

161 Wagenaar, Alex. Remarks at meeting sponsored by U.S. DOT and the OECD, The Effectiveness of Safety Belt Use Laws: A Multi-National Examination. Washington, D.C. (1985).

162 Walpole, Bryan. Motor vehicle accident — multiple trauma. Australian Family Physician, Vol. 13, No. 4, (1984).

163 Walz, Felix H. et al. Severely and Fatally Injured Rear Seat Car Passengers (OAIS >/= 2) in Switzerland During 1976. Proceedings, 22d AAAM conference (1978).

164 Warner, Charles Y. Belt Occupant Restraint Effectiveness. Proceedings, 17th AAAM conference, Oklahoma City (1973).

165 Wexler, L. and Silverman, J. Traumatic rupture of the innominate artery — a seat belt injury. N. Eng. J. Med. 21:1186 (1970).

166 Wild, B.R. et al. Effect of seat belts on injuries to front and rear seat passengers. Br. Med. J. 290:1621 (1985).

167 Williams, Allan F. and Zador, Paul. Injuries to children in automobiles in relation to seating location and restraint use. Accident Analysis and Prevention, Vol. 9, No. 1 (1977).

168 _____ et al. Occupant Protection in Interior Impacts: An Analysis of FMVSS No. 201. Proceedings, 23d AAAM, Louisville (1979).

169 Williams, James S. and Kirkpatrick, John R. The nature of seat belt injuries. J. Trauma 11:207 (1971). (Also published as SAE 700896 in, Proceedings, 14th Stapp Car Crash Conference, Detroit (1970); also presented at 28th Annual Convention of the American Association for Surgery of Trauma, Montreal (1971).

170 _____ et al. The automotive safety belt: in saving a life may produce intra-abdominal injuries. J. Trauma 6:303 (1966).

171 Witte, C.L. Mesentery and bowel injury from automotive seat belts. Ann. Surg. 167:486 (1968).

172 Woelfel, G.F. et al. Severe Thoracic and Abdominal Injuries Associated with Lap-Harness Seatbelts. J. Trauma, Vol. 24, No. 2 (1984).

173 Yajko, R.D. et al. Rupture of the stomach from blunt abdominal trauma. J. Trauma 15:177 (1975).

SELECTED CASES FROM MEDICAL LITERATURE ON LAP BELT INDUCED INJURIES

Aiken, D.W. (1963). Lap belt-induced jejunal perforation of the small intestine. Undetected for 6 days after crash. Injury probably caused by sudden compression between belt buckle and spinal column. Only external indication of belt injury was welt across lower abdomen, below umbilicus. Probable correct belt use, no submarining.

Beckwinkel, K.D. (1968). Reports 2 cases. Case 1: A 61-year woman in rear with lap belt; frontal impact, followed by right lateral. Belt bruising across abdomen seen initially, accompanied by complaints of abdominal pain, but condition seemed stable until next morning, when severe pain developed and woman went into shock. At laparotomy, a tear in the mesentery of the small bowel was found, with about 12" of gangrenous bowel. Generalized peritonitis was present and the woman died on the operating table. Case 2: A 19-year man in "high speed" frontal hit, wearing lap belt in right front seat. Driver ejected, fractured nose. Lap belt wearer had extensive multiple laceration of scalp, upper/lower lips, requiring emergency surgency. 20" x 20" area of abrasion and ecchymosis corresponding to seat belt dimensions across lower abdomen, right across left and right iliac crests (indicates correct belt placement). Fracture of third lumbar vertebra. Abdominal distention, no blood at 4-quadrant tap. At laparatomy, however, 750 cc of old blood found, along with perforation of ileum, large tear in mesentery of small bowel, which extended down to inferior mesenteric vein. Also, incomplete tear of ileocolic artery. A 15-cm length of sigmoid colon was "completely stripped of its external coat of serosa, muscularis propria, submucosa, and muscularis mucosae."

Blumenberg, R.M. (1967). Reports 20 cases of "intra-abdominal visceral and mesenteric trauma due to the seat belt syndrome" in the literature at that time. Reports a new case: 25-year lap belted man involved in an approximate 35 mph lateral skid into pole. Received facial lacerations, contusions of the lower abdominal wall at the iliac crests (indicates proper belt placement). Discharged from hospital. 3 days later, abdominal distention and cramping appeared. Internal inspection found a linear tear of the mesosigmoid "extending to its root, and avulsion of the mesentery of a 4-inch segment of redundant sigmoid." Also, a 2-cm performation on the mesenteric aspect of sigmoid. Required 6 weeks in hospital.

Cocke, W.M., J. and Meyer, K.K. (1963). Reports case involving frontal crash into side of another vehicle at estimated 35 mph. Unbelted driver said to have received no injury. A 62-year woman at right front, lap belted (overweight), showed a reddened band on the upper abdomen but no other symptoms noted. 5 hours later, went into shock. The spleen was "severely ruptured," required removal. Also fractured ribs.

Dajee, H. and MacDonald, A.C. (1982). Discusses 27-year woman admitted to hospital with "noticeable seat belt abrasion across the abdomen." Complained of "severe abdominal pain," was pale, with heart rate 120, blood pressure of 70/40 mm Hg. Abdominal distention with tenseness and rebound tenderness. No bowel sounds. At laparatomy, the peritoneal cavity found "filled with food fragments and blood." Transection of stomach, avulsion of the left colonic mesentery and several small bowel serosal lacerations with areas of contusion of the peritoneum and mesentery. She had lost considerable blood.

Doersch, K.B. and Dozier, W.E. (1968). Reports 3 cases of lap belt-induced injury, all in "head-on" collisions. Case 1: 45-year man. Fractured ankle, multiple facial and head injuries. Lower abdominal contusions, abrasions, and ecchymoses. Audible peristalsis, no rebound tenderness of abdomen. Abdominal bleeding noted after catheter had been in place for 8 hours. Laparotomy undertaken 12 hours after accident. Found "large mesenteric laceration beneath a 15-inch segment of infarcted ileum." Case 2: 20-year man sustained compression fracture of 4th lumbar vertebra, multiple facial fractures and lacerations. Abdominal tap was negative, no bowel sounds. Laparatomy undertaken 10 days after accident. Found 2 perforations of cecum with surrounding abscesses. Mesenteric tears and hemoperitoneum. Victim required a "very prolonged convalescence." Case 3: 23-year woman sustained facial fractures and lacerations, fractured right ankle and fracture of the fifth lumbar vertebra. Multiple abdominal contusions and abrasions, "severe 'seat belt sign.'" No abdominal spasm or rebound tenderness. Peristalsis. Hunger. Left femoral pulse moderately diminished. Abdominal taps negative twice. Began deteriorating on day 2. At surgery, found "both rectus muscles, including their sheaths, as well as their adjacent oblique musculature, were completely transected." Peritoneum torn, one continuous abscess cavity from peritoneal space into the muscles and subcutaneous tissues on each side lower abdomen. Small bowel almost completely transected. Two large mesenteric lacerations and traumatic thrombosis of left iliac artery with dissection of intima. Patient died one week later of "overwhelming sepsis."

DuBois, E.F. (1952). Reports 23 cases of intra-abdominal injuries sustained by lap belted aircraft occupants, along with 32 cases of contusions along the belt line.

Fish, J. and Wright, R.H. (1965). Presents 4 cases of lap belt-induced injuries from air crash. Case 1: Arrived hospital in shock. Bruises across lower abdomen and pelvis. Abdomen tense, tender. Paracentesis in 3 quarters was negative. found 2-foot segment of ileum avulsed from its mesentery; small seromuscular tear midportion of the intestine. Avulsed end of mesenteric artery actively bleeding. Hematoma in left transverse mesocolon; spleed had capsular tear near inferior pole. Case 2: Shortly after crash, noted pain in right flank and lower abdomen. Examination found lower abdominal wall and right flank contusions corresponding to areas of pain. Paracentesis in 4 quadrants all negative. In hospital, complained of abdominal discomfort, ate little, had low grade fever to the 13th post-injury day. Exploratory operation found proximal ileum partially transected, adjacent bowel markedly contused; the injured bowel was adherent to the left side. Case 3: This man "extracted himself without difficulty from the wreckage." Only complaint at hospital was lower abdominal and flank pain corresponding to contusions from belt. Able to eat, had normal bowel movement following day. During next 3 days, developed abdominal distention and nausea. Abdominal X-rays showed dilated loops of small intestine. Abdominal exploration on 9th post-injury day found lacerated proximal ileum adjacent to urinary bladder, with considerable surrounding inflammatory reaction. Also, large tear in mesentery. Case 4: Arrived hospital in shock, died within 1 hours. Autopsy showed "wide band of contusions across the lower abdominal wall corresponding to the seat belt. Peritoneal cavity and retroperitoneal space filled with blood. Large segment of small intestine and segment of sigmoid colon avulsed from mesentery. Hemorrhage secondary to laceration of mesentery determined to be cause of death."

Fletcher, B.D. and Brogdon, B.G. (1967). 21-year driver of "small, foreign sports car" struck rear of semitrailer "at a high rate of speed." She "flexed acutely over the seat belt and struck her face against the dashboard." Multiple hematomas of lower limbs, laceration and fracture of nose. "No abdominal contusions, hematomas, or abrasions were noted." Transverse fracture of third lumbar vertebra; also small compression fracture of anterosuperior margin of vertebra body."

Gerritsen, R. et al (1966). Reports 2 cases, both "obese" women in "head-on" collisions, said to be wearing lap belt "loosely." Case 1: Passenger in left rear. At surgery, revealed laceration of jejunum, multiple lacerations of mesentery, traumatic amputation of lower half of omentum. Case 2: Passenger in right rear. At surgery, found to have 3,000 cc of blood in abdominal cavity with lacerations of mesenteric attachment of small bowel, laceration of ileum and cecum, division of ileocecal artery, and tear in serosa of sigmoid colon.

Howland, W.J. et al (1965). 19-year male driver (5'9", 150 lb.) in estimated "80 mph, head-on" collision with steel pole. Said to be wearing belt "loosened." Remained conscious. Low back, neck, left hand pain. Facial lacerations. Numerous upper chest contusions, neck contusions and abrasions. Large hematoma in muscles both sides of midlumbar. Transverse fracture of third lumbar vertebra. Attributed injuries to "seat belt's acting as fulcrum, over which vertebral body was split transversely into two parts; the mechanism was similar to breaking a stick over one's knee."

Hurwitt, E.S. and Silver, C.E. (1965). Young woman, right front passenger, involved in ran-off-road crash into abutment at high speed. Received facial injuries, fractured vertebrae, subluxation of fourth lumbar over fifth lumbar vertebra. White striae over both iliac crests "which conformed to the region of distribution of the seat belt over this area at the time of injury." 16 months after crash, a large hernia, containing colon, small bowel, and stomach, developed in the left upper quadrant of abdomen. (Cf. Case 1 in LeMire et al.)

Kulowski, J. and Rost, W.B. (1956). Said to be first report of a case in which crash injury was attributed to a lap belt. Belt-induced trauma to segment of ileum; later, fibrous adhesion of the terminal ileum to the right iliac crest developed, causing obstruction of the distal part of the small bowel.

"Lap seat belt useful but can injure children," AMA 245:2281 (1981). Reports findings by orthopedic surgeon in 7 cases of serious lap belt-induced injuries among children 9 to 15 in Ontario auto crashes 1977-79 (after Ontario's mandatory belt use law in effect). All riding in rear seat, in frontal collisions. Three sustained torn posterior ligaments, lumbar spine dislocations; two of these remain paraplegic. Four sustained "Chance" fractures of lumbar spine; two of these were immobilized for 6 months in body casts and braces. One had "extensive intra-abdominal injury requiring laparotomy." All had seat belt bruises on their abdomen, facial contusions, the latter resulting from head strikes during hyperflexion over belt.

LeMire, J.R. et al (1967). Reports 2 cases. Case 1: 26-year woman at right front in rear end impact. Lap belt said to be "loose" and "high." Only sign of intra-abdominal injury was "ecchymosis and contusion of lower part of abdominal wall corresponding to site of seat belt." Five months post-crash, victim re-entered hospital. Exam found large hernia in right side of abdominal wall, containing colon and small intestine. (Cf. case described in Hurwitt and Silver.) Case 2: 24-year man in "head-on" crash. Lap belt "broke." On admission, general condition seemed good, but complained of pain, tenderness in lower abdomen. Observed for 7 hours, released. Ten hours later, returned to hospital with greatly increased abdominal pain, vomiting. Blood pressure was low, pulse elevated, weak. Abdomen rigid, with rebound tenderness. No bowel sounds. At surgery, 4-cm perforation found in proximal end of jejunum.

Ritchie, W.P. et al (1970). Reports four cases. Case 1: 35-year male driver involved in "head-on" collision "while passing at 50 mph." Car destroyed. Lap belt was in "proper position," but says that "buckle was arranged to ride across the lower part of the abdomen between the iliac crests." Lacerations to chin and knees. 12 hours after admission, abdominal distention, vomiting. 36 hours later, transferred in "moderate distress." Blood pressure 116/70, pulse 104. Abdomen "slightly distended, tense, diffusely tender." Rebound tenderness, most severe over right lower quadrant. No bowel sounds. No evidence of fractured lumbar vertebrae. At surgery, 1000 cc bloody fluid in peritoneal cavity. Terminal portion of ileum transected in 2 adjacent areas. Subjacent mesentery also interrupted, intervening tissue "clearly non-viable." 2 weeks in hospital. Case 2: Woman at right front in same crash. Severe back pain at admission. Fracture of 2d lumbar vertebra. 7 hours later, still severe pain, plus abdominal pain. Blood pressure 130/80, pulse 110, low fever. Transverse contusion over the lower part of abdominal wall corresponded to site of seat belt. Below contusion was palpable defect in tissues of anterior abdominal wall. Abdomen rigid, tender, with rebound tenderness over lower quadrants. No bowel sounds. At laparotomy, found circumferential serosal tear at midjejunal level, 1-cm punctate laceration of antemesenteric border of proximal protion of ileum, longitudinal serosal tear of hepatic flexure of colon. 2 months in hospital. Case 3: 11-year girl in same crash (seated rear). "Pale and agitated" at admission. Blood pressure 100/60, pulse 130 and "thready." Abdomen tense, moderately distended, extensive ecchymosis over lower quadrants. Diffuse rebound tenderness. No bowel sounds. Transverse fracture of body of 3d lumbar vertebra. At laparotomy, showed "circumferential transection of proximal protion of ileum. Serosal tear along antemesenteric border of ileum, just proximal to area of transection, rent in mesentery of ascending colon. 2 months hospital. Case 4: 7-year girl in same crash (rear seat). No signs of acute distress at admission. Blood pressure 104/60, pulse 100. Abdomen "soft and flat but not tender." Bowel sounds present. Tender contusions over anterior superior iliac spines bilaterally, no contusions on abdominal wall. Soft tissue swelling, tenderness, over lumbar spine were prominent. Fracture of 3d lumbar vertebra. Fracture of right transverse process. 5 weeks hospital.

Snyder, R.G. et al (1967). Reports 2 cases with correct lap belt use. Case 1: Right front female passenger in VW struck by oncoming car. Wearing a "snug" lap belt. Concussion, nose fracture, lacerations to cheek and left elbow. Numerous contusions and faintly visible marks from belt on lower abdomen and anterior superior iliac spines. 12 hours later, surgery found tear of jejunum about 8 inches below ligament of Treitz, which nearly severed the bowel. Case 2: 61-year woman in right front, "wearing a snug lap belt," in frontal crash at "about 30 mph." Compression fracture to body of first lumbar vertebra. Cites to "personal communication" with Nahum and Siegel, indicating in "their unpublished study of over 150 accidents in the L.A. area," more than 30 cases of seat belt injuries.

Tolins, S.H. (1964). Reports on man in right front wearing lap belt when car hit tree. Driver and three rear seat passengers unrestrained. They were all uninjured. Lap belted passenger suffered severe midabdominal wall contusion and perforation of upper jejunum. Admitted to hospital 28 hours post-injury, not operated on until 4th post-injury day.

Walpole, Bryan (1984). 45-year woman admitted to hospital after crash. "External signs of seat belt contusion" on abdomen. Swelling, generalized tenderness, marked guarding and rebound tenderness. Bowel sounds audible. "Extremely pale, very confused and gasping for air but responding to commands. Pulse 140, blood pressure 90/50, respiration 45/minute (shallow)." X-ray found left ruptured diaphragm, protrusion of abdominal contents into left chest. At emergency laparotomy, ruptured spleen removed, left 12th rib excised; diaphragmatic deficit repaired; several segments torn small bowel and mesentery removed; end-to-end anastomosis and relieving colostomy performed.

Williams, James S. and Kirkpatrick, John R. (1971). Discusses findings from 80 crash victims wearing lap belts. Intra-abdominal injuries in 42; 39 sustained intestinal or mesenteric injuries, or both. 51 had lumbar spine injuries: 32 fractures, 7 subluxations, 2 ruptured disks, 2 complete anterior dislocatoins. (6 spinal injuries were unknown). 7 patients had intra-abdominal injuries as well. 35 additional injuries due to belt: 22 to abdominal organs or other soft tissue, 4 fractured pelvis, 9 fractures of extremities or facial bones.

Williams, James S. et al (1966). Reports 4 cases, all involving correctly placed lap belts. Case 1: 42-year man in "severe" impact. Sustained perforation of mid-ileum. Case 2: 33-year woman in "severe" impact. Sustained transection of rectus muscle, blood in peritoneal cavity, mid-portion of omentum amputated from attachment to transverse colon (found "hanging by only one thin, vascular stalk"), multiple hematomas and lacerations along small bowel, contusion of right colon, serosal tear in right colon. 2 months in hospital. Case 3: 16-year girl in side impact into fire hydrant (side opposite victim). Transverse tear of duodenum around two-thirds of circumference. 3 months in hospital. Case 4: 20-year man in "severe" impact. 6-cm tear in mesentery of mid-ileum, 6-cm tear in mesosigmoid, contused sigmoid with subserosal hemorrhage, sigmoid questionably viable, blood in peritoneal cavity. 3-1/2 weeks in hospital.

PARTIAL CHRONOLOGY OF SEAT BELT RELATED EVENTS

This chronology of events related to the development and use of motor vehicle seat belts may provide some perspective for those unfamiliar with these topics. The Board was unable to locate a single, complete history of seat belts and their use; the following has been pieced together from a number of sources (14, 33, 52, 69, 71, 78, 82, 89, 110, 131, and correspondence of Thomas Turbell, Chief Biomechanics Researcher, Swedish Road and Traffic Research Institute, to Safety Board, October 11, 1985).

1930's

Several U.S. physicians equip their own cars with lap belts and begin urging manufacturers to provide them in all new cars

1953

Colorado State Medical Society publishes policy supporting installation of lap belts in all automotibles

1954

Sports Car Club of America requires competing drivers to wear lap belts

American Medical Association House of Delegates votes to support installation of lap belts in all automobiles

1955

California Vehicle Code is amended to require State approval of seat belts before their sale or use

National Safety Council, American College of Surgeons, International Association of Chiefs of Police vote to support installation of lap belts in all automobiles

Society of Automotive Engineers (SAE) appoints Motor Vehicle Seat Belt Committee

1956

Volvo markets 2-point cross-chest diagonal belt as accessory

Ford and Chrysler offer lap belts in front as option on some models

Ford begins 2-year ad campaign based on safety, focusing heavily on belts

1957

Volvo provides anchors for 2-point diagonal belts in front

Special Subcommittee on Traffic Safety, U.S. House of Representatives, opens hearings on effectiveness of seat belts in automobiles

1958

Volvo provides anchors for 2-point diagonal belts in rear

1959

Volvo introdues 3-point belt in front as standard, in Sweden

New York considers and rejects bill to require seat belts in new cars sold in State.

1960

New York again considers and again rejects seat belt bill

1961

SAE issues standard for U.S. seat belts (J4)

New York requires seat belt anchors at front outboard seat positions (effective January 1, 1962)

Wisconsin requires seat belts in front outboard seat positions

Standards Association of Australia issues standard for "safety belts and harness assemblies"

1962

Association for Aid to Crippled Children and Consumers Union sponsor landmark conference on "Passenger Car Design and Highway Safety" with occupant protection the sole theme

Six U.S. States require front outboard seat belt anchors

U.S. manufacturers provide seat belt anchors in front outboard as standard

1963

Volvo introduces 3-point belt in front as standard, in USA

Some U.S. manufacturers provide lap belts in front outboard positions (23 States have laws to require belts in front, most effective 1/64)

SAE issues revised standard (J4a)

U.S. Congress passes P.L. 88-201 to allow Commerce Department to issue mandatory standards for seat belts sold in interstate commerce

1964

About half the U.S. States require seat belt anchorages at front outboard

Most U.S. manufacturers provide lap belts at front outboard seat positions

Victoria and South Australia require seat belt anchorages at front outboard positions in new cars (either 2- or 3-point permitted)

1965

U.S. Commerce Dept. issues first seat belt standard (adopted SAE standard)

SAE issues revised standard (J4c)

All U.S. manufacturers providing lap belts in front outboard positions by this time

Some U.S. manufacturers provide automatic locking retractors (ALRs) in front seat belts

1966

Swedish regulations prohibit 2-point cross-chest diagonal belt at seats next to a door, and Y-type of 3-point belt altogether

U.S. Commerce Dept. issues revised seat belt standard (SAE J4c)

U.S. Congress passes P.L. 89-593, establishing National Highway Safety Bureau (now NHTSA)

Sports Car Club of America requires competing drivers to wear a shoulder harness as well as a lap belt (perhaps 1967, according to ref. 131)

1967

U.S. manufacturers provide lap belts at rear outboard positions (MY 1967)

NHSB issues initial Federal Motor Vehicle Safety Standards 208, 209, setting standards for lap and shoulder belts in front outboard positions, lap belts in all other positions (to take effect 1/1/68 and 3/67, respectively)

Volvo introduces 3-point belt in rear as standard, certain markets

Great Britain requires 3-points in front outboard positions

Australian standard for belt anchorages issued

South Australia requires seat belts (lap belts OK) at front outboard positions

1968

Volvo provides emergency locking retractors (ELRs) as standard in front, in Sweden

Great Britain requires retrofit of 3-point belts in front in MY 65 and newer cars

Many U.S. cars this MY provide ALRs.

1969

Sweden requires 3-point belts of approved type in front

Volvo provides 3-point belt in rear as standard, all markets

Mercedes-Benz adds 3-point belt in rear outboard seats as standard, all markets

Japan requires seat belts, front and rear

Australia requires 3-point belts, front outboard seats, all cars registered since 1965

1970

Sweden requires belts in rear (diagonal and static allowed; lap-only not approved)

Victoria, Australia requires 3-point belts, front and rear and mandates use, front and rear

1971

Volvo provides ELRs as standard in rear, all markets

NHTSA amends FMVSS 208 to require passive restraints in front, to be effective 1973

New South Wales requires use of seat belts

1972

Volvo introduces adjustable B-post anchor point (not standard) to permit better fitting of shoulder portion of front lap/shoulder belts

Last Australian state law requiring belt use, front and rear, goes into effect 1/1

New Zealand requires belt use, front and rear

W. Germany requires 3-point belts, front and rear

NHTSA requires anchorages for (detachable) shoulder straps for rear outboard (FMVSS 210)

VW displays 3-point belt system with webbing pre-tensioner (Transport 72, Washington, D.C.)

1973

Mercedes-Benz provides ELR on 3-point belts in large ("S" class) cars

1974

Mercedes-Benz provides ELR on 3-point belts in midsize (300 Series) cars

Sweden requires ELR on belts in front seats

NHTSA requires 3-point belts (i.e., non-detachable shoulder straps) in front outboard positions

U.S. cars provide "vehicle-sensitive" ELRs in front outboard shoulder belts (lap belt portion has ALR)

First production tension relief device on U.S. vehicle.

1975

Sweden requires 3-point, ELR belts in rear; mandates front use by persons 15 and older

1979

France mandates seat belts in rear: either 3 lap belts or 3-points at outboard positions and lap belt at center (most manufacturers choose latter option)

New Zealand requires 3-point belts, front and rear outboard positions

1980

Mercedes-Benz provides driver side airbag and knee bolster, and pre-tensioner on all 3-point belts

1981

NHTSA rescinds requirements for eventual installation of passive restraint systems

1983

New Brunswick and Ontario make belt use mandatory, front and rear (front seat use mandatory in Ontario since 1/76)

Saab introduces 3-point in rear in all models sold in U.S. (had provided "for years" in Scandinavia and Europe)

1984

Austria makes belt use mandatory in rear for cars with vehicle approval after 1/84 (front seat use mandatory since 7/76)

W. Germany makes rear seat belt use mandatory in cars manufactured since 5/79 (mandatory use in front since 1/76)

Seven of Canada's 10 provinces by this time require occupants of moving vehicles to use whatever seat belt system is available to them

1985

Nova Scotia makes belt use mandatory, front and rear

Norway makes rear seat belt use mandatory in vehicles registered after 1/84 (front seat use mandatory since 9/75)

New York makes belt use mandatory, front and rear (in rear for persons 10 years or older)

Mercedes-Benz introduces driver side air bag with knee bolster (in addition to pre-tensioned 3-point belts) in U.S. market

Excerpted From: Evans, L., Occupant Protection Device Effectiveness in Preventing Fatalities, General Motors Research Laboratories, April 14, 1987.

Table 9. Empirically determined effectiveness of three occupant protection devices. In all cases effectiveness means the reduction in fatalities which would occur if a population not using the protection device were to change to universal use. The uncertainty indicated is plus or minus one standard error.

Vehicle	Occupant	Protection device	Effectiveness in preventing fatalities	
Car	Driver	Lap/shoulder belt	(42 ± 4)%	(41 ± 4)%
	Right front passenger	Lap/shoulder belt	(39 ± 4)%	
Car	Left rear passenger	Lap belt	(19 ± 10)%	(18 ± 9)%
	Right rear passenger	Lap belt	(17 ± 9)%	
Motor-cycle	Driver	Helmet	(25 ± 9)%	(27 ± 9)%
	Passenger	Helmet	(29 ± 9)%	

Table 10. Summary of the effectiveness of the three devices in preventing fatalities.

Occupant protection device	Effect-iveness
Lap/shoulder belts in outboard front seats of cars	(41 ± 4)%
Lap only belts in outboard rear seats of cars	(18 ± 9)%
Motorcycle helmets	(27 ± 9)%

ROCKY MOUNTAIN MEDICAL JOURNAL, VOL. 61, no. 8, August 1964

Thirty-three fatal crashes with seat belts

Horace E. Campbell, MD, Denver*

DUE TO THE GENEROUS CO-OPERATION of the Department of Highways, the Motor Vehicle Division, and the Colorado State Patrol, it has been possible to study all fatal crashes in Colorado in the last two years in which at least one person was wearing a seat belt. At the outset, it should be understood that this study does not attempt to ascertain the protection afforded by a seat belt. A study of 232 matched pairs of crashes with and without seat belts, by the Cornell group,[1] to be published soon, proves that the seat belt is not enough.[2] Although this investigation confirms this observation, the purpose of the study is to learn why belts must frequently fail to protect—motorcars being constructed the way they are.

In Colorado during 1962 and 1963, there were 51 persons fatally injured in 33 automobile accidents, in which at least one person was wearing a seat belt. There were 129 persons and 59 automobiles involved in these 33 fatal crashes. Twenty-three of those fatally injured were wearing seat belts. Data of these fatal accidents are summarized in Table 1. On analysis, the fatalities were from steering shaft displacement, roll-over, or crushing of car interior except for one belted passenger who died because of head injuries incurred by striking the instrument panel—a death preventable by adequately padded panel or shoulder strap.

Steering shaft displacement

Five drivers, one-third of the belted ones fatally injured, were killed because the solid steel steering shaft was displaced back into the drivers' seating space for a distance of one and a half to two and a half feet. These were severe crashes, but the drivers' seating space was not otherwise severely encroached upon. One of these deaths was in a compact in which the steering shaft starts from a point some two inches in front of the leading surface of the front tires. In almost any crash involving the left front corner, the shaft is routinely displaced backwards. In the fatal crash, the shaft was displaced as measured two

TABLE 1

33 FATAL CRASHES IN COLORADO IN 1962 AND 1963 IN WHICH AT LEAST ONE PERSON WAS WEARING A SEAT BELT

	Fatally Injured	Survived
With Seat Belts	23	26
Drivers	15	18
Passengers	8	8
Without Belts	28	32
Drivers	8	14
Passengers	20	34
Total	51	78

* Dr. Campbell is Chairman of the Automotive Safety Committee, Colorado Medical Society.

feet, and broke the driver's neck. He had no other injuries of consequence.

That severe crashes with steering shaft displacement can be survived with a seat belt is illustrated by a case in a previous series[1] where the driver was fortunate to be thrown to the left, so that the steering shaft passed over his right shoulder, and the steering wheel came to rest behind the front seat back. It must be pointed out that a shoulder strap in this case would have prevented this survival, although for maximum protection we must add upper torso restraints to the current lap belt. The Liberty Mutual Survival Car has eliminated the solid steel steering shaft.

Roll-overs

There were eight roll-overs in this series: all the drivers had belts fastened; three survived, and five were fatally injured. There were three right front seat passengers, all with seat belts fastened; one survived with scarcely any injury, and two were fatally injured. In one of the latter, a right side impact preceded the roll-over and was the probable cause of the fatality.

Door opening was the definitive factor in four of the five driver fatalities in roll-overs. Three of the four deaths were in European compacts, and one in a late-model American car. These recall the accident of Dr. John Waugh, distinguished surgeon, who was wearing a seat belt when his car rolled, the door opening, and death resulting from multiple skull fractures.

Although door locks have been improved beginning with the 1956 models, doors continue to pop open in roll-overs. It is in this type of accident that upper torso control is needed to keep the head inside the car under any circumstances. For the shoulder strap to come into general use, we must have built-in attachment points in forthcoming cars, because shoulder straps are more difficult to attach than were seat belts before built-in attachment points for these were provided. New York State is the first to introduce legislation requiring built-in shoulder strap attachment points, and other States should quickly follow. Although the small foreign cars have shortcomings as regards protection, it must be pointed out that both the Volvo and the Volkswagen have ten built-in strap attachment points, three for each of two front seat passengers, and two for each of two rear seat passengers. We plead for twelve such points in all cars, so that upper torso control may be provided for at least four car occupants.

Crushing of car interior

Five drivers were killed by the destruction of, or severe encroachment upon, their seating space. In perhaps two of these, upper torso control by means of a shoulder strap might have allowed survival since there was marked bending forward of the steering column by body impact. Five of the eight passenger fatalities were crashes from the side with penetration of the passenger seating space. Seat belts can be expected to provide little or no added protection in this type of crash.

There would appear to be several improvements which might be made to reduce injuries in blows from the side. We have noted that liver injuries are a prominent feature of crashes from the right side, and in non-fatal accidents without liver injuries, the arm rest seems to be the cause of very disabling bruises. We suggest the use of one of the plastic foams for the molding of broad based armrests. These plastic foam armrests might well be an integral part of a two-inch sheet of this padding material applied over all the lateral surfaces of the car interior. This is protection which will not need the consent or decision of the occupants for use, but will be built-in and inconspicuous, but ever-present for the time of need.

Aluminum honey-comb material has widespread use in airplane construction. Other metals and alloys can be thus formed, and when electrically welded to the "skin" material provide the lightest and strongest type of construction yet devised. Undoubtedly side panels of these materials would save many lives.

However, perhaps an even more important and immediately available remedy is reversion to the old-style wide and concave bumper. The bumpers for the last three years are narrow and convex and are bound to override. In fact, a former automobile engineer states that "... many auto designers are now shaping front bumpers in an attempt to ride over the bumper of the car ahead."[2] In end-to-end crashes this can be very expensive, but perhaps not too dangerous to the car occupants. However, in lateral crashes, the modern bumper over-rides the side rails (if any) and penetrates the impacted car more deeply than formerly. In those cars without frame side rails, fatalities are significantly greater in lateral crashes. A wide concave bumper, on the other hand, like those in cars of the mid-40's, would engage and remain in contact with the side rails and inflict less damage to occupants of the laterally impacted car, and also would produce very much less property damage in any end-to-end crash. Inter-

ance underwriters are aware of the destructive qualities of the modern bumper and call it "that decorative bauble."

Conclusions

All motorists, in both front and rear seats, should wear seat belts whenever the car is in motion. We beg the carmakers to provide built-in seat belt attachment points for the rear seat, just as they have for the front seat since the 1962 models.

Twenty-three crash fatalities to seat belt wearers are reported and analyzed. An extremely wide range of motion, and potential injury, is still available to the head of the belted motorist. Upper torso control and restraints, in addition to the seat belt, are needed. We beg the carmakers to provide built-in shoulder strap attachment points for all belt positions, front and rear. Two popular foreign cars have done this for the last two years.

Side impact fatalities are increasing and the carmakers must give the motorist more protection in crashes of this nature. Current bumpers provide almost no protection for car or occupants, and actually increase property damage and occupant injury. The most serious design defect of the current automobile is the steering assembly, against which the driver is hurled to his death, or which is displaced backwards on impact to kill the driver wise enough to wear a seat belt and shoulder strap.

REFERENCES

1. Campbell, B. J., and Kihlberg, J.: Seat Belt Effectiveness in the Nonpedestrian Situation, Cornell Aeronautical Laboratory, in the publishing.
2. Campbell, K. E.: Role of the Safety Belt in Minimum Auto Crashes, Bull. Amer. Coll. Surgeons 48:138-139 (May-June) 1963. Case 3.
3. Wakeland, R. H.: Unnecessary Designed-In Hazards of Today's Automobiles, Bulletin, Public Information and Education Committee, The National Association of Chiefs of Police, 3:1-4 (Jan.) 1964.

Attachment C

Ford Motor Company — ENGINEERING STAFF

Intra-Company Communication — 19 September 1967

Mr. John Versace

cc P. C. Bertelson

From: R. G. Snyder

Subject: Protection Offered by Shoulder Belt (3-Point System)

In response to the request for more complete documentation pertaining to the protection, pro and con, offered by the 3-point shoulder restraint system proposed for 1968, the following clinical and experimental data should be combined with Impact Dynamics' findings for consideration. These are essentially contained in my memo of 29 August to Mr. Briggs. We have noted all published data, and some unpublished data, known to us relative to clinical cases found to date in automotive accidents. This is very sparse to date and certainly inconclusive. It seems important to note that members of the Biomechanics Department have participated in the only experimental studies with living subjects accomplished to date with an objective of assessing injury potential which may be attributed to various restraint systems. Our position based upon the evidence we have found experimentally is as follows:

I. ADVANTAGES

1. When properly worn, the 3-point, diagonal shoulder belt system has been demonstrated to offer much greater protection to the vehicle occupant than does a single lap belt alone, since it prevents injuries from jackknifing. (Attachment B)

2. The few injuries reported to date for auto accidents (Fisher, '65; Fletcher and Bragdon, '67; Ebbetts, '62; Snyder, et al, '67) involving 3-point systems would all have probably been much worse had the individuals been wearing no belt, European-type diagonal belt only, or a lap belt only. (Attachment A)

II. DISADVANTAGES

1. When snugged properly, the diagonal belt may not allow the occupant to reach all controls adequately, without the addition of an inertia reel.

2. Improper location of the upper belt anchorage can critically affect the usefulness of the system. Since the lower and upper anchor

points in current installations are fixed, movement of the seat, combined with a wide range of occupant body sizes, increases the likelihood of improper positioning.

a) If the upper anchorage is too far forward relative to the seated occupant, the belt angle will be such that it is too low on the shoulder, and this can allow the individual not only to flex over it and slip out, but may be torqued forward and rotated sideward during the deceleration, which could be particularly injurious.

b) On the other hand, if the anchorage location is too far to the rear relative to the seated occupants' position, the diagonal belt will impinge upon the neck, causing discomfort even during normal driving (Figs. 1 - 5 attached). Such a situation can, by creating pressures upon the blood vessels of the neck, and particularly upon the carotid artery, have a subtle but disastrous effect. In an impact or rapid deceleration, severe neck injury could occur.

3. Improper positioning in vehicles sold to the public may also affect occupant acceptance and future use if, upon first experience, it is uncomfortable, rubs against the neck, or will not allow proper freedom to reach controls. (See photos, 1968 Mercury, attached)

4. In side impact at higher impact velocities (30G), there is some evidence that serious and fatal injury attributable to impingement of the neck upon the diagonal belt may result. (See attached test results.)

Our conclusion, based upon review of the available epidemiological and clinical studies of accidents, reinforced by our experimental data, is that a properly worn, 3-point system clearly protects the occupant better than a lap-belt-only system. However, in practice, it must be noted that effectiveness is greatly dependent upon the installation of the shoulder belt anchorages allowing proper positioning for the occupant. Although injuries may occur that are attributed to this system, the increased protection provided the occupant by the shoulder belt far outweighs, in our opinion, any argument for non-installation based upon such potential injury.

While this communication pertains only to the question of the relative value of the 3-point system, it should also be noted that there are several restraint systems which are considerable improvements, from a protection point-of-view, over the 3-point, including the double-torso harness, the Ford inverted-Y yoke with inertia reel (either roof or seat mounted), and potentially, the experimental air bag system.

Richard G. Snyder, Manager
Biomechanics Department

/gds

A. Clinical Studies of Injuries to Automotive Occupants Attributed to the 3-Point Belt

A comprehensive review of the published and unpublished clinical findings relating to seat belt injuries is provided in reference 8. These may be summarized as follows:

Since the 3-point restraint configuration has not yet been used extensively, being offered only as options in 1967 vehicles, accident experience is still limited and injuries attributed to this system have been infrequently reported to date. Fisher in 1965 described the first case of a splenic rupture from use of a 3-point combination lap and diagonal belt. Ironically, the impact forces involved were unusually small, a Volkswagen striking a Renault broadside at 5-10 mph from a full stop. Both the 42-year-old woman driver and the 67-year-old woman passenger were wearing snugly fitted 3-point restraints. The driver received a fractured sternum; the passenger fractures of the left fifth, sixth, seventh, eighth and ninth ribs and a severely lacerated spleen. Since this woman had been taking Coumadin^{R} daily for two years prior to this accident for anticoagulation, the hemorrhaging of the spleen required unusual treatment.(5) In another case, Fletcher and Bragdon reported fractures of the left 6-9th ribs and rupture of the spleen.(6)

A second case, involving a hyper-extension, hyper-flexion cervical injury, was attributed by Ebbetts to a 3-point belt. In his opinion trauma occurred "in a low-velocity impact in which there was little danger of serious injury to the patient had she not worn a seat belt. Conversely, it was an injury which was definitely aggravated by the use of a seat belt."(4)

Two cases of injury to pregnant occupants wearing 3-point restraints have been reported by Snyder, et al(8) In one instance, the woman was a right-front seat passenger in a small foreign car which had a head-on collision with a larger one. Impingement of the diagonal seat belt caused fractures

of every rib on her left side, and ruptured her spleen with massive intra-abdominal hemorrhage. Post-impact, an outline of the belt (in ecchymoses) was visible extending from right shoulder to left thigh. The fetus was stillborn 48 hours post-impact. The diagonal belt did not prevent both her head and knees from impacting the panel. Injuries to the chest and head of a pregnant woman also occurred in a second case, occurring under almost identical conditions; however, the outcome of trauma to the fetus is still unknown.

Swedish studies have reported few injuries due to this system[1] and similar studies have been made in England[7] and Australia.[3] In a Dutch study "three times as many chest and leg injuries" were found for diagonal and 3-point users as for lap belt users.[2] (In the American 3-point system, both ends of the diagonal and lap belt are attached, while in the European 3-point system, there are only three points, one end of the lap belt swiveling up to form the continuous diagonal attachment.) Unfortunately, these European studies do not provide specific injury breakdowns. The major advantage of the 3-point system over either the single diagonal or the lap belt is that it offers additional protection by preventing flexion of the upper torso. Disadvantages appear to be that it must fit the occupant correctly to be effective, can allow the occupant to slip out in side impact if impacted on the same side as the shoulder harness. There may also be some possibility of cervical injury through impingement on the belt if impacted from the other side, nevertheless, a properly worn 3-point restraint system offers greater protection than the lap belt.[9, 10]

REFERENCES CITED

1. BACKSTROM, C.: 1963 Traffic Injuries in South Sweden with Special Reference to Medico-Legal Autopsies of Car Occupants and Value of Seat Belts. Chirurgica Scandinavica, Suppl. 308.

2. BASTIAANSE, J. C. and A. A. BOIROMON: 1966 Statistical Study. Effectiveness (of) Seat Belts. Rapport. RAI-TNO, Institunt Voor WegtransportMiddelen. Netherlands.

3. BIRRELL, J. E.: 1964 "Safety Belts for Motor Vehicles in Victoria" Med. J. Australia 1:67

4. EBBETTS, J.: 1962 "Seat Belts and Cervical Spondylosis" Practitioner 188:802.

5. FISHER, P.: 1965 "Injury Produced by Seat Belts: Report of 2 Cases" J. Occupational Medicine 7:211-212.

6. FLETCHER, E. D. and B. G. HRAGDON: 1967 "Seat Belt Fractures of the Spine and Sternum" JAMA 200(2):177-178, 10 April

7. LISTER, R. D. and B. M. MILSON: 1963 "Car Seat Belts: An Analysis of the Injuries Sustained by Car Occupants" Practitioner 191:332-340

8. SNYDER, R. G., W. M. CROSBY, C. C. SNOW, J. W. YOUNG P. HANSON: 1967 "Seat Belt Injuries in Impact" (In press) Proceedings, The Prevention of Highway Injury Symposium, The University of Michigan Medical School. (Preprint attached).

9. YOUNG, J. W.: 1967 "A Functional Comparison of Basic Restraint Systems" CAM Report (in press) Federal Aviation Administration.

B. Experimental Studies of Restraint Protection with the 3-Point Harness

Eight tests have been conducted with baboon subjects utilizing the Holloman AFB Daisy Decelerator. Three were impacted in the forward-facing body orientation, two rearward facing, one at 50° side facing, and two at 90° side facing. To our knowledge, these represent the only experimental study of the injury protection represented by the 3-point restraint system. The results of these tests are summarized in the attached Table. Complete discussion and conclusions are found in reference 1.

In two forward-facing impacts at 20 and 22G, no injury was found in one case and slight injury (pancreatic petechial hemorrhage, adrenal pericapsular hemorrhage, uterus broad ligament hematoma) in the other. A third test a 30G (20° seat pitch, 74.2 ft/sec velocity, 3000 g/sec onset rate for 0.095 secs duration) also resulted in minor trauma (belt contusions, dural congestion) only. This appears to offer much better injury protection, for example, to the same level of impact than with a lap belt only which appears to offer marginal survivability at 30G.

Two rear-facing tests were run in this configuration. At 20G, no injury was found. At 40G, injury was not severe (subdural hemorrhage, subcapsular kidney hemorrhage, and petechial hemorrhages), and only the kidney and rib petechial hemorrhages attributed to the belt (in rebound).

After one 50° left, side impact at 22G moderate intra-dural hemorrhage was found upon gross examination, and myocardial myomalacia upon microscopic histological study.

Two 90° sideward-facing impacts at 22 and 30G were run. At the lower level, severe dural and urinary bladder hemorrhage occurred, in marked contrast to the 22G forward run where no trauma was found. At 30G

trauma was instantly fatal, due primarily to dislocation of the occipital-atlantoid joint as the neck impinged upon the diagonal belt.

REFERENCE

1. SNYDER, R. G., C. C. SNOW, J. W. YOUNG, W. M. CROSBY and G. T. PRICE: 1967 Pathology of Trauma Attributed to Restraint Systems in Crash Impacts. Presented Sixth Scientific Session, Joint Committee on Aviation Pathology, Ottawa. 12 September.

THE 3-POINT RESTRAINT SYSTEM

TABLE III
3-POINT (DIAGONAL AND LAP BELT) TESTS

Test	Dummy Test No.	Wt. (lbs.)	Pathology: Gross	Pathology: Microscopic	Sled: Peak G	Sled: End Pitch	Sled: Lo. Vel. (ft/sec)	Sled: Onset Rate (g/sec)	Time Duration (secs): Plateau	Time Duration (secs): Total	Peak Belt Force (LBS) Lap: Right	Lap: Left	Diagonal: Top Right	Diagonal: Bottom Left
A. FORWARD FACING BODY ORIENTATION (-Gx)														
61	3314(1)	21.2	None	None	31.2	30°	51.8	1000	0.012	0.056			470	100
62	3318	30.5	Petechial Hemorrhage, Head of Pancreas; Broad Ligament Hematoma; Subarachnoid Hemorrhage Insertion of Cord	Adrenal Pericapsular Hemorrhage, slight	90.5	15°	60.4	8150	0.072	.115	410	410	740	150
63	3316	26.0	Transverse Contusion (lap belt); Dural Congestion, moderate, bilateral	Arachnoid Hemorrhage of Pons, slight	30	20°	74.8	2400	0.021	0.065	141	215	110	100
B. REARWARD FACING BODY ORIENTATION (+Gx)														
64	3341(2)		None	None	34.3	30°	60	3100	0.076	.104	0	0	15	15
65	3344(3)	11	Subpleural Hemorrhages either side T-7 to T-11; Bilateral Subdural Hemorrhages; Petechial Hemorrhage over Ribs, Extensive; Subcapsular Hemorrhage Anterior Left Kidney	No Report	40.1	10°	66.4	5400	0.032	0.077	10	0	35	50
C. 90° SIDEWARD FACING BODY ORIENTATION (-Gy)														
66	3347	30	Marked Subcortical Congestion; Mod. Intracranial Hemorrhage; Intraventricular Hemorrhage	Myocardial Myomalacia	31	12°	40.1	3300	0.067	.143	400	330	450	119
D. 90° SIDEWARD FACING BODY ORIENTATION (+Gy)														
67	3404	34.5	Subpleural Hemorrhage, L. Lung; Right Intracapsular Hemorrhage L. Kidney; Right Intracapsular Petechial R. Kidney; Retroperitoneal Hemorrhage, Severe; Marked Hemorrhage Bladder [illegible] (Fetus, Dural Hemorrhage)	Subpleural Hemorrhage; Urinary Bladder Hemorrhage; Severe Brain Hemorrhage	33.1	10°	50.0	1900	0.062	.150	140	—	—	300
68	3347	34.0	Total Dislocation, Occipital-Atlantoid Joint; Mod. Bilateral Intrathoracic Hemorrhage; Contusion, left side Neck; Transverse Heart Contusion (lap belt); Subcutaneous Hemorrhage Right Mandible; Subpleural; Subpleural Ecchymotic Hemorrhages Left, 3-4 ribs; Right 3-4 ribs; Uterine Hemorrhage; Sternocleidomastoid Muscle Hemorrhage; Extensive right intramuscular Hemorrhage (Right shoulder), Left Thoracic Wall 3-7 ribs, 11-12 ribs	Intra-alveolar Hemorrhage; Leptomeningeal Hemorrhage; Perirenal Hemorrhage; Cerebral vessels Hemorrhage; Ventricular Hemorrhage; Subarachnoid Hemorrhage	30	30°	74.0	3000	0.034	0.065	100	370	600	340

(1) 130 days pregnant. Terminated post-impact. Fetal death 10 hr. post Caesarian Section
(2) 140 days pregnant. Fetus died 1-1/2 hrs. post-impact, placental separation.
(3) [illegible] days pregnant.

(Source: Snyder, R.G., C.C. Snow, J.W. Young, W.H. Crosby, and G.T. Price 1967 "Pathology of Trauma Attributed to Restraint Systems in Crash Impacts". Paper presented 12 October, *Sixth Scientific Session*, Joint Committee on Aviation Pathology, Ottawa.)

Attachment D

THE NATIONAL SWEDISH ROAD SAFETY BOARD
(Statens trafiksäkerhetsverk)

27.3.1968 F 9 1968

REGULATIONS RE SAFETY BELTS (Translation from the Swedish origi: l)

1. Application

1.1 These regulations apply to passenger cars.

2. Definitions

2.1 "Safety belt" means a device consisting of straps with fastening and adjustable buckles, attachment fittings and, occasionally a retractor device, which, firmly secured to the structure of a car, is designed to reduce the risk of injury to the wearer by limiting his mobility in the event of collision or other violent retardation of the vehicle.

2.2 "Three point belt" is a safety belt with a diagonal strap and a lap strap and with one upper and two lower anchorage points.

2.3 "Two point belt" is a safety belt with a diagonal strap with one upper and one lower anchorage point.

2.4 "Lap belt" is a safety belt with a lap strap with two lower anchorage points.

2.5 "Anchorage point" means a point where a safety belt is connected to the car body or equivalent part of the constructio

3. Scope

3.1 With the exceptions stated in point 3.2, a safety belt shall be installed in each seat position.

3.2 The requirement of point 3.1 does not apply to side-facing seats, folding auxiliary jump seats and rear-facing seats.

4. Requirements

4.1 For the use of different types of safety belts the followin- shall apply :

4.1.1 Three point belts may be used for all seat positions.

4.1.2 Two point belts must not be used for the seat position by the

4.1.3 Lap belts may be used only for a middle seat position and for other seat positions in convertible cars where an upper anchorage point cannot be arranged.

4.2 Safety belts shall be of a type approved by the National Road Safety Board according to special regulations.

4.3 The anchorage points for safety belts shall be located in accordance with the Swedish Standard SMS 2470 "Seat Belts Anchorages". If the construction of the vehicle does not make this possible, other suitable locations may be used.

4.4.1 Pins and holes in anchorages shall conform to the above-mentioned standard.

4.4.2 The regulation of point 4.4.1 need not be applied to a car which has been equipped with safety belts of an approved type by the manufacturer, provided that the requirements for sufficient strength are fulfilled.

4.5 The vehicle body structural strength at the anchorage points shall be satisfactory for the type of safety belt to be used.

5. Control that the requirements are fulfilled

5.1 At type inspection, or the first registration inspection, the applicant shall present a certificate from the manufacturer stating that the vehicle with the chassis number as stated in the certificate fulfils the requirements of point 4.5 and when necessary of point 4.4.2. As for the rest, the inspector shall control that the requirements are fulfilled.

6. Coming into operation

6.1 The regulations shall, concerning safety belts for seat positions in front seats, be applied to vehicles which are considered as 1969 or later models, or which are otherwise included in type certificate or presented for registration inspection after January 1, 1969 for the first time, with the exception of second-hand imported vehicles which were manufactured before this date, and for other seat positions one year later.

6.2 The regulations of point 4.5 are meant to be replaced by more detailed ones when present work on international regulations has been completed.

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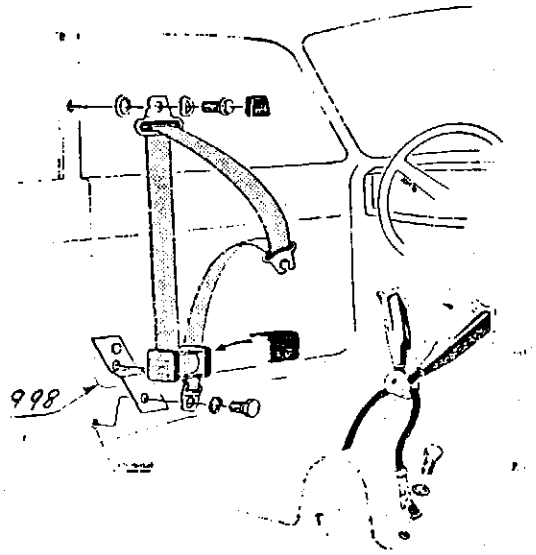

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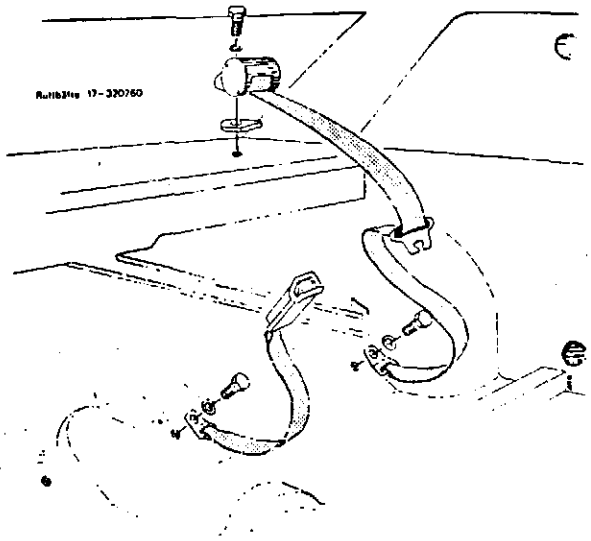

EXHIBIT

B

Attachment F

870483

A Three-Point Belt in the Rear Center Seating Position as Accessories

Leif Karlbrink and Hugo Mellander
Volvo Car Corp.

ABSTRACT

This paper describes some of the engineering situations encountered during the development of a three point belt for the rear center seating position in a sedan car. The belt will be sold as an accessory for the after market.

The reinforcement of the parcel shelf to achieve a sufficiently strong anchorage for the retractor and the geometrical locations of the belt anchorages are presented.

The conflict between the geometrical requirements, the design and the visibility will be focussed. The need for updated requirements for belt installations in the rear center seating position will be pointed out.

Data from the performed tests show that all demands from regulations and "in-house" requirements are fulfilled.

BACKGROUND

THE 1ST OF JULY, 1986, Sweden introduced a compulsory belt law for the rear seat in passenger cars. Countries as West-Germany, Norway, New Zeeland and Australia have already enforced similar laws. This will increase the use of seat belts in the rear and also increase the demand on comfort of seat belt installations.

Today most European car manufacturers have three point belts on the rear outboard positions and a lap belt in the center as standard equipment.

It is, even for the front seat occupant, important that rear seat occupants use their safety belts [1]*. In the center seating position today we have a very low usage rate, mainly because it is uncomfortable and difficult to put on and wear a non-retractor lap belt.

Children may prefer to sit in the rear center position where they can have a clear view out on the road. Families with three children may want to have all their children use the same type of three point belt.

Taking all this into account it was decided to develop a three point belt for this seating position as an accessory. The main advantages of a three point belt in the rear center position are:

- Higher safety level in frontal impacts
- Increased comfort and convenience
- Better design, compared to a non-retractor lap belt
- Children prefer this place

* Numbers in parentheses designate references at end of paper.

ENGINEERING

The requirements governing the development of this belt system came from "in-house" requirements and from regulations. The regulations were static strength testing of belt anchorages according to ECE R14 and ADR 5B, belt system testing as in FMVSS and geometrical locations of anchorage points.

The "in-house" requirements were frontal barrier crash tests in 30 and 35 mph, design and comfort requirements, such as easy handling, minimizing of the webbing pressure on the shoulder and easy installation in the car of the accessory belt.

During the development phase it became clear that the parcel shelf had to be reinforced. Special parts had to be engineered to make the parcel shelf anchorage meet the existing strength requirements.

In the engineering of the special parts (see figures 1 and 2) the following points had to be considered:

- As low weight as possible
- Low manufacturing cost
- No interference with the luggage area
- No interference with existing parts like loudspeakers, window shade and head restraints

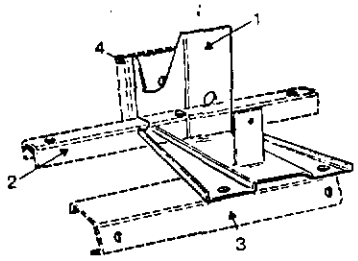

Fig. 1. Reinforcement brackets supplied in the accessory kit

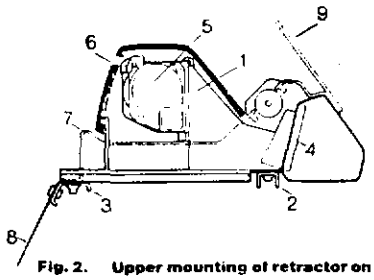

Fig. 2. Upper mounting of retractor on the parcel shelf

1. A bracket holding and keeping the retractor at the decided position
2. Profile distributing the load
3-4. Profiles preventing the tipping of the retractor due to the bending moment
5. Retractor
6. Plastic cover
7. Parcel shelf trim
8. Parcel shelf sheet-metal
9. Rear window

It was also a problem to find a retractor that was capable of withstanding a load of 15 kN directly into the reel. In this beltsystem there is no D-ring and the load comes from a different angle than in a normal loading case, as in a B-post installation (see figure 3).

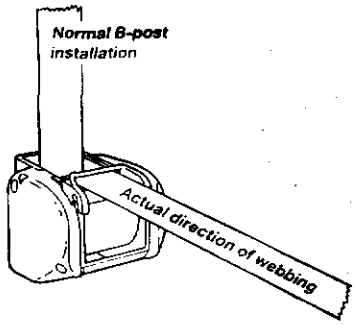

Fig. 3. Difference in loading directions for the retractor

Due to the regulations of geometrical zones the retractor had to be placed about 100 mm above the parcel shelf trim, which meant that the retractor had to be covered with a plastic cover (see figure 4).

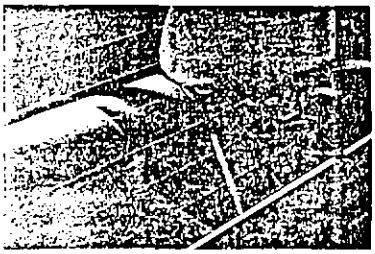

Fig. 4. View through rear window showing the installation

The installation of the new three point belt also permits the lap belt to remain in the car and be used for securing long luggage or restraining certain child- seats (see figure 5).

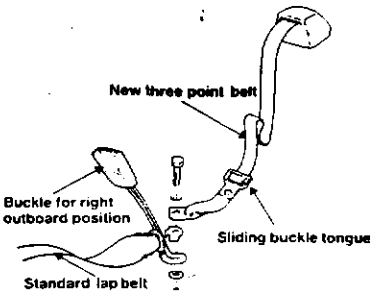

Fig. 5. Lower anchorages of rear center position

SIMULATIONS

Mathematical simulations were done to determine the effect of a lowered upper anchorage point. In the 760 sedan car there are three different belt geometries (see figure 6) and the question was what effect the lowered upper anchorage had on compression of the spine.

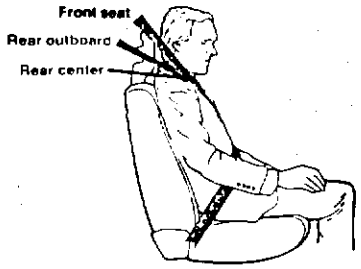

Fig. 6. Belt geometries for the different seating positions in a 760 sedan car

A two-dimensional lumped mass computerprogram developed by Volvo (2) was used to study this situation.

According to the simulations the compression force in the spine is greater with a lower upper anchorage point but still at an acceptable level compared with the outboard higher point (3). The simulation showed 2.8 kN in compression of the lower spine in a 30 mph crash. This value was also later confirmed in sledtests as described below.

TESTING

All regulation tests, the strength testing of belt anchorages and the belt system testing, were conducted with satisfactory results. The in-house demands of the system included dynamic crash tests. Frontal barrier tests at 35 mph and Hy-Ge sledtests at 30 mph have been performed with the belt.

SLED TESTS - The sled tests were conducted with a Hy-Ge crash simulator that simulated a 30 mph crash. The dummies used were a P572 dummy and child dummies : TNO P3, US3year, US6year, TNO P10.

The 50 perc. dummy was also equipped with a special axial force transducer in the lower spine to measure the compression load in the spine. (See figure 7).

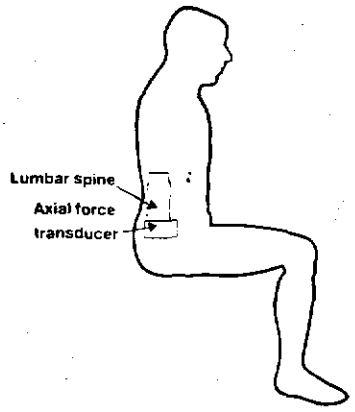

Fig. 7. Position of special axial force transducer in the P572 dummy

An advantage with this new belt geometry compared with the outboard geometry was a reduced forward displacement of the head and lower HIC- values.

The tests conducted with child dummies were done with Volvo's child cushion. There was no significant difference of child dummy response restrained with three point belt on center place compared to outboard places.

The dummy responses in average from 30 mph sledtests were as follows:

	HIC	Chest resultant, cr G	Upper anchorage belt force, kN
50 perc.	770	41	7
3 years	560	46	not measured
6 years	430	48	"
10 years	450	51	"

The loads from the load cell in the lower spine showed 2-4 kN. This is somewhat higher compared with the outboard places and confirmed the results from the simulation. The outboard places showed 1.5 - 3.0 kN.

FRONTAL BARRIER TEST - The frontal barrier test were run at 35 mph with a 760 sedan car. The rear center position was equipped with a three point belt and occupied by a P572-dummy.
The dummy responses were:

HIC = 780
Chest resultant, Cr = 41 G
Femure forces = 2.5 kN

The maximum force in the diagonal belt was 6.4 kN.

GEOMETRICAL BELT ANCHORAGE ZONES

Three different regulations of belt anchorage zones apply to this belt system. The US (FMVSS 210), Australian (ADR 5B) and the European (EG 76/115, 82/318, R14/02) zones. (See figure 8).

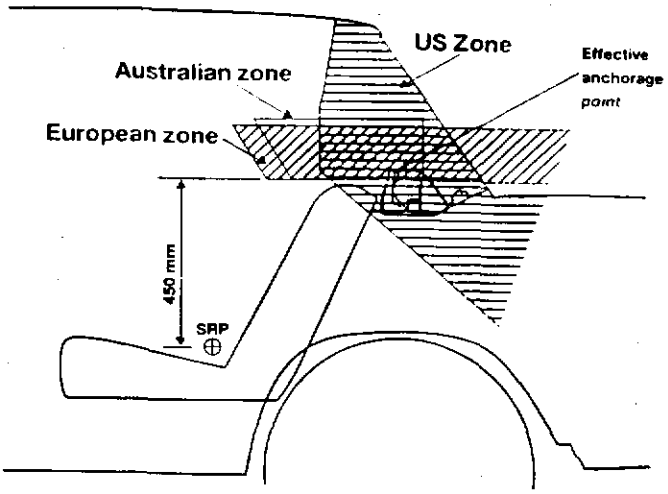

Fig. 8. Upper belt anchorage zones in different regulations

Today the European regulations state certain zones for three point belts anchorages in the outboard positions and zones for a lap belt in the center position. The zones for the upper anchorage point also apply for the center position, if equipped with a three point belt.

In order not to interfere with the sight out through the rear window, the retractor was put close to the lower limits of the European and Australian zones. An additional European requirement is that even after a static pull test of 13.5 kN the retractor has to be inside the zone. (See figure 9).

This project has shown that the installation of a three point belt in the center position would benefit from not having the same geometrical zones as for the outboard places. Due to lack of high body structure, design and conflicts with rear sight, the middle place ought to have a lower zone if equipped with a three point belt. Note that the US-zone already allows a lower position.

During the development phase of this project, the differences of the national regulations became very obvious. A harmonization between the different regulations would be beneficial. The geometrical zones and the static strength testing are areas where there are possibilities to have the same regulations. Since today's regulations are not intended for the rear center position, specific regulations for this position ought to be founded.

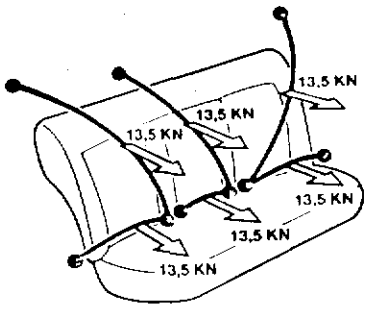

Fig. 9. Schematic figure of required European static pull test if the rear seat is equipped with three three point belts.

CONCLUSIONS

This project has shown that it is possible to install a three point retractor belt for the rear centre seating position in a sedan car.

This paper describes the development of an accessory belt where effort has been spent on reinforcing the parcel shelf with bolt-on brackets to achieve sufficient strength of the upper mounting. It is fairly easy to engineer the body structure, during the design of a new car, so that these special parts would be integrated in the body.

The variety of regulations applicable to belt systems has obstructed the work and it has to be stressed that *amendment* to existing regulations in Europe and Australia is needed to cover the specific problem of the three point belt installation in non-outboard places.

There is definitely a need for harmonization of regulations and also possibilities to certify restraint systems by performing dynamic system tests.

REFERENCES

1. H Norin, A Nilsson-Ehle, E Saretok, C Tingvall "Injury-Reducing Effect of Seat belts on rear seat occupants" -8th ESV Conf., October 21-24, 1980.
2. Jernström, C (1983) "Computer simulation of a motor vehicle crash dummy and use of simulation in the design/analysis process". Int. J. of Vehicle Design, vol. 4, no 2, PP. 136-149.
3. J.P. Stapp "Review of Air Force research on biodynamics of collision injury". Proc. of 10th Stapp Car Conf. November 8-9, 1966.
4. J.D. Horsch, P.C. Schneider, C.K. Kroell, F.D. Raasch "Response of belt restrained subjects in simulated lateral impact". Proc. of 23rd Stapp Car Conf. October 17-19, 1979.
5. J.D. Horsch "Occupant dynamics as a function of impact angle and belt restraint". Proc. of 24th Stapp Car Conf. October 15-17, 1980.
6. B Lundell, H Mellander, I Carlsson "Safety performance of a rear seat belt system with optimized seat cushion design". Pass. car meeting, June 8-12, 1981.

APPENDIX

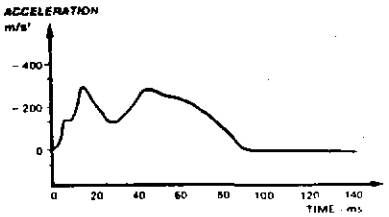

Diagram 1. **Sled acceleration pulse 30 mph (simulation of a frontal barrier test)**

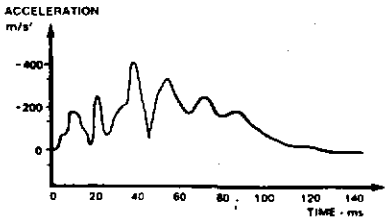

Diagram 2. **Frontal barrier test acceleration pulse 35 mph**

Attachment F

6/22/88

A NOTE ABOUT THE PREEMPTION ISSUE

Basic Issue - Automobile manufacturers have argued in a number of lawsuits that claims against a manufacturer for injuries resulting from the manufacturer's failure to provide adequate safety are preempted from trial when the involved automobile component or system meets a minimum Federal Motor Vehicle Safety Standard (FMVSS).

Section 103(d), the preemption subsection of the Act (15 USC 1392(d)), contains no language, legislative history or intent precluding tort actions where a FMVSS has been met. It is directed solely at preempting "a State or political subdivision" from adopting motor vehicle safety standards which are "not identical" to the Federal standards.

Most important, tort actions against manufacturers for safety defects, whether or not they involve components that comply with minimum FMVS standards, are specifically protected by 108(c) as follows: "Compliance with any Federal motor vehicle safety standard issued under this law does not exempt any person from any liability under common law."

Floor debate bearing on 108(c) confirms Congress's clear intent not to preempt tort actions.

(House Debate on passage of the National Traffic and Motor Vehicle Safety Act, Congr. Rec., Aug. 17, 1966, p. 19663): Mr. Dingell, for the bill and against an amendment (defeated) offered by Mr. O'Neill of Massachusetts to impose criminal penalties for non-compliance:

> Second, we have preserved every single common-law remedy that exists against a manufacturer for the benefit of a motor vehicle purchaser. This means that all of the warranties and all of the other devices of common law which are afforded to the purchaser, remain in the buyer, and they can be exercised against the manufacturer.

In the Senate's floor consideration of the Conference Committee report, on August 31, 1966, at p. 21487, Sen. Magnuson, Chairman of the Senate Commerce Committee, explained the Senate's acceptance of the House-originated language of 108(c) as follows:

> The Senate conferees accepted the House provision that compliance with Federal standards does not exempt any person from common law liability. This

> provision makes explicit, in the bill, a principle developed in the Senate report. This provision does not prevent any person from introducing in a lawsuit evidence of compliance or noncompliance with Federal standards. No court rules of evidence are intended to be altered by this provision.

The "principle developed in the Senate report" - Report To Accompany S.3005, June 23, 1966 - was as follows:

> ...the Federal minimum safety standards need not be interpreted as restricting State common law standards of care. Compliance with such standards would thus not necessarily shield any person from product liability at common law.

Later in the same debate (p. 21490) the ranking minority member of the Committee, Sen. Cotton, a strong supporter of the legislation, characterized 108(c) as follows:

> The Senate conferees also yielded on a provision, inserted by the House, declaring that compliance with any Federal standard does not exempt any person from liability under the common law. Nevertheless, it seems clear and was, I believe, the consensus of the conferees on both sides, that proof of compliance with Federal standards may be offered in any proceeding for such relevance and weight as courts and juries may give it.

The clear intent of the Senate acceptors of the House language was that automobile manufacturers should have the right - which they had sought as the Act took shape - to introduce evidence of compliance with federal vehicle safety standards for the consideration of the court and the jury in tort suits. The assertion of that right, and the Senate's concern for its protection, would have been made largely unnecessary by a Congressional intent that 103(d) had been to preempt all such suits involving Federal vehicle safety standards.

It is clear from the language of the statute, the intent of its framers, and the subsequent actions and interpretations of DOT that these provisions in no way erect preemptions of tort claims in actions against motor vehicle manufacturers for failure to provide passive restraints or failure to provide shoulder as well as lap belts for rear seat occupants, even though they may have complied with the minimum standards governing provision of restraint systems.

Mr. KLECZKA. Which gentleman prefers to go next? Mr. Kelley.

Mr. KELLEY. Mr. Chairman. I'm going to submit my full statement for the record, but I would like to summarize it and underscore for you the research that we have conducted that emphasizes the severity of the problem and the failure of manufacturers so far to take steps—long needed steps—to solve it.

The Institute for Injury Reduction has completed two research projects that bear on this issue and we're presenting them for the first time at this hearing. They're described in full in attachments to my testimony and I will summarize them briefly now.

First, we conducted a series of frontal impact tests to compare lap-only and lap/shoulder belts in terms of their differences in producing potentially injurious forces to the abdominal, lower spinal column, and head areas of rear seat occupants. At the conclusion of my statement, I will show you a brief videotape of one of these tests.

Second, we undertook a survey of 30 new car dealers across the country to determine the extent to which the manufacturers are actually making available retrofit rear seat lap/shoulder belt systems to car owners who want to purchase them, something many of the manufacturers say they are doing today. The survey's results indicate however that by and large, manufacturers and their dealers are failing to make such retrofit rear seat protection available to car owners.

As I say, we questioned 30 dealerships in urban areas across the country divided equally between Chrysler, Ford, General Motors, Nissan, and Toyota. We found that not one of these dealers had a retrofit rear seat lap/shoulder belt system in stock. We found that 21 of the 30 dealers had no such systems available and said they could not be ordered.

Only eight—five of them GM dealers and three Toyota dealers—said that the systems could be ordered. Prices per car for rear lap/shoulder belts, that is for both outboard rear seat positions, both the left and the front, ran between $99 and $400 for the various GM dealers and were $156 for each of the Toyota dealers.

That is not inclusive of labor rates and installation rates which might run, it was indicated, as much as $180 to $200 per car. The conclusion is inescapable from these findings that manufacturers have failed to undertake vigorous production, marketing, pricing and installation programs aimed at substantially increasing the availability of retrofit rear seat lap/shoulder belts to American car owners.

Our survey indicates that General Motors has done better than the others. Yet even General Motors has placed pricing and delivery time conditions on the belts which frustrate rather than encourage their purchase by GM car owners. Nor does GM or any other manufacturer appear to be informing car owners of the hazards associated with rear lapbelt-only use or aggressively promoting sales of the lap/shoulder belt alternative.

Meanwhile the data, including General Motors' own data, which is included in Mr. Coben's testimony as an attachment, make it clear that the risk of death and injury in crashes for rear seat motorists is greatly reduced when lap/shoulder belts instead of lap-only belts, are made available.

Unless the car companies and NHTSA undertake a national effort to get both warning information and retrofit rear belt systems to the motoring public, rear seat occupants will continue to face unacceptable levels of exposure to harm in car crashes. We call on the companies and on NHTSA, therefore, to do the following: To disseminate data, crash test results, and other information directed at educating motorists as to the dangers of rear seat lapbelts and the possibilities of alternative rear lap/shoulder belts; to develop production plants for effective, widely available rear lap/shoulder retrofit kits; to undertake vigorous programs to advertise and market those kits and to ensure that they are in stock at dealers at all times; to price the retrofit kits at bare-bones, no-profits, levels to encourage rather than frustrate their sale; and finally, to place warning labels and issue warning information to the owner of every car that does not have a rear shoulder belt as to the increased hazards associated with the lapbelt-only.

These actions would represent an important step toward reducing the likelihood that as more and more rear seat occupants wear their safety belts, more and more of them will be needlessly killed or hurt in crashes because the belts are lap-only and not lap/shoulder.

With your permission, I will show the video, if you would like to see it, of our crash test.

Mr. KLECZKA. Please do.

Mr. KELLEY. Mr. Chairman, attached to my testimony is a detailed discussion of the crash test we ran. I'm going to show you an excerpt here from a test run at approximately 32 miles per hour. Please begin, yes.

[Videotape was shown.]

Mr. KELLEY. Thirty-two miles an hour, involving two 6-year-old child test dummies, one with lap-only protection, simulating the rear seat system, and one with lap/shoulder belt protection. I suggest here that you keep your eyes on what happens at the waist area, what happens at the abdominal and lower spinal cord area to these dummies, each with these two different systems of protection in the rear seat.

These tests, as this title indicates, were conducted in April for us and we used standard equipment, 1987 Honda rear seat lap and lap/shoulder belt systems along with, of course, a Honda seat. We're looking at 6-year-old child dummies, 32 miles per hour. The dummy to your right is seated, wearing a lap/shoulder belt combination. The dummy to the left is wearing a lapbelt-only. Notice that the dummy at the right has had its forward excursion curtailed by the shoulder belt.

The forces are spread very evenly across the body and now we'll get a close look at the lapbelt-only dummy. We'll see it from a number of views, twice for each view so that you'll have a good look and we can stop the action if you so request.

You will sense from this shot the tremendous amount of force which is being applied to the very delicate lower abdominal area of what could be a real child in a real crash—force that exceeds that on the waist of the lap/shoulder belt dummy by 60 percent. In some of our tests with adult dummies, the forces were as much as four times greater on the laps of the lapbelt-only dummies.

Notice here——

Mr. KLECZKA. On the video, there is no front seat. Now, possibly for the child and definitely for an adult, what is the effect of the person hitting the back of the front seat?

Mr. KELLEY. It would probably be to aggravate the excursion since you would now have the head impacting something. Best that the head impact nothing. Nonetheless, you still have, in a forward crash, tremendous forward movement of the seat and the people in the front so that excursion continues and we know from real life cases that injuries to the lower abdominal area and the lower spinal cord are coming out of just this kind of performance in real crashes.

Again, we see this tremendous amount of force on the waist and the dummy is flung forward all the way.

Mr. COBEN. To answer a little bit more specifically, in terms of the head injury issue, the presence of those seat backs would undoubtedly cause an increase risk of head injury if the child or person were to strike the rear seat back, because they're not really padded.

Mr. KELLEY. Here we're seeing the counterpart child wearing the lap/shoulder belt and you see here that the forces are distributed and we'll see it from the side in a moment, the forces are distributed very evenly across the upper torso and the lower part of the body and as I say, the actual measured pounds of loading on the lapbelt were reduced by 60 percent if you want to put it that way in this crash for the child.

So the risk of injury would have been substantially reduced. This will be the last view that I will show you and then we'll show the next tape. This tape runs longer, but I'm going to cut it off here because I think we have made our point. Again, the shoulder belt dummy is coming back, he's been nicely restrained across his body. The lapbelt dummy in the rear—all right—you can cut it off, please. I want to show you now, in conclusion, a brief piece of tape from Government footage, a test series, an extensive test series run by the National Highway Traffic Safety Administration in November but not yet officially released. In this test, the Government has looked at lap and lap/shoulder belt comparisons.

The Government's report has not been issued, but we have been given a draft of the report. The Government should submit it for the record of these hearings. As our tests showed, these tests show tremendously increased loadings on average for the lapbelt-only dummies in the abdominal area compared to the lap/shoulder belt dummies.

Mr. KLECZKA. Who authored the report?

Mr. KELLEY. This is a National Highway Traffic Safety Administration report but it has not been published yet. We have a draft of the report and we have been given a copy of the film. Notice here, the dummy's forward excursion, which hits the lapbelt so violently that the lapbelt breaks. It breaks after measuring an average loading on the belt of more than 2,200 pounds, which is as much as three times that measured on a lap/shoulder belt dummy.

Here is a very good close shot of all of that force at the waist, which is finally so great that it breaks the lapbelt. That's enough. Mr. Chairman, that concludes our direct presentation.

[The prepared statement of Mr. Kelley follows:]

STATEMENT OF ALBERT BENJAMIN KELLEY
PRESIDENT, INSTITUTE FOR INJURY REDUCTION
BEFORE A HEARING OF THE
GOVERNMENT ACTIVITIES AND TRANSPORTATION SUBCOMMITTEE,
HOUSE GOVERNMENT OPERATIONS COMMITTEE
INTO
'SEAT BELT SAFETY: NHTSA OVERSIGHT'
JUNE 23, 1988

Madam Chairwoman, Members:

I am Albert Benjamin Kelley, president of the Institute for Injury Reduction. With me today is Larry E. Coben, IIR's chairman, and Harold Sakayan, a founding member of IIR. We are appearing in response to the Subcommittee's request for testimony bearing on the subject of these hearings.

It has been known and widely publicized for decades that seat belts can prevent deaths and injuries in crasnes. Reflecting this knowledge, the National Highway Traffic Safety Administration for twenty years has required the installation of belts in new cars. More recently, state governments, at the urging of NHTSA and the car companies, have begun to enact laws requiring belt use. More than 30 states have passed such laws to date, including some that require rear belts to be worn.

It has also been known, but not widely publicized, that lap-shoulder belts do a much better job of providing protection against injury than lap-only belts. In fact, it has been known since the mid-1960's that lap belts alone can cause or aggravate injuries - including fatal injuries - thus becoming agents of harm rather than protectors against it. Attachment B to Mr. Coben's testimony provides details.

Current federal standards require lap-shoulder belts in the front but not the rear seats of new cars sold in America. Standards in many countries abroad require lap-shoulder belts in rear seats as well, but the U.S. federal standards mandate only lap belts for rear seat occupants. Although the National Highway Traffic Safety Administration recently began looking at the possibility of future requirements for such belts in the rear seats of new cars, its current proposals are vague and unpromising.

Thus more than 100 million cars today are operating on the U.S. highways with only lap belts in the rear seats. Yet other than the publication by the National Transportation Safety Board of its July 1986 study, "Performance of Lap Belts in 26 Frontal Crasnes," no action has been taken by the government or the manufacturers to warn owners and occupants of these cars that the belts may do them more harm then good if a crash takes place.

Meanwhile, in crash after crash, children and adults are dying, being rendered paraplegic or quadriplegic, or suffering disabling injuries to their abdominal organs while wearing only rear-seat lap belts. In many of these same crashes the front seat occupants - some of them wearing no belts at all and others wearing lap-shoulder belts - are emerging unscathed or with relatively little injury. This makes it clear that the crashes are - or should be - survivable, and that rear-seat occupants could do as well as their front-seat counterparts if they were provided with lap-shoulder belt systems.

The Institute for Injury Reduction has completed two research projects that bear on this issue. They are described in full in attachments to this testimony, and I will summarize them briefly now:

1. We conducted a series of frontal impact tests to compare lap-only and lap-shoulder belts in terms of their differences in producing potentially injurious forces to the abdominal, lower spinal column and head areas of rear-seat occupants. At the conclusion of my testimony we will show you a brief videotape of one such test.

The results make it clear that rear-seat occupants who find themselves in frontal car crashes are exposed to much greater likelihood of fatal or serious injury when wearing lap-only belts than when wearing lap-shoulder belts. In our tests, the lap-belt-only systems regularly produced forces at the waist that were up to four times greater than those produced by lap-shoulder belt systems, and in two out of three tests the lap-belt-only systems produced Head Injury Criteria measurements two or more times greater than those produced by the lap-shoulder belts. (The complete test results are provided in Attachment A.)

2. We undertook a survey of 30 new-car dealers across the country to determine the extent to which manufacturers are making available retrofit rear-seat lap-shoulder belt systems to car owners wanting to purchase them.

The survey was intended to corroborate manufacturers' plans for the production and sale of retrofit rear-seat lap-shoulder belts. Those plans, reported by the car companies to the National Transportation Safety Board following its 1986 study, were summarized in an April, 1987 Board memo. (Attachment B.)

The survey's results indicate that by and large, manufacturers and their dealers are failing to make such retrofit rear-seat protection available to car owners.

The survey questioned thirty dealerships in urban areas across the country. (See Attachment C for the complete survey report.) They were divided equally between Chrysler, Ford, General Motors, Nissan and Toyota. Each was asked whether retrofit rear-seat lap-shoulder belts were available for both a 1987 model car and an early 1980s-model car and if so, on what price and delivery terms. Highlights of the survey's findings were as follows:

--Not one of the dealers had a retrofit rear-seat lap-shoulder belt system in stock.

--Twenty-one dealers said that no such systems were available. Only eight - five GM dealers and three Toyota dealers - said that the systems could be ordered. One Ford dealer said he "might" be able to get a system, but was unsure.

--Prices per car for rear lap-shoulder belts - that is, for both outboard rear-seat positions - were $99, $283 and $400 for the various GM dealers and $156.96 for each of the Toyota dealers. Installation prices varied from $100 to $180 per car; some dealers would quote only their hourly labor rates. The Ford dealer said he would refuse to install such a belt even if he could get it "because we are concerned about liability if it fails."

The conclusion is inescapable from these findings that manufacturers have failed to undertake vigorous production, marketing, pricing and installation programs aimed at substantially increasing the availability of retrofit rear-seat lap-shoulder belts to American car owners. Our survey indicates that General Motors has done more than the others, yet even General Motors has placed pricing and delivery-time conditions on the belts which frustrate rather than encourage their purchase by GM car owners.

Nor does GM or any other manufacturer appear to be informing car owners of the hazards associated with rear lap-belt-only use, or aggressively promoting sales of the lap-shoulder replacement systems. Meanwhile, the data - including data developed by General Motors - make it clear that the risk of death and injury in crashes for rear-seat motorists is greatly reduced when lap-shoulder belts instead of lap-only belts are made available.

Unless the car companies and NHTSA undertake a concerted, sustained national effort to get both warning information and retrofit rear belt systems to the motoring public, rear-seat occupants will continue to face unacceptable levels of exposure to harm in car crashes. We call on the companies and NHTSA, therefore, at a minimum to cooperate in doing the following:

--Disseminate data, crash test results and other information directed at educating motorists as to the need for and desirability of rear-seat lap-shoulder belt systems, and warning them of the dangers associated with lap-belt-only systems.

--Develop production plans for effective, widely available retrofit kits to replace existing lap-only belts with lap-shoulder belts in the rear seats of tens of millions of cars.

--Undertake vigorous programs to advertise and market the retrofit kits and to assure that they are in dealer stocks at all times.

--Price the retrofit kits at bare-bones, no-profit levels so as to encourage rather than frustrate their sale, and provide one-time free or very low-cost installation service.

These actions would represent an important step toward reducing the likelihood that as more and more rear-seat occupants wear their safety belts, more and more of them will be needlessly killed or hurt in crashes because the belts are lap-only and not lap-shoulder.

Today, the burden is on the car owner to find out whether a rear-seat lap-shoulder belt is available for his or her model - in fact, even General Motors, with a better record than the others, warns customers that they may have to "be persistent with your dealer" when trying to find such a belt for their car. (See memo in Attachment D.) NHTSA appears to have distributed only one piece of public information about acquiring retrofit rear belts. It is a one-paragraph assurance, in a "consumer information" pamphlet that urges belt use, that Chrysler, Ford, GM, Honda, Mitsubishi and Toyota "have retrofit kits available" for some models.* The pamphlet urges raders to "Buckle Up In The Back Seat."

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*The pamphlet directs consumers to "check with your dealer for details on whether your particular vehicle can be retrofitted with shoulder belts." But the fact is that because NHTSA requires rear shoulder belt anchorages, all vehicles can be retrofitted with the belts. The real issue is whether a particular manufacturer chooses to provide the belts - an issue which NHTSA has failed to address.

The burden is in the wrong place. It is time for the car companies and NHTSA to accept that burden - to "be persistent" in warning motorists of the hazards of rear-seat lap-only belts and providing them with a better alternative. The alternative is the lap-shoulder belt that has performed so well in the front seats of American cars -and the rear seats of cars in foreign countries - for years. The public's inability to obtain it represents a continuing threat to the lives and well-being of all rear-seat car passengers.

1/ 49 CFR Part 571, Docket No. 87-08: Notice 1, ANPRM, FMVSS; Occupant Crash Protection.

2/"Consumer Information: Buckle Up In The Back Seat." NHTSA, February, 1988.

Automotive Safety Testing, Inc.

Attachment A
PRODUCT LIABILITY-TESTING-CERTIFICATION

at TRC of OHIO, Bldg. #20
Rd. 152 & SR 33
East Liberty, Ohio 43319
Phone (513) 666-5191
Fax: (513) 666-5066

TEST REPORT

ACCELERATOR SLED TESTS:
COMPARISONS OF LAP, LAP-SHOULDER BELTED
REAR SEAT AUTOMOBILE OCCUPANT LOADINGS

Conducted by:
Automotive Safety Testing, Inc.
for:
Institute for Injury Reduction
at:
TRC of Ohio, East Liberty, OH

Approved:
Billy S. Peterson
President
June 13, 1988

INTRODUCTION

Automotive Safety Testing, Inc., performed a series of simulated crash tests at various moderate speeds using the 24-inch Hyge accelerator sled at the Transportation Research Center, East Liberty, Ohio, on March 31 and April 14, 1988.

The tests were performed for the Institute for Injury Reduction. The purpose of the tests was to determine the differences, if any, in lap belt loadings and HIC (Head Injury Criteria) results experienced in identical crashes by identical test-dummy occupants wearing lap belts only and, in comparison, wearing lap-shoulder belts.

TEST DESIGN, PREPARATION

All tests were performed using a rear seat assembly from a 1987 Honda Accord LX four-door sedan. Floor to seat distance, seat cushion and seat back angles replicated those of a real-world version of this model. Each left seating position was fitted with a new continuous-webbing lap-shoulder safety belt system - the standard unit provided by Honda as original equipment for this model. The retractor was installed at the same angle as found for a real-world version of this model.

The right seating position was fitted with a new manually adjustable lap belt - the standard belt provided by Honda for the rear seat center position in this model.

The fixed anchor points for both belts were installed as in a real-world version of this model. The belts were adjusted snugly around the lower abdomen of each dummy and the shoulder belt portion of the lap-shoulder unit was fully retracted, leaving no slack in the belt.

For each test, new sets of belts were installed in both positions.

The lap belt of each dummy was fitted with one or more seat belt load cells. The shoulder belts of the lap-shoulder belt dummies also were fitted with load cells. These cells provided a "belt force vs. time" trace at each position.

In addition, each dummy was instrumented with accelerometers mounted in the head. Three axis accelerations were measured and a Head Injury Criteria (HIC) result was obtained.

(The HIC measure was developed by the National Highway Traffic Safety Administration. The higher the HIC result, the more severe the expected injury outcome. For purposes of its crash test programs NHTSA considers a HIC measure of 1000 to equate to fatal injury.)

TEST PARAMETERS, RESULTS

Test results for the complete series are shown in the table on Page 6.

Test No. 1: Two six-year-old child test dummies were accelerated to an impact speed of 32.7 miles per hour. The lap-shoulder belt child dummy experienced a peak loading of 408.4 pounds on the outboard webbing of the lap belt. The lap-belt-only child dummy experienced a peak measured outboard-webbing loading of 658.5 pounds on the lap belt.

In other words, lap-belt loadings were 61 percent higher for the lap-belt-only dummy than for the lap-shoulder belt dummy.

HIC reading for the lap-shoulder belt dummy was 572.3. For the lap-belt-only dummy it was 689.3, or about 20 percent higher.

Test No. 2: Two 50th percentile adult male (Hybrid II) dummies were accelerated to an impact speed of 26.8 miles per hour. The lap-shoulder belt dummy experienced peak loadings of 537.1 pounds on the outboard webbing and 977.9 pounds on the inboard webbing, compared with peak loadings of 2350 pounds on the outboard webbing and 1195.2 pounds on the inboard webbing experienced by the lap-belt-only dummy.

In other words, outboard and inboard lap-belt loadings were 338 percent and 22 percent higher, respectively, for the lap-belt-only dummy than for the lap-shoulder belt dummy.

HIC measurement for the lap-shoulder belt dummy was 580. For the lap-belt-only dummy it was 2168, or 273 percent higher.

Test No. 3: Two 50th percentile adult male (Hybrid III) dummies were accelerated to an impact speed of 31.8 miles per hour. The lap-shoulder belt dummy experienced peak loadings of 778.7 pounds on the outboard webbing and 989.8 pounds on the inboard webbing, compared with readings at the same points on the lap belt of the lap-belt-only dummy of 1907.0 pounds and 2560.2 pounds.

In other words, outboard and inboard lap-belt loadings for the lap-belt-only dummy were higher by 145 percent and 158 percent, respectively, than for the lap-shoulder belt dummy.

HIC measurement for the lap-shoulder belt dummy was 1153.4, compared with a measurement of 2875.6 for the lap-belt-only dummy, or an increase of 149 percent.

5

CONCLUSIONS

The test results confirmed that in moderate-speed motor vehicle crashes, rear-seat occupants wearing only lap belts are exposed to substantially greater impact forces in the abdominal and lower spinal column area than occupants wearing lap-shoulder belts. This greatly increases their risk of sustaining severe injuries - including disabling or fatal injuries to the spinal cord and abdominal organs - in such crashes.

The results also showed substantial overall increases in head injury exposure for rear-seat occupants wearing only lap belts in such crashes when compared with those wearing lap-shoulder belts. This indicates a greater likelihood for lap-belt only occupants to sustain severe (quadriplegia, permanent brain damage) or fatal injuries in such crashes.

SUMMARY OF RESULTS

TEST	LAP BELT LOAD (LBS) Outboard	Inboard	SHOULDER BELT LOAD (LBS)	HIC
#1: 32.7 MPH - 6-Yr-Old Child				
Lap-Shoulder	408.4	-----	653.9	572.3
Lap Only	658.5	-----	----	689.3
% Increase	61			20
#2: 26.8 MPH - 50th %tile Male				
Lap-Shoulder	537.1	977.9	1412.8	580
Lap Only	2350	1195.2	----	2168
% Increase	338	22		274
#3: 31.8 MPH - 50th %tile Male				
Lap-Shoulder	778.7	989.8	1776.5	1153.4
Lap Only	1907	2560.2	----	2875.6
% Increase	145	158		149

MANUFACTURER ACTIONS ON REAR SEAT LAP/SHOULDER BELT RETROFIT, NEW CAR STANDARD EQUIPMENT, AND RESEARCH ON REAR CENTER SEAT LAP/SHOULDER BELT, as of end of April 1987

Manufacturer	Retrofit Kits	New Car Equipment	Rear Center
Alfa-Romeo	Avail for only model not std.	Std equipment on all but 1 model	Will consider
American Motors	Working to develop program	Medallion (87) std. eqpmt; Premier (88) perhaps	Work w/NHTSA
Aston-Martin	Yes	Std. eqpmt now all models	N/A
Audi (but see VW)	Not needed	Already std. eqpmt.	No comment
BMW	Not needed	Already std.; improved system on '88 7351	No; not needed; wd. interfere w/ outbd belts on 7351.
Chrysler	Avail. most models	Standard by 1990	Work w/NHTSA
Daihatsu	No cars sold U.S.	Studying	N/A
Fiat	No longer exporting to US		
Ford	Available for '88 and similar earlier models	Standard by 1990	Work w/NHTSA
GM (see also New United Motor Mfr'ing)	Available most models; advertising underway	Standard by 1989 (ads for new Corsica, Beretta feature)	Work w/NHTSA
Honda	Will be available; studying which models (more info "w/in next few weeks" -- 4/6/87)	Standard on Accord, Acura Legend; will provide in MY88 on Civic, Prelude, Acura Integra (i.e., all models)	No comment

Attachment B

Hyundai (Excel)	No (too much body modification required)	Considering making standard beginning early MY88	No comment
Isuzu	Available end of '87; will advertise	Next model change	Work w/NHTSA
Jaguar	No (too much body modification required on XJS)	Std. on XJ6 sedan since MY77; standard on all models MY87	Will consider
Mercedes-Benz	Not needed	Optional manual belts since '69; full retractor systems std. since '74 in US	Work w/NHTSA
MMC (Mitsubishi)	Considering	Std. on Galant since '85; willing to use in all models	No comment
New United Motor Mfring (Toyota/GM)	No comment	Std. on MY88 Chevy Nova; no comment re Toyota Corolla FX	No comment
Nissan	Integrated, continuous loop, self-storing systems available for all models	Maxima in '87, others by 1990	Work w/NHTSA
Peugeot	Not needed	Already standard	No comment
Rolls-Royce	Not needed	Standard since 1971	Reply unclear
Saab	Available for '81/'82 900's	Std. on 900's since '83, on 9000's since '85 (year intro'd US)	Work w/NHTSA
Subaru	Studying	Std. on next generation models	Work w/NHTSA
Toyota (see also New United Motor Mfr'ing)	Studying which models	Std. on Cressida, Camrys 1988, studying others for possible optional equipment	No comment
Volvo	Not needed	Standard in U.S. since '72	Option in 700 series sedans
VW	Considering ("will make whatever changes necessary to meet future req'ments")	Standard on Audi 5000S, 4000S, Coupe, VW Quantum since MY 82. "Majority" of VW/Audi lines by MY85. All sedan, wagon, and hatchbacks beginning in MY88.	No

INSTITUTE FOR INJURY REDUCTION
POST OFFICE BOX 376
DUNKIRK, MARYLAND 20754
(301) 855-9474

Attachment C

June 1988

A SURVEY OF NEW CAR DEALERS TO DETERMINE AVAILABILITY OF RETROFIT LAP-SHOULDER BELTS FOR REAR SEAT POSITIONS OF IN-USE CARS

By A. B. Kelley and Jon S. Vernick

Abstract: To determine the availability of retrofit rear-seat lap-shoulder belt kits, 30 new-car dealers in six major cities were contacted between June 1 and June 5, 1988. Each was asked about the availability of such retrofit belts both for a 1987 model and an older model for a total of 40 make-model-year combinations. The dealers represented Chrysler, Ford, General Motors, Nissan and Toyota - six dealers for each manufacturer.

Of the 30 dealers contacted, none had retrofit rear-seat lap-shoulder belt systems in stock. Twenty-one said no such systems were available. Eight said they were definitely able to order such belts - five GM dealers and three Toyota dealers. One Ford dealer said it "might" be able to order such belts. The remaining twenty-one dealers said no such belts were available from the manufacturer. Where belts were available, parts costs per car (both sides) ranged from $99 to $400. Installation costs varied widely, but in all cases where a firm quote was given they exceeded $100 per car. Waiting periods to obtain the belts ranged from two to 60+ days.

Background

The National Transportation Safety Board's publication in July, 1986, of its safety study, "Performance of Lap Belts in 26 Frontal Crashes," underscored the nature and seriousness of crash injuries to belt wearers that are associated with the lack of shoulder belts in the rear seats of automobiles. These include fatal and disabling injuries directly caused by the rear-seat lap-belt-only systems.[1]

At present the vast majority of the estimated 134 million cars on America's roads are equipped only with lap belts for rear-seat outboard occupants, unlike cars in many foreign countries where lap-shoulder belt systems have for some years been required in new cars for outboard rear-seat passenger positions.[2]

As public awareness of this problem has begun to take hold, an increasing number of American motorists are asking whether they and their families are better off travelling unbelted in the rear seats of cars equipped with lap-belt-only systems.[3]

Since there are hazards associated in some types of crashes with the non-use of rear lap-belt-only systems - such as complete ejection in rollover impacts - the question presents a painful quandary. Both non-use and use of lap-belt-only systems in the rear seats of cars can be hazardous, depending on the type of crash. Thus motorists, including parents of children who often are placed in the rear seat, are confronted with a "pick your poison" choice as to rear-seat lap-belt use or non-use.

Car owners and passengers ought not to be faced with such a choice - nor would they be if manufacturers provided retrofit three-point lap-shoulder belts to replace the rear-seat lap belts now found in most cars on the roads.

Federal regulations governing the minimum performance and installation of standard-equipment belts in new cars (Federal Motor Vehicle Safety Standard 208, 209 and 210) have been in effect for some twenty years.[4] At the outset the standards envisioned that manufacturers initially would sell and install optional retrofit rear-seat shoulder belts to buyers who wanted them, and that by the mid-1970s the manufacturers would be providing rear-seat lap-shoulder belts on all new cars as standard equipment.

A strong indication of the intent to encourage availability of retrofit rear-seat shoulder belts was the requirement, which took effect in 1972 in FMVSS 210, that manufacturers designate "anchorage points" for shoulder belts in the rear outboard seating positions of all new cars.[5] These points serve no other purpose than to accomodate shoulder belts that manufacturers would provide to new or used-car owners who want to reduce the likelihood of crash injury to rear-seat outboard-position occupants.

Yet until recently there has been little if any indication of manufacturer commitment, whether real or illusory, to produce, market, sell or install such retrofit lap-shoulder belt systems.

4

Following issuance of the NTSB report in 1986, some manufacturers indicated a change in attitude toward rear-seat lap-shoulder belts and voiced a willingness to provide such systems for both new cars and cars already in use. For instance, as of the end of April 1987, the following major manufacturers had reported to NTSB that they were or soon would be making retrofit rear-seat lap-shoulder belt kits on their older models (see Appendix A):

Chrysler, "available most models"; Ford, "available for 1988 and similar earlier models"; GM, "available most models; advertising underway"; Honda, "will be available"; Nissan, "integrated, continuous loop, self-storing systems available for all models," and Toyota, "studying which models."

Study Design

To determine the extent to which manufacturers in fact are making retrofit rear-seat lap-shoulder belt systems available for cars already in use, we surveyed car dealers in six major U.S. urban areas: Baltimore, Chicago, Los Angeles, New York, Philadelphia and Washington, D.C.

Five dealers in each city - one each representing Chrysler, Ford, General Motors, Nissan and Toyota - were contacted. The dealers were selected randomly from Yellow Page or local newspaper advertisement listings in their areas.

5

In the survey, conducted May 25-26, 1988, a telephone interviewer posed as the owner of two specific, popular make-models of automobile manufactured by the company represented by that dealer. One was a 1987 model. The other was an early 1980's model. Inquiries involved a total of 40 make-model-year combinations. (See Appendix B for a list of dealers and make-models involved in the survey.) Questions about the availability of the retrofit system were directed at the dealer's parts department, while questions about installation were directed at the service department. (See Appendix C for a sample of the questionnaire form used.) When initial questioning elicited a negative response, the interviewer was persistent in asking that the dealer employee check again to determine whether the system was available.

Results

The inquiries directed at the thirty dealers produced the following results:

--None had a retrofit rear-seat lap-shoulder belt kit in stock.

-Twenty-one said that no such kits were available. Only eight definitely were able to order such a kit. Of these, five were GM dealers and three were Toyota dealers. One Ford dealer indicated he "might" be able to order a rear-seat retrofit shoulder belt. The GM and Toyota dealers were certain the order would be filled; the Ford dealer was not. No Chrysler or Nissan dealer was able to order a retrofit belt kit.

--Each dealer that would accept an order for retrofit belts for the 1987-model car also would accept an order for the older car. No dealer would accept an order for one but not the other.

--Price of the belts per car (both sides) quoted by dealers who said they could order the units ranged from $99 to $400. Three GM dealers quoted a price of $99 per car; one quoted $282 per car, and the fifth quoted a price of $400 per car. All three Toyota dealers quoted identical prices of $156.90 per car. The single Ford dealer who said he "might" be able to secure a retrofit belt priced it at "around" $100 per car.

--Installation prices quoted by dealers who said they could order the units varied widely; in many cases the dealer declined to give a firm estimate and said the final price would depend on the time needed to install the units. One Toyota dealer quoted an installation price of $100 per car. A second quoted $180 per car, and the third would give no quote. Two of the GM dealers quoted prices of $175-180 per car; the other three provided only hourly rates, ranging from $40-44. The Ford dealer said he would refuse to install the belt even if it arrived "because we are concerned about liability if it fails."

--Waiting periods for retrofit kits that could be ordered varied widely as well. Of the five GM dealers, two estimated a waiting period time of 10 days, two 14 days, and one 21 days. Each of the three Toyota dealers estimated different waiting periods - 2, 7 and 14 days. The Ford dealer gave a period of 60 days "plus".

--All prices quotes appeared to be for rear-seat three-point retractor-mounted lap-shoulder belt systems which would replace the existing lap belt, rather than add-on shoulder belts which would complement it. However, the Ford dealer was unclear about the design.

Conclusions

Car owners who want to eliminate the hazards of rear-seat lap- belt-only travel for their families and friends will find it a hard or impossible task depending on the manufacture of the car they own. For Chrysler and Nissan owners, retrofit rear-seat shoulder belts simply weren't available. Although one Ford dealer responded that it "might" be able to get retrofit rear-seat shoulder belts, we believe that the five dealers who said they were unable to get such belts were typical; Ford owners should not expect to find such systems available from their dealers.

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The situation for General Motors and Toyota dealers was better, with most of the General Motors dealers and half of the Toyota dealers stating they could provide the belts. Buyers should not expect to walk into a dealer and purchase the belts, however, since the dealers do not stock these units and their promised delivery dates may run as high as three weeks from day of order.

Car owners who are able to find dealers that can provide the belts may be shocked by the prices they are asked to pay. In its recent Advance Notice of Proposed Rulemaking, the National Highway Traffic Safety Administration indicated that standard-equipment rear-seat lap-shoulder belts would add about $12 to the price of a new car.[6] In contrast, our survey found that the lowest cost available to a car owner wishing to buy and install two sets of retrofit rear-seat lap-shoulder belts would be $260 (Toyota dealer quote, $160 for parts and $100 for labor). Parts and labor prices quoted by some GM dealers brought that cost to above $400 per car.

The current parts and pricing policies of the major manufacturers, as indicated by this survey, make it clear that on balance the companies are not presently committed to providing retrofit rear-seat lap-shoulder belt systems to the owners of more than one hundred million cars in use that are now equipped with only rear-seat lap belts. This perpetuates the exposure of rear-seat belt wearers to great and needless

risk of injury in crashes - a risk that could be substantially reduced if manufacturers would undertake vigorous and sustained efforts to supply, price and market rear-seat retrofit shoulder belt systems so as to stimulate rather than frustrate their purchase by car owners.

References:

1. National Transportation Safety Board, "Performance of Lapbelts in 26 Frontal Crashes, July 26, 1986.

2. Federal Highway Administration, Office of Highway Information Management, "Highway Statistics", 1986.

3. See e.g., Baskin, E. and Pearce, K. for WJLA-TV, "Unsafety Belts", May 12-13, 1988.

4. 49 CFR 571.

5. Id.

6. 52 FR 22818.

Appendix B: List of Dealers and Car Models Selected for the Survey

Baltimore Metro Area:

1. Jerry's Chevrolet, Baltimore, Md.
   1987 Chevrolet Celebrity
   1982 Chevrolet Chevette

2. Towson Dodge, Parkville, Md.
   1987 Dodge Lancer
   1982 Dodge Omni

3. Sherwood Ford, Baltimore, Md.
   1987 Ford Festiva
   1982 Ford Escort

4. Ritchie Nissan, Glen Burnie, Md.
   1987 Nissan Maxima
   1982 Nissan Sentra

5. Bill Kidd's Timonium Toyota, Baltimore, Md.
   1987 Toyota Corolla
   1982 Toyota Tercel

Chicago Metro Area:

1. Seip Chevrolet, Chicago, Il.
   1987 Chevrolet Caprice
   1982 Chevrolet Citation

2. Mancari's Oak Lawn Chrysler-Plymouth, Oak Lawn, Il.
   1987 Chrysler Fifth Avenue
   1982 Chrysler New Yorker

3. Lynch Ford, Chicago, Il.
   1987 Ford Tracer
   1982 Lincoln Town Car

4. Fergus Nissan, Skokie, Il.
   1987 Nissan 200SX
   1982 Nissan Sentra

5. Metro Toyota, Chicago, Il.
   1987 Toyota Cressida
   1982 Toyota Corolla

Los Angeles Metro Area:

1. Irv White Buick, Los Angeles, Ca.
   1987 Buick Century
   1982 Buick Skyhawk

2. Pasadena Chrysler-Plymouth, Pasadena, Ca.
   1987 Plymouth Sundance
   1982 Chrysler New Yorker

3. City Ford, Los Angeles, Ca.
   1987 Ford Tempo
   1982 Ford Escort

4. Long Beach Nissan, Long Beach, Ca.
   1987 Nissan Maxima
   1982 Nissan Sentra

5. Terry York Toyota, Encino, Ca.
   1987 Toyota Camry
   1982 Toyota Corolla

New York Metro Area:

1. Russel Buick, Roslyn, New York
   1987 Buick Electra
   1982 Buick Skylark

2. Island Chrysler-Plymouth, Mineola, New York
   1987 Pymouth Sundance
   1982 Chrysler New Yorker

3. Universal Ford, Long Island City, New York
   1987 Ford Escort
   1982 Ford Mustang

4. Manhattan Nissan, New York City, New York
   1987 Nissan Sentra
   1982 Nissan Stanza

5. Five Town Toyota, Lawrence, New York
   1987 Toyota Corolla
   1983 Totota Camry

Philadelphia Metro Area:

1. Southern Motors Chrysler-Plymouth, Philadelphia, Pa.
   1987 Chrysler New Yorker
   1983 Chrysler LeBaron

2. Pacifico Ford, Philadelphia, Pa.
   1987 Ford Tracer
   1982 Ford Escort

3. Campus Nissan, Philadelphia, Pa.
   1987 Nissan Pulsar NX
   1982 Nissan Stanza

4. Pitcairn Oldsmobile, Langhorne, Pa.
   1987 Oldsmobile Cutlass Ciera
   1982 Oldsmobile Firenza

5. Sloane Toyota, Glenside, Pa.
   1987 Toyota Celica GTS
   1982 Toyota Corolla

Washington, D.C. Metro Area:

1. Bill Ayares Chevrolet, Laurel, Md.
   1987 Chevrolet Cavalier
   1982 Chevrolet Citation

2. Anacostia Chrysler-Plymouth, Washington, D.C.
   1987 Chrysler Newport
   1982 Chrysler New Yorker

3. Ted Britt Ford, Fairfax, Va.
   1987 Ford Taurus
   1982 Ford Escort

4. Capitol Nissan, Washington, D.C.
   1987 Nissan Sentra
   1982 Nissan Stanza

5. Jack Taylor's Alexandria Toyota, Alexandria, Va.
   1987 Toyota Camry
   1982 Toyota Corolla

Appendix I

Survey Report Form

Dealer: Call Date:

Person Spoken To:

Car Model:

1) Do you have a (manufacturer made) rear seat shoulder belt in stock? (retrofit).

yes?_____ no?_____

a. cost for part? $_____ a. can you order one?

yes?_____ no?_____

b. when? _____ days

2) Will the dealer install it?

yes?_____ no?_____

a. cost for installation? $_____ a. who will install it?

b. how long to install? _____ days _____

Comments:

Attachment D

Information From General Motors

Dealer-Installed Rear Seat Lap/Shoulder Safety Belts

Revised dealer-installed optional outboard rear seat lap and shoulder safety belts are available for the following GM passenger cars.

	1976-1987	T	Chevrolet Chevette, Pontiac T-1000
	1977-1986	B,D,C (RWD)	Chevrolet Impala and Caprice, Pontiac Parisienne, Buick LeSabre and Electra, Oldsmobile Delta 88 and 98, Cadillac Fleetwood and De Ville
	1979-1985	E	Buick Riviera, Oldsmobile Toronado, Cadillac Eldorado
	1980-1985	K	Cadillac Seville
	1986	E,K	Buick Riviera, Oldsmobile Toronado, Cadillac Eldorado and Seville
	1980-1985	X	Chevrolet Citation, Pontiac Phoenix, Buick Skylark, Oldsmobile Omega
	1982-1986	A	Chevrolet Celebrity, Pontiac 6000, Buick Century, Oldsmobile Cutlass Ciera
	1982-1986	J	Chevrolet Cavalier, Pontiac J2000/ Sunbird, Buick Skyhawk, Oldsmobile Firenza, Cadillac Cimarron
	1985-1986	C,H	Buick Electra and LeSabre, Oldsmobile 98 and Delta 88, Cadillac De Ville
	1985-1986	N	Pontiac Grand Am, Buick Skylark and Somerset, Oldsmobile Calais
*	1978-1981	F	Chevrolet Camaro, Pontiac Firebird
	1982-1986	F	Chevrolet Camaro, Pontiac Firebird
*	1978-1986	G,A (RWD)	Chevrolet Malibu and Monte Carlo, Pontiac Bonneville and Grand Prix, Buick Regal, Oldsmobile Cutlass
*	1978-1980	H (RWD)	Chevrolet Monza, Pontiac Sunbird, Buick Skyhawk, Oldsmobile Starfire

* All current models

* = Availability date to be determined (except T - see above)

Be persistent with your dealer if it appears he is not familiar with the accessory availability. You may suggest the dealer call the local zone Parts Distribution Center for further information.

Dealer-installed rear lap/shoulder safety belt accessory packages will be made available for light trucks and vans. The availability date remains to be determined.

12-5-86

Mr. KLECZKA. OK, Mr. Kelley, how long have the major auto manufacturers been aware of the safety features of the rear lap-belt?

Mr. KELLEY. Well, as Mr. Coben said in his statement and as is supported by attachments to his statement and mine, that would be at least 20 years. The knowledge has been available from the medical and engineering professions. Let me show you, if I may, we have another tape which I brought with me, a piece of film prepared by Chrysler Corp., we don't know when but we believe it was in the late seventies and this was submitted to a docket of the National Highway Traffic Safety Administration. This is Chrysler's film statement about lap and lap/shoulder belts. You may find it of interest.

[Another videotape shown.]

Mr. KELLEY. Ironically, Mr. Chairman, Chrysler was one of the dealer systems in our survey which was totally unable to provide any kind of retrofit shoulder belt in response to our requests.

Mr. KLECZKA. OK, but this film didn't indicate any study or documentation on the rear lap——

Mr. KELLEY. No, this was directed at the front seat system, but as the statement was made and it's absolutely true, for every position in the car, lap/shoulder belts provide a higher margin of safety, substantially.

Mr. KLECZKA. In the questioning, after we hear from all the witnesses, we can also possibly talk about the airbags, I see Chrysler ads all over the newspapers on teaching an old dog a new trick, or something? Mr. Sakayan, I believe you're next sir?

STATEMENT OF HAROLD A. SAKAYAN, ESQ., INSTITUTE FOR INJURY REDUVTION

Mr. SAKAYAN. Yes, thank you.

I happen to have unfortunately a number of real life examples to give you today. The first one covers every base that we've seen and talked about this morning. It's an accident that happened right down here in Anne Arundel County a couple of years ago.

Four youngsters were in a 1985 American-made Ford Escort. Two girls up in the front, one was wearing a shoulder/lap belt, the other was wearing nothing. Two kids in the back seat, 11 years old and 14 years old, each put on their lapbelt. The car was involved in a head-on collision with a tractor trailer truck at rather low speeds.

Each of the vehicles were going about 22, 25 miles an hour which is about what you'd be having on a city street in a typical accident in town. When the dust settled, the girls up front, one wearing a shoulder/lap, one with nothing at all, had broken legs. The client that I had, Jimmy Garrett, 11 years old, ended up being paralyzed from the waist down for life. His best friend seated next to him died 6 hours later because he bled to death.

When they pulled the boys out of that Escort, the only mark that either of them had on their body was a purple welt that went across their abdomen around their belly button made by the seatbelt. There was not another mark of injury or contact anywhere except the belt.

Both boys were done in by their seatbelt. Neither of them would have suffered anything more than temporarily disabling injuries if they had had the good sense not to put anything on that day. Because they buckled up, one's under the ground, the other one's in a wheelchair for life.

Now, if you think that's sort of a freak occurrence, think about this. Ford makes the Escort in America and in Europe. In America, they have lapbelts-only in the back seat. We went over to Germany and brought a European Escort back here and lo and behold, they have shoulder/lap belts in the back seat of the car that they produce in Europe.

They were pressed about that. Why do you produce it one way in America and another way in Europe? Ultimately the response was we do it this way in America because we're not required to do anything more. We make it better in Europe because they make us, and that was their answer and if there is anything that I've come across that underscores the need for some sort of action more than that, I don't know what it is because the same company making the same car with two different configurations and not making it better here because they're not required to. That was their answer.

To give you a few other horror stories which are currently in our office now. All of these incidentally have come into being in just the last 6 months. Close by here, coming home from Bethany Beach 2 week ago, 2 weeks ago, four persons in their mid 60's driving—it happened to be a Ford product, but it was a 1983 LTD—as they entered Georgetown, DE, the man dozed in the middle of the afternoon, hit a telephone pole. The front seat passengers walked away from the accident. In the back seat there were two ladies, 65 years old, one of them had on her lapbelt, the other one had on nothing. The lady who had on nothing ended up with a broken wrist. The lady who had on the lapbelt died 7 hours later in Lewes Memorial Hospital—bled to death from the injuries caused internally by her seatbelt.

This was a low-speed accident. The only serious injury—happened to be a fatality—was to the person wearing a lapbelt. It's a laboratory case because right next to her was the same aged adult with nothing on. She ended up with a broken wrist.

You had a 6-year-old child. Well, down in South Carolina in January 1987, the mother was driving her 1987 Mercury station wagon. She had her 16-year-old daughter in the front seat with her and her 6-year-old son strapped in with his lapbelt in the left rear seat.

They ran off the road and hit a parked tractor trailer truck, right front corner to the back of the truck. The mother walked away with nothing. The daughter sitting in the front had some facial cuts. The young boy sitting in the back seat with that lapbelt on ended up with a brainstem injury. If you recall what you saw on the tape, when the accident happens with the lapbelt, your body jackknifes over, your head extends all the way down, which is what happened here. He made contact either with the floor pan or the back of the front seat and he ended up with a brain injury which has left him pretty much a vegetable for life.

Those examples could clearly have been avoided if there had been a shoulder/lap combination in place of the lapbelt-only. None

of those persons had any other mark of injury on them except that related directly to the seatbelt—the lapbelt.

The reason why the lapbelt is such a dangerous device and ought to be removed immediately or else augmented by the shoulder strap is there doesn't seem to be any minor injuries when you're involved with a lapbelt in an accident. It's almost all or nothing.

The typical seatbelt injuries that result from lapbelts alone involve spinal fractures, spinal cord injuries, abdominal musculature tearing, abdominal intestinal injuries, all of which are severe and the one that has proved to be fatal is a rupture or tear of the mesenteric artery and vein which is the blood supply for the bowels and it happens to be located at that level just around or above the navel which is where these belts tend to ride up and pull in on you.

I have other illustrations I can give you. I think in my statement I've set them all forward. Everyone of those cases have these features in common. The person who was injured was wearing a lapbelt-only. The person who was injured became far more seriously injured than anyone else in the car even those who were completely unrestrained or those wearing the shoulder/lap belt.

Everyone of the injuries that I've detailed in these seven cases could specifically have been avoided had the automobile been equipped with a shoulder/lap belt in lieu of the lapbelt-only. The saddest part of all of this is that since 1962 there has been a continuous stream of literature that has spewed forth from the automotive, the medical, the engineering, and the safety community. I believe the number is over 1,000 published articles that speak about the dangers associated with lapbelts.

That's a 26-year-run. That has been well-known by the auto industry who has contributed to it. There's nothing new about this and yet nothing has been done even though we've had 26 years of record in history. With your mandatory use laws, these cases are occurring much more frequently because as mommy and daddy get in the front seat and buckle up, kids who most often ride in the back seat are being told to buckle up too.

The problem is that mommy and daddy don't know that what they're telling their children to buckle up into is far less safe than what they're provided up front. Thank you.

Mrs. COLLINS [presiding]. Thank you.

[The prepared statement of Mr. Sakayan follows:]

TESTIMONY OF HAROLD A. SAKAYAN, Esq.
BEFORE A HEARING OF THE
GOVERNMENT ACTIVITIES AND TRANSPORTATION SUBCOMMITTEE,
HOUSE GOVERNMENT OPERATIONS COMMITTEE
INTO
'SEAT BELT SAFETY: NHTSA OVERSIGHT'
JUNE 22, 1988

Madam Chairwoman, Members:

I am Harold A. Sakayan, of the law firm of Margolis, Sakayan & Holtz with offices in the District of Columbia and the State of Maryland. We are currently representing a number of persons who have sustained serious or fatal injuries from rear seat lap belts and at your invitation will address that issue.

You have heard from Mr. Kelley and Mr. Coben on the general nature of the problem and now I would like to make it a little more personal by giving you some real world examples of tragic and unnecessary injuries and deaths that are resulting from an unsuspecting public heeding the admonition to Buckle Up.

First, my perception is that NHTSA has failed to provide leadership in the area of automotive safety and the minimum performance standards known as the Federal Motor Vehicle Safety Standards (FMVSS) have become the maximum which the industry will deliver because there is no-one that is demanding more of them, even when they know better.

The mission of NHTSA should be re-defined in clear and unequivocal terms so that they, the industry and the public will understand that NHTSA has an important leadership role and is expected to be out front on safety issues.

The issue of rear seat belts is a classic illustration of everything that is wrong with the present system and how it could be easily changed.

The seat belt system for the rear outboard seating positions was defined in 1968. The manufacturers were given a choice of using either a lap belt only or a shoulder/lap combination. Every U.S. manufacturer chose the lap belt only.

In 1972 NHTSA directed that anchorage points for rear shoulder/lap belt systems be installed in all domestic cars presumably because they felt the industry would voluntarily make the change.

We have been waiting sixteen years and still no auto manufacturer has attached a shoulder harness to the anchorage point that they must install in the rear of every car they manufacture.

NHTSA, instead of enacting a rule requiring this much needed improvement, has issued an advance notice of proposed rule making and the industry has responded by saying that if you don't require us to install the shoulder lap belt in the rear seats we will do it on our own when we get around to it probably by the mid 1990's No provision was made for the more than 100 million automobiles already on the street with lap belts only in the rear seats.

The European experience as well as the overwhelming weight of the engineering, safety, medical and automotive literature has clearly demonstrated that the shoulder/lap belt offers much greater protection to a belted occupant than the lap belt only, particularly in a frontal collision. This same experience and literature also demonstrates that certain injury patterns are the result of the lap belt and can be avoided by the shoulder/lap belt.

Lap belt injuries unfortunately are serious ones. Spinal cord injuries which result in paralysis; spinal column fractures; abdominal wall tears; devascularization of the bowels; internal hemorraghing; tears in the small or large intestines, etc.

All of these can be avoided by the addition of a small piece of cloth that crosses the body diagonally and keeps the upper torso restrained against the back of the seat. It can be done for approximately $12 to $20 per car. The entire cost is absorbed by the consumer.

In Europe shoulder/lap belts in the rear outboard seating positions have been common for over ten years now. Volvo installed them voluntarily almost twenty years ago.

Mandatory use laws have significantly increased the overall usage of seat belts in the U.S. and although

these laws pertain generally to the front seat occupants it seems that the rear seat passengers are also making use of the belts. Unfortunately, more of the rear seat passengers tend to be children. The increase in belt use has produced a corresponding increase in seat belt injuries.

Let's look at some examples of the price Americans are paying because NHTSA is unwilling to lead on the issue of automotive safety and our manufacturers refuse to act until they are compelled to, claiming that compliance with FMVSS is the most that can be expected of them:

August 29, 1985:

Jimmy Garrett, 11 years old, got in the back seat of a 1985 Ford Escort. His best friend and next door neighbor Chris Gaboury, 14, sat next to him. Jimmy buckled up and told his friend that he should also. Chris did.

A short while later they were involved in a low speed head-on collision with a tractor trailer truck. The two girls up front suffered a broken leg. One had on the shoulder/lap belt, the other did not.

Chris died six hours after the accident having bled internally from his lap belt injuries. Our client, Jimmy Garrett, was paralyzed from the waist down with a fracture of his L3/L4 vertebra and spinal cord damage. He also had his insides torn apart and lost most of his small intestine and a part of his large intestine. He happens to be in the hospital right now undergoing his fourth or fifth operation since the accident. He still blames himself for Chris dying because he was the one who insisted they should buckle up.

Cause of Injury: Jimmy's lap belt
Solution: Shoulder/Lap in rear seat

November 15, 1985:

Sonja Wood, 24 years old and a promising singer, buckled herself up in the rear of a Ford Pinto. The car was in a head on collision. Sonja suffered a fracture of

L3/L4 vertebrae and is paralyzed from the waist down for life. She also had a tearing of her abdominal wall.

Cause of Injury: Sonja's lap belt
Solution: Shoulder/Lap belt in rear seat.

July 25, 1986:

Tracy Stanciu, 20 years old, buckled herself up in the rear seat of a 1986 Ford Escort. The car was involved in a collision at an intersection. The driver suffered no injuries. The front seat passenger suffered a minor facial cut. Tracy suffered a fracture of the L2/L3 vertebra and abdominal injuries.

Cause of Injury: Tracy's lap belt
Solution: Shoulder/Lap belt in rear seat.

January 3, 1987:

Audrey Bergman, 30 years old, was riding in the rear of a 1984 Buick Century driven by her brother. Her mother was riding in the front passenger seat. The car was involved in a head on collision at low speeds. The driver suffered no injuries. The mother suffered a broken arm. Audrey suffered a fracture of her L4 vertebra.

Cause of Injury: Audrey's lap belt
Solution: Shoulder/Lap belt in rear seat.

January 16, 1987:

David Walters, six years old, was buckled up on the left mid-rear seat of his mother's 1983 Mercury Station Wagon when the car hit a truck parked on the shoulder. Mrs. Walters and her 16 year old daughter seated in the front suffered minor injuries. David suffered a brain stem contusion, left sided hemiplegia, among other things and is severely disabled.

Cause of Injury: David's Lap Belt
Solution: Shoulder/Lap Belt in rear seat.

April 27, 1987:

Beverly Differding, age 47, and three friends had just finished a round of golf near Palm Springs, California and were returning to their hotel. Beverly was buckled up in the right rear of a 1987 Oldsmobile Ninety-Eight. The car was involved in a head on collision on the left front corner. The driver died. The right front passenger survived and has essentially recovered from her injuries. Beverly suffered a fracture of L3 vertebra and spinal cord damage. She is now paralyzed from the waist down for life.

Cause of Injury: Beverly's lap belt
Solution: Shoulder/Lap Belt in rear seat.

June 1, 1988:

Priscilla Rice, 65, her husband and another couple were driving home from Bethany beach in the middle of the afternoon in a 1983 Ford LTD. Priscilla was buckled up in the right rear seat. The car struck a telephone pole at relatively low speed. The lady seated next to Mrs. Rice in the rear did not put on her seat belt. She suffered a broken wrist and other minor injuries. Priscilla died on the operating table about six hours after the accident from internal bleeding.

Cause of Injury: Priscilla's Lap Belt
Solution: Shoulder/Lap Belt in rear seat.

These cases are drawn from matters pending in our office and are representative of a much larger volume of cases that are now surfacing all over the country. They are matters on which we have been consulted just within the past few months. The common features which they share are:

1. Each rear seat passenger was using a lap belt.

2. The passenger using the rear seat lap belt suffered serious or fatal injuries.

3. The injuries were caused by the lap belt.

4. The injuries could have specifically been avoided with a shoulder/lap belt.

5. Each of the injured persons would have suffered lesser injuries if they had not used a seat belt at all.

6. The front seat passengers belted or unbelted, with one exception, suffered much less serious injuries even though almost every collision was a frontal type crash placing the rear seat passenger furthest away from the impact.

7. NHTSA during this entire time and for at least fifteen years before the first of this series of accidents knew that this type of injury could be caused by a lap belt.

8. Every automobile manufacturer involved knew for at least the same period of time that these types of serious or fatal injuries could be caused by a lap belt.

9. NHTSA and every domestic automobile manufacturer knew for at least twenty years that the shoulder/lap belt would avoid the injuries described in these cases.

10. NTSB in its 1986 study of 26 accidents, including the Garrett case, developed the same information as the study of our case files has disclosed.

11. NHTSA instead of acting on the NTSB recommendations that shoulder/lap belts be installed in all rear seats, has done nothing to acknowledge the problem or remedy the situation.

RECOMMENDATIONS:

A. That Congress enact legislation requiring shoulder/lap belts for the rear seats of all new cars beginning this year if NHTSA doesn't take action on this issue within the next 60 days.

B. That NHTSA issue a detailed warning regarding injuries caused by lap belts and compel all manufacturers to offer car owners retrofit kits within a 12 month period at no cost to the car owner.

C. That NHTSA be required to take into consideration safety standards from all over the world and adopt that which provides the greatest which provide the measure of protection.

D. That NHTSA be directed to require dynamic testing of all occupant restraint systems, passive or active, by independent laboratories and the results published.

Respectfully submitted,

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Mrs COLLINS Mr. Dewey.

STATEMENT OF ROBERT L. DEWEY, VEHICLE SAFETY STAFF, CENTER FOR AUTO SAFETY

Mr. DEWEY. Madam Chairman and members of the subcommittee. Thank you for the opportunity to testify on automobile rear seat shoulder and lapbelt safety. The Center for Auto Safety [CAF] is a nonprofit organization founded by Consumer's Union and Ralph Nader in 1970, CAS has been independent since 1972.

The subcommittee's oversight into the National Highway Traffic Safety Administration's [NHTSA's] inadequate efforts to encourage rear seat shoulder/lap belts is especially needed at this time. A 1986 report by the National Transportation Safety Board [NTSB] focused national attention on a real and all too common irony. seatbelts, which have so much potential and are relied upon to provide life-saving protection, can in some accidents themselves be the primary cause of death and serious injury. This is because in higher speed frontal collisions, which account for a substantial percentage of all crashes, wearing a lapbelt only concentrates the restraint effect in the lower abdominal region.

In these crashes, occupants restrained by lapbelts can suffer abdominal trauma and internal injuries which sometimes cause death. The NTSB report was and is important because of the timing of its release and the substance of its recommendations to NHTSA. While there have long been reports of lapbelt injuries, low belt usage rates have kept the number of such cases small. This allowed the problem to go uncorrected by NHTSA and virtually unnoticed by the American public. Today however, more Americans than ever before are wearing seatbelts—including rear seat lapbelts.

The NTSB report not only identified a growing safety problem, it contained two simple but crucial recommendations to NHTSA about actions that would reduce the number of lapbelt- induced injuries and make safety belts safer.

First, NTSB recommended NHTSA immediately initiate rulemaking to require automakers to provide shoulder/lap belts instead of lap-only belts in all new cars. The Board also recommended NHTSA encourage automakers to offer retrofit kits and enable consumers to convert lapbelts converted into the shoulder/lap design. It is NHTSA's response to these recommendations that I wish to discuss in the remainder of my testimony.

Today, nearly 2 years after NTSB's recommendations, NHTSA has still not formally proposed let alone adopted a rear seat shoulder/lap belt mandate. Further, NHTSA has done little to encourage the availability of retrofits.

Following NTSB's report, NHTSA delayed nearly 10 months before issuing a preliminary notice of proposed rulemaking. Even worse, the notice expressed skepticism about the need for a shoulder/lap belt requirement. Instead of concentrating on the safety benefits, NHTSA's notice emphasized the cost of a shoulder/lap belt requirement. CAS believes NHTSA's application of cost-benefit analysis is of limited value in this instance and as applied, is fundamentally flawed. NHTSA's analysis fails to even mention that

children are especially victimized by lapbelt-induced injuries. Not only are children much more likely to buckle-up than adults, NHTSA's surveys indicate children at up to age 20 account for two-thirds of all rear seat occupants.

Our concern for the disproportionate impact of lapbelts on children is not just statistical. The majority of lapbelt-induced injury reports we receive concern injuries to children. Since more and more States are passing mandatory seatbelt use laws that apply to rear seats and are amending child restraint laws to apply to older children in all seating positions, an increasing number of children are wearing rear seatbelts.

At least five States now require that all rear seat occupants buckle-up. Eight other States require older children to buckle up wherever they sit. It is especially tragic that NHTSA has been averse to requiring shoulder/lap belts even though these State laws will in certain accidents, sentence rear seat occupants including many children to a greater risk of death and serious injury than occupants wearing shoulder/lap belts or occupants wearing no belts at all.

This tragedy is compounded by the fact that there is today a familiar cheap and simple solution that would effectively eliminate lapbelt-induced injuries—a combination shoulder/lap belt. NHTSA not only fails to factor into its analysis the effect of lapbelts on children, the agency also places too great an emphasis on the minuscule cost of requiring shoulder/lap belts in the rear outboard seating positions of new passenger cars, a cost NHTSA estimates to be about $12.

Further, NHTSA appears to substantially underestimate the number of lives that would be saved by a shoulder/lap belt requirement. The notice emphasizes a NHTSA requirement may not be needed since many manufacturers have announced tentative plans to voluntarily install shoulder/lap belts in coming model years. CAS disagrees. First, some manufacturers may make rear shoulder/lap belts an option rather than standard equipment. Further, there is no guarantee that rear shoulder/lap belts may not someday be removed for competitive reasons.

Shoulder/lap belts are simply too important to be left to future marketing and competitive cost considerations of individual auto makers.

Mrs. COLLINS. Mr. Dewey, on that note let me remind you that your 5 minutes have expired. Your entire testimony will be made a part of the record and any further statement that you might want to make will come out in the question and answer session.

Mr. DEWEY. Let me just conclude by talking briefly about seatbelts retrofits. Besides failing to require rear seat shoulder/lap belts on new cars, NHTSA has not followed through to assure consumers can have cars they now own retrofitted with shoulder/lap belts. NHTSA's retrofit recommendation is especially important since virtually all of the approximately 80 million cars now on the road have only lapbelts in the rear seats.

The reports we receive from vehicle owners attempting to obtain shoulder/lap belts show that retrofitting is still not a viable alternative for the vast majority of consumers.

[The prepared statement of Mr. Dewey follows:]

STATEMENT OF ROBERT L. DEWEY
VEHICLE SAFETY STAFF, CENTER FOR AUTO SAFETY
Before the
GOVERNMENT ACTIVITIES AND TRANSPORTATION SUBCOMMITTEE
of the
HOUSE COMMITTEE ON GOVERNMENT OPERATIONS
Washington, D.C., June 23, 1988

Madam Chairwoman and members of the Subcommittee, thank you for the opportunity to testify on automobile rear-seat shoulder and lap belt safety. The Center for Auto Safety is a non-profit organization founded by Consumers Union and Ralph Nader in 1970 but is now independent of both. The Center works to improve vehicle and highway safety. I have worked on seat belt issues for the Center since 1984.

THE NATIONAL TRANSPORTATION SAFETY BOARD REPORT

The Subcommittee's oversight into the National Highway Traffic Safety Administration's (NHTSA's) inadequate efforts to encourage rear seat shoulder/lap belts is especially needed at this time. A 1986 report by the National Transportation Safety Board (NTSB) focused national attention on a real and all too common irony: seat belts, which have so much potential and are relied upon to provide life-saving protection, can in some accidents themselves be the primary cause of death and serious injury. This is because in higher speed frontal collisions, which account for a substantial percentage of all crashes, wearing a seat belt consisting of a lap belt-only concentrates the restraint effect in the lower abdominal region. In these crashes, occupants restrained by lap belts can suffer abdominal trauma and internal injuries which sometimes cause death.

The findings of the NTSB were not news to automobile safety experts. Internal analyses by automakers including Ford and General Motors, some dating back to the 1960's, noted the inferior performance of a lap-only seat belt as compared to a shoulder/lap combination.[1] A 1986 GM study found lap belts were only 7-18% effective in preventing fatalities as compared to 41% for shoulder/lap belts. The Center has been receiving reports of lap belt-induced injuries since our founding. Indeed, the Center petitioned NHTSA to require rear seat shoulder/lap belts in 1974.

The NTSB report was and is important because of the timing of its release and the substance of its recommendations to NHTSA. While there have long been reports of lap belt injuries, low belt usage rates kept the number of such cases small. This allowed the problem to go uncorrected by NHTSA and virtually unnoticed by the American public. The situation began to change, however, in the mid-1980's. Through advertising campaigns and pressure on state governments, NHTSA began aggressive efforts to encourage the public to buckle-up. Many states passed mandatory seat belt use laws and/or amended child restraint laws to require older children to buckle-up. Today, more Americans than ever before are wearing seat belts, including rear seat lap belts.

The NTSB report not only identified a growing safety problem, it contained two simple but crucial recommendations to NHTSA about actions that would reduce the number of lap belt-induced injuries and

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1. See, for example, "Protection Offered by Shoulder Belt," Intra-Office Communication," R.G. Snyder, Ford Motor Co., September 19, 1967, and "Seat Belt Use and Injury Patterns in Automobile Accidents," J.S. Kihlberg, et at., Automobile Crash Injury Research, Cornell Aeronautical Laboratory, December 1967.

make safety belts safer. First, NTSB recommended NHTSA immediately initiate rulemaking to require automakers to provide shoulder/lap belts, instead of lap-only belts, in all new cars. The Board also recommended NHTSA encourage automakers to offer retrofit kits to enable consumers to have their lap belts converted to the shoulder/lap design. It is NHTSA's response to these recommendations that I wish to discuss in the remainder of my testimony.

A SHOULDER/LAP BELT REQUIREMENT FOR NEW VEHICLES

Today, nearly two years after NTSB's recommendations, NHTSA still has not formally proposed, let alone adopted, a rear seat shoulder/lap belt mandate. Further, NHTSA has done little to encourage consumers to obtain or manufacturers to offer retrofits. Following NTSB's report, NHTSA delayed ten months before issuing a preliminary notice of proposed rulemaking. Even worse, the notice expressed scepticism about the need for a shoulder/lap belt requirement. Instead of concentrating on the safety benefits, NHTSA's notice emphasized the costs of a shoulder/lap belt requirement: "The agency is concerned that such costs are extremely disproportionate to the possible safety benefits."

The Center believes NHTSA's application of cost/benefit analysis is of limited value in this instance and, as applied, is fundamentally flawed. NHTSA's analysis fails to even mention that children are especially victimized by lap belt-induced injuries. Not only are children much more likely to buckle-up than adults, NHTSA surveys indicate children at up to age 20 account for 2/3 of all rear seat occupants. Our concern for the disproportionate impact of lap belts on children is not just statistical, the majority of lap belt-induced

injury reports we receive concern injuries to children.

In addition to the case of Jimmy Garrett, which will be discussed today by another witness, the Center has received other tragic reports describing lap belt-induced injuries to children. Last August, for example, Dr. Salvatore Orlando, a Pittsburgh pediatrician wrote to describe the severe lap belt injuries sustained by his sixteen-year-old daughter, Vicki. The accident occurred while Vicki and three friends were returning from a swim meet. All four occupants, two in the front seats and two in the back seats, were wearing seat belts when their vehicle, a 1984 Cadillac Eldorado struck a tree at 25 mph. According to the pediatrician, the two shoulder/lap belted front seat occupants "did not receive any serious injuries." In contrast, the lap belt-restrained girl, sitting next to Vicki, "received multiple fractures to her spine necessitating surgery to fuse her lower spine." Vicki Orlando suffered "severe injuries to her abdominal wall, spine, and intestines, necessitating resection of several segments of her small intestine and large bowel, and a colostomy."

Since more and more states are passing mandatory seat belt use laws that apply to rear seats and are amending child restraint laws to apply to older children in all seating positions, an increasing number of children are wearing rear seat belts. At least five states, including California, Wisconsin, Washington, Montana and Nevada, now require that all rear seat occupants buckle-up. Eight other states, including New York, Massachusetts, Maine, Oregon, Rhode Island, West Virginia, New Mexico, and Minnesota, require older children (ranging from up to ages 8-15) to buckle-up wherever they sit.

Yet it is especially tragic that NHTSA has been averse to

requiring shoulder/lap belts even though these state laws will, in certain accidents, sentence rear seat occupants, including many children, to a greater risk of death and serious than occupants wearing shoulder/lap belts or occupants wearing no belts at all. This tragedy is compounded by the fact that there is today a familiar, cheap and simple solution that would effectively eliminate lap belt-induced injuries: a combination shoulder/lap belt.

Unfortunately, NHTSA not only fails to factor into its analysis the effect of lap belts on children, the agency also places too great an emphasis on the minuscule cost of requiring shoulder/lap belts in the rear outboard seating positions of new passenger cars -- a cost NHTSA estimates to be about $12. Incidently, General Motors' (GM) rulemaking comment pointed out that this $12 figure was too high since it referred only to the first year costs of meeting a new requirement for current vehicles. GM's comment stated: "Current costs may not reflect efficiencies that might be possible if vehicles were initially designed to accommodate lap/shoulder belts . . . This is especailly true of light trucks and MPVs [Multi-Purpose Vehicles] . . ."

The cost/benefit analysis not only ignores the cases of lap belt-induced injuries suffered by children, it appears to substantially underestimate the number of lives that would be saved by a shoulder/lap belt requirement. NHTSA's fatality reduction estimates assume lap belts are 26% effective in preventing fatalities. Yet 1986 GM studies show lap belts to be only 7-18% effective in preventing fatalities. Even by minimizing the safety benefits of shoulder/lap belts, NHTSA estimates 80 fatalities and 2,585 injuries would be prevented annually by a shoulder/lap belt requirement and a 70% usage rate.

The notice also emphasizes a NHTSA requirement may not be needed since many manufacturers have announced tentative plans to voluntarily install, or make available as an option, shoulder/lap belts in coming model years. The Center disagrees. First, some manufacturers may make rear shoulder/lap belts an option rather than standard equipment. Further, there is no guarantee that rear shoulder/lap belts may not someday be removed for competitive reasons. Toyota, for example, installed shoulder/lap belts in rear seating positions of 1981-82 Cressidas but subsequently reverted to lap belts in 1983. Shoulder/lap belts are simply too important to be left to the future marketing and competitive cost considerations of individual automakers. A federal regulation would assure that by a certain date all models are equipped with shoulder/lap belts and provide NHTSA with an enforcement mechanism to assure compliance.

SHOULDER/LAP BELT RETROFITS FOR VEHICLES CURRENTLY ON THE ROAD

Separate from failing to require rear seat shoulder/lap belts on new cars, NHTSA has not followed through to assure consumers can have the cars they now own retrofitted with shoulder/lap belts. NTSB's retrofit recommendation is especially important since virtually all of the approximately 80 million passenger cars now on the road have only lap belts in the rear seats. The reports we receive from vehicle owners attempting to obtain shoulder/lap belts to replace the lap belt now in their rear seats show that retrofitting is still not a viable alternative for the vast majority of consumers.

Substantial problems exist both at the manufacturer and dealer levels. Reports we have received by consumers and review of service information manufacturers have issued to dealers, indicates that

retrofit kits are simply not offered by some automakers, including Ford, Volkswagen and Nissan. In other cases, retrofits are not available for all makes and models. Even General Motors, which appears to have retrofit kits available for many different models, does not make retrofits available for any of its Japanese imports.

Even when retrofit kits are made available, most manufacturers are doing little to inform consumers or dealers about their availability. Surveys conducted the Center for Auto Safety and others show widespread lack of dealer knowledge about retrofits. Regardless of whether or not the manufacturer offers a retrofit kit for a particular model, dealers may not even know they exist and will often tell consumers that they are unavailable. One of the only manufacturers encouraging consumers to install retrofits is Chrysler, which last fall informed owners "Chrysler Motors highly recommends these restraints."

Unfortunately, even Chrysler does not appear to make retrofits available for all vehicles. Last September, Zillah Davis of Elroy, Wisconsin, died in an automobile accident in which she was wearing a rear seat lap belt. Her husband, Louis Davis, recently tried to get shoulder/lap belts added to his Jeep Cherokee but was told they were not offered by Chrysler.

It is critical that NHTSA encourage consumers to ask for retrofits and press manufacturers to offer them and inform dealers of their availability. Some aftermarket automobile parts suppliers do offer generic retrofit kits and manufacturers have been required to provide anchorages for rear shoulder belts since 1972. However, consumers report that independent repair shops and even dealerships

are unwilling to install a shoulder/lap belt retrofit kit not issued by the manufacturer. If consumers cannot obtain retrofit shoulder/lap belts made by their vehicle's manufacturer, it is likely that they will not be able to retrofit their car at all.

Following the NTSB report, NHTSA told the Senate Commerce Committee that a final rule, which became effective September 1, 1987, would be helpful in retrofitting shoulder/lap belts. The regulation does not, however, enable consumers to get retrofit belts, it only requires manufacturers provide information in their owner's manuals about the availability of shoulder/lap belt anchorages.

The Center understands NHTSA lacks the authority to require aftermarket equipment, including retrofit belts, for vehicles in use. We do, however, believe the agency should do much more than it has been to encourage shoulder/lap belt retrofits. The Reagan Administration has agressively encouraged Americans to buckle-up through educational activities and promotion of mandatory seat belt use laws. Redirecting just a small percentage of these funds to a retrofit education campaign would be consistent with these efforts and is the logical next step. Finally, NHTSA should more agressively press automakers to make retrofits available and inform dealers that they exist.

Mrs. COLLINS. Why is retrofitting not acceptable to the vast number of car owners?

Mr. DEWEY. Substantial problems exist, both at the manufacturer and dealer levels. At the manufacturer level, some auto makers don't even make shoulder/lap belt retrofits available. We know for example that Ford, Volkswagen and Nissan don't currently offer them to consumers. At the dealership level, dealerships are reluctant to put in belts that are not offered by the manufacturer such as belts made by after market auto parts suppliers. That's a real problem for the consumer as well.

Mrs. COLLINS. Thank you. Mr. Sakayan, I was very interested in the illustrations you have given us about how lapbelt-only caused major injuries. Now, I'm sorry I was not here for the opening part of your testimony and had to leave because we were having a vote in the Energy and Commerce Subcommittee that I needed to go to, but did you by any chance mention the fact that you have made NHTSA aware of all of these things?

Mr. SAKAYAN. Well, what we did, Madam Chairwoman, is we filed a petition asking for a recall on the Escort because of a specific defect in their seatbelt system. The 120-day period by which they were supposed to make the decision expired on May 11.

As of yesterday, they have still not made a decision nor will they discuss the matter with us when we call them and ask what's happened to our petition. All I can say is that based on our experience up until now, not much has happened. They were prompt in sending someone out who did an initial investigation and we thought was impressed with what we had to offer but ever since it went beyond the first level, it's sort of sitting there in limbo at the moment.

Yes, we have tried to make them aware with our specific cases about these problems and whatever we can do to try and get some relief we've attempted, but I can say, without success, this far.

Mrs. COLLINS. Well, can anyone tell me why NHTSA would require companies to make anchor points for shoulder straps but not the straps themselves?

Mr. KELLEY. Well, Mrs. Collins, it was the clear intention of NHTSA when it set the anchorage requirement that two things would happen. One, that the agency itself within a year or so would require new cars to have rear seat lap/shoulder belts and second, that it expected the car companies to begin in good faith providing those retrofit kits for cars on the roads.

Neither one of those things has happened and we are now close to 20 years later. The agency's expectations were clearly spelled out in its policy documents at the time. In fact, I was in the Department of Transportation when some of those policy documents were prepared and somewhere along the way the ball has been totally dropped and the car companies have failed to live up to that expectation.

Mrs. COLLINS. Mr. Dewey, do you think there's an institutional bias against the back seat shoulder straps by NHTSA?

Mr. DEWEY. I think the requirement is long overdue. The requirement should have been promulgated in 1972 when shoulder belts were required for front seats. I think the problem has only become more acute in recent years as more people have worn rear

lapbelts and people have become aware of the injuries. I think that NHTSA has been slow to recognize the irony of States requiring rear seat occupants to wear lapbelts and not doing anything to assure that shoulder/lap belts are available.

Mrs. COLLINS. How do you suppose a company like Volkswagen for example, can get away with not selling rear shoulder seat straps for refitting older cars?

Mr. COBEN. Basically, it's a matter of whether there's a demand in the marketplace and without a demand in the marketplace, manufacturers choose not to provide these additional safety features as was——

Mrs. COLLINS. *But it's so inexpensive.* I think somebody testified it was $15 or $20, that's all it costs.

Mr. COBEN. That's true but we've seen that repeatedly over the years. It began perhaps early on in the seventies with airbags when manufacturers realized that the manufacture of these products in huge numbers would reduce the costs to virtually less than a radio but chose because of policy reasons and philosophic reasons not to deal with that.

The same thing was true of shoulder harness approach to things. There was some reference to Mr. Iaccoca and Chrysler and the airbag issues. Certainly in the early seventies, Mr. Iaccoca was an opponent to both airbags and shoulder harnesses in vehicles. He believed that that was unnecessary and the orientation of the industry has been that car crashes and their results are the product of individuals driving those vehicles.

The Government imposition of regulation belongs somewhere else and not on this industry that understands how to design vehicles to protect people.

Mr. KELLEY. Mrs. Collins, if I may, I think it's important to understand that without additional legislation, the National Highway Traffic Safety Administration has three distinct areas of existing authority that it has failed to use in this situation.

The first of those is that it can declare defective—declare inadequate—existing cars that do not have shoulder belts. That provides an incentive to the car companies to begin getting those shoulder belts out there so people can buy them and alerting people to their availability. It can require the belts for future new cars.

Finally, it can require that car companies warn—and the Government can do this by explicit requirement—warn through a placard and a brochure, owners of existing cars, of these hazards. Those are three areas of existing power that it has and it has failed to use any one of those areas. It has not done any one of those three things and it has known about this problem for a long, long time.

Mrs. COLLINS. Thank you. Mr. Nielson.

Mr. NIELSON. Yes. Mr. Sakayan. You mentioned that a lot of lives have been lost because they wore lapbelts. How many, if any, could you estimate have been involved in litigation—I'm going to change the question. How many lives do you estimate have been saved by wearing seatbelts as opposed to injuries caused by wearing lapbelts only?

Mr. SAKAYAN. We're talking about lapbelts in the rear seat of a car because——

Mr. NIELSON. Yes.

Mr. SAKAYAN. OK.

Mr. NIELSON. You gave us a picture that the lapbelts in the back seat in several instances caused deaths and serious injuries. How many serious injuries and deaths have been caused by not wearing seatbelts at all in the back seat?

Mr. SAKAYAN. I honestly don't know a statistic to give you there because I just don't. I have seen a symposium recently that was done last year on rear seat restraints, I believe it was the SAE in which the whole need for added protection was questioned because of the safer environment generally but I don't—I can't tell you how many people have gone out the rear window of a car because they weren't wearing any restraint at all.

Mr. NIELSON. You gave the impression—I'm not sure you intended to—but you gave the impression that it was better not to wear a seatbelt at all than to wear a lapbelt-only. Did you intend that impression?

Mr. SAKAYAN. Under certain circumstances, yes. If the lapbelt——

Mr. NIELSON. But we don't know the circumstance, when you buckle up in the back seat——

Mr. SAKAYAN. Let me explain that if I can——

Mr. NIELSON. When I decide whether to buckle up or not, what are my odds?

Mr. SAKAYAN. OK. The predicament is this. A lapbelt is designed to provide pelvic restraint and it functions best for that kind of a system when it comes at approximately a 45-degree angle to a person who is seated upright and it falls below the iliac crest, that top part of your hip bone somewhere around the area of what they call the anterior/superior iliac spine. It's a little hook out in front of the pelvis.

If the belt comes across there, then whatever protection it's capable of providing will fall on the largest bone mass you have in your body, the pelvis, and it is better able to absorb the forces that come out in an accident and also the pelvic bowl has the bladder and the lower part of your intestines in front of it but because of the way it is shaped, there is less likelihood that those are going to suffer serious injury.

As soon as it rides up——

Mr. NIELSON. But you still haven't answered my question. Is it better to wear a lapbelt in the back if that's all that's there? Obviously, if the shoulder harness is there, that's fine, but if there's only a lapbelt, should you or should you not wear it?

Mr. SAKAYAN. I'm answering it——

Mr. NIELSON. No, you're not.

Mr. SAKAYAN. Oh, I'm sorry. Let me try it this way.

Mr. NIELSON. Try just yes or no.

Mr. SAKAYAN. Yes or no depends on whether it comes across your pelvis or rides up higher. If the lapbelt when you strap it on rides high above the pelvis so that it comes across your abdomen around your navel for example, based on the cases I've had and this is not that many, but it's more than I think most other people

have had so far, I would say you're better off without it than with it.

If it rides down on the pelvis where it's supposed to be, then I would say use it as opposed to nothing and the reason I say that is if it's high, that's when it cuts in and does the damage that all of these L-3, L-4 fractures I've cited to you occur.

Mr. NIELSON. Of all the cases you've handled, how many have been the result of wearing the lapbelt-only versus how many you have had which were due to wearing nothing at all?

Mr. SAKAYAN. Well, I haven't taken a case where a person wasn't wearing anything at all, I mean these are only——

Mr. NIELSON. Mr. Coben.

Mr. COBEN. Yes, sir, if I may speak to that. I think there is an obvious generic answer which I think we ought to make and that is this. It is obvious that in low speed crashes whether you are in the front of a car or in the back of a car, you should be restrained. You should wear the available seatbelt system and that includes wearing the lapbelt if that's all that's available to you. We are not recommending that people abandon the available safety systems.

What we are saying is that in higher speed crash environments, and when I mean higher crash, we're talking about anything in excess of 30 miles an hour, there is an increased risk of harm to the person who is wearing that lapbelt-only. That doesn't mean that he doesn't have some benefit from it, but it's an increased risk.

Mr. NIELSON. I have about 15 questions and if each question takes that long to answer, I won't get through very many of them, but let me ask this question. If I were to take Mr. Sakayan's testimony verbatim and follow it, I could arge getting rid of seatbelt laws in every State in this country.

Especially with young children, you'll hurt them. Most of the people back there are young children and they are more apt to buckle up. Nebraska took out the seatbelt law largely because of this particular argument, and frankly, I think you're flirting with danger. Until you get the other in hand, I certainly wouldn't want to do anything or say anything that would discourage people from wearing seatbelts because I'm convinced lapbelts do help more than harm and that's the point I was trying to get across. I'd like—we're going to have another round are we not? OK, otherwise——

Mr. KELLEY. May I just address a brief comment to that, Mr. Nielson? I think the tragedy of this situation is that it's a "pick your poison" situation for the person in the back seat. The fact of the matter is in some crashes you are worse off and more vulnerable to death and injury with the lapbelt than without. In others you are not. I think our position is emphatically that we want to eliminate that choice as rapidly as possible and one component of eliminating that choice is educating people as to the better alternative and seeing that it's provided.

I don't know another way to do it than to have the Government and the car companies get out there and get those shoulder belts out and explain to people why that is superior protection.

Mrs. COLLINS. Mr. Kleczka.

Mr. KLECZKA. Question, Mr. Sakayan. You made mention in your testimony of a petition that was filed with NHTSA, the expiration date has come and gone and you've received no reply? What was the case in point? What was the petition actually——

Mr. SAKAYAN. The petition had to do with a recall of all Ford Escorts from 1984 on which have a particular modification to their rear lapbelt system that prevents them from providing pelvic restraint as it's defined in the law because it has a tendency to pull the belt up above the pelvis and what we sought was a correction of that particular defect which could be done just by taking a pair of scissors and snipping——

Mr. KLECZKA. OK, but the petition didn't address the issue that we're talking about today and that's the——

Mr. SAKAYAN. No, sir, it went to a specific defect in a particular model of car. It happened to have involved lapbelts, but not the larger question.

Mr. KLECZKA. OK, so as I understand it, all American made automobiles today do have the anchors in place, I'm assuming somewhere under the seat.

Mr. KELLEY. That's correct.

Mr. KLECZKA. And this was a requirement?

Mr. KELLEY. Yes, it was. It was a requirement that was adopted by the agency in anticipation of two things. One, that the car companies would offer optional rear shoulder belts to their car buyers and two, that the Government itself would soon be requiring mandatory rear lap/shoulder seatbelt systems for all new cars.

Mr. KLECZKA. And neither scenarios have played out?

Mr. KELLEY. Neither scenario has played out which has been a disappointment and a tragedy. I might, by the way, let you know that anchorage is not under the Government rule and its interpretation, the anchorage is not a device or a system. It is simply a place, a point, on the inner body of the car that is strong enough to carry the shoulder belt under the Government regulations. Manufacturers must designate that point and inform the consumer when the consumer wishes to put in a shoulder belt if there's a belt available, which usually there isn't.

Mr. KLECZKA. So what's the resolve to the problem? A mandate coming out of NHTSA that all automobiles sold after a certain date have these devices installed, is that——

Mr. KELLEY. Certainly for future new cars, NHTSA should be using its long existing regulatory authority to require that those cars have rear seat lap/shoulder belts in the outboard positions. For cars existing on the highways today and being driven by people, it should issue a warning to those people and an urging and a working with the car companies to be sure that retrofit rear seat shoulder belts are available at reasonable prices, meaning barebones costs, which should be perhaps $10.

Mr. KLECZKA. Thank you, Madam Chair.

Mrs. COLLINS. I get the impression from the hearing thus far that many automobile makers and dealers have been lax in advertising the availability of shoulder strap add-on kits for older cars. Would anybody have a reason for this?

Mr. KELLEY. I think, Mrs. Collins, you'll have to ask the motor vehicle manufacturer's association and the industry representa-

tives why, but the fact of the matter is that no car manufacturer and no car dealer is advertising the availability of those belts. None.

Mr. DEWEY. I would add to that, even for manufacturers who do offer retrofit belts, dealers just don't seem to know about their availability. Another problem is that some manufacturers do offer them but don't inform dealers of that fact so as a practical matter, if you call up and ask for retrofits even if they're available, chances are the dealer won't know about them and consequently he'll tell you they're not available.

Mrs. COLLINS. Are there shoulder harnesses in the back seats of the Chrysler minivans, do you know that have been sold each year?

Mr. KELLEY. There are shoulder harnesses in the rear seat of one Dodge Colt van, I believe it is called the Vista. That model is made, I believe, by Mitsubishi for Chrysler and it happens to have shoulder belts in the rear seat, probably because they are put there for export models going to other destinations that require shoulder belts. So buyers of those are lucky enough to get a rear seat shoulder belt but it appears to be totally by accident.

Mrs. COLLINS. And is that the only minivan that we're driving around in America today that has those shoulder harnesses?

Mr. KELLEY. To the best of my knowledge, Mrs. Collins.

Mrs. COLLINS. Do you think if there were to be active testing of back seatbelt systems by manufacturers that it would perhaps cause their earlier introduction if we aren't able to get legislation passed for some reason? Would that cause manufacturers to be more self-policing and begin to put them in?

Mr. COBEN. I can tell you from experience in past instances that the automobile industry has for the last 20 years been actively testing the belt systems in their vehicles. The automobile industry is well aware of the performance in crashes of existing restraint systems in those vehicles.

Mrs. COLLINS. For the record, let me ask a question. I see a lot of these baby seats that go on the back seat of cars and most of them are supported by the seatbelt that goes beneath the seat in some kind of way. How safe do you think those are?

Mr. COBEN. Do you mean in conjunction with specific seatbelt system?

Mrs. COLLINS. Yes. In a crash, you know you have this big thing, so tall, and you have a baby in it, and it's all sort of put in the back seat and set back on two little—or some kind of device and the seatbelt slips between those and that's supposed to lock the seat in place. Upon impact, it's supposed to keep the baby from getting harmed, but how can it because it's only supported at the back in most instances and you have the weight of the child, perhaps 15, 20 pounds. How safe is this device?

Mr. DEWEY. The devices vary obviously in their safety, depending upon how they're designed. There are devices that are built—child-restraint devices to accommodate and deal with a three-point system in the rear of vehicles which make them superior to simply depending upon the lapbelt-only system. So the variations in safety depend upon the design as well as the restraint system.

Mrs. COLLINS. But for the most part, when there is an accident and there's an infant in the back seat, then the infant usually is—is it safe to say the infant is usually not harmed upon the impact?

Mr. DEWEY. Clearly, child restraint systems add safety for that child, clearly.

Mrs. COLLINS. I have no further questions. Mr. Nielson?

Mr. NIELSON. Who formed the Institute for Injury Reduction and with whom are you affiliated?

Mr. KELLEY. Well, that's explained in detail, Mr. Nielson, in the first attachment to Mr. Coben's testimony, but in brief, the founders were plaintiffs' attorneys who have worked in injury cases and have become concerned about the kinds of injuries they've seen and the lack of their necessity. Our membership is open to anyone who believes in the mission of injury reduction.

Mr. NIELSON. Mr. Sakayan said he concentrates on lapbelt-only injuries. Is that the only thing you focus on?

Mr. KELLEY. Oh, no, not at all, Mr. Chairman.

Mr. NIELSON. What other products or product-related injuries do you——

Mr. KELLEY. Well, we're a new organization. We have been looking at among other issue areas, the rollover propensities of vehicles. We are looking at motor boat propeller injuries. We're going to be working far afield in this product-injury area. I believe Mr. Sakayan was referring to restraint system cases. I believe he also does other product cases, but I'm not really——

Mr. NIELSON. When a customer buys a vehicle, he accepts a certain amount of risk. He buys insurance for that risk. In your view, how much risk is acceptable in society and how much should we regulate to make sure that accidents don't happen.

Mr. KELLEY. Well, I agree with the mission of the Traffic and Motor Vehicles Safety Act of 1966 written and passed by this Congress as amended, and that mission is to take feasible technological steps within economic reality to reduce motor vehicle crashes——

Mr. NIELSON. Would you repeat that? Within——

Mr. KELLEY. I'm not using the exact words of the act——

Mr. NIELSON. Within economic reality——

Mr. KELLEY. I believe, in fact, I don't even think the act says economic, I believe it says feasible.

Mr. NIELSON. Should we consider cost-to-risk ratios as a measure of how much we can require?

Mr. KELLEY. I don't know what cost risk ratio you'd be referring to, Mr. Nielson. I think that the mission of the act is to do the best work possible to encourage the marketplace and the regulatory mechanism to do away with needless deaths and injuries in car crashes, the leading cause of death from birth to about age 60 in this country, far and away beyond all other health hazards including illnesses. I think that mission is well spelled out in the act, in the legislative history, and I believe everything we're saying here is four-square within that intention.

Mr. NIELSON. No, it's rather well-known that most accidents injure occupants in the front seat. Do you know what the breakdown might be between the accidents and injuries to front seat occupants versus back seat passengers?

Mr. KELLEY. I don't know the data offhand, but certainly those are available and I'd be happy to provide them to the subcommittee.

Mr. NIELSON. Would you do that?

Mr. KELLEY. Certainly.

[The information follows:]

Source: [illegible]

Chapter 7

Occupants

In 1986, 60,297 drivers were involved in fatal accidents. Table 7-1 provides the distribution of drivers by vehicle type, accident type, and age-group. The largest percentage of these drivers for 10 year age-groups was for the group between 15 and 24 years of age (32.5 percent). This was followed by the group between 25 and 34 years of age (26.8 percent). So, almost 60 percent of the drivers involved in fatal crashes in 1986 were under the age of 35. Table 7-1 also shows that as driver age increases, the proportion of their fatal crashes that are multi-vehicle also increases.

As Figure 7-1 illustrates, more passenger car occupants who lost their lives in fatal accidents were sitting in the left front seat (generally, the driver's seat) than in any other position. Forty-six percent of the occupants of this seat who were in passenger cars involved in fatal accidents died. The lowest proportion of deaths for all of the possible seating positions, front and back, was among occupants sitting in the middle rear seat. Of 1,465 occupants of this position, only 246 were fatalities (16.8 percent).

Figure 7-2 shows that non-passenger car occupants met similar fates. Of 24,378 occupants in the front left seat, 10,084, or 41.4 percent, died in the fatal accident. The lowest fatality rate occurred in the rear middle seat (15.1 percent).

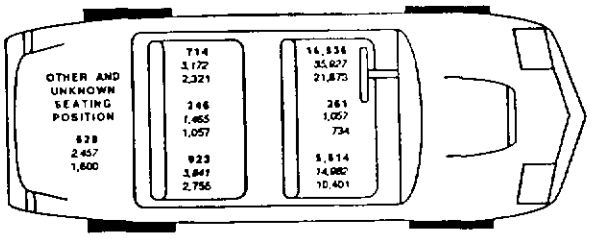
Table 7-2 shows that, of the 60,297 drivers involved in fatal accidents, more were involved in accidents on Saturday (19.4 percent) than on any other day of the week. The days on which the next greatest number of drivers were involved in fatal accidents were Friday (16.5 percent) and Sunday (15.1 percent).

Table 7-3 depicts drivers in fatal accidents by age-group and time of day. Drivers in the 25 to 34 age-group represented 26.8 percent of the total number of drivers involved in fatal accidents. Of these drivers, 22.9 and 22.2 percent were involved in crashes in the 4 p.m. to 8 p.m. and 8 p.m. to 12 a.m. time slots, respectively. In general, younger drivers had a much greater proportion of their fatal crashes at night compared to older drivers.

Table 7-1
Number and Percent of Drivers Involved in Fatal Accidents by
Vehicle Type, Accident Type, and Age-Group
(60,297)

	Under 15		15 to 17		18 to 20		21 to 24		25 to 34		35 to 44		45 to 54		55 to 64		Over 64		Total	
Vehicle Type	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Passenger Cars	44	0.1	2,395	7.3	4,417	13.1	5,420	15.8	8,757	26.7	4,107	13.1	2,421	7.6	2,441	7.8	1,795	11.5	31,174	100.0
Motorcycles	52	1.2	242	5.7	704	16.1	1,000	23.4	1,563	36.5	482	11.3	139	3.3	52	1.2	27	0.6	4,279	100.0
Other Motorized Cycles	39	15.4	42	16.6	35	13.8	37	14.6	44	19.0	25	9.9	8	3.2	9	3.6	17	6.7	253	100.0
Light Trucks	21	0.2	352	4.7	1,107	9.5	1,756	14.6	3,444	29.2	2,130	18.0	1,166	9.9	867	7.3	718	6.1	11,777	100.0
Medium Trucks	0	0.0	6	0.9	39	6.0	77	11.9	225	34.7	138	21.3	86	13.9	62	9.2	20	3.1	649	100.0
Heavy Trucks	0	0.0	9	0.2	56	1.3	333	7.7	1,431	33.0	1,277	29.2	816	18.8	414	9.6	54	1.2	4,331	100.0
Buses	0	0.0	5	1.8	4	1.4	15	5.3	66	23.5	88	31.3	69	24.6	30	10.7	4	1.4	281	100.0
Special Vehicles	35	2.0	109	6.3	175	10.0	263	15.1	536	30.9	293	16.9	142	8.2	97	5.6	80	4.6	1,736	100.0
Unknown	5	1.5	22	6.7	34	10.3	51	15.5	98	29.8	46	14.0	25	7.6	25	7.6	23	7.0	329	100.0
Total	196	0.3	3,562	6.0	6,885	11.4	9,130	15.1	16,163	26.8	9,235	15.3	5,079	8.4	4,017	6.7	4,001	8.5	60,297	100.0
Accident Type																				
Single-vehicle	98	50.0	1,735	48.7	3,377	49.0	4,160	45.6	6,717	44.3	3,198	34.6	1,652	32.5	1,419	35.3	1,166	29.1	24,143	40.0
Multi-vehicle	98	50.0	1,827	51.3	3,508	51.0	4,964	54.4	9,415	56.3	6,037	65.4	3,426	67.5	2,625	64.8	2,497	71.1	36,154	60.0
Total	196	100.0	3,562	100.0	6,885	100.0	9,130	100.0	16,163	100.0	9,235	100.0	5,079	100.0	4,017	100.0	4,001	100.0	60,297	100.0

Note: Vehicle type total includes 1,762 drivers of unknown age.



TOTAL
24,922 - **FATALITIES**
62,901 - **OCCUPANTS**
40,741 - **OCCUPANTS OF VEHICLES IN WHICH A FATALITY OCCURRED**

Figure 7-1
Passenger Car Occupant and
Fatality Seating Positions

Table 7-2
Number and Percent of Drivers Involved in Fatal Accidents by
Age-Group and Day of Week
(60,297)

	Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Under 15	43	21.9	21	10.7	15	7.7	24	12.2	20	10.2	29	14.8	44	22.5	196	100.0
15 to 17	543	15.2	427	11.9	356	9.9	415	11.6	387	10.8	689	19.2	765	21.4	3,582	100.0
18 to 20	1,302	18.9	679	9.9	710	10.3	743	10.8	781	11.3	1,149	16.7	1,521	22.1	6,885	100.0
21 to 24	1,568	17.2	1,002	11.0	940	10.3	974	10.7	1,118	12.3	1,503	16.5	2,014	22.0	9,120	100.0
25 to 34	2,445	15.1	1,913	11.8	1,906	11.8	1,984	12.3	2,088	12.9	2,601	16.1	3,223	20.0	16,163	100.0
35 to 44	1,230	13.3	1,217	13.2	1,133	12.3	1,234	13.4	1,213	13.1	1,513	16.4	1,695	18.3	9,235	100.0
45 to 54	647	12.8	665	13.1	705	13.9	705	13.9	701	13.8	851	16.8	795	15.7	5,070	100.0
55 to 64	494	12.3	542	13.5	555	13.8	559	13.9	558	13.9	674	16.8	635	15.8	4,017	100.0
Over 64	633	13.0	714	14.6	700	14.3	689	14.1	686	14.1	770	15.8	689	14.1	4,881	100.0
Unknown	221	19.3	115	10.0	95	8.3	125	10.9	124	10.8	184	16.0	284	24.7	1,148	100.0
Total	9,126	15.1	7,295	12.1	7,115	11.8	7,452	12.4	7,676	12.7	9,963	16.5	11,665	19.4	60,297	100.0

Note: Five drivers with unknown day of week are included in the total column.

Mr. NIELSON. NHTSA has been concentrating on the front seat because, with their limited resources, they can reduce injuries and deaths more by concentrating on the front seat rather than on the back seat, which is generally not used as often. Is that a proper approach on NHTSA's part, or do you think they've been ignoring the back seat entirely?

Mr. KELLEY. I don't think it's an either/or issue, Mr. Nielson. I think the issue is one of providing the best performing restraints within reason to all occupants of cars. Were we to take, for instance, that segmentation of back seat/front seat or left and right or driver/passenger, you can actually build a rationale that nothing should be done for anybody but the driver and eventually do away with everything that's done for the driver. Where do you stop? Where do you start?

Mr. NIELSON. Actually, the emphasis has been on the right hand passenger, the so-called death seat, and that's where most of the emphasis has been.

Mr. KELLEY. Actually, the emphasis has been most strongly on the driver with the energy managing steering column which was one of the earliest of our—I was then at the agency—of our requirements and other features in that area and of course, the airbag now being provided in cars is being provided in most cars, unfortunately, only for the driver, along with the knee bolster. My own belief is that NHTSA is correct to provide restraint systems—require restraint systems in the rear. It should be requiring the right kind of restraint systems and it's not doing that now.

Mr. NIELSON. Are the shoulder/lap belts which are currently on the market designed for children or for adults, or both?

Mr. KELLEY. Children under a certain size should be in child restraint seats and both the Government and the manufacturers so recommend and instruct. Children too high for those seats—too large for those seats but too small for lap/shoulder belts—should be in bolsters that raise them up to a proper height. Otherwise, those systems should be amenable to children.

Mr. NIELSON. But if they are raised up to a certain height so the shoulder belt works, doesn't that negate the effectiveness of the lapbelt—won't the lapbelt come too low?

Mr. KELLEY. No, in fact, it probably will augment its effectiveness by increasing the angle and moving it down on the pelvis.

Mr. NIELSON. I might have additional questions. I'd like to submit them in writing, if I may.

Mr. KELLEY. We'll be happy to answer them.

Mrs. COLLINS. We'd like to have the responses in a very timely fashion so that we can close the books on this particular hearing, please. Within the next couple of weeks would be fine, I think.

Mr. KELLEY. We'll be happy to do that, Mrs. Collins.

Mrs. COLLINS. Thank you. Mr. Kleczka?

Mr. KLECZKA. Thank you, Madam Chairman. We've talked about the lap and shoulder belts for the passenger in front, the driver, and then the two rear passengers by the door. What do you recommend for safety restraints for the center passengers on cars so designed?

Mr. COBEN. You will see in the attachment that I've provided you an article written by one of the leading engineers for Volvo in

which they have in fact designed and provided to all consumers a retrofitted kit for a shoulder harness system in the center position, the rear seats, of their automobiles.

That is also provided in a number of other European vehicles. We think that engineering knowledge is there so that safety can also be provided there. It's a question of statistics and where you begin—the design of safety and where the priorities lie. They certainly lie with the outboard seating positions but ultimately, as Volvo has done, there ought to be shoulder harnesses for all people seated in the vehicle.

Mr. KLECZKA. You're saying the technology is already developed?

Mr. COBEN. Oh, yes, sir.

Mr. KLECZKA. We're not remaking the wheel here.

Mr. COBEN. Yes, sir.

Mr. KLECZKA. During the testimony this morning, you indicated that the auto manufacturers on a voluntary basis will be putting in the rear lap and shoulder belts. Is this in fact accurate and how many manufacturers are going to move ahead with that program?

Mr. KELLEY. Well, the manufacturers have so stated to the National Highway Traffic Safety Administration. Again, the control——

Mr. KLECZKA. Effective when?

Mr. KELLEY. Well, effective they say, and don't hold me to this, sometime by 1992, I believe, they say they will be in all cars. I'm sure that the industry representative will be able to give you a more precise figure. The problem is that he who giveth may taketh away. These are the same car companies who began to provide airbags and airbag protection in the midseventies and said if you'll leave us alone from a regulatory standpoint, we'll do this voluntarily.

They gaveth for awhile and then they tooketh away for every year from then until about 2 years ago or 1 year ago and we still do not have airbags in most cars. It is the job of regulation and it is the purpose of the act to see that what the companies can do and the public needs, becomes codified in the regulatory process and that hasn't happened here.

Mr. KLECZKA. Give me an update on the airbag situation. Is that airbag design only to protect and provide additional safety for the driver or are they somehow positioned in the dashboard for other occupants in the front seat?

Mr. COBEN. The existing product on the market today, with the exception of perhaps one automobile manufacturer, is providing only protection for the driver with an airbag. One manufacturer, that is Porsche, is providing its vehicles at an option with the passenger side modem as well.

There are many automobile manufacturers that have suggested in the future—planning will be that same protection for the front seat passenger. I remind the committee that starting in 1973, the manufacturers that put airbags in vehicles at that time had systems for full frontal protection, both passenger and driver, two separate operations.

Mr. KLECZKA. In your estimation, is the airbag critical since all cars are now equipped with the lap and shoulder front seatbelts?

Mr. COBEN. We believe it is. We believe that the airbag provides supplemental and additional protection which is highly superior to seatbelt systems alone.

Mr. KLECZKA. Would you also prefer to see that a mandatory regulation?

Mr. COBEN. We would most definitely. What is happening here is that the industry is being provided with options of choice. They are electing—in the passive restraint options—they are electing to go with what they believe is feasible, practical, and less costly to them and to the consumer. What is happening, though, is we see that the industry is being forced because of consumer demand to go to airbags.

However, we're talking about a very slow introduction into the marketplace and in the meantime, people are dying.

Mr. KLECZKA. I have no further questions, Madam Chair. Thank you all.

Mrs. COLLINS. Thank you. Just for my own curiosity, I wonder if I can get an answer to this. Why is the diagonal shoulder halter more beneficial than perhaps a double shoulder halter?

Mr. KELLEY. It is not necessarily more beneficial, Mrs. Collins, and some of the attachments to our testimony suggest knowledge and engineering work within the industry showing that the double harness is even more effective than the shoulder belt. However, there has been the feeling within the industry and possibly the Government that many people would not use that system since it requires a good deal more action in order to get it on and keep it on and it may be regarded as more restrictive.

Technically, that is a better system even than the diagonal shoulder/lap combination.

Mrs. COLLINS. Thank you. I have no further questions. We thank you for your testimony this morning. You certainly helped to give us some idea of the severity of the problem. Our next witness is going to be Mr. Thomas H. Hanna who is the president of the Motor Vehicle Manufacturer's Association. Would you come forward please?

STATEMENT OF THOMAS H. HANNA, PRESIDENT, MOTOR VEHICLE MANUFACTURERS ASSOCIATION

Mrs. COLLINS. Mr. Hanna, you may begin your testimony at this time, please.

Mr. HANNA. Thank you, Madam Chairwoman. I am Tom Hanna and I'm president of the Motor Vehicle Manufacturers Association and I have a brief statement to make to the committee.

MVMA is a trade association whose members produce more than 96 percent of the motor vehicles manufactured in the United States. I'm here today to tell you about the domestic manufacturer's plans to install lap/shoulder belts in the outboard rear seating positions of passenger cars, light trucks and multipurpose passenger vehicles and to offer accessory kits for inservice vehicles.

MVMA members are committed to install those restraint systems. In fact, many of the 1988 models already include them. By 1990, virtually every car produced in the United States will be equipped with lap/shoulder belts in outboard rear seating posi-

tions. By 1992, practically all light trucks and multipurpose passenger vehicles also will be included in this effort.

Of course, those actions apply only to new motor vehicles. To extend the availability of these systems to vehicles already in service, MVMA members have designed accessory kits and notified their dealer service networks of the availability of outboard rear seating position kits for most models manufactured in the last 10 years.

Manufacturers have included information on accessory kits in national print advertising. It's contained in the owner's manuals and it's publicized regularly in speeches and in corporate communications by the manufacturing companies. In addition, the manufacturers communicate directly to dealers about their availability and the dealers have been made repeatedly aware of their availability.

Manufacturers have also cooperated with the National Highway Traffic Safety Administration in its efforts to produce consumer information about accessory kits. Domestic manufacturers have indicated to NHTSA in response to the advance notice of proposed rulemaking, that they would not oppose amendments to Federal Motor Vehicle Safety Standard No. 208, to require the systems they are already voluntarily providing.

There are however, additional issues raised in the notice that could if pursued to the level of regulatory requirements, disrupt manufacturers' schedules for introduction of these systems. For example, the agency has solicited comments on dynamic testing of belts and on the need for comfort and convenience requirements to promote their use. The multitude of issues that would need to be resolved for such requirements could seriously delay some manufacturers' schedules for introduction.

A greater incentive for rear seat lap/shoulder belt use would be mandatory State belt use laws that require both front and rear seat occupants to buckle up. Neither the availability of the belt system nor its effectiveness will produce results unless the belts are used. For this reason, MVMA car company members joined with other private sector interests to create Traffic Safety Now, Inc. [TSN], 4 years ago.

The sole mission of TSN is to encourage the widest possible use of safety belts through educational programs and enactment and enforcement of effective use laws in all fifty States. To date, TSN has expended over $58 million on this effort which has directly contributed to the fact that 32 States and the District of Columbia now have belt use laws in effect.

However, only eight of those laws cover rear seat passengers, two of which limit the rear belt use requirement to children. As the life-saving and injury prevention benefits of safety belt use laws become even more apparent than they are today, we're hopeful that soon every occupant of a passenger motor vehicle in all 50 States will be required to use safety belts.

This is a goal to which we remain committed. Madam Chairwoman, that completes my prepared statement and I thank you for the opportunity to appear here today.

[The prepared statement of Mr. Hanna follows:]

MVMA TESTIMONY
BEFORE THE
GOVERNMENT ACTIVITIES AND TRANSPORTATION SUBCOMMITTEE
OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
OF THE
UNITED STATES HOUSE OF REPRESENTATIVES

JUNE 23, 1988

My name is Thomas H. Hanna. I am president of the Motor Vehicle Manufacturers Association of the United States, Inc., a trade association whose members produce more than 96 percent of the motor vehicles manufacturered in the United States. I am here today to tell you about domestic manufacturers' plans to install lap/shoulder belts in the outboard rear seating positions of passenger cars, light trucks and multipurpose passenger vehicles and to offer accessory kits for in-service vehicles.

MVMA members are committed to install those restraint systems. In fact, many of the 1988 models already include them. By 1990, virtually every car produced in the U. S. will be equipped with lap/shoulder belts in outboard rear seating positions, and by 1992, practically all light trucks and multipurpose passenger vehicles also will be included in this effort.

Of course, those actions apply only to new motor vehicles. To extend the availability of these systems to vehicles already in service, MVMA members have designed accessory kits and notified their dealer service networks of the availability of outboard rear seating position kits for most models manufactured in the last 10 years.

MANUFACTURERS HAVE INCLUDED INFORMATION ON THE ACCESSORY KITS IN NATIONAL PRINT ADVERTISING AND IN OWNERS MANUALS AND PUBLICIZED THEIR AVAILABILITY IN SPEECHES AND CORPORATE COMMUNICATIONS. IN ADDITION, MANUFACTURERS COMMUNICATED DIRECTLY TO DEALERS ABOUT THEIR AVAILABILITY, AND COOPERATED WITH THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION IN ITS EFFORTS TO PRODUCE CONSUMER INFORMATION ABOUT ACCESSORY KITS.

DOMESTIC MANUFACTURERS HAVE INDICATED TO NHTSA--IN RESPONSE TO THE ADVANCE NOTICE OF PROPOSED RULEMAKING--THAT THEY WOULD NOT OPPOSE AMENDMENTS TO FEDERAL MOTOR VEHICLE SAFETY STANDARD (FMVSS) NO. 208 TO REQUIRE THE SYSTEMS THEY ARE ALREADY VOLUNTARILY PROVIDING. THERE ARE, HOWEVER, ADDITIONAL ISSUES RAISED IN THE NHTSA NOTICE THAT COULD, IF PURSUED TO THE LEVEL OF REGULATORY REQUIREMENTS, DISRUPT MANUFACTURERS' SCHEDULES FOR INTRODUCTION OF THESE SYSTEMS. FOR EXAMPLE, THE AGENCY HAS SOLICITED COMMENTS ON DYNAMIC TESTING OF THE BELTS AND ON THE NEED FOR COMFORT AND CONVENIENCE REQUIREMENTS TO PROMOTE THEIR USE. THE MULTITUDE OF ISSUES THAT WOULD NEED TO BE RESOLVED FOR SUCH REQUIREMENTS COULD SERIOUSLY DELAY SOME MANUFACTURERS' SCHEDULES FOR INTRODUCTION.

A GREATER INCENTIVE FOR REAR SEAT LAP/SHOULDER BELT USE WOULD BE STATE MANDATORY BELT USE LAWS THAT REQUIRE BOTH FRONT AND REAR SEAT OCCUPANTS TO BUCKLE UP. NEITHER THE AVAILABILITY OF THE BELT SYSTEM NOR ITS EFFECTIVENESS WILL PRODUCE ANY RESULTS UNLESS THE BELTS ARE USED.

FOR THIS VERY REASON, MVMA CAR COMPANY MEMBERS JOINED WITH OTHER PRIVATE SECTOR INTERESTS TO CREATE TRAFFIC SAFETY NOW (TSN)

FOUR YEARS AGO. THE SOLE MISSION OF TSN IS TO ENCOURAGE THE WIDEST POSSIBLE USE OF SAFETY BELTS THROUGH EDUCATIONAL PROGRAMS AND ENACTMENT AND ENFORCEMENT OF EFFECTIVE USE LAWS IN ALL 50 STATES. TO DATE, TSN HAS EXPENDED OVER $58 MILLION ON THIS EFFORT WHICH HAS DIRECTLY CONTRIBUTED TO THE FACT THAT 37 STATES AND THE DISTRICT OF COLUMBIA NOW HAVE BELT USE LAWS IN EFFECT. HOWEVER, ONLY EIGHT OF THOSE LAWS COVER REAR SEAT PASSENGERS--TWO OF WHICH LIMIT THE REAR BELT USE REQUIREMENT TO CHILDREN.

AS THE LIFE-SAVING AND INJURY PREVENTION BENEFITS OF SAFETY BELT USE LAWS BECOME EVEN MORE APPARENT THAN THEY ARE TODAY, WE ARE HOPEFUL THAT SOON EVERY OCCUPANT OF A PASSENGER MOTOR VEHICLE IN ALL 50 STATES WILL BE REQUIRED TO USE SAFETY BELTS. THIS IS A GOAL TO WHICH TSN AND MVMA REMAIN COMMITTED.

I APPRECIATE THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY.

Mrs. COLLINS. I can't help but wonder why it's taken the manufacturers so long to get around to doing something about shoulder belts in the back seats?

Mr. HANNA. The effectiveness of any safety belt system depends mostly on whether or not it is used. There are data published, for example, in the advance notice by NHTSA that as recently as 1982 for example, only about 2 percent of the population used the belt systems that were in the back seats of cars.

Mrs. COLLINS. But is that a reason why the manufacturers should not make sure that they have the safest kind of automobile?

Mr. HANNA. Yes, ma'am, and I was going to continue to get to that point. It is this. There is also an ample body of evidence that indicates that the more complicated you make the belt system, the more cumbersome to use, the less likely people are to use it. And if by introducing a lap and shoulder harness system that might make people less likely to use it rather than the lapbelts that are in place, you wouldn't advance the cause of safety at all.

There is a related point to this. You've heard testimony this morning about the relative effectiveness of the lapbelt and the shoulder/lap belt combination. It is true that there is an incremental increase from the belt across the shoulder and it is for that reason that the manufacturers are now voluntarily introducing this. The point is it's not as great a discrepancy as I think you've been led to believe. If you look at the analysis that was done——

Mrs. COLLINS. Well, that's not my question. My question is why is it that manufacturers haven't put in a shoulder halter in the back seats on the outboard of automobiles, knowing that they would in fact be safer and with a cost that's so minimal. According to what we've heard now, the costs run $15 to $20. Is that the case?

Mr. HANNA. I wouldn't dispute that number. It's——

Mrs. COLLINS. So, for $15 or $20, they can make an automobile that is apparently safer and yet they've refused to do so and I want to know why.

Mr. HANNA. It's safer if people will use them.

Mrs. COLLINS. Well, it's not your—it's not the manufacturer's decision whether or not the people will use them. I believe it's the manufacturer's responsibility to make sure they make an automobile that is as safe as possible and if there is knowledge that a seatbelt with a shoulder halter in the back seat is more safe and for $20, they ought to put it in there without determining whether or not somebody's going to use it. The assumption should be that they are going to use it.

Mr. HANNA. It is for that reason, rising use rates, that manufacturers are doing it voluntarily, even though they are not required to do so.

Mrs. COLLINS. Well, it's a little bit slow coming voluntarily if they have had this information for 20 years and they still don't have them in the cars and they can't assure us—you haven't assured us that until 1990 virtually every car was going to have this manufactured in the United States, and yet, when your company's manufacture these cars overseas, they all have the shoulder halter in the back seat. It seems to me that you have a different standard for American passengers than you do for those who happen to be using your cars overseas. That's not fair. That's not right. That's

not taking care of the safety of the American consumer. You're telling us all the time to buy American.

Mr. HANNA. There's an entirely different set of circumstances in Europe due to the fact that they have national seatbelt use laws and usage rate there are typically in the 90-percent plus range. That means——

Mrs. COLLINS. Your point is if it's required by law, you do it. If it's not required by law, you don't think it's necessary to try to make the rider of an automobile in America safe.

Mr. HANNA. No. My point is you will do it if you have some assurance that you will actually improve the aggregate safety of car passengers as evidenced by their willingness to use the system.

Mrs. COLLINS. Oh, that's baloney. That to me is not a plausible response. It seems to me that automobile manufacturers have a duty and a responsibility to make the automobile as safe as humanly possible. Mr. Kleczka, my time is expiring.

Mr. KLECZKA. Thank you, Madam Chairwoman. In your testimony, Mr. Hanna, you indicate that some of the 1988 models already are including the lap/shoulder rear seatbelts. Could you indicate to me which models?

Mr. HANNA. I have a summary here, a very good summary, that's been published by the National Highway Traffic Safety Administration. Could I submit it for the record?

Mr. KLECZKA. Are there too many models to mention here? Maybe just give me a flavor for which manufacturers are now on their own——

Mr. HANNA. Just to give you an example, as I look at this list, it appears that General Motors has about a dozen models that have them in 1988.

Mr. KLECZKA. The Chevrolet Impala, is that one of them?

Mr. HANNA. Chevy Corsica, Beretta, Chevy Nova, and incidentally they have indicated in the next model year that all of their domestic production will have these. That is all GM cars, manufactured in the United States

Mr. KLECZKA. OK, you also indicate in the testimony that the retrofit kits, the designer kits, are available and your members have notified the dealer networks that these things are available. We heard testimony from the previous panel that upon taking a survey, very few if any knew about them. Very few and—namely GM, had any knowledge about them or could order them. Now that sort of flies in the face of your statement and your testimony.

Mr. HANNA. If that's what they found when they surveyed, I would not dispute that.

Mr. KLECZKA. So, basically this is not accurate then?

Mr. HANNA. Well, no, no, what I've said is——

Mr. KLECZKA. You can't have it both ways.

Mr. HANNA. What I've said is that the manufacturers have advised the dealers. Now, if when you go into the dealer and he disclaims knowledge of this, then perhaps we haven't done as good a job as we should have. We're going to have to work hard on that. But my point was and I think the statement is accurate, that information on their availability has been made known to all dealers.

Mr. KLECZKA. OK, if the technology is already available at an affordable cost, which I believe is the case, why would it take the

manufacturers until 1992 to put these devices in the cars? What's the lag time there?

Mr. HANNA. For automobiles, virtually every automobile will be completed by 1990. That's the next 2 model years.

Mr. KLECZKA. OK.

Mr. HANNA. The 1992 date refers to the vans and multipurpose vehicles——

Mr. KLECZKA. I'm talking all vehicles. If the technology is with us today, why wait some 4 years before the manufacturers actually install the device.

Mr. HANNA. It doesn't have to do with the technology of the belt system itself, it has to do with the current construction of the vehicle. Just as it was indicated before, you have to provide an anchorage and——

Mr. KLECZKA. Are those anchors already in automobiles produced today?

Mr. HANNA. In automobiles, yes, sir.

Mr. KLECZKA. But not trucks?

Mr. HANNA. But not necessarily in all vans and multipurpose vehicles, no, sir.

Mr. KLECZKA. So, then as early as 1989, we could have all passenger automobiles equipped with these devices?

Mr. HANNA. Some manufacturers will. Some have indicated there will be a few models that will go into the next year.

Mr. KLECZKA. What's their rationale for the delay?

Mr. HANNA. It goes to the construction of the car and the amount of engineering that will have to be done to get them in there. I can't tell you precisely model by model——

Mr. KLECZKA. No, you just said the anchors are there. The anchors are already there, so I don't think any more engineering would have to be done. Maybe drill a hole, put a plate in there so you can attach the belt.

Mr. HANNA. The point is that they are doing this across their model lines. In the next 2 model years, they will have completed the entire job. Beyond that, I don't have specific information as to what specific problem there might be with a particular car model.

Mr. KLECZKA. OK, so you're going to advise your members that they better have a little better outreach on the retrofit kits, since certainly what we heard about this morning didn't really prove this statement to be very accurate.

Mr. HANNA. If the availability isn't being made known to the customer when he comes into the dealership, not a good enough job has been done to get that message through. I wouldn't contest that, no, sir.

Mr. KLECZKA. How about the affordable cost of the retrofitting? Is there anything that can be done about that? We're talking $200 labor and the kits being around $200. I think very few consumers will invest $400 for a device, knowing or not, it's better for their passengers.

Mr. HANNA. The numbers published by the manufacturers that I have access to are less than that. They're in the range of $66 to about $99 for the kit itself.

Mr. KLECZKA. Including labor?

Mr. HANNA. No, sir. For the kit itself, plus labor.

Mr. KLECZKA. And labor, average, would be what?

Mr. HANNA. Oh, if you figured $25 an hour and it took a couple of hours to do it, maybe another $50, but please, that's just a rough estimate off the top of my head. It's going to vary depending on the vehicle and the dealer's service charge and so on.

Mr. KLECZKA. Thank you, Madam Chair. You indicate on page 3 of your testimony that you really don't have any opposition or objection to a mandate by NHTSA to make these devices mandatory. Is that accurate?

Mr. HANNA. Yes, sir.

Mr. KLECZKA. So then, if this committee should recommend that to the entire Congress, you would not oppose that?

Mr. HANNA. That's correct, sir.

Mr. KLECZKA. OK, but you have a caveat to that endorsement and that is the agency is soliciting comments on dynamic testing of the belts. Explain that to the committee.

Mr. HANNA. That would require that a whole test protocol be established so that you would do the testing of these vehicles model by model. You would have to work that out first and establish a test procedure. Our concern is that if that is undertaken, it's going to delay the process and the manufacturers already have schedules to put these into vehicles or car——

Mr. KLECZKA. Aren't these tests already being conducted or haven't they been conducted?

Mr. HANNA. There are tests of a kind that test the quality and strength of the belt materials. There are observations that go on regularly during the test process. Sled tests of dummy kinematics, observations of this. I really don't think it's——

Mr. KLECZKA. So it's really no additional burden if in fact, NHTSA would ask for these lab tests.

Mr. HANNA. If the tests were of a character that are being done now for the front seats, no.

Mr. KLECZKA. But it's your understanding that the tests that they are asking for are different.

Mr. HANNA. No, sir. It was an advance notice. They just raised the question of whether there should be. We're saying that we don't think it's necessary so that we can get on with the job of installing these systems.

Mr. KLECZKA. That's all the questions I have.

Mrs. COLLINS. I have no further questions. Thank you for your testimony, Mr. Hanna.

Mrs. COLLINS. Our next witness will be Jeffrey R. Miller, who's Deputy Administrator for the National Highway Traffic Safety Administration. Mr. Miller.

Mr. MILLER. That's a long title.

Mrs. COLLINS. Yes. Easier for us to say NHTSA. Will you tell us for the record, who's accompanying you, please?

Mr. MILLER. Yes, ma'am. To my left is Mr. Barry Felrice, who's our Associate Administrator for Rulemaking in NHTSA. To my right is Mrs. Erika Jones. She's chief counsel of the agency and I am Jeffrey Miller, Deputy Administrator.

STATEMENT OF JEFFREY R. MILLER, DEPUTY ADMINISTRATOR, NATIONAL HIGHWAY TRAFFIC ADMINISTRATION, ACCOMPANIED BY BARRY FELRICE, ASSOCIATE ADMINISTRTOR FOR RULES, AND ERIKA JONES, CHIEF COUNSEL

Mr. MILLER. Madam Chairwoman, members of the subcommittee. We appreciate this opportunity to appear before you today to discuss the matter of rear seat safety belt safety, both with regard to lapbelts and lap/shoulder belts.

We'll also be discussing the NHTSA rulemaking on this issue, our followup to certain recommendations made by the National Transportation Safety Board in 1986. Before discussing some specifics, I'd like to provide just a little background. I will be summarizing my testimony here but I would ask that the full text be inserted into the record.

Mrs. COLLINS. Without objection. It will be.

Mr. MILLER. Thank you. Historically, safety belt use in the rear seats has been lower than safety belt use in the front seats, and even that usage was very low until just recently. In the early eighties for example, when front seatbelt use was only around 12 percent, usage in the rear seat was almost too low to measure. Our surveys indicated only around 2 percent.

Now with the increasing publicity about the benefits of safety belt use and the advent of safety belt use laws in States around the United States, belt use in the front seats has increased substantially. Belt use in the rear seat has also increased, but it's still far less than in the front seat. Our latest national survey indicates that usage rates in the rear seat are only about 16 percent.

We also believe it's important to keep in mind that over 90 percent of all the passenger vehicle deaths and injuries in this country occur in the front seat of passenger vehicles. Since that was the area of greatest risk and greatest harm, it was also the area of greatest opportunity to save lives and prevent injuries.

We therefore believe it was entirely appropriate for the Federal Government and for State governments and for motor vehicle manufacturers to place their top priority on improving occupant protection systems and usage rates in the front seats of passenger vehicles.

Those campaigns are now well underway. We believe they are responsible for saving literally thousands of lives. Now the number of rear seat passengers is far lower, and that seating environment is also less risky than the front seat. Nonetheless the safety of rear seat passengers is just as important as the safety of front seat passengers.

While the total opportunity for saving lives and reducing injuries in the rear seats is smaller because the numbers are smaller, there still are some opportunities to improve occupant protection in the rear. So we now have a second campaign underway, and again, it involves the Federal Government, State governments and the automakers, to improve safety for rear seat passengers.

We now have 32 State safety belt use laws in the United States. Six of those require safety belt use in the rear seats. We don't have extensive data so far on just how effective those usage laws are in improving actual usage rates in the rear seat, but we believe they

will be effective, at least based on the experience we've had with front seat usage laws.

We've seen about a 20-percent increase in usage rates in the front seat due to usage laws, and we are optimistic that rear seat usage rates will continue to rise as well. The total benefits of any safety system, whether it's front or rear seat, is going to depend on how many people actually use and take advantage of those life-saving and injury-reducing systems.

We've stated on many occasions, and I know this subject has been addressed earlier before the subcommittee today, that the systems that are currently in place in the rear seats of passenger cars; namely, lap safety belts, are in fact effective in reducing and reducing substantially the risk of death and injury. We also believe that rear seat lap/shoulder belts will be even more effective.

At the current estimated usage rate of 16 percent in the rear seat, we believe that lap/shoulder belts, if they were installed in all passengers cars in use today, might prevent another 25 deaths. That's above and beyond the 100 deaths that we believe are prevented annually due to current levels of lapbelt usage. As usage rates go higher, benefits of either system, either lap-only or lap/shoulder belts, could be expected to increase.

Because we believe that lap/shoulder belts will be even more effective than lapbelts, we've been encouraging vehicle manufacturers to install lap/shoulder belts voluntarily. In part as a result of these discussions in recent years, many manufacturers who had not previously done so are now installing those systems in their new models. They're doing so on a rapid basis.

We see that many 1988 models already have rear seat lap/shoulder belts, even in similar models that did not have those belts in recent years. As you heard from Mr. Hanna, most manufacturers plan to have them in all of their passenger car lines within the next year or two. In fact, by 1990, virtually every passenger car and over half of all light trucks and multipurpose passenger vehicles will come equipped with rear seat lap/shoulder belts as standard equipment.

Earlier this year, we canvassed all of the automakers, and in February we released a consumer information bulletin which showed that 24 out of 29 manufacturers already have rear seat lap/shoulder belts in at least some of their car models this year. We think that NHTSA bulletin, a copy of which I have with me and I would like to leave for the committee, will help consumers in making purchase decisions. We also believe that our decision to prepare this bulletin did in itself help to accelerate the plans of manufacturers to install rear seat lap/shoulder belts.

I'd be happy to submit that for the committee. I'd also be pleased to—I've heard the bell so I will keep my further summary even briefer—we have responded to the recommendations made by the National Transportation Safety Board in 1986 when it examined the subject of rear seat lapbelts. We were concerned quite frankly that some people drew some improper inferences from that report.

The NTSB itself studied only a very small number of cases and they did not draw any conclusions or make any recommendations one way or the other on usage of lapbelts. They strongly encouraged the movement to lap/shoulder belt systems. We were con-

cerned that that report weakened public confidence in the safety of lapbelts and indeed in safety belts generally. As we've stated many times, we believe the record is very clear that lapbelts are effective. Lap/shoulder belts are even more effective, but that does not diminish the safety of the systems that are currently in place.

We have also made provisions to assist in providing information to consumers on retrofit kits. Most manufacturers now have retrofit kits available for those models where they believe it is appropriate, and indeed we believe it's appropriate to look to manufacturers for their expertise in determining which models can and which cannot be suitably equipped with retrofit kits.

The effectiveness of a retrofit kit is going to depend in large part on the specifics of the vehicle—the seat stiffness, seat height, floor pan design, things of that nature. Therefore, it's very important to look to the manufacturer for guidance as to whether a specific retrofit kit can be adapted to a vehicle and also on installation instructions. We have information available through our toll-free consumer hotline to assist consumers in finding retrofit kits if they encounter difficulty through the manufacturers.

We are also proceeding—we issued an advance notice of proposed rulemaking in 1987—on the question of whether rear seat lap/shoulder belts should be made mandatory in the United States. There are many ancillary issues to consider such as comfort and convenience standards, dynamic crash testing.

We expect to announce a decision very soon on the issue of mandatory installation. But as a practical matter, the commitments have all been made and cemented by the manufacturers now to have rear seat lap/shoulder belts installed as standard equipment in virtually every car to be sold in the country in the near future.

That concludes the summary of my prepared remarks. My colleagues and I would be very happy to try to respond to any questions you or members of the subcommittee might have.

Thank you.

[The prepared statement of Mr. Miller follows:]

STATEMENT OF JEFFREY R. MILLER
DEPUTY ADMINISTRATOR, NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
BEFORE THE
GOVERNMENT ACTIVITIES AND TRANSPORTATION SUBCOMMITTEE
OF THE HOUSE COMMITTEE ON GOVERNMENT OPERATIONS

JUNE 23, 1988

Madam Chairwoman and Members of the Subcommittee.

I appreciate this opportunity to discuss the matter of rear-seat shoulder and lap belt safety, the National Highway Traffic Safety Administration's (NHTSA) rulemaking on this issue, and NHTSA's follow-up to the 1986 National Transportation Safety Board report "Performance of Lap Belts in 26 Frontal Crashes." With me at the witness table are Barry Felrice, Associate Administrator for Rulemaking, and Erika Jones, Chief Counsel.

Before I address the specifics of our rulemaking, I would first like to provide some general information as a background for our discussion.

Historically, safety belt use in the rear seats has been lower than belt use in the front seats. In 1981-1982, for example, when the front-seat belt use rate was around 12 per cent, rear-seat usage was almost too low to measure -- around 2 per cent. With the increasing publicity about safety belts and the enactment of safety belt use laws, belt use in the rear seat has increased to about 16 per cent in 1987 but it remains still significantly lower than belt use in the front seat, which has risen to an estimated 42 per cent nationwide.

One should also keep in mind over 90 per cent of all passenger vehicle occupant deaths and injuries occur in the front seat. That was the area of greatest risk, and the greatest opportunity to save lives; so it was appropriate for the Federal government, State governments and motor vehicle manufacturers to place top priority on improving occupant protection systems and usage rates in the front seat. That campaign is well under way, and it is saving thousands of lives.

Rear-seat passengers are far fewer in number, and that seating environment is less risky than the front. But the safety of those passengers is just as important as their front-seat counterparts, and there are opportunities to prevent deaths and injuries in the rear seat through improved occupant protection. So we now have a second campaign in progress, again involving the Federal and State governments and automakers, to upgrade safety for rear-seat passengers.

During the last four years, 32 States and the District of Columbia have adopted safety belt use laws for front-seat passengers, but only six of these laws currently require safety belt use in the rear seats. We cannot yet draw any firm conclusions as to how effective those laws will be in encouraging increases in rear-seat safety belt use. Nonetheless, we would expect such laws to result in increased usage of safety belts in the rear seat. We know the front-seat safety belt use in States with belt use laws is 20 per cent higher than in other States -- roughly 50 per cent compared to 30 per cent. We also expect that belt usage rates

in the rear seat will continue to increase to some extent, even where not required by law, as the habit or influence of buckling up in the front seat carries over to those riding in the rear.

The total benefits of any safety belt system will naturally depend on how many people wear these life-saving and injury-reducing systems. As we have stated on many occasions, we are convinced that rear-seat lap safety belts are effective in reducing the risk of death and injury. We also believe rear-seat lap/shoulder safety belts may be even more effective. At the estimated belt use rate of 16 per cent in the rear seat, we estimate that lap/shoulder belts installed at rear outboard seating positions would prevent an additional 25 fatalities and 547 moderate-to-critical injuries annually, as compared to lap-only belts. If usage rates were higher, the added benefits of the lap/shoulder system would be larger, too. We are examining these effects in the context of our rulemaking on rear-seat lap/shoulder belts.

I will return to the subject of our rulemaking in a moment, but first I want to give you a report on developments in the motor vehicle industry. Because of agency estimates that lap/shoulder belts in the rear seat would be somewhat more effective than lap belts in reducing fatalities, we have been encouraging the vehicle manufacturers to install lap/shoulder belts voluntarily in the rear seats of passenger cars. In part as a result of these discussions, many manufacturers who had previously not done so are now rapidly installing these systems in their new models.

Many 1988 models already have rear-seat lap/shoulder belts as standard equipment, and most manufacturers plan to phase them in to the remainder of their passenger car models within a year. By 1990, virtually all cars, and approximately 50 per cent of all light trucks and multipurpose vehicles, will come equipped with these devices as standard equipment.

Early this year, we canvassed all of the automakers, and in February we released a consumer information bulletin which showed that 24 of 29 manufacturers have rear-seat lap/shoulder belts in some or all of their car models this model year. Among the domestic manufacturers, GM said all of its 1989 domestic models will have rear-seat lap/shoulder belts, while Ford said 40-45 per cent of its cars will be so equipped by 1989 and all models, except for certain convertibles, by 1990. Chrysler also plans to have all of its models equipped with these systems by 1990, except for certain convertibles. This NHTSA bulletin, together with other consumer information materials we have prepared, will help consumers in making their purchasing decisions. We believe that our decision to prepare this bulletin may in itself have encouraged the manufacturers to accelerate their plans for providing lap/shoulder belts in the rear seats.

At your request, I will discuss NHTSA's follow-up to the National Transportation Safety Board's report of August 1986 that called into question the safety of rear-seat lap belts. That report noted various lap-belt-induced injuries among rear-seat occupants in 26 frontal crashes, a number the Board admitted was far too small for any statistical validity.

When the report was released, NHTSA strongly disagreed with the implication that people might be better off not using lap belts when riding in the rear seat. We expressed our deep concern that the Board based its analysis on the very small number of crashes contained in its report, and that the report did not examine cases where rear-seat lap-belt use had prevented serious injuries. The Board's conclusions contradict the findings of numerous studies by a wide range of professional researchers involving far more cases that clearly show the life-saving performance of rear-seat lap belts. Based on our analysis of a number of crash data files, rear-seat lap belts are about 32 per cent effective in preventing fatalities and about 36 per cent effective in reducing injury. In 1987 alone, we estimate that rear-seat lap belts saved about 100 lives and prevented over 1500 serious injuries. And these figures would have been much larger if usage rates had been higher.

We are concerned that the publicity accompanying the Board's report confused the public and dampened enthusiasm for safety belt use in general. This publicity has been cited by Nebraska State officials as a "particularly damaging event" in the referendum which repealed Nebraska's safety belt use law in November 1986. We can only hope that our future efforts and those of others in the safety community will overcome any long-term negative effects that the publicity surrounding the Board's report may have had.

As a result of its study, the Board made four recommendations: that NHTSA should encourage manufacturers to provide after-market lap and

shoulder belts for consumers to install in the rear seats; that NHTSA should initiate rulemaking to require such belts in the future; that the agency should encourage manufacturers to install such belts voluntarily as an interim measure; and that we should examine the feasibility of installing 3-point belts in other seating positions.

The agency has carefully reviewed these recommendations. We agree that properly designed lap and shoulder belts have the potential to offer even greater crash protection than lap belts alone. While both systems are effective in preventing ejection (a major cause of serious injury or death), lap/shoulder belts provide the added benefit of protecting the head and upper torso as well as the lower body. However, we must again stress that our views about the added protection offered by lap/shoulder belts do not in any way alter our conclusion that rear-seat lap belts are themselves effective in reducing the risk of serious injury or death.

With regard to the Board's recommendation for the retrofitting of lap and shoulder belts into cars equipped with rear-seat lap-only belts, we have been cautious in our advice to consumers. There are some important reasons for this approach. First, in view of the general effectiveness of lap-only belts in the rear seat, we believe it is extremely important that we not undermine public confidence or deter usage of the safety systems that are already available in millions of cars on the road. Second, the effectiveness of a retrofitted lap/shoulder safety belt system may well depend on its design compatability with the vehicle and the installation, since they were not engineered and built in at the factory. A vehicle's floor pan design, seat stiffness, and seat design

(as it relates to occupant posture) can affect the possibility of an occupant's submarining in a crash. The suitability of a particular vehicle for retrofitting is therefore a complex question. In our view, the judgment as to whether a retrofit lap/shoulder belt system should be installed in a vehicle is best made by the vehicle manufacturer, which is most familiar with the detailed seat and structural design and crash performance of the car. Third, consumers should be aware that the purchase and proper installation of a retrofit rear-seat lap/shoulder belt kit will entail considerable cost. With these cautions in mind, however, we have actively sought the manufacturers' cooperation in the provision of retrofit belts to interested consumers.

We have contacted each of the major vehicle manufacturers to ascertain their plans for offering lap/shoulder belt retrofit kits for rear seats of vehicles originally equipped with lap belts. General Motors is already offering such kits to the public for many of its passenger cars. Chrysler has issued a service bulletin to its dealers that describes the retrofit kits that are available for its models. Ford is developing retrofit kits for most of its 1979 and later model-year cars and will provide these kits to its dealers this August. Other manufacturers are also offering kits or have indicated they are reviewing the issues but have not yet made final decisions.

In both public and private meetings, NHTSA has encouraged manufacturers to offer well-designed retrofit kits for those consumers who desire them, and we are continuing our efforts in this regard. We also are trying to educate consumers, through public information materials, about the

benefits and costs of these belt systems so that they can make an informed choice. We provide the name, address and telephone number of any interested consumer who contacts the agency to a manufacturer's representative who in turn arranges to have a factory representative advise the consumer about the retrofit option.

I would also like to call your attention to a related final rule we issued in 1985, months before the NTSB report was released, to assist consumers who wish to have retrofit lap/shoulder belts installed. That rule requires, for any vehicle not equipped with rear-seat lap/shoulder belts as standard equipment, that the manufacturer must provide a diagram in the owner's manual showing the location of the rear-seat shoulder belt anchorages, which are critical in proper installation. NHTSA has required these anchorage points in all passenger cars since 1968. This owner's manual information requirement, which went into effect on September 1, 1987, should alert consumers that their vehicles can be equipped with such belts and it should complement manufacturers' efforts in this regard.

The NTSB also made recommendations regarding possible rulemaking to require rear-seat lap/shoulder belts in new motor vehicles. In this regard, the agency granted a petition filed by the Los Angeles Area Child Passenger Safety Association requesting the agency to require the installation of rear-seat lap/shoulder belts as original, standard equipment. Two new factors led the agency to grant this petition. First, many States had adopted safety belt use laws, which led to an increase in belt use in the rear seat. Second, a number of child

restraint systems had been designed for use with shoulder belts and could more easily be used in rear seating positions if shoulder belts were provided.

Accordingly, in June 1987 we published an advanced notice of proposed rulemaking (ANPRM) seeking comments on the need to require lap/shoulder belts in the rear seating positions of passenger cars, multipurpose passenger vehicles, such as vans and utility vehicles, and small buses. The center seating positions were to be considered, as well as the outboard positions. The comments in response to the ANPRM have provided us with considerable information on this subject.

In connection with our reexamination of the issue of requiring lap/shoulder belts in rear seats, the ANPRM also discussed the results of the agency's preliminary review of the costs and safety benefits of rear-seat lap/shoulder belts and requested comments on those results. The preliminary review showed that rear-seat lap belts have been effective in reducing deaths and serious injuries. At that time, we estimated that the benefits of having rear-seat lap/shoulder belts in all passenger vehicles would be an additional annual reduction of about 10 fatalities and 400 serious injuries, at the 1985 usage rate of about 10 per cent for rear-seat occupants. The preliminary review also estimated that the annual cost of a requirement for lap/shoulder belts at the rear outboard seating positions would be $139 million for passenger cars, $21 million for light trucks and multipurpose passenger vehicles, and $100,000 for small buses.

Given the current estimated belt usage rate of 16 per cent in rear seats, as compared to the 1985 usage rate of 10 per cent, the benefits associated with requiring lap/shoulder belts in the rear seats would be greater than we estimated in the ANPRM. We are now completing our work to determine more exactly the costs of the rulemaking and the benefits for different projected usage rates.

The rulemaking process entails careful consideration of the comments received in response to the ANPRM, as well as the thorough analysis of the manufacturers' plans to install lap/shoulder belts voluntarily in the rear seats of their vehicles, the continuing trend of States to enact safety belt use laws, and increasing belt usage rates. We are in the final stage of formulating our response to all this information and we expect to be able to publish the results of this process in the near future.

With regard to NTSB's recommendation that NHTSA should encourage the manufacturers to provide rear-seat lap/shoulder belts on a voluntary basis, we would again note that we have been doing so for several years. In part as a result of this encouragement, we are seeing the results I discussed earlier concerning the manufacturers' plans to install these systems in their new models. Thus, we believe we have complied with this recommendation as well.

Madam Chairwoman, this concludes my prepared remarks. My colleagues and I would be happy to try to answer any questions you may have.

Mrs. COLLINS. Thank you very much. Could you tell me why NHTSA has been so long in trying to make sure that they have a rulemaking regarding lap/shoulder for the rear seats?

Mr. MILLER. Well, as I indicated in my prepared statement, our first priority was to improve the safety for passengers in the front seats of passenger cars because that's where over 90 percent of our passenger car occupant fatalities occur.

There are about 25,000 people killed in passenger cars each year in this country. Of that, less than 2,000 is in the rear seat, over 23,000 are in the front seat. Our top priority had to be in the front seat. Now that those campaigns——

Mrs. COLLINS. Why could it not have been done simultaneously, both front and back seat?

Mr. MILLER. Well, in our agency as in any agency, we have limited resources of engineers and program analysts and regulatory attorneys and we felt it was most important to put our resources first in the area with the highest safety payoff to save the maximum number of lives and reduce the maximum number of injuries. Now that those campaigns are underway, we have in fact turned our attention to the rear seats. Even before the rulemaking process began, we actively encouraged manufacturers to do this voluntarily.

Manufacturers can do things more quickly on a voluntary basis than waiting for the rulemaking process to proceed——

Mrs. COLLINS. Well, how successful——

Mr. MILLER. Our rulemaking process is in fact underway. We issued an advance notice last year and we intend to issue a further notice this summer.

Mrs. COLLINS. Well, it's my understanding from testimony that we have received today, that NHTSA and the manufacturers have known for the past 20 years that it would be safer for the passengers on the outboard side of automobiles in the back seat to have the shoulder/lap halter. So my question is that you've been encouraging them for 20 years and they haven't done anything. So why were you so slow about getting around to a rulemaking?

Mr. MILLER. Well, I think the response of the manufacturers in the last few years has been very positive. I can't really speak to the period before that although their focus and our focus was improving occupant protection in the front seats. Usage rates of safety belt systems in both the front and rear seats in this country were very low; and regardless of the quality of the system, the benefits were very low just because usage rates were so low.

So our top priority was to increase usage of systems in both front and rear seats and to improve the quality of the system in the front seat, where we've gone to automatic protection systems such as airbags and automatic safety belts which will provide at least some protection even if the occupant does not take the action voluntarily.

Mrs. COLLINS. You think it makes any sense to require anchor points for the back seats shoulder straps but don't have any requirement for the straps themselves?

Mr. MILLER. The requirement for the anchorage point is of some assistance for consumers who wish to install retrofit kits. It is certainly not as good as having the belts installed as original equip-

ment. That's why we and the manufacturers are moving toward a standard installation of rear seat lap/shoulder belts. Indeed, they are now standard in many of the new model cars in the showrooms this year.

Mrs. COLLINS. Mr. Nielson asked a question of the previous witness of how many lives have been saved by the rear seatbelts. Have you got any information on that?

Mr. MILLER. Yes. We have some estimates of savings by lapbelts. At current rates of lapbelt usage, we believe they are responsible for saving about 100 lives per year and that's with an estimated usage rate of 16 percent. If usage was higher, we could expect higher savings. Indeed, if we had 100 percent usage of those systems currently in cars today, we believe we could save another 600 lives per year. The savings if we had lap/shoulder belts in the rear seat would be slightly higher. Our estimates of effectiveness of the systems when used in the rear seat is about 32 percent for lapbelts and about 41 percent for lap/shoulder belts. So there's a slight increase but we believe evidence is very clear that lapbelts themselves are—and we've looked at numerous data sources involving literally thousands of cases—safe and that usage should be encouraged.

Mrs. COLLINS. Mr. Felrice, now that the car companies have said the manufacturers say that they're going to have the lap/shoulder belts in the cars by 1990, isn't your regulation or rulemaking a little bit late?

Mr. FELRICE. Well, not necessarily, because our proposed rulemaking addressed more than passenger cars. It addressed all light-duty vehicles and it includes vans, utility vehicles and pickup trucks, many of which also have other than a front seat.

We don't see the same kind of voluntary efforts for these other vehicles, or at least the efforts for those vehicles are later in time. Our rulemaking is more comprehensive than the voluntary actions of the companies so far. For passenger cars, yes, we could not require them to put in lap/shoulder belts faster than they're doing by themselves. But for other vehicles, it's a potentially different question.

Mr. MILLER. May I also add, Madam Chairwoman, as we've seen in recent years that there are a large number of new entrants into the U.S. auto market. While the commitments and our surveys have looked at all of the manufacturers that are currently selling in the United States, there are from time to time, new auto companies coming into the United States. A Federal requirement on our part would help to guarantee that those new entrants made similar commitments.

Mrs. COLLINS. Mr. Nielson.

Mr. NIELSON. Yes, I'm sorry I didn't hear all of your statement, Mr. Miller. On page 3, you say, and I quote, "First I must give you a report on developments of the motor vehicle industry. Because the agency estimates the lap/shoulder belts in the rear seat would be somewhat more effective than lapbelts in reducing fatalities, we have been encouraging the vehicle manufacturers to install lap/shoulder belts voluntarily in the rear seat."

If the lapbelt-only in the back seat is worth one unit, how much is the lap-plus-shoulder belt on that scale? Is it three times as effective? Twice as effective—1.5?

Mr. MILLER. I'd defer to Mr. Felrice, but I'll double check my math. I believe about 1.2.

Mr. FELRICE. 1.29 is our estimate.

Mr. NIELSON. In other words, 30 percent more effective having the other?

Mr. FELRICE. Yes.

Mr. MILLER. That incidentally, is only an estimate. We do not have extensive hard data on the effectiveness of the lap/shoulder systems in the rear seats as yet.

Mr. NIELSON. We had witnesses earlier who indicated that the lapbelt-only really was of questionable value. In some cases, you're better off not even wearing it. Do you concur with Mr. Sakayan when he made that kind of a generalization?

Mr. MILLER. I was not here to hear the exact language that Mr. Sakayan used, but I would not concur with that general statement. We believe the evidence is very clear that on balance, the usage of lapbelts in the rear seat is considerably effective in reducing the risk of death or injury.

It is not necessarily effective in every case, and indeed, the same thing could be said of lap/shoulder belts. There are some crashes that simply cannot be survived.

Mr. NIELSON. I may be misinterpreting what I heard earlier, but I got the impression that the lapbelt-plus-shoulder belt was many times better than the lapbelt-only—not just 30 percent better.

Mr. MILLER. Our figures are estimates; they are aggregates. Even in the front seat, which is a more dangerous seating environment, there were demonstrated benefits of lapbelts before the time in which lap/shoulder belts were introduced in the front seat.

The principal benefit, or at least one primary benefit of any belt system—whether it's lap or lap/shoulder—is to hold the occupant in place and to prevent ejection. In other words, to prevent the occupant from being thrown outside the vehicle. That's the single biggest cause of death and serious injury. lapbelts do that job very well.

The one advantage of a shoulder strap is it provides additional support for the upper torso.

Mr. NIELSON. I'm older than some of you and I can remember the time when they emphasized: Be sure that you have seatbelts, particularly in the right hand passenger side in the front seat. I asked the question, is that the most dangerous place? They said, no, the driver seat is the most dangerous place. That's where you're putting the airbags.

Why don't you have airbags or recommend them for the right seat passenger, where it seems you have nothing to grab onto and therefore would be more vulnerable than the driver?

Mr. MILLER. We do recommend airbags in both seating positions in the front. In fact, Ford Motor Co. just yesterday unveiled a new model that they'll be selling this next model year; the first domestically produced car to offer airbags at the right passenger seating position as well as for the driver.

Our automatic protection requirement that I referenced earlier, which was issued in 1984 by former Secretary Dole, requires automatic protection systems for both the driver and the right-front passenger. That requirement is phasing in. This is the second year of a 4-year phasein program. We have permitted driver-side-only airbags as a means to encourage the airbag technology.

At the end of the phasein, whatever technology the manufacturer chooses must be available at both seating positions.

Mr. NIELSON. You also mentioned the fact that if you have automatic seatbelt, as some cars do, that was very effective. Why don't you recommend that for all cars. In some cars now, when you open the door and get in, the seatbelt automatically closes over you. Why don't you recommend that?

Mr. MILLER. We've done more than recommend it. We've, in fact, required either that or airbags. Our automatic protection standard that was issued in 1984, will require——

Mr. NIELSON. Effective when?

Mr. MILLER. We're in a phasein period. It becomes fully effective in September 1989. We're in the middle of a phasein right now.

Mr. NIELSON. The 1990 model year will have them though?

Mr. MILLER. That's correct. Every new car sold in the United States in model year 1990, will be required to have automatic protection systems in the front seat. It's the manufacturer's option as to whether to do that through airbags or through automatic safety belts or if they come up with some new technology, they're free to try that as well.

Mr. NIELSON. The Institute for Injury Reduction said they are trying to get a car recalled because ist has a defective seatbelt system. What is your recall authority and what are its limitations?

Mr. MILLER. Under the National Traffic and Motor Vehicle Safety Act, which is our authorizing statute, we are authorized and also motor vehicle manufacturers are required to recall and remedy any vehicle which is determined to have a safety-related defect. That term is left very broad so that it can encompass any system. It doesn't matter whether it's specifically covered by our regulations or not.

Mr. NIELSON. It can include a seatbelt system?

Mr. MILLER. It certainly would include a safety belt system. It must present a safety defect, which means an unreasonable safety risk to motor vehicle travel. We have, in fact, had a number of cases in which safety belt systems have been the subject of recalls.

Mr. NIELSON. So you have recalled a vehicle due to a faulty seatbelt system?

Mr. MILLER. Yes, sir, we have—more properly, the manufacturers have. Those have been to address a number of problems such as faulty retractors or inadequate webbing. Safety belts are—and I don't want to leave the impression that in general they're bad, because they're not. They're very good. They're very effective, but like any system in a motor vehicle, there may be some occasional problems during manufacture and because those relate directly to the safety of occupants, they're covered by our recall authority.

Whenever we find a defect in a safety belt system, we do require a recall.

Ms. JONES. I would like to add that under the statute, if a safety-related defect is determined to exist in a car, whether ordered by our agency or determined by the motor vehicle manufacturer, the consumer who owns that car is notified and the remedy is provided free of charge under the law.

Mr. NIELSON. I have more questions which I'll submit later unless there's another round.

Mrs. COLLINS. Mr. Kleczka.

Mr. KLECZKA. Thank you, Madam Chairwoman. Mr. Miller, for the auto manufacturers installing the rear shoulder/lap belts in the 1988 models; is that being done as standard equipment in the car?

Mr. MILLER. Yes, sir. There may be one or two models—there are so many models, it's difficult to keep track of them all—where it is still optional, but our focus has been on installation as standard equipment. That is the commitment that the manufacturers have made, that by model year 1990, virtually every new passenger car sold in this country will have rear seat lap/shoulder belts as standard equipment.

Our consumer information piece——

Mr. KLECZKA. How can you guarantee that? If in fact, today, some are optional, why not, between now and 1990, more manufacturers, for cost reasons, just make that equipment optional?

Mr. MILLER. The information that we provided in our consumer informational bulletin, is the commitments that have been publicly made by the manufacturers. We have no reason to doubt their word, but we are nonetheless proceeding with the rulemaking with an eye toward making those systems mandatory.

Mr. KLECZKA. Wouldn't that indicate that it might be wise for your agency to provide for a rule which makes this mandatory?

Mr. MILLER. Well, that is indeed one of the reasons why we are pursuing our rulemaking. As Mr. Felrice indicated, another reason is to cover all of the different types of larger vehicles, such as minivans.

Mr. KLECZKA. The rulemaking, you indicated, will be complete sometime this Summer?

Mr. MILLER. We expect to issue another notice. What we issued last year was an advance notice of proposed rulemaking. We would expect to proceed into the next phase of the rulemaking this Summer.

Mr. KLECZKA. Which is?

Mr. MILLER. Which would be a notice of proposed rulemaking.

Mr. KLECZKA. Will be that formal rule?

Mr. MILLER. That will be the formal proposal with the details of the proposal.

Mr. KLECZKA. Can we anticipate that in that proposed rule, the second stage, that we will see a statement of a mandatory inclusion of this equipment?

Mr. MILLER. That would be the purpose of the notice. That's correct.

Mr. KLECZKA. So the agency is going to come out and make this equipment mandatory.

Mr. MILLER. That's our current intention, that's correct.

Mr. KLECZKA. Do you have any guesstimate as to what year this might be required to be put into cars?

Mr. MILLER. It would depend to some extent on the number of comments we received on the rulemaking and the length of time it took to resolve any issues that surfaced before we issued the final rule.

Under the law, we must provide some leadtime, and that would also be one of the issues to be discussed during a formal rulemaking proceeding as to just what amount of lead time was necessary. We might have staggered lead times—one year for passenger cars and another year for the larger vehicles since they—since, the passenger cars already have the anchorage points. Some of the larger vehicles may not. But it would be within the next few years.

Mr. KLECZKA. The speaker from the Auto Association indicates that there might be other provisions of the rule which could provide a hardship for the manufacturers. Do you know what he might be referring to?

Mr. MILLER. Yes, I believe I do, Mr. Kleczka. We raised some of those issues in our advance notice, in an effort to try to stimulate some discussion at an early stage so we could perhaps expedite later stages of the rulemaking. One of the issues would be whether to require dynamic testing of the belts in the rear seat.

Dynamic testing is our way of describing a full-scale crash test with instrumented crash test dummies. That's an extremely complex means of proceeding with a regulation. Our front seat automatic protection requirement is governed by dynamic testing and that took—there were other issues involved there, too—but that took almost 20 years to resolve.

Mr. KLECZKA. OK, but it seems to me that that testing has already been done. In fact, we just saw a video here in which the institute did tests on the rear shoulder/lap belts.

Mr. MILLER. We do those sorts of test and I'm sure the manufacturers do those sorts of test as well for purposes of development. But when those tests are conducted for purposes of compliance with a regulation, there are an almost countless number of highly technical details. These include issues such as placement of the dummy. If you have a dummy in the rear seat, should you simultaneously have a dummy in the front seat; the angle of impact; the speed of impact; the conditioning and pretesting of a dummy prior to usage in the test.

If we were to determine that that was necessary, that would both, I think, delay the rulemaking and also require a longer leadtime.

Mr. KLECZKA. The Institute indicated that they sent your agency a petition some time ago and the time for response has since lapsed and that was May of this year, I believe. That was relative to an unsafe seatbelt in the Escort. What's the status of that petition filed with your agency?

Mr. MILLER. That was a petition for a defects investigation. That is currently pending before the agency. We expect to make a decision on whether or not to open an investigation in that case very shortly—within the next few weeks. As a matter of general agency policy, as with any law enforcement agency, we do not discuss pending enforcement matters at length in public forums.

Mr. KLECZKA. Didn't the deadline pass though, for a response by the agency?

Mr. MILLER. The statute does call for 120 days. We are a little past that and we expect to make that decision very shortly.

Mr. KLECZKA. When can we anticipate that?

Mr. MILLER. Within the next few weeks.

Mrs. COLLINS. Can you tell us or do you have information as to the number of older cars that are traveling on our highways and streets in any given year—a percentage figure perhaps?

Mr. MILLER. There are approximately 120 million passenger cars on the road in the United States and sales are about 10 million per year, so that would leave the balance—110 million that were one year or more older.

Mrs. COLLINS. So it's about 90 percent?

Mr. MILLER. That's approximate.

Mrs. COLLINS. Approximate figure—well, my question is, if roughly 90 percent of the vehicles on our roads in any given year are one or more years old would it be possible for you, given the safety factor, to do a modified recall that would require automobile makers to install shoulder belts on those 90 percent of all cars at some reasonable cost? For central locations, particularly for metropolitan areas where you have a lot of cars and so forth?

Mr. MILLER. I don't believe that we have legal authority to do that. I'll ask my chief counsel to address that in more detail in just a minute. Basically, our statute authorizes us to order recalls only when we identify a safety defect—a risk to the public.

The evidence that we have so far indicates that lapbelts not only do not pose a risk, but indeed, they provide a benefit. I don't believe under the law, that we could consider that a defect and require recalls.

I'm discussing lapbelts generally. I'm not discussing individual cases. There might be problems with individual belts for which we could conduct a recall. Let me ask my chief counsel to amplify on that.

Ms. JONES. Mr. Miller's summary was correct. The statute authorizes us to order recalls only in the event that we identify a safety-related defect, but if we were to identify a defect, then the remedy would be free of charge. So we wouldn't be discussing the cost at all. The cost would have to be free to the consumer.

Mrs. COLLINS. OK, thank you. Speaking of cost, I don't know if you were here or not, when Mr. Dewey gave his testimony, but in that testimony, he said that for 2 years after your recommendation, you still haven't formally proposed, let alone adopted a rear seat shoulder/lap belt mandate.

He goes on to say, even worse is that notice that you sent out for the preliminary notice of proposed rulemaking, expressed skepticism about the need for a shoulder/lap belt requirement.

Instead of concentrating on the safety benefits, NHTSA's notice expressed the cost of the shoulder/lap belt requirement. "The agency is concerned that such costs are extremely disproportionate to the possible safety benefits." What is your response to that?

Mr. MILLER. We are required by law to examine issues of cost and benefits. Our notice looked at the benefits of adding the lap/shoulder requirement as well as the costs.

At that time, based on the most recent usage rates we had, which at that point were 1985 usage rates, the benefits appeared to be low. Our more recent information is that usage rates are higher. They've gone from an estimated 10 percent in the rear seat to 16 percent.

That increases the level of benefits that one could expect with rear shoulder belts. We also have slightly increased our estimates of the effectiveness of those systems when used. Because usage rates are continuing to rise in the front seat, we are more optimistic now, I believe, than we were previously, as to the projections for future usage in the rear seat. The more usage you have, the more benefits you will have.

Mrs. COLLINS. So then you don't feel today that costs are extremely disproportionate to the possible safety benefits on the shoulder/lap belts, right?

Mr. MILLER. We have more recent thinking on the subject.

Mr. FELRICE. If I could just add, Madam Chairman, one of the reasons that statement was in the rulemaking notice was, in the past, the agency has been able to issue safety regulations which, although we don't put a dollar figure on a human life or an injury, we figured would cost the public about $300,000 for every fatality that our regulations avoided.

For this regulation, that number would have been closer to $15 million for every fatality avoided. So it was about 50 times more expensive than the typical regulation we have issued. It kind of raised our eyebrows and that's why we asked the public for comment on that point.

Mr. MILLER. Again, we're not focusing so much on the dollars as we are the usage—the best use of limited resources. We have resources within our agency; the manufacturers have limited resources and we want to make sure that when we are directing somebody through regulation to do something, that we're going to get a good safety payoff for that investment.

If we're not, we probably ought to try to channel it into some other part of the vehicle where we could get a good safety payoff.

Mrs. COLLINS. I believe in response to a question from Mr. Kleczka, that you mentioned that you at first had an advance notice of rulemaking and you were now into a second phase. My question is, when are you ever going to get to the final rulemaking?

Mr. MILLER. The issuances of a final rule would depend on the extent and complexity of the comments that are received in a notice of proposed rulemaking, but I would envision that could be completed by early or middle of next year.

Mrs. COLLINS. Is that your target date?

Mr. MILLER. That would be our target date now, but again, that will be dependent, in large part, on the type of comments that we receive. We're required under our statute and under the APA to fully address and consider all comments received.

Mrs. COLLINS. If it should be that you reach a target which is perhaps some time in the middle of next year—another year from now—how long will it have taken you to get that rule into a final rulemaking position?

Mr. MILLER. Well, it would be——

Mrs. COLLINS. When did you start?

Mr. MILLER. I guess it depends a little on what you consider the——

Mrs. COLLINS. Well, when did you start? You know when you started the process. When did you start it? What year?

Mr. MILLER. Well, the first notice we published on the issue was our advance notice for proposed rulemaking, published in the summer of 1987. So that would have been approximately 2 years. That is, for our rulemaking process, probably about the norm.

Mrs. COLLINS. OK, thank you. Mr. Nielson.

Mr. NIELSON. Yes, Mr. Miller, in terms of safety, how do you compare the relative safety of the back seat environment with the front seat environment?

Mr. MILLER. The back seat of a vehicle tends to be a much safer place.

Mr. NIELSON. How much safer?

Mr. MILLER. I'll defer to my expert.

Mr. NIELSON. If the risk in the back seat——

Mr. MILLER. I can describe why it's safer.

Mr. NIELSON. No, I don't want that. If the risk of the back seat's a "one," what's the risk in the front seat?

Mr. FELRICE. I don't know. We could supply that for you. Essentially your asking, given that a seat is occupied, what's the risk of being injured or killed in that seat?

Mr. NIELSON. Well, I know that there's the probability of it's being occupied, but leave that factor out.

Mr. FELRICE. I'm saying, given that a seat is occupied, what's the probability of injury or death and I'd have to go back and check our crash data.

Data from the agency's crash data files indicate that the rear seat provides a safer environment than the front seat for passenger car occupants. If the likelihood of injury to a rear seat occupant is 1.0, the likelihood of injury to a front seat occupant is approximately 1.4 or 40 percent greater.

Mr. MILLER. I think it would be somewhere between one and two.

Mr. NIELSON. Obviously, we need a better range. Our first panel—you weren't here, some of you. I think Erika was here. They advocated more effort by the Government to pressure the industry to provide retrofit kits so that consumers can equip their own cars, their existing cars, with lap/shoulder belts in the rear seats, if they so choose.

Is this a good idea?

Mr. MILLER. We believe it can be a good idea, although it's not necessarily a good idea for all vehicles. That's why we rely very heavily on the expertise of the manufacturers to identify which vehicles can properly be retrofitted with kits and also identify the appropriate kit for the appropriate vehicle.

Mr. NIELSON. There are some vehicles for which it would not be a good idea?

Mr. MILLER. That's what we are informed by the manufacturers, and they have the detailed model-by-model information.

Mr. NIELSON. Would the burden of proof of saying it would be or would not be a good idea be on them or on you?

Mr. MILLER. On the manufacturer—for all of this information, we rely on the vehicle manufacturers. Particularly for a manufac-

turer that offers large numbers of models, such as Ford or General Motors; they have done some pretty extensive analysis as to just which models can and which can not be properly outfitted with retrofit kits.

Mr. NIELSON. It was also asserted by the first panel that in some cases, lap-only safety belts may actually contribute to or even cause injury during an accident. In your experience, is it unusual to hear of problems with safety features like that? In other words, is it rather unusual for someone to be downgrading items that you've found to be safe?

Mr. MILLER. Well, we try not to downgrade safety systems, but it's not unusual that a system which ordinarily works well and contributes to safety, may in some instances, either not provide safety, or in a rare instance, provide some detriment.

One analogy we frequently use is in the medical community to vaccines. Vaccines do a wonderful job of insulating us against disease, but there are some rare case where vaccines may actually injure a person. On balance, they are very effective. We feel the same way about safety belts.

Mr. NIELSON. It seems to me like you're treading a very fine line there, because if you tell people about the danger of using lapbelts only and the superiority of the shoulder/lap combination, that you would need to be careful that you don't encourge them to stop using the lapbelts entirely.

I'm afraid, unless I misread the first panel—I hope they'll forgive me, but I felt the impression was: "If you haven't got a lap/shoulder combination, don't bother." That was the basis on which Nebraska changed their law, basically.

Mr. MILLER. That was one of the factors cited by State officials in Nebraska.

Mr. NIELSON. Plus the fact that the people thought you shouldn't try to legislate good behavior.

Mr. MILLER. That's another issue that surfaces from time to time as well. I think your analysis there is correct. We do try to walk that line carefully so that even when we tout the added benefits of new systems, we do not in any way denigrate the demonstrable benefits of existing systems.

We find a similar situation in the front seats. We are very excited about the added benefits that could be supplied with airbags, but that does not in any way cause us to weaken our recommendations for usage of the safety belts that are currently in the front seats of passenger cars.

Mr. FELRICE. Mr. Nielson, if I can just add for a second. A lot of the potential problems that were mentioned by the earlier panel, were related to the misuse of the system. We've been trying as hard as we can to urge everyone we speak to, to use the systems properly.

In terms of a lapbelt, wear it on the pelvis. Any safety system, whether it's a lapbelt, a lap/shoulder belt, an airbag; they all, in some rare circumstances, can cause injury that would not have otherwise occurred.

Mr. NIELSON. I think you're being unfair to the first panel. They did say, it's better to have it lower. It secures it better, but if you

have it around your stomach, it's liable to cause harm. I think they emphasized that as well.

But let me ask this question: Do you have enough data to accurately measure the benefits of a 3-point belt in the rear seat?

Mr. MILLER. We don't presently have definitive data on the subject, for the simple reason that up until the last year or two, there were relatively small numbers of vehicles in the United States equipped with rear seat lap/shoulder belts.

Mr. NIELSON. What about other countries?

Mr. MILLER. Other countries have had those systems longer, but they tend not to have as good record keeping systems as we do, and occupancy rates in the rear seats tend to be pretty low. We believe there is an added benefit, based on our experience with front seat shoulder belts.

Mr. NIELSON. If you don't have enough data yet, at what time do you think you'll get enough data to make a definitive judgment?

Mr. MILLER. Well, we're currently proceeding in the rulemaking. The data collection to document effectively—to move from estimates into after-the-fact analysis—will probably take another 2 to 3 years. It will depend in large part upon usage.

Mr. NIELSON. How did you determine that they would be sufficiently effective in reducing fatalities to justify your making a rule to require them—if you don't have enough data?

Mr. MILLER. We have some anecdotal data, and we do have the experience in the front seats where there is demonstrable improvement. Also the crash tests we conduct show that in most cases, although not necessarily every case, but with a well-designed lap/shoulder belt system in the rear, it will provide added protection as compared to a well-designed lapbelt.

Mr. NIELSON. I could ask the same series of questions about the automatic harness in the front seat. Do you have data indicating that that's better than the voluntary system, other than the fact that in the voluntary, only 42 percent use them, whereas with an automatic system, they'd all have to? Is that the only basis?

Mr. MILLER. That's the only benefit to automatic safety belts in the front seats, to increase usage rather than to increase the level of protection that's provided. airbags in the front seat will provide added protection, provided the occupant remembers to wear the safety belt in the first place.

Mr. NIELSON. I have a number of other questions. I'd like to submit them in writing and I'd appreciate your answers. Let me ask one that I asked the previous panel. You've mentioned yourself that you have to look at cost and benefit analysis.

Were you justified having concentrated so much on the front seat, since 90 percent of the injuries occur there? Did you sort of ignore the back seat for all those years? Were you justified in doing so?

Mr. MILLER. I wouldn't say that we have entirely ignored the rear seat, but we did focus most of our efforts on the front seat, because the front seat is where the overwhelming majority of the occupants and the deaths and the injuries are. The other reason why the focus on the rear seat has been slower in coming, is because usage rates have been so low in the rear seats.

It's only when you have a reasonable prospect of obtaining good levels of usage in the rear seat, that it really starts to pay off to provide improved types of systems. An unused lap/shoulder belt is no better than an unused lapbelt.

Mr. NIELSON. I'm a little confused an a little bit dubious about your statistics. On the one hand, you say children are more likely to buckle up than adults are; children more often ride in the back seat than adults; how come there's only one-sixth as many people buckling up in the back seat as in the front seat? It doesn't make sense.

Mr. MILLER. First, I'd point out that we exclude the very small children who are in child restraint systems—usually those under age 5. We're looking at people 5 years or older in belt systems. Rear seat occupants are not always children, and I'm not sure we have data that indicates that age group necessarily does tend to buckle up more than adults.

Mr. NIELSON. The first group said so. My experience is that's the case; that it's the children who remind adults.

Mr. MILLER. We're hopeful that that will happen in the future. We have not seen that definitively in our survey data so far. Maybe my colleague, Mr. Felrice, can amplify on that.

Mr. FELRICE. I believe that's the case. We hope that's the case; and logic would tell us that's the case, but I don't believe we have the data to prove it yet.

Mr. MILLER. We're certainly gearing many of our education programs with that goal in mind—to try to reach children through schools, through types of programs that appeal to children—our crash test dummies, Vince and Larry.

There's a muppet program that goes around touring the country touting safety belt use and other types of traffic safety programs. We want to reach that group, both to set good patterns for the future and also so they'll influence their parents. But it's a little too early to judge the results of that campaign.

Mr. FELRICE. Mr. Nielson, if I could just add one more quick point. That is, the agency's regulatory priorities for the 11 years that I've been in NHTSA, have always been governed by rulemaking plans. There are two pertinent criteria in those plans which deal with the selection of activities that we will undertake.

One is the magnitude of the safety problem. In this case, rear seat passenger car occupants, although in an absolute number, isn't a small problem, relative to the total highway safety problem, it did rank fairly low on the list.

The second criterion we use is our ability to ameliorate that problem. Here's where usage comes in. Since we could hardly find anyone wearing belts in the back, it just didn't seem worth the application of our scare resources to a problem that we didn't think we could solve by mandating a more effective device that would not be used.

Times change and that's why we've reexamined the situation, just as we are with light truck safety. A lot of our standards similarly apply to passenger cars and now that light trucks are being used differently, the environment is different and we are reexamining our regulations to see which ones we should add to light trucks which are often used as passenger car substitutes now. Just as

usage increases in the rear seat, we are now in the midst of reexamining the regulation for rear seat shoulder belts.

Mr. NIELSON. I thank you for testifying. I return the balance of my time.

Mrs. COLLINS. I thank the gentleman. That concludes our witness panels for today. We thank you for testifying before us today.

Mr. MILLER. Thank you.

Mrs. COLLINS. If there are any questions submitted to you in writing, would you please see to it that the answers are returned to us within two weeks.

Mr. MILLER. We would be happy to do so.

Mrs. COLLINS. Thank you very much. Hearing is adjourned.

[Whereupon, at 12:15 p.m., the subcommittee adjourned, to reconvene subject to the call of the Chair.]

APPENDIX

MATERIAL SUBMITTED FOR THE HEARING RECORD

U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the
Committee on Energy and Commerce
Washington, DC 20515

JUN 7

June 3, 1988

The Honorable Cardiss Collins
Chairwoman
Subcommittee on Government Activities
and Transportation
Committee on Government Operations
B350A Rayburn House Office Building
Washington, D. C. 20515

Dear Cardiss:

I understand through discussions with our staffs that your Subcommittee is planning an investigation regarding seat belts in the rear of existing and new motor vehicles and their use, including the availability and cost of installing shoulder belts in the rear of existing vehicles.

The use of seat belts by all persons while driving in the United States has been of considerable concern of this Subcommittee, as shown by the enclosed Committee on Energy and Commerce report on H.R. 11 (pages 10-12), my letter of April 29, 1988 to the National Highway Traffic Safety Administration (NHTSA) and the General Accounting Office's (GAO) report for the Subcommittee on these matters. I call your particular attention to a letter of April 12, 1988 from the Chairman of the National Transportation Safety Board, Mr. Jim Burnett, who states:

> In our view, the GAO was correct in its finding that the controversy provoked by the Board's lap belt report arose from our conclusions about the validity of estimates on rear seat lap belts, more particularly our finding that none of the available databases (including our own) is adequate for this purpose.
>
> Ironically, this whole controversial matter arose because, dismayed by what we were learning about the serious hazards of lap belts, we were eager to be able to include in the report reassurances that, overall, lap belts provide positive benefits. Thus, Board staff spent a substantial portion of its time and effort examining studies on seat belt effectiveness, reviewing the nature of the various databases used in these

studies, and considering the strengths and weaknesses of them for the purpose of estimating rear seat lap belt effectiveness. We were well aware that "no database is perfect," as the GAO report notes, and that the "possible inaccuracies or limitations in the data" must "be evaluated to determine how likely it is that they would significantly affect" conclusions about rear seat lap belt effectiveness. It was indeed our evaluation of this that led us to conclude, regretfully, that the databases' possible inaccuracies or limitations were sufficiently great to render them inappropriate for the purpose of showing that rear seat lap belts are, overall, effective (or ineffective). Our detailed reasons for reaching that conclusion -- a conclusion the Board continues to hold -- have been set forth, as you know, in the lap belt report itself, the Board's response to B.J. Campbell's paper, and the several pieces of correspondence between yourself and the Board.

We are pleased that the GAO report has drawn further attention to the fact that there are very real shortcomings in the major accident databases, and it is good that the National Highway Traffic Safety Administration (NHTSA) is trying to improve the accuracy of accident data reporting. Many researchers have warned that the accuracy of belt use reporting is likely to be worsening as an unfortunate side effect of mandatory belt use laws. (Ken Campbell's statements in the GAO report, pages 41-42 refer to this phenomenon, for example.)

We are also pleased, as you are, with the gratifying response of the industry itself to our recommendations. For example, Ford Motor Company staff recently briefed Board staff on the status of plans for providing rear seat lap/shoulder belts (both new and retrofits). New promotional materials from General Motors give prominent coverage to the new availability of these systems in that company's vehicles. Chrysler recently mailed to its owners of record a description of its rear seat shoulder belt retrofit program and "highly recommended" that its owners have them installed. We are still hopeful that the NHTSA ultimately will move forward to provide a uniform standard for rear seat lap/shoulder belt installations.

Certainly, your strong support for the passage of state seat belt use laws has played an important role in the success thus far of that effort. Indeed, one of the reasons the Board issued its lap belt report early on was to encourage a prompt transition from lap belts to lap/shoulder belts, since people are increasingly buckling up. Perhaps our deepest frustration has been that much of the highway safety "community," including

the NHTSA, failed to deal with the main thrust of the report -- the need to move to lap/shoulder belts -- and focused almost entirely on its disagreement with our database conclusion.

> The Board continues to endorse the importance of mandatory belt use laws, and looks forward to even greater loss reductions as more vehicles are equipped with the superior lap/shoulder belt throughout. (Underlining supplied)

As you can see our investigation into these various seat belt-related issues is far from over. Although, given the cost to the consumer, I am not convinced that many will install retrofit kits, particularly on older vehicles. Nevertheless, I wanted you to be aware of the extensive efforts of this Subcommittee in this area. At the same time, I want to caution you that public awareness and acceptance of seat belts is still not great. There continues to be fears and misunderstandings about these belts that are exploited by some who are opposed to State Mandatory Seat Belt Use Laws which I support. Many, including myself, believe that unintentionly the Board's 1986 lap belt report contributed to Massachusetts, at least, voting to rescind its seat belt use law. I urge your Subcommittee to be careful that your efforts not also unintentionally rekindle opposition in other states (such as New York and Ohio) where efforts to rescind these laws are pending. Such rescissions are clearly contrary to good safety.

I agree with the Board that the thrust should be to encourage more belt use and to move to "lap/shoulder belts" for the rear seat in all new vehicles (see enclosed NHTSA publication). At the same time, I stress the comments of our Committee report on H.R. 11 where we quote from the Board's 1987 letter that the "Safety Board agrees completely" with the Committee "that seat belts of any type, including lap belts, are effective in preventing ejection." The Board had noted that "36,000 of the 15,437,000 people involved in reported traffic crashes had been ejected." The Committee then said (p. 12):

> It is the Committee's understanding that not all of the 15 million people reported to be in traffic crashes were injured. Nevertheless, the Committee believes that 36,000 ejections is large, particularly when one realizes that many result in death, head injuries, or other severe injuries with lasting effects.
>
> Despite this controversial issue, the Committee shares the Board's view that the best solution is the installation of the three-point belt in the outboard positions of the rear seats. Most, if not all, the auto companies are quickly moving to install these belts in all models. We applaud that effort.

Because of this serious ejection issue alone, the Subcommittee has been very cautious about over-playing the possible injury from lap belts that is a proper concern of the Board. Death or serious head injury, for example, from ejection because belts are not used is at least as great a concern.

With best wishes.

Sincerely,

JOHN D. DINGELL
Chairman
Subcommittee on
Oversight and Investigations

Enclosures

cc: The Honorable Thomas J. Bliley, Jr., Ranking Minority Member
Subcommittee on Oversight and Investigations

100TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPT. 100–158
Part 2

INDEPENDENT SAFETY BOARD ACT AMENDMENTS OF 1987

MARCH 28, 1988.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. DINGELL, from the Committee on Energy and Commerce, submitted the following

REPORT

[To accompany H.R. 11 which on January 6, 1987, was referred jointly to the Committee on Public Works and Transportation and the Committee on Energy and Commerce]

[Including cost estimate of the Congressional Budget Office]

The Committee on Energy and Commerce, to whom was referred the bill (H.R. 11) to amend the Independent Safety Board Act of 1974 to authorize appropriations for fiscal years 1987, 1988, and 1989, and for other purposes, having considered the same, report favorably thereon with amendments and recommend that the bill as amended do pass.

CONTENTS

The amendments are as follows:

Strike out all after the enacting clause and insert in lieu thereof the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Independent Safety Board Act Amendments of 1987".

SEC. 2. AUTHORIZATION OF APPROPRIATIONS.

(a) GENERAL AUTHORIZATION.—Section 309 of the Independent Safety Board Act of 1974 (49 U.S.C. App. 1907) is amended by adding at the end the following: "There are authorized to be appropriated for the purposes of this Act not to exceed $25,400,000 for the fiscal year ending September 30, 1988 and $27,000,000 for the fiscal year ending September 30, 1989, such sums to remain available until expended.".

(b) ESTABLISHMENT OF EMERGENCY FUND.—Section 309 of such Act is further amended by inserting "(a)" after "309." and by adding at the end the following new subsection:

"(b) An emergency fund of $1,000,000 is authorized for expenditure by the Board to be available for necessary expenses, not otherwise provided for, of the Board for accident investigations. There is authorized to be appropriated such sums as may be necessary to establish the emergency fund under the preceding sentence and to replenish the fund annually. Such sums are authorized to remain available until expended.".

SEC. 3. ELIMINATION OF CERTAIN NOTICE REQUIREMENTS.

(a) REPORTS.—Section 304(a)(2) of the Independent Safety Board Act of 1974 (49 U.S.C. App. 1903(a)(2)) is amended by striking "and to cause notice of the issuance and availability of such reports to be published in the Federal Register".

(b) SAFETY RECOMMENDATIONS.—The last sentence of section 307(a) of the Independent Safety Board Act of 1974 (49 U.S.C. App. 1906(a)) is amended to read as follows: "The Board shall make copies of each such recommendation and response thereto available to the public at reasonable cost.".

SEC. 4. TRAINING SCHOOLS.

Section 304(b) of the Independent Safety Board Act of 1974 (49 U.S.C. App. 1903(b)) is amended by redesignating paragraph (10) as paragraph (11) and by inserting after paragraph (9) the following new paragraph:

"(10) The Board may at any time utilize on a reimbursable basis the services of the Transportation Safety Institute of the Department of Transportation (established for the purpose of developing courses and conducting training in safety and security for all modes of transportation) or any successor organization. The Secretary shall continue to make available such Institute or successor organization (A) to the Board for safety training of employees of the Board in the performance of all of their authorized functions and (B) to such other safety personnel of Federal, interstate, State, local, and foreign governments and non-governmental organizations as the Board may from time to time designate in consultation with the Secretary. Utilization of such training at the Institute or any successor organization by any designated non-Federal safety personnel shall be at a reasonable fee to be established periodically by the Board in consultation with the Secretary. Such fee shall be paid directly to the Secretary for the credit of the proper appropriation, subject to the requirements of any annual appropriation, and shall be an offset against any annual reimbursement agreement entered into between the Board and the Secretary to cover all reasonable direct and indirect costs incurred for all such training by the Secretary in the administration and operation of the Institute or any successor organization. The Board shall maintain an annual record of all such offsets. In providing such a training to Federal employees, the Board shall be subject to chapter 41 of title 5, United States Code (relating to training of employees).".

SEC. 5. PAYMENT FOR GOODS AND SERVICES.

Section 304(b)(6) of the Independent Safety Board Act of 1974 (49 U.S.C. App. 1903(b)(6)) is amended by striking "and" before "(G)" and by striking the period at the end and inserting the following: "; and (H) require payment or other appropriate consideration from Federal agencies, and State, local, and foreign governments for the reasonable cost of goods and services supplied by the Board and to apply the funds received to the Board's appropriations.".

SEC. 6. REPORTING OF ACCIDENTS AND INCIDENTS INVOLVING CERTAIN PUBLIC AIRCRAFT.

Section 304(a)(6) of the Independent Safety Board Act of 1974 (49 U.S.C. App. 1903(a)(6)) is amended to read as follows:

"(6) establish by regulation requirements binding on persons reporting (A) accidents and aviation incidents subject to the Board's investigatory jurisdiction

under this subsection; and (B) accidents and aviation incidents involving public aircraft other than aircraft of the Armed Forces;".

Amend the title to read as follows:

A bill to amend the Independent Safety Board Act of 1974 to authorize appropriations for fiscal years 1988 and 1989, and for other purposes.

PURPOSE AND SUMMARY

The purpose of H.R. 11, the "Independent Safety Board Act Amendments of 1987" is to reauthorize the activities of the National Transportation Safety Board (NTSB). As amended by the Committee, H.R. 11 would authorize $25.4 million for fiscal year 1988, and $27 million for fiscal year 1989. The bill would also amend certain provisions of the Independent Safety Board Act of 1974.

Following are the major provisions of the bill:

1. The bill authorizes funding as follows: for fiscal year 1988, $25.4 million; and for fiscal year 1989, $27 million.
2. The NTSB's emergency fund is reauthorized in the amount of $1 million for use in years where there is an unusual number of accidents and regular funding authority would not be adequate to cover expenses.
3. Certain Federal Register publication requirements believed to be unnecessary are eliminated.
4. Tuition funds collected from non-NTSB employees attending NTSB accident investigation training courses are redirected to NTSB's appropriations in order to offset the cost of the courses.
5. The NTSB is permitted to collect payment, which would be applied to the NTSB's appropriations, from Federal agencies, and State, local, and foreign governments which request assistance with accident investigations.
6. The NTSB is authorized to require reports from persons involved in accidents involving public aircraft, other than military aircraft.

BACKGROUND AND NEED FOR THE LEGISLATION

The NTSB is an independent Federal agency charged with investigating transportation accidents. The agency is responsible for investigating, determining the cause of, reporting the facts and circumstances of, and making recommendations on, all civil aviation accidents; all railroad accidents in which there is a fatality or substantial property damage, or which involve a passenger train; all pipeline accidents in which there is a fatality or substantial property damage; highway accidents, including railroad grade-crossing accidents, which the NTSB selects in cooperation with the States; major marine casualties, and marine accidents involving a public vessel and a nonpublic vessel, in accordance with regulations prescribed jointly by the NTSB and the U.S. Coast Guard; and other transportation accidents that are catastrophic, involve problems of a recurring character, or otherwise should be investigated in the judgment of the Board. The NTSB also conducts periodic special safety studies and evaluations. The NTSB itself has no regulatory authority; rather, its authority derives from its power to persuade.

The last enacted authorization bill for the NTSB was Public Law 98-37, which authorized funding for fiscal years 1984 through 1986. That authorization expired on September 30, 1986.

In the 99th Congress, the NTSB submitted in June 1986 an authorization proposal similar to H.R. 11. It was enacted by Congress, but it was vetoed by the President. In his veto statement of November 4, 1986, the President indicated objections to the budget authorization levels and to provisions relative aviation matters not within the jurisdiction of this Committee. The Committee believes that H.R. 11 lacks these problems.

The Committee is concerned, however, about the adequacy of the NTSB's staffing, including the impact of cutbacks, and about the allocation of resources by the Board. We believe that there must be adequate funding and the Board must turn its attention to activities beyond aviation. Both matters are addressed in an exchange of letters between the Committee and the Board. In an April 7, 1987 letter, the Board discussed the budget and the impact of staff cuts as follows:

> Below are the dollars and staff requested in our authorization request, H.R. 11. Unfortunately, the dollar estimates in H.R. 11 do not take into consideration the recently enacted changes to the new Federal Employee Retirement System and the additional costs for the general pay raise. Therefore, our revised estimates for the next three years is provided below. These are the same estimates contained in the Senate Commerce, Science and Transportation Committee version.

H.R. 11

[Dollar amounts in thousands—fiscal years]

	1987	1988	1989	Revised estimates		
				1988	1989	1990
Budget authority	$24,000	$25,400	$27,000	$26,200	$27,500	$28,800
Full-time equivalents [FTE]	347	347	347	374	347	347

Question 2(a). In a December 10, 1986 letter to the Director of the Office of Management and Budget (OMB), the Board appealed OMB's funding allowance for Fiscal Year 1988. What was the result of that appeal? Was the 347 FTE level restored? If not, why not, and what was the final level established by OMB? How will that level be assigned within the Board?

Response. As a result of the Board's appeal, the OMB increased the Board's allowance from $22.24 million and 300 FTE to $23.56 million and 310 FTE, which is still considerably lower than the Board's request of 347 FTE. The OMB did not provide the Board with a written response to our appeal and therefore it is not clear why the OMB only increased the Board's funding to the 310 FTE level. Below is the distribution of the 310 FTE as reflected in the Board's Congressional budget request.

Policy and direction	41
Accident investigation	146
Technology	64
Safety programs	24
Administration	30
Administrative law judges	5
Total	310

Question 2(b). The Committee is concerned about the "sharp reduction" in the Board's staff level since Fiscal Year 1982 and requests an explanation of the impact of the cutbacks on the professional and nonprofessional staff and on the Board's important functions. Please also show the FTE attritions annually since that year.

Response. We share the Committee's concern. Enclosed (enclosure 5) is a graphic description of the fluctuation that the Board's staffing level has experienced in recent years. This fluctuation has been very disruptive to the Board's productivity and to employee morale. In the first wave of reductions occurring in 1981, the Board made significant reductions in its administrative and support staff. However, reductions continued into 1982, forcing the Board to implement a rather large reduction in force. Overall, approximately 60 percent of the Board's losses have been from the professional ranks.

The unrelenting pressure on key staff caused by increased workload demands, coupled with these reduced staffing levels, has resulted in a continuing loss of essential technical staff. The Board's staff is composed for the most part of highly trained technical specialists in all the various transportation modes. Reductions in staff have forced the Board to eliminate the depth in most technical specialty areas to the point where, in some areas, there are only one or two specialists. Therefore, it is common for investigators to be on call 24 hours a day, seven days a week. This is one of the reasons why industry and other government agencies recently have been very successful in hiring the Board's technical staff.

Any additional reductions would further compound our problem of maintaining experienced staff, and seriously jeopardize our ability to fulfill our statutory mandate.

In general, the scope of the Board's accident investigation activity and the comprehensiveness of its aviation accident data base have been significantly and adversely impacted. The resulting scope, detail and number of our safety recommendations has been less than what could be achieved. Also, our ability to assure the effective implementation of the recommendations through aggressive, persistent follow-up has been limited.

To put this in perspective, it should be noted that after the substantial cutbacks in fiscal year 1982 the Safety Board was forced to reevaluate all of its programs. At that time, we determined that we needed at least 347 FTE to fulfill our Congressional mandate. Consequently we have

consistently made budget requests for the past six years to support 347 FTE.

Out nation's safety is not enhanced or protected by cuts at the NTSB or other safety agencies. We all recognize the need for deficit reduction and budget cuts, but we must also recognize that in some vital areas the public's safety could be imperiled. The bill is reasonable in trying to maintain the needed personnel levels, but there is no flexibility. We strongly urge the Office of Management and Budget to recognize this concern and refrain from further reductions.

As to the Board's allocation of resources, the letter states:

Question 3. The December 10 letter states that the "Board's current allocation of resources" is "heavily weighted toward aviation" and that any reduction "will necessarily impact the aviation program most severely." Please explain why the Board's resources are allocated "so heavily" toward aviation. How is that allocation affecting the Board's activities in such areas as railroads, hazardous materials, pipelines, highways, and other activities? We, of course, recognize the importance of aviation safety, but believe that railroads and these other activities are no less important.

Response. The Safety Board's allocation of resources historically has always been weighted heavily toward aviation, and the reason is that aviation is the only mode in which the Board is required by law to investigate all civil transportation accidents. This amounts to about 3,000 accidents per year and accounts for about 62 percent of the staff resources. Since the Safety Board originally investigated only aviation accidents (our roots date back to a Bureau of Safety within the Civil Aeronautics Board), its resources in other modes have been added commensurate with responsibilities to investigate transportation safety in those modes mandated.

The Safety Board shares your concern that activities in the other modes deserve attention, and we strive to choose those accident investigations and studies in the other modes which provide the greatest safety benefit. We believe that our current allocation of resources among the various forms of transportation is an appropriate balance given the available resources.

The Committee expects the Board to examine the allocation issue closely this fiscal year as we are not as convinced as the Board that its allocation "is an appropriate balance given the available resources." We look forward to learning of the results of that review.

HEARINGS

On June 25, 1987, the Subcommittee on Transportation, Tourism, and Hazardous Materials held a hearing to consider reauthorizations for the NTSB and other matters. Oral testimony was received from Mr. James E. Burnett, Chairman, NTSB; and Mr. Vance Fort,

Deputy Assistant Secretary for Policy and International Affairs, U.S. Department of Transportation.

COMMITTEE CONSIDERATION

On January 6, 1987, the bill, H.R. 11, was introduced by Mr. Mineta. The bill was referred jointly to the Committee on Energy and Commerce and to the Committee on Public Works and Transportation.

On December 15, 1987, the Committee on Energy and Commerce met in mark-up session adopted an amendment in the nature of a substitute offered by Mr. Luken, and ordered the bill reported to the House as amended by unanimous vote with a quorum present.

COMMITTEE OVERSIGHT FINDINGS

Pursuant to clause 2(l)(3)(A) of rule XI of the Rules of the House of Representatives, the Committee has made oversight findings and recommendations as set forth in this report.

The Committee, as part of its oversight responsibilities, inquired into the Board's efforts to have the DOT better address the potential hazards to public safety in the transportation of hazardous materials. The Committee noted that in December 1984 the Board wrote to the DOT about the "inadequacy of the DOT's system for hazard identification and classification." The Board said the need for redesigning the system stemmed back to the Board's recommendations issued to the DOT on December 13, 1972. The Board, in its April 7, 1987 letter to the Committee, said:

> In 1981, the Safety Board reviewed the DOT's hazardous materials regulatory program to identify corrective actions taken and analyze the results of such actions. The findings of this review are reported in our "Safety Report: Status of Department of Transportation's Hazardous Materials Regulatory Program" which was issued September 29, 1981. Even though called for by the Safety Board, the General Accounting Office, various Congressional committees, and even by some of DOT's own reports, there was no evidence of any systematic efforts by the DOT to improve its hazard identification and classification system.
>
> As you will note in our December 19, 1984 letter, the present hazard identification and classification system is an outgrowth of an industry-developed system based primarily on accident experience to make judgments about the hazard posed by a material and about the adequacy of packaging methods to minimize the potential for releases during transportation. Additionally, this system is further limited in that it was developed with consideration only for acute threats to life for persons at the scene of the accident and upon the assumpton that all accidents would be accompanied by fire. Such limitations prevent consideration of long-term hazards to health and safety and prevent considerations about hazards posed to persons nearby an accident scene involving the release of materials when

fire is not present. Or said more specifically, conditions similar to those which existed at Bophal, India.

In response to the Safety Board's December 19, 1984 letter, the DOT issued, on February 4, 1985, a Notice of Proposed Rulemaking. On March 27, 1985 the Safety Board commented on this rulemaking proposal, and enclosed is a copy of that correspondence (enclosure 8). On October 3, 1985, the DOT issued a final rule for regulating toxic liquids. Safety Board staff reviewed this final rule in light of the Safety Board's original letter and our response to the rulemaking proposal. The review found that:

1. The hazards of many hazardous materials have not been addressed because the rulemaking excludes consideration of solids and gases.

2. Materials for which specific container requirements presently are listed in the regulations will have no change made in the container specifications. What if any changes will be made to these container specifications will have to await the result of final action on Docket HM-181: a rulemaking activity which began in 1982. Under this rulemaking action, the DOT proposes to address container requirements in performance language. At the time of this review, we were advised that HM-181 would be made final by the spring of 1986. While we yet are awaiting final action of the rulemaking, it is reported that final action is expected in the near future.

3. The toxic hazard identification requirement was not integrated into the existing hazard identification and classification system, rather it has been applied more as a bandaid to an already identified deficient system.

4. No action was taken to interrelate the hazards of Poison A and Poison B materials. However, the final rule reported that the entire hazard classification scheme will be reconsidered in the DOT rulemaking actions within Docket HM-181: This again deferred corrective action until this 1982 rulemaking activity was completed.

5. No action was taken by the DOT for reconsidering the scientific basis for the standards established for identifying materials which posed substantial toxic hazards. It is unclear whether or not this also was being deferred until final action on Docket HM-181.

The Committee is pleased that the DOT has begun to act on these matters, but we are concerned that recommendations of the Board are apparently ignored or shelved for long periods by the DOT before action takes place. When asked about this, the then DOT Secretary, in a May 13, 1987 letter to Chairman Dingell, said that the Board "makes important contributions by identifying problem areas, and keeping safety issues before the public eye." Their ideas are often a part of the solutions crafted by the modal agencies, and are always considered in the crafting of those solutions." Nevertheless, the DOT has concerns about Board recommendations in that the Board does not assess costs or prioritize their recommendations. The DOT Secretary said:

> At the same time, there are several factors which often make NTSB recommendations less usable and effective than they otherwise might be. NTSB makes no effort to assess the costs of its recommendations, or gauge their cost benefit. This can put the Board in a position of offering recommendations which provide the public with a negative cost benefit, or which are simply not feasible for technical or economic reasons. The Board could increase the functional value of its recommendations by exploring implementation issues, making a preliminary cost benefit estimate, and providing this information as part of their recommendation package.
>
> Moreover, the Board issues a large number of recommendations—106 in the railroad area over the last eight years—without making any effort to prioritize among them. Each recommendation is treated in isolation, both from a cost and an implementing perspective. All are accorded equal priority. The problem with this approach is that, as much as we might like it to be otherwise, resources are finite, be they in the public or private sector. Regulatory agencies have enormous influence on how private parties allocate those safety dollars. The key challenge before any safety regulatory agency is the challenge to prioritize, to pursue the option that will steer available dollars to their most effective use from a public safety perspective. To the extent that regulatory agencies utilize their authority to steer limited resources to the 8th, 9th, or 10th most productive area, they have a less than optimum impact on safety because of opportunities foregone. Determining which safety initiatives have the greatest impact on public safety, and can offer the public the greatest cost benefit, is a challenge that lies at the heart of effective regulation. And NTSB's recommendations, in their current format, offer little guidance in making this type of judgment.
>
> The modal administrations, on the other hand, must make safety policy decisions that are in fact resource allocation decisions, and must make them in a real world environment. They must consider not only the merit of a safety-enhancing measure, but also its technical, financial, and operational feasibility.

The Board responds that it has "very limited resources and is unable to make a cost/benefit analysis with respect to the recommendations we issue." The Board, however, contends that it does analyze "the expected impact" of its recommendations and "only issue those which pass a test of 'reasonableness'." The Board says that the "cost of implementing a recommendation is a factor frequently considered in this test" and the "highest priority is given to recommendations which are 'reasonable' and which will yield the highest safety benefits." The Board adds:

> Also, after we issue recommendations to the modal agencies we are frequently drawn into cost benefit discussions. If the modal agency presents a convincing case that imple-

mentation of our recommendation is not cost effective or practical, we reconsider our position. While the cost may at times seem high, the benefits over a long period of time may far exceed the initial cost.

Clearly, costs should not be ignored. However, the first priority should be safety. Costs can be used as an excuse, not a sound reason for failing to act. Even costs can be lessened through phasing and other methods. Recommendations that improve safety significantly should be given the highest priority. The Committee's concern is that Board recommendations tend to "sit on the shelf" for far too long at the DOT, although to be fair, the Committee's examination shows that DOT makes the required statutory response, but the Board is not always pleased with the response. In its reply, the Board said of 2,271 nonaviation recommendations issued since 1980, there were 146 in an "Open Unacceptable Action" category. These are cases where the "addressee responds by expressing disagreement with the need outlined in the recommendation and when the Board has some further evidence to substantiate the need defined."

While this is not a huge number, the Committee believes a system is needed to ensure that all recommendations are addressed in a quicker and fuller fashion and where the responses are not satisfactory to the Board, to resolve differences. There may be sound reasons not to adopt them in whole or in part, but they can only be determined after consideration.

We expect both agencies to examine this problem and report to the Committee before the end of fiscal year 1988. The report should identify all outstanding recommendations of the Board relating to nonaviation safety matters that are more than two years old that have not been reviewed and implemented. It should indicate whether they are still sound from a safety standpoint and whether implementation is still needed. If not implemented, reasons for such non-implementation should be provided.

Finally, the Committee's Subcommittee on Oversight and Investigations with the help of the General Accounting Office has been examining in great detail the efforts of the Federal Government to encourage the use of seat belts in the operation of motor vehicles. Of particular concern to the Subcommittee has been the slowness and, in some cases, the resistance of Federal agencies to require seat belt use by all persons when operating on Federal areas. To its great credit, the Defense Department (with encouragement from the Subcommittee and the GAO) has taken an aggressive stance in requiring such use. On the other hand, the National Park Service recently abandoned a proposed rule requiring such use after receiving complaints from its employees. This investigation is continuing with the help of the GAO.

During the hearing, Chairman Dingell expressed concern about the Board's 1986 report on the use of rear seat belts. In exchange of letters between the Oversight and Investigations Subcommittee and the Board, there was concern about the adequacy of the report and about its adverse impacts on efforts to have all 50 States adopt mandatory seat belt use laws. In a November 13, 1987 report by the GAO about the Board's study, the GAO said:

We do not believe that NTSB's concerns about the data provide a sufficient basis for dismissing either the results of other research in this area or the databases themselves. No database is perfect. The question an agency that intends to use data must address is whether the data are sufficiently accurate to yield valid findings about the thing being analyzed. Possible inaccuracies or limitations in the data should be evaluated to determine how likely it is that they would significantly affect any conclusions based on the data. NHTSA investigated the flaws in the data it uses to analyze seat belt effectiveness and concluded that the problems were not sufficient to invalidate the data for research. NTSB did no analysis of its own to demonstrate the NHTSA's findings about the usability of the data were incorrect.

Therefore, we find that while NTSB has highlighted some important limitations in widely used accident databases, it has not shown that these databases cannot be used to show that lap belts, on balance, protect rear seat passengers in automobile crashes. The presence of inaccuracies in the data is not a sufficient reason for dismissing the findings of all the research that has used that data.

Finally, NTSB's criticisms of the principal databases researchers used to analyze the performance of different types of safety systems have not been fully answered. While we believe that NTSB has not shown the data to be useless for analysis, there are, nonetheless, shortcomings in the quality of databases that rely on police accident reports. NHTSA is working on several programs that might improve the accuracy of police reporting and provide more current information on the relationship between police reports and investigator analysis of accidents.

Also of particular concern to the Subcommittee is the fact that many people injured in motor vehicle accidents are ejected. In a July 14, 1987 letter to the Committee, the Board responded to this concern by saying:

To put this in some perspective, the statement in our October 20, 1986 letter that "ejection is not at all a probable outcome for most crash-involved car occupants, even unbelted ones" is based on data contained in the 1984 NHTSA National Accident Sampling System (NASS) report. That report indicates that 36,000 of the 15,437,000 people involved in reported traffic crashes had been ejected. That is about 0.2 percent. About 0.6 percent of all occupants involved in reported crashes were ejected and received at least moderate injuries. Even for towaway crashes, the NASS report indicates that only 1.0 percent of occupants are ejected.

The Safety Board agrees completely that seat belts of any type, including lap belts, are effective in preventing ejection. The Board's report did address the issue of ejection and the role of lap belts in preventing it. In fact, an entire section (pp. 23–24) on the role of lap belts in ejection

prevention was included in the Board's safety study on lap belts.

It is the Committee's understanding that not all of the 15 million people reported to be in traffic crashes were injured. Nevertheless, the Committee believes that 36,000 ejections is large, particularly when one realizes that many result in death, head injuries, or other severe injuries with lasting effects.

Despite this controversial issue, the Committee shares the Board's view that the best solution is the installation of the three-point belt in the outboard positions of the rear seats. Most, if not all, the auto companies are quickly moving to install these belts in all models. We applaud that effort.

COMMITTEE ON GOVERNMENT OPERATIONS

Pursuant to clause 2(l)(3)(D) of rule XI of the Rules of the House of Representatives, no oversight findings have been submitted to the Committee by the Committee on Government Operations.

COMMITTEE COST ESTIMATE

In compliance with clause 7(a) of Rule XIII of the Rules of the House of Representatives, the Committee notes that the bill would establish an authorization level of $25.4 million for the fiscal year ending September 30, 1988, and $27 million for the fiscal year ending September 30, 1989, for the activities of the NTSB. In addition, the bill would authorize $1 million for an emergency fund for NTSB investigations.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, January 27, 1988.

Hon. JOHN D. DINGELL,
Chairman, Committee on Energy and Commerce, House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 11, the Independent Safety Board Act Amendments of 1987.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

JAMES L. BLUM,
Acting Director.

CONGRESSIONAL BUDGET OFFICE—COST ESTIMATE

1. Bill number: H.R. 11.
2. Bill title: Independent Safety Board Act Amendments of 1987.
3. Bill status: As ordered reported by the House Committee on Energy and Commerce, December 15, 1987.
4. Bill purpose: This bill would authorize the appropriation of $25.4 million and $27.0 million for fiscal years 1988 and 1989, respectively, for the National Transportation Safety Board (NTSB). In addition it would authorize an emergency fund of $1 million to be available for necessary expenses of the NTSB, not otherwise pro-

vided for, for accident investigations. The bill would authorize the appropriation of such sums as may be necessary to establish and replenish the fund annually.

Other provisions in this bill would (1) provide that tuition collected from non-federal employees attending Department of Transportation training courses will be credited to the department's appropriation, (2) require payment from federal agencies and state, local and foreign governments for the reasonable cost of goods and services provided by NTSB, with these payments applied to the board's appropriation, (3) eliminate certain Federal Register notice requirements, and (4) allow the NTSB to obtain information about accidents and aviation incidents involving public aircraft other than aircraft of the armed forces.

5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1988	1989	1990	1991	1992	1993
Authorization level:						
NTSB authorization	25.4	27.0				
Replenishment of emergency fund	0.4					
Total estimated authorizations	25.8	27.0				
Less: Existing appropriation	24.0					
Net additional authorizations	1.8	27.0				
Estimated outlays	1.3	24.4	2.7			

The costs of this bill fall within budget function 400.

Basis of estimate: It is assumed that the full amounts authorized would be appropriated. The outlay estimate is based on the historical spending rates.

In fiscal year 1983, an appropriation of $1 million was provided for the emergency fund authorized by this bill. Since then, $351,000 has been obligated from the fund. This estimate assumes that $351,000 would be appropriated for fiscal year 1988 to bring the fund balance back to the full authorized amount of $1 million. No outlays are reflected from this appropriation because CBO is unable to predict when conditions will arise requiring use of these funds.

The Continuing Resolution for fiscal year 1988 appropriated $24.0 million for the NTSB, while this bill authorizes $25.4 million. This estimate reflects the net additional funding authorized.

Other provisions of the bill are not expected to have a significant budgetary impact.

6. Financing mechanism: This legislation authorizes funding to be provided in subsequent appropriation bills. This cost estimate shows the amount of budget authority that would be authorized to be appropriated. The estimated outlays, with the exception noted above, are those that would be generated if the Congress chooses to fully fund the authorized amounts.

7. Estimated cost to state and local governments: As stated above, this bill would require state and local governments to reimburse NTSB for goods and services supplied to them. This is not expected to result in a significant cost for these governments.

8. Estimate comparison: None.

9. Previous CBO estimate: On March 13, 1987, CBO transmitted a cost estimate to the Senate Committee on Commerce, Science, and Transportation for S. 623, the Independent Safety Board Act Amendments of 1987. On June 9, 1987, CBO transmitted a cost estimate to the House Committee on Public Works and Transportation for H.R. 11, as ordered reported by that committee. These bills differ as to the years funded and the amounts authorized, and CBO's cost estimates reflect these differences.

9. Estimate prepared by: Marjorie Miller.

10. Estimate approved by: C.G. Nuckols, (for James L. Blum, Assistant Director for Budget Analysis).

Inflationary Impact Statement

Pursuant to clause 2(l)(4) of Rule XI of the Rules of the House of Representatives, the Committee makes the following statement with regard to the inflationary impact of the reported bill:

The NTSB makes recommendations on how to improve the safety of all transportation modes. Many of these recommendations, if implemented, would result in fewer accidents and would thus reduce costs from personal injury and property damage. Therefore, by reauthorizing the NTSB, this bill should have an anti-inflationary impact.

Section-by-Section Analysis and Discussion

Section 1. Short title

This section provides that the short title of the bill is the "Independent Safety Board Act Amendments of 1987".

Section 2. Authorization of appropriations

The first subsection, subsection (a), authorizes funding for the National Transportation Safety Board for fiscal years 1988 and 1989. The level of appropriations are fixed as follows:

$25,400,000 for the fiscal year ending September 30, 1988;
$27,000,000 for the fiscal year ending September 30, 1989.

Funding of the NTSB at this level should provide for 347 full-time staff positions.

The second subsection, subsection (b), authorizes an "Emergency Fund" of $1,000,000. The purpose of this fund is to provide the NTSB with an account from which funds may be obtained in order to pay necessary expenses incurred in accident investigations. According to the Board, it is needed "to cover extraordinary circumstances."

The emergency fund was created in fiscal year 1982, and since then has been used only once (to assist in recovery of the Air India Boeing 747 that crashed off of the coast of Ireland in 1985). The fund is intended to ensure that the NTSB has adequate resources available to it in years when there is an unusually high number of accidents, and general appropriations are not sufficient to cover the cost of investigations. The fund is to be replenished annually.

In its April 7, 1987 letter, the Board discussed the fund as follows:

> This emergency fund assures that there always will be sufficient funds available to conduct thorough accident investigations and to identify and recommend needed safety improvements, particularly in years in which there are a large number of catastrophic accidents. However, the Safety Board will use this fund only when it determines that an accident investigation is required in the interest of public safety and there are no other funds available to perform the work.

The Committee appreciates the Board's assurances.

Section 3. Elimination of certain notice requirements

This section, in subsection (a), eliminates the requirement that the NTSB publish notice in the Federal Register of the availability of accident investigation reports.

Subsection (b) eliminates the requirement that the NTSB publish notice in the Federal Register of the issuance and availability of safety recommendations, and responses thereto.

The Board assures the Committee that elimination of these notices will not result in an appreciable loss of information to the public. Many other, more effective means of information dissemination are being employed by the NTSB. On two prior occasions since 1974, the NTSB has curtailed the scope of its notice publication, and no public comments or objections were received. The NTSB has estimated that this will result in savings of approximately $25,000 per year. In its letter, the Board explained why this provision would appear to be sensible. The Board said:

> Escalating costs and the absence of evidence of any significant use or value derived by the public from publication of these notices in the Federal Register twice has caused the Board to reduce the scope of such notices over the years. Originally, the notice consisted of short summaries of accident report facts and findings and of recommendations and recommendation response contents. Several years later, the notices were reduced to publishing the titles of the accident reports, the verbatim recommendations only and a one sentence characterization of the responses received. More recently, the recommendation and response notice has been reduced to chart form with key words used to identify the content of the recommendation and responses.
>
> No public comments or objections have been received following each reduction. Further, Board staff receives relatively few inquiries or requests for further information about accident reports, recommendations or recommendation responses identified as having been prompted by Federal Register notices, although the Board receives a total of over 16,000 such inquiries each year. In summary, the Board believes that publication of this information in the Federal Register is one of the least effective techniques it uses to inform the public of its activities and of significant transportation safety issues.

Among the techniques which the Board believes are successfully fulfilling the public notification purpose intended by the mandated Federal Register publication requirement are the following:

1. Press releases are issued on all major accident reports and related safety recommendations.
2. Paid subscriptions for receipt of all accident reports and safety recommendations are available through the National Technical Information Service.
3. A free subscription to a quarterly summary of significant Safety Board publications is available.
4. Copies of individual safety recommendations issued by the Board and recommendation responses received are available on request from the Board's Public Inquiries Section.

The Board is now using these techniques and would continue to rely on them instead of publication in the Federal Register. In addition, we would place a notice in the Federal Register several times a year describing the availability of these methods for keeping informed of the issuance of Safety Board publications and how to use them.

Section 4. Training schools

Section 4 of the bill has been the subject of considerable discussion between the Board and the Committee. That exchange has helped to provide a better understanding of the Board's purpose in seeking the provision which, as introduced, the Committee believed to be overly broad and in the nature of a "blank check."

In essence, the exchange showed that the Board was not intending to establish multiple schools throughout the U.S. Instead, the Board intended to continue to provide its formal technical training program at the Transportation Safety Institute in Oklahoma that is operated by the Department of Transportation. In a June 22, 1987 letter to the Committee, the Board explained the purpose. The letter follows:

NATIONAL TRANSPORTATION SAFETY BOARD,
Washington, DC, June 22, 1987.

Hon. JOHN D. DINGELL,
Hon. THOMAS A. LUKEN,
Committee on Energy and Commerce,
House of Representatives, Washington, DC.

DEAR CHAIRMEN DINGELL AND LUKEN: The National Transportation Safety Board (NTSB) is in receipt of a copy of your June 5, 1987 letter to Secretary Dole regarding Section 5 of H.R. 11 which deals with the Board's accident investigation school.

The Safety Board has conducted a formal technical training program in accident investigation techniques and methodology for its own employees and others since the establishment of the NTSB in 1967 (and a similar school was conducted by the Civil Aeronautics Board which performed the aviation accident investigation activity prior to NTSB's establishment). The only period during which the Safety Board did not have a formal technical training program was from 1982 to 1984. It was necessary to discontinue the program

during this period for lack of funds following the massive budget cut sustained by the Board in FY 1982 during which employment fell below 300 and a major reduction-in-force was required.

Similarly, the Board conducted its school in cooperation with the FAA at Oklahoma City in the 1960s and 1970. In 1971 it established its own small training facility in conjunction with a field office it maintained at Dulles International Airport, in order to better integrate on-the-job investigative training with its classroom training and to clearly separate NTSB's non-regulatory approach to investigative training from the DOT's enforcement and regulatory training perspective. Upon reestablishing its school in 1984, while maintaining its separate curriculum, the Board decided to relocate the school in Oklahoma City in order to take advantage of the already existing excellent training facilities and support services of the DOT's Transportation Safety Institute (TSI).

It should also be pointed out that the Safety Board's "school" has never consisted of more than one full-time training specialist (with part-time administrative support). Lecturers are drawn from the Board's own technical specialist staff and from industry technical personnel on an as-needed basis.

Although this program is significantly more advanced than the courses offered by the Federal Aviation Administration (FAA) program, cost savings are realized by both agencies through sharing instructors and educational facilities. TSI's safety programs in other transportation modes offer further opportunities for shared resources.

Beyond the basic vocabulary of aircraft accident investigation, there is little commonality in the content of the NTSB aviation accident investigation course and the FAA course in accident investigation. As in a comparison of the roles played by each parent agency, the program shares a common purpose in enhancing the safety of the flying public, but achieves that purpose through different and complementary means. The fundamental basis of the FAA course is regulatory; the students are taught to find answers to the questions of adequacy in the creation, enforcement and compliance with Federal Aviation Regulations. The fundamental basis of the NTSB program is to determine all causal and contributory factors in an accident, and to make recommendations to regulatory authorities, manufacturers and operators to rectify problems discovered. The NTSB has primacy in the investigation of an aircraft accident and may draw upon the resources of any or all of these entities. In the same manner, the NTSB school begins with the assistance of the FAA and goes on to teach leadership and management of the investigation, requiring a broader and deeper understanding of the areas of expertise, capabilities and limitations of each party to the NTSB investigation.

The courses taught by the NTSB at TSI go beyond aviation accidents to include virtually all modes of transportation. Current courses include highway and rail accident investigation, cross-modal training in human performance and cross-modal training in fires and explosions. With the latitude permitted in H.R. 11 and S. 623, additional cost savings and enhanced training will result from sharing TSI's capabilities in hazardous materials, pipeline safety, urban mass transit and security. For example, the NTSB could not

justify maintenance of a bomb range to demonstrate the effects of various types of hazardous materials on aircraft, truck or marine structures; TSI has access to two explosive ranges. Dedicated displays of wreckage sites that provide valuable hands-on training experience have been made possible at TSI through the combined efforts of several agencies. Within the year, these wreckage layouts will be housed in a large metal building, providing even greater training opportunities. This is made possible by effectively pooling the training resources of federal agencies.

Tasking other agencies with the requirement to train NTSB personnel would overburden their training programs, requiring them to hire additional personnel and acquire expertise in fields outside their responsibilities. No single program at TSI could fulfill our needs, and the management of a piecemeal training program would be inefficient. By establishing a viable NTSB program at TSI, both agencies benefit, at no additional cost to the student and minimal cost to the government.

If you have additional questions, please do not hesitate to contact us.

Respectfully yours,

JIM BURNETT, *Chairman.*

The Board operates under a reimbursable agreement with the Federal Aviation Administration. However, in an October 22, 1986 memorandum an FAA lawyer raised some questions about this agreement. He said:

> *Crediting of NTSB Appropriation.*—The second area of concern is the language in paragraph V.b. which authorizes the FAA to credit to the NTSB operations appropriation those tuitions collected by TSI for training conducted by NTSB. The crediting of tuitions is apparently conditioned on the existence of specific legislative authority permitting NTSB to credit its appropriation in this manner.
>
> Based on the information that I have received from your office, it appears that such enabling legislation has not been signed into law. In the absence of the specific legislative authority, it appears that the final Agreement should not contain the language of paragraph V.b. The FAA should not agree to crediting NTSB's appropriation in the absence of specific legal authority to do so. I should point out that the FAA credits its appropriation under the authority of Section 313(d) of the Federal Aviation Act of 1958 (49 U.S.C. Section 1354(d)), which explicitly permits such crediting. Crediting NTSB's appropriation is not legally supportable without similar legislative authority.

The Committee amendment clarifies section 4 of H.R. 11 and provides the authority needed by the Board to address this problem. It authorizes the Board to continue to use the DOT's training school in Oklahoma on a reimbursable basis. It directs the Secretary of DOT to make the school available to the Board and to other safety entities that are governmental or nongovernmental. However, such use by non-Federal personnel must be covered by a fee sufficient to cover applicable costs. The fee would go directly to the DOT and it

shall be treated as an offset against the annual training agreement entered into between the Board and the DOT. The fee will be reviewed and adjusted periodically. Use of the fee is subject to annual appropriation requirements.

The Committee believes this revised section will meet the needs of the Board fully, while eliminating features that we considered objectionable. The Committee emphasizes, however, that we expect the Board and the DOT to provide training in all safety fields, not just aviation.

Allowing the Board to directly recover part of the costs of conducting classes will enable the Board to hold classes more frequently, to better serve its own needs, since the costs of operating the program will be divided among a larger, paying student base. The Chairman of the NTSB testified that the tuition fees would total approximately $75,000 annually, which would be about one-third of the direct costs necessary to run the school.

Section 5. Payment for goods and services

The Board is authorized to recover the reasonable costs of goods and services furnished to State, local, and foreign governments, with such recovery to be credited to the Board's appropriation.

On many prior occasions, the Board has provided its accident investigation expertise to other governments, both in the United States, and abroad. The most common example of this is the widespread use of the NTSB's laboratory to examine data from cockpit voice recorders, and flight data recorders. In commenting on this provision, the Board said:

> The Board always has been willing to furnish those services without charge to the foreign government, but we do incur costs in providing such assistance. Since the net effect of providing these services is a diminution of the Board's resources, the Board believes that it should have the authority to recoup these costs at least in those cases where the organizations offer to pay for these services.
>
> Each year the Board voluntarily investigates a number of accidents involving aircraft that are owned or used exclusively by federal, state or local governments (public use aircraft). Unlike accidents concerning civil aircraft which the Board must investigate, the Board is not required to investigate accidents involving public use aircraft. However, upon request the Board will assist if at all possible. The benefits of our participation are high quality investigations by an objective organization with unique skills for identifying problems and recommending corrective action.
>
> Further, in many instances the public use aircraft involved in these accidents have civilian counterparts which may be susceptible to the same failures. Thus, an emerging safety problem for civil sector aircraft may be more readily identified through the Board's participation in such investigations.
>
> In view of continued tightening of the Board's resources, we may have to abandon these types of activities. The authority to provide such services at a reasonable cost and

the ability to apply the funds received to current appropriations would enable the Board, minimally, to continue to offer these valuable services.

This section provides the NTSB with the ability to recover the expenses which it incurs in conducting accident investigations on behalf of these entities.

The Committee expects the Board to keep the Committees, including the Committee on Appropriations, aware of the extent of such revenues and their uses each year.

Section 6. Reporting of accidents and incidents involving certain public aircraft

This section allows the Board to establish requirements for the reporting of accidents and incidents involving public aircraft, excluding aircraft of the armed forces. Since many types of aircraft are owned and operated in both the public and private sector, valuable information regarding public aircraft safety may be acquired from establishing performance histories for public aircraft.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

INDEPENDENT SAFETY BOARD ACT OF 1974

* * * * * * *

GENERAL PROVISIONS

SEC. 304. (a) DUTIES OF BOARD.—The Board shall—

(1) * * *

(2) report in writing on the facts, conditions, and circumstances of each accident investigated pursuant to paragraph (1) of this subsection and cause such reports to be made available to the public at reasonable cost [and to cause notice of the issuance and availability of such reports to be published in the Federal Register];

* * * * * * *

[(6) establish by regulation requirements binding on persons reporting accidents and aviation incidents subject to the Board's investigatory jurisdiction under this subsection;]

(6) establish by regulation requirements binding on persons reporting (A) accidents and aviation incidents subject to the Board's investigatory jurisdiction under this subsection; and (B) accidents and aviation incidents involving public aircraft other than aircraft of the Armed Forces;

* * * * * * *

(b) POWERS OF BOARDS.—(1) * * *

* * * * * * *

(6) The Board is authorized to (A) use, on a reimbursable basis or otherwise, when appropriate, available services, equipment, personnel, and facilities of the Department of Transportation and of other civilian or military agencies and instrumentalities of the Federal Government; (B) confer with employees and use available services, records, and facilities of State, municipal, or local governments and agencies; (C) employ experts and consultants in accordance with section 3109 of title 5, United States Code; (D) appoint one or more advisory committees composed of qualified private citizens or officials of Federal, State or local governments as it deems necessary or appropriate, in accordance with the Federal Advisory Committee Act (5 U.S.C. App. I); (E) accept voluntary and uncompensated services notwithstanding any other provision of law; (F) accept gifts or donations of money or property (real, personal, mixed, tangible, or intangible; [and] (G) enter into contracts with public or private nonprofit entities for the conduct of studies related to any of its functions[.]*; and (H) require payment or other appropriate consideration from Federal agencies, and State, local, and foreign governments for the reasonable cost of goods and services supplied by the Board and to apply the funds received to the Board's appropriations.*

* * * * * * *

(10) The Board may at any time utilize on a reimbursable basis the services of the Transportation Safety Institute of the Department of Transportation (established for the purpose of developing courses and conducting training in safety and security for all modes of transportation) or any successor organization. The Secretary shall continue to make available such Institute or successor organization (A) to the Board for safety training of employees of the Board in the performance of all of their authorized functions and (B) to such other safety personnel of Federal, Interstate, State, local, and foreign governments and non-governmental organizations as the Board may from time to time designate in consultation with the Secretary. Utilization of such training at the Institute or any successor organization by any designated non-Federal safety personnel shall be at a reasonable fee to be established periodically by the Board in consultation with the Secretary. Such fee shall be paid directly to the Secretary for the credit of the proper appropriation, subject to the requirements of any annual appropriation, and shall be an offset against any annual reimbursement agreement entered into between the Board and the Secretary to cover all reasonable direct and indirect costs incurred for all such training by the Secretary in the administration and operation of the Institute or any successor organization. The Board shall maintain an annual record of all such offsets. In providing such training to Federal employees, the Board shall be subject to chapter 41 of title 5, United States Code (relating to training of employees).

[10] *(11)* Establish such rules and regulations as may be necessary to the exercise of its functions.

* * * * * * *

RESPONSE TO BOARD RECOMMENDATIONS

SEC. 307. (a) Whenever the Board submits a recommendation regarding transportation safety to the Secretary, he shall respond to each such recommendation formally and in writing not later than 90 days after receipt thereof. The response to the Board by the Secretary shall include this intention to—

(1) initiate and conduct procedures for adopting such recommendation in full, pursuant to a proposed timetable, a copy of which shall be included;

(2) initiate and conduct procedures for adopting such recommendation in part, pursuant to a proposed timetable, a copy of which shall be included. Such response shall set forth in detail the reasons for the refusal to proceed as to the remainder of such recommendation; or

(3) refuse to intiate or conduct procedures for adopting such recommendation. Such response shall set forth in detail the reasons for such refusal.

[The Board shall cause notice of the issuance of each such recommendation and of each receipt of a response thereto to be published in the Federal Register, and shall make copies thereof available to the public at reasonable cost.]

The Board shall make copies of each such recommendation and response thereto available to the public at reasonable cost.

* * * * * * *

AUTHORIZATION OF APPROPRIATIONS

SEC. 309. *(a)* There are authorized to be appropriated for the purposes of this Act not to exceed $12,000,000 for the fiscal year ending June 30, 1975; and $12,000,000 for the fiscal year ending June 30, 1976, such sums to remain available until expended. There are authorized to be appropriated for the purpose of this Act not to exceed $3,800,000 for the transition quarter ending September 30, 1976, $15,200,000 for the fiscal year ending September 30, 1977, and $16,400,000 for the fiscal year ending September 30, 1978, such sums to remain available until expended. There are authorized to be appropriated for the purposes of this Act not to exceed $16,420,000 for the fiscal year ending September 30, 1979, and $17,650,000 for the fiscal year ending September 30, 1980, such sums to remain available until expended. There are authorized to be appropriated for the purposes of this Act not to exceed $18,540,000 for the fiscal year ending September 30, 1981, $19,925,000 for the fiscal year ending September 30, 1982, and $22,100,000 for the fiscal year ending September 30, 1983, such sums to remain available until expended. There are authorized to be appropriated for the purposes of this Act not to exceed $22,600,000 for the fiscal year ending September 30, 1984, $24,500,000 for the fiscal year ending September 30, 1985, and $26,100,000 for the fiscal year ending September 30, 1986, such sums to remain available until expended. *There are authorized to be appropriated for the purposes of this Act not to exceed $25,400,000 for the fiscal year ending September 30, 1988 and*

$27,000,000 for the fiscal year ending September 30, 1989, such sums to remain available until expended.

(b) An emergency fund of $1,000,000 is authorized for expenditure by the Board to be available for necessary expenses, not otherwise provided for, of the Board for accident investigations. There is authorized to be appropriated such sums as may be necessary to establish the emergency fund under the preceding sentence and to replenish the funds annually. Such sums are authorized to remain available until expended.

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U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the
Committee on Energy and Commerce
Washington, DC 20515

April 29, 1988

The Honorable Diane K. Steed
Administrator
National Highway Traffic Safety Administration
Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20515

Dear Ms. Steed:

Thank you for your March 3, 1988 reply to my December letter concerning the General Accounting Office's report on rear seat belt effectiveness. Enclosed is an April 12, 1988 letter I received from the National Transportation Safety Board concerning the General Accounting Office's report. I am awaiting the GAO's comment to the Subcommittee. Enclosed also is the Committee's report on H.R. 11 which discusses these and other relevant safety belt issues.

The most important statement by the Board is that it "continues to endorse the importance of mandatory belt use laws." I applaud the Board, for which I have great respect, for this significant statement. It is important in all our efforts, particularly yours, in furthering greater belt use through mandatory belt use laws and improved enforcement of those laws. I once again urge you and Secretary Burnley to include in this important safety crusade the Federal Government, such as the National Park Service and the National Forest Service. I am sure the Board shares my view that one leads best by good example.

The Board's letter does draw attention again to the "shortcomings" in accident data as identified by the GAO and commends you for trying to improve the data. I request an update on those efforts every three months beginning in June, together with a more detailed discussion of the problems you are trying to correct.

Enclosed also is the Board's March 4 press release on belts which discusses the so-called "windowshade" feature of some lap/shoulder belts. I request that you examine the Board's statements and provide comments to the Subcommittee as to whether or not this is a serious problem, the background for these types of

belts, and the actions being taken by the automakers and NHTSA toward correction, if needed.

Finally, I must express dismay about the lack of any real timetable for action regarding the proposal of a rule concerning rear seat belts. A great deal of time has passed since this issue was first raised and movement at NHTSA appears, at least, to be in "turtle-like" fashion. I request a table in chronological order of all actions regarding this issue since January 1987 and a date certain for a decision by NHTSA on whether a rule will be proposed and if proposed, a date when that will occur. I cannot imagine that it will take much more time to analyze the "comments received."

I also note your comment that "24 of 27 manufacturers will provide those systems in virtually all of their vehicles by model year 1990." Please identify the three firms that will not meet that date and explain when they will do so. Please also identify the firms of the other 24 that will not provide those systems in all models by that date and indicate when they will provide them for all models. Finally, please explain the extent to which these systems for all 27 will be uniform from firm to firm and indicate what, if any, value or advantage a rule would have over this voluntary effort. To my knowledge, the domestic firms, at least, have not expressed opposition to a rule, although they may be concerned about lead time. I do not favor rules for the sake of rules, particularly if voluntary compliance really works, but I am not, in this case, convinced that a voluntary program, although laudable, will be satisfactory. If you think it will suffice, you need to explain in great detail how and why it will suffice. I am a skeptic.

I request a reply within 30 days after receipt of this letter.

Sincerely,

JOHN D. DINGELL
Chairman
Subcommittee on
Oversight and Investigations

Enclosures

cc: The Honorable Thomas J. Bliley, Ranking Minority Member
Subcommittee on Oversight and Investigations

The Honorable Thomas A. Luken, Chairman
Subcommittee on Transportation, Tourism,
and Hazardous Materials

The Honorable Bob Whittaker, Ranking Minority Member
Subcommittee on Transportation, Tourism,
and Hazardous Materials

In addition, the study found that correctly worn lap/shoulder seat belts provide good protection to both a pregnant woman and her unborn child and should be preferred over use of 2-point lap-only belt. The lap/shoulder belt diffuses crash forces over a larger area of the mother's body and minimizes the possibility of maternal or fetal injury.

A careful examination of the case vehicle was carried out in each crash investigation, documenting its "vital statistics" and collecting information about the restraint system available to each occupant. The events of the accident were carefully reconstructed and the necessary measurements made to estimate the collision severity. The age, weight, height, and seating location of each occupant was determined. The crash investigation also determined whether the available seat belt was used, whether it was used correctly, the probable source of each injury, and the severity for each injury sustained.

The investigations revealed cases of lap/shoulder belt misuse which degraded the otherwise excellent protection offered by the 3-point belts. Lap/shoulder belts were misused by occupants wearing them with too much slack, or with the shoulder portion misrouted -- under the arm or around the back -- or the seat was reclined, while the vehicle was moving, causing a grossly improper lap/shoulder belt fit.

The most common form of lap/shoulder belt misuse in the United States appears to be slack in the shoulder portion of the 3-point belts. In the Safety Board's cases, lap/shoulder belts equipped with a "windowshade" feature were more often worn with slack than non-windowshade belts. This finding is consistent with results of the National Highway Traffic Safety Administration's (NHTSA) 19-city survey of restraint use and a survey, conducted by the Insurance Institute for Highway Safety, of Maryland drivers in 1987. These surveys found slack far more common among drivers of windowshade-equipped cars than those without. NHTSA crash test data suggest that the slack in a windowshade-equipped lap/shoulder belt increases the chance of a serious or fatal head injury.

A windowshade feature allows slack to be introduced into the shoulder portion of a lap/shoulder belt in much the same manner as a windowshade operates. When the shoulder belt is slowly extended, slack is introduced until a pause is made, and then the shoulder harness "locks" at that position. If the belt is further extended, the system will relock at the new length. An occupant can introduce slack by extending the belt or through voluntary or involuntary body movement; the slack remains in the system until the occupant deliberately reactivates the windowshade and resets the belt more snugly. Contrary to the belief held by many occupants in the Board's study, the slack existing at the beginning of the crash will not be taken out of the belt as the crash progresses -- i.e., the belt will not tighten up as the crash takes place.

The NTSB said that "increasing the level of occupant protection in passenger cars is one of the most important steps this country can take to lower the number of transportation casualties. Since the vehicle always has a driver and other seating positions are not always occupied, drivers constitute the largest group of occupants killed or injured in crashes. Countermeasures aimed at protecting the front seat occupants -- particularly the driver and the right front passenger -- have the greatest potential safety payoff."

The Safety Board said it supports the passage of state mandatory lap/shoulder belt use laws. Thirty-one states and the District of Columbia have enacted some type of mandatory seat belt use law. Lives have been saved as a direct result of this legislation, since use rates have reportedly increased substantially in several states with laws.

As a result of this Safety Study, the NTSB made four recommendations to NHTSA:

--revise publications to eliminate suggestions to drivers and parents transporting children that they misroute a child's lap/shoulder belt or allow children to share a seat belt;

--require that windowshade-equipped lap/shoulder belts be tested with the maximum amount of slack that can be introduced, or have these belts equipped with a pre-tensioner as part of the belt system, to ensure that slack present in the shoulder portion of the belt will be taken up during the crash;

--limit the angle of inclination allowable in reclining seats in passenger vehicles to no greater than the maximum angle that can safely and effectively be used, while the vehicle is in motion, with a lap/shoulder seat belt;

--explore the possibility of requiring an adjustable upper anchorage point for the shoulder portion of lap/shoulder belts in newly manufactured automobiles.

The Safety Board's complete printed report will be available in approximately one month. Copies of this report, which should be identified as PB-88-917002, may be purchased by mail from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

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Press Contact: Alan Pollock
(202) 382-6606

National Transportation Safety Board
Washington, D.C. 20594

Office of the Chairman

April 12, 1988

APR 14 1988

Honorable John D. Dingell
Chairman, Subcommittee on Oversight
and Investigations
Committee on Energy and Commerce
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Thank you for your letter of December 21, 1987, transmitting a copy of the General Accounting Office (GAO) report, "A Review of the NTSB Report on Rear Seat Lap Belt Effectiveness," and inviting the Board's comment.

In our view, the GAO was correct in its finding that the controversy provoked by the Board's lap belt report arose from our conclusions about the validity of estimates on rear seat lap belts, more particularly our finding that none of the available databases (including our own) is adequate for this purpose.

Ironically, this whole controversial matter arose because, dismayed by what we were learning about the serious hazards of lap belts, we were eager to be able to include in the report reassurances that, overall, lap belts provide positive benefits. Thus, Board staff spent a substantial portion of its time and effort examining studies on seat belt effectiveness, reviewing the nature of the various databases used in these studies, and considering the strengths and weaknesses of them for the purpose of estimating rear seat lap belt effectiveness. We were well aware that "no database is perfect," as the GAO report notes, and that the "possible inaccuracies or limitations in the data" must "be evaluated to determine how likely it is that they would significantly affect" conclusions about rear seat lap belt effectiveness. It was indeed our evaluation of this that led us to conclude, regretfully, that the databases' possible inaccuracies or limitations were sufficiently great to render them inappropriate for the purpose of showing that rear seat lap belts are, overall, effective (or ineffective). Our detailed reasons for reaching that conclusion -- a conclusion the Board continues to hold -- have been set forth, as you know, in the lap belt report itself, the Board's response to B.J. Campbell's paper, and the several pieces of correspondence between yourself and the Board.

We are pleased that the GAO report has drawn further attention to the fact that there are very real shortcomings in the major accident databases, and it is good that the National Highway Traffic Safety Administration (NHTSA)

is trying to improve the accuracy of accident data reporting. Many researchers have warned that the accuracy of belt use reporting is likely to be worsening as an unfortunate side effect of mandatory belt use laws. (Ken Campbell's statements in the GAO report, pages 41-42 refer to this phenomenon, for example.)

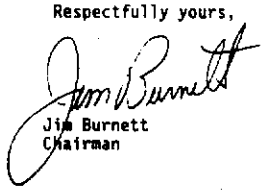
We are also pleased, as you are, with the gratifying response of the industry itself to our recommendations. For example, Ford Motor Company staff recently briefed Board staff on the status of plans for providing rear seat lap/shoulder belts (both new and retrofits). New promotional materials from General Motors give prominent coverage to the new availability of these systems in that company's vehicles. Chrysler recently mailed to its owners of record a description of its rear seat shoulder belt retrofit program and "highly recommended" that its owners have them installed. We are still hopeful that the NHTSA ultimately will move forward to provide a uniform standard for rear seat lap/shoulder belt installations.

Certainly, your strong support for the passage of state seat belt use laws has played an important role in the success thus far of that effort. Indeed, one of the reasons the Board issued its lap belt report early on was to encourage a prompt transition from lap belts to lap/shoulder belts, since people are increasingly buckling up. Perhaps our deepest frustration has been that much of the highway safety "community," including the NHTSA, failed to deal with the main thrust of the report -- the need to move to lap/shoulder belts -- and focused almost entirely on its disagreement with our database conclusion.

The Board continues to endorse the importance of mandatory belt use laws, and looks forward to even greater loss reductions as more vehicles are equipped with the superior lap/shoulder belt throughout.

We appreciate the continuing interest you have shown in these important safety issues, and look forward to working closely with you and others to improve transportation safety in many areas.

Respectfully yours,



Jim Burnett
Chairman

cc: General Accounting Office

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U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the
Committee on Energy and Commerce
Washington, DC 20515

April 29, 1988

The Honorable Donald P. Hodel
Secretary of the Interior
18th and C Streets, N. W.
Washington, D. C. 20240

Dear Mr. Secretary:

I am rather astounded by your reply of April 6, 1988 to my letter of February 12, 1988 concerning the initial (and public safety based) proposal to require persons driving within the National Park System to use seat belts. I really fail to see how the Department can defend the National Park Service's efforts which misled the public to believing that elimination of this safety provision was based on overwhelming "public" comments. Clearly, it was not.

I fully agree that it is "entirely appropriate for agency policymakers to solicit and consider the views" of its employees. I presume that was done before the NPS proposed the entire regulation, not during the public process. Indeed, I request (pursuant to Rules X and XI of the House of Representatives) a chronological history of this regulation from the first stage of initiation of the proposed rule to the date the regulation was published in the Federal Register as a final rule, together with a copy of all letters, memoranda, notes, and other documents in the Department's and the NPS files relative to the proposed and final rule and the identity of all NPS people who prepared and reviewed the proposed and final rule.

The fact remains that the NPS staff is not the general public. Further, no effort was made in the NPS discussion of the changes to inform the general public, as part of the final rule, that the comments, but for one, were solely from internal NPS comments.

I think it is instructive that no State commented on the rule. Obviously, they were not as concerned about an intrusion into State prerogatives as the NPS. Perhaps their silence was intended to show support, not opposition.

Similarly, my staff's discussions with the National Highway Traffic Safety Administration and the Department of Transportation indicates that it is not their normal practice to comment on

another agency's rules. That, in fact, should occur through Office of Management and Budget clearance, although in this case, at least, it looks like that clearance did not work well. I might add that as to motor vehicle safety, I think NHTSA should always comment on agency proposals either publicly (if the OMB fails to bring the rule to NHTSA's attention) or through the OMB process or informally.

In this case, there apparently was no reason for NHTSA or DOT to comment. The proposed rule required use of belts. It was consistent with NHTSA's successful efforts to gain greater use of belts as shown in the enclosed NHTSA letter to Subcommittee Chairman Lehman. NHTSA presumably was comfortable in a "silence is golden" posture. It is my understanding that no one at the NPS, Interior, or OMB alerted NHTSA about the NPS's new anti-safety stance based on a conservative view of its staff who apparently did not want to be bothered by this safety idea. If that understanding is incorrect, then please tell me so I can quiz NHTSA.

Mr. Secretary, the NPS action was its own. It was indefensible. It was an anti-safety action. It should be reversed, possibly by Congress. I understand that Chairman Lehman shares my view. I intend to work with him to see how best we can bring the NPS into the 20th Century from the standpoint of safety.

I request a reply to the above matters within 30 days.

With best wishes.

Sincerely,

JOHN D. DINGELL
Chairman
Subcommittee on
Oversight and Investigations

Enclosures

cc: The Honorable Thomas J. Bliley, Ranking Minority Member
Subcommittee on Oversight and Investigations

The Honorable Thomas A. Luken, Chairman
Subcommittee on Transportation, Tourism,
and Hazardous Materials

The Honorable Bob Whittaker, Ranking Minority Member
Subcommittee on Transportation, Tourism,
and Hazardous Materials

The Honorable William Lehman, Chairman
Subcommittee on Transportation, Committee on Appropriations

The Honorable James Burnley III, Secretary
Department of Transportation

The Honorable Diane K. Steed, Administrator
National Highway Traffic Safety Administration

The Honorable Charles A. Bowsher, Comptroller General
General Accounting Office

Mr. Jim Burnett, Chairman
National Transportation Safety Board

The Honorable James C. Miller III, Director
Office of Management and Budget

U.S. Department of Transportation
National Highway Traffic Safety Administration

The Administrator

400 Seventh St., S.W.
Washington, D.C. 20590

APR 13 1988

The Honorable William Lehman
Chairman, Subcommittee on the
Department of Transportation
and Related Agencies
Committee on Appropriations
House of Representatives
Washington, D.C. 20515-0917

Dear Mr. Chairman:

The Conference Report to accompany H.J. Res. 395 (H.R. Rep. 100-498) directs the National Highway Traffic Safety Administration (NHTSA) to conduct a comprehensive evaluation of the effectiveness of State motor vehicle inspection programs in (1) reducing highway accidents that result in injuries and deaths, and (2) limiting the number of defective or unsafe motor vehicles on the highways. In addition, the House Report requested that we prepare a study plan describing study methodology and specifying a detailed study timetable. Enclosed is a copy of the study plan on the effectiveness of State periodic motor vehicle inspection programs (PMVI).

The evaluation will be conducted by a task force of senior level NHTSA analysts and engineers, all of whom have extensive familiarity with the background issues surrounding PMVI.

To assure the broadest input, we will publish a Federal Register notice to solicit information from State, local, public and private agencies, affected industries and consumer organizations, the automobile insurance industry, and experts in the fields of highway safety research, vehicle safety performance, inspection equipment and techniques, PMVI administration, and enforcement. The notice will also provide for public hearings for the solicitation of information.

For additional input, the task force will conduct a series of site visits to review on-going programs, and will prepare the final report. Outside support will be provided by a consultant for data analysis, as required.

SAFETY BELTS SAVE LIVES

The report is scheduled for completion by March 1989. I believe our study program is both reasonable and practical, and that it should greatly improve our knowledge in this field.

We have also provided Chairman Stennis a copy of our study plan.

Sincerely,

Diane K. Steed

Diane K. Steed

Enclosure

U. S. Department of Transportation

National Highway Traffic Safety Administration

Title: A Plan for the Study of the Effectiveness of State Motor Vehicle Inspection Programs

SUMMARY: In response to direction provided by Congress in the Conference Report to accompany H.J. Res. 395 (H.R. Rep 100-498) the National Highway Traffic Safety Administration (NHTSA) will conduct an evaluation of the effectiveness of State motor vehicle safety inspection programs in:

reducing highway crashes that result in injuries and deaths, and

limiting the number of unsafe motor vehicles on the highways.

The evaluation will be conducted by a NHTSA task force. This task force will review all relevant literature, study existing Periodic Motor Vehicle Inspection (PMVI) programs, analyze NHTSA's crash data bases for evidence of effectiveness of these programs, and seek public participation through public hearings and a Federal Register Notice. NHTSA will especially encourage participation by State and local motor vehicle agencies, other public and private organizations, affected industries and consumer organizations, the automobile insurance industry, and experts in such fields as highway safety research, vehicle safety performance, inspection equipment and techniques, PMVI program administration, emissions inspections, and enforcement. The task force will also conduct a series of site visits to survey on-going PMVI programs.

The evaluation will be completed and the report prepared by March 1989.

BACKGROUND: Currently, safety oriented PMVI programs are conducted by 21 States and the District of Columbia. These programs affect about 68 million, or roughly 38%, of all registered vehicles in this country as of December 31, 1985. Of the non-inspection States, some do provide for "spot" inspection, or other variations of inspection affecting certain classes of vehicles, such as school buses.

There are significant differences among the States that do have PMVI. These differences include which vehicle components are inspected, the inspection procedures that are employed, the supervision of the process, and the enforcement activities. Some States have both safety PMVI programs and emission inspection programs. Other States have just one of the programs.

In those States with PMVI, all classes of vehicles registered in the State are subject to inspection. However, under the Motor Carrier Safety Act of 1984, FHWA is in the process of developing a rule for periodic motor vehicle inspection for commercial motor vehicles. Because this will change the status of truck inspections, we will focus only on those vehicles with a GVWR of less than 10,000 lbs.

Since the early 1970's, several attempts have been made to determine the effectiveness and cost-benefits of PMVI programs. In addition, attempts have been made to develop improved methods for inspecting vehicle subsystems as part of the PMVI process. The results of these efforts demonstrate mixed success.

First, it has been shown that it is extremely difficult to assess the extent to which PMVI results in a better maintained vehicle fleet. This is so because such an assessment must be made independent of the PMVI process, such as an extensive random vehicle inspection program. Because of sample size considerations, and their attendant cost implications, studies addressing this issue have not been done for several years. For these same reasons, it will not be possible to address this issue experimentally in this study either. However, all previous work will be reviewed and it will form the basis for the discussions in this area.

The safety benefits resulting from PMVI programs have been difficult to establish because of the limited amount of information available concerning the role that vehicle defects play in highway crashes. However, data sets have improved and more information might now be obtainable than was possible in earlier efforts.

Finally, the issues involved in inspecting vehicle systems with the goal of predicting vehicle safety system failures are quite well-understood and the implications that these issues have on the PMVI process are documented. The problem is that existing inspection techniques do not provide inspectors with the ability to make meaningful predictions of system failures. During the course of the study, these issues will be reexamined, and new data will be obtained where such data are available.

In addition to the effectiveness and cost-benefits issues cited above, the possibility of combining PMVI with emissions inspections will also be considered. Information relevant to this issue will be solicited during the public hearings, in the Federal Register Notice, and during the site visits. We will also request the views of the EPA.

We will also solicit the views of appropriate State and local, public and private agencies, affected industries and consumer organizations, and the motor vehicle insurance industry. Material obtained during public hearings, from assessments of current PMVI programs, from the literature, from crash data analyses, and from various other sources will form the basis for the discussions and conclusions in the final report.

It is the objective of this study to examine the various issues concerning the effectiveness of State motor vehicle safety inspection programs in limiting the number of defective or unsafe motor vehicles on the highways and reducing highway crashes that result in injury and deaths.

WORK PLAN:

To meet the objectives of the Congressional request, NHTSA will complete the tasks described below. The work will be accomplished by a task force made up of senior level NHTSA analysts and engineers, all of whom have extensive familiarity with motor vehicle safety and other issues surrounding PMVI. As such, the task force represents a most highly qualified source of technical expertise to accomplish this effort. This task force will be supported by limited (under $10,000) outside consultant support.

Task 1: Literature Review

Over the past two decades a significant amount of effort has gone into the assessment of the effectiveness and cost/benefits of PMVI. Many reports dealing with PMVI have been published by various research organizations such as the Transportation Research Institute, University of Michigan, States and others. Much of this work was sponsored by NHTSA; thus, it is readily available for review by the task force. Special emphasis will be placed on reports regarding the effectiveness of PMVI in limiting the number of defective or unsafe vehicles on the roadways and in reducing highway crashes resulting in injury and deaths. We will especially seek out reports of State experience which document their reasons for expanding or reducing their PMVI safety programs. We will also seek reports regarding the effectiveness of PMVI inspections in detecting components that are mechanically unsafe.

Similar reviews by the States of New Jersey, and Virgina, the Comptroller General of the United States, and NHTSA have been conducted in the past and there has not been a significant amount of new work contributed since the last reviews were done. It is, however, important to revisit the literature to assure ourselves that we are familiar with the most current efforts and to then use that data as the point of departure for the other tasks in the study.

TASK 2: Data Analysis

NHTSA has numerous crash data sets that will be used in this study to develop a better understanding of the possible relationship between PMVI

programs and highway crashes where vehicle defects may have played a major role. The most notable set is the FARS set which has been used in many similar analyses in the past. While this set is excellent because it includes all fatal crashes, it is limited because it is quite small - about 40,000 crashes each year.

Another source of information that has recently become available to the agency is State crash data files. These files contain many times the number of crashes as does FARS and, as such, offer the potential to perform analyses that were previously not possible. We currently have data sets for the past ten years for 18 States. We will review these sets to determine which are the most appropriate for this type of analysis and then proceed to try to establish links between the existence of PMVI programs and the frequency of crashes involving malfunctioning brakes, worn out tires, defective suspension or steering systems, or broken glass.

TASK 3: Assessment of Current PMVI Programs

Prior to the public hearings, NHTSA technical staff will make a series of site visits to PMVI States to determine the actual practices in the inspection facilities, to document the history of inspection results, to review what enforcement practices are followed to ensure that defective vehicles are repaired, to review the criteria for training and certification of inspectors and certification of inspection stations, to make an initial assessment of the feasibility of combining safety and emission inspection programs, and to explore the feasibility of use by States of private organizations to conduct motor vehicle safety inspection programs. As part of these assessments, we will visit several States which employ random spot inspections to better understand the advantages and disadvantages inherent in that form of inspection system as well. In addition to providing valuable information about actual State practices, these site visits will also provide extremely valuable background information for the public hearings.

TASK 4: Federal Register Notice

A Federal Register Notice will be published announcing the Public Hearings and requesting comments on the same issues raised in Tasks 1,2,3 and 5. The Federal Register Notice will provide another means for getting the broadest possible participation from the public and private sectors.

TASK 5: Public Hearings

Two public hearings will be held to solicit information from States, public safety, and motor vehicle agencies, other public and private organizations, affected industries and consumer organizations, the automobile insurance industry, and experts in such fields as highway safety research, vehicle safety performance, inspection equipment and techniques, PMVI program administration, emissions inspection, and enforcement. The information solicited during these hearings will cover the full range of topics including evidence of PMVI effectiveness in limiting the number of unsafe vehicles on the roadways, evidence of effectiveness in reducing defect related crashes, estimates of the feasibility of combining safety and emissions inspections, enforcement issues, and training and certification issues.

TASK 6: Final Report

Upon completion of the above tasks NHTSA will prepare a draft report of the results of its efforts, and, if appropriate, recommendations concerning PMVI. This draft report will be made available in the Federal Register to seek public comment. The report will contain:

an executive summary including important findings of the analyses, surveys, public meetings and conclusions,

a statement of the objectives and review of background material,

a brief summary of the literature review,

a discussion of the results obtained from the data analysis,

a discussion of the materials obtained from the site visits,

a summary of the information gained from the public hearings and from the Federal Register Notice,

a presentation of all data derived during the study that bear on the PMVI issues under consideration, and

a discussion of the findings and conclusions, along with any appropriate recommendations.

A final report will then be prepared.

SCHEDULE: A tentative schedule for the study tasks is shown as Figure 1.

Figure 1
Schedule of Study Tasks

1988	Task 1 Lit Review	Task 2 Data Anal	Task 3 Survey Current PMVI Programs	Task 4 Fed Reg Public Hearings	Task 5 Public Proj	Task 6 Anal Notice & Rept
Mar	X	X	X			
Apr	X	X	X	X		
May	X	X	X		X	
Jun		X	X			
Jul		X	X			
Aug		X	X			
Sep		X	X		X	X
Oct						X
Nov						X
Dec			(draft report published in the Federal Register for public comment)			
1989						X
Jan						X
Feb						
Mar				(final report)		X

GAO **United States**
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-223735

November 13, 1987

The Honorable John Dingell
Chairman, Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

This report is in response to your August 27, 1986, request that we review the study of rear seat lap belt effectiveness issued by the National Transportation Safety Board (NTSB). This report examines the methodology used by the Board and pays particular attention to the Board's criticisms of other research that shows lap belts to be effective protection for rear seat occupants.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Chairman, National Transportation Safety Board, and to the Secretary, Department of Transportation. Copies will also be made available to other interested parties.

This report was prepared under the direction of Herbert R. McLure, Associate Director. Major contributors are listed in appendix II.

Sincerely yours,

J. Dexter Peach

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Lap belts for rear seat automobile passengers have long been promoted as an effective life-saving device. However, a July 1986 study by the National Transportation Safety Board (NTSB) challenged this widely held belief. The study, Performance of Lap Belts in 26 Frontal Crashes, uncovered a number of cases in which passengers were injured because they wore lap belts. Given this evidence and the Board's belief that existing data were inadequate for showing lap belt effectiveness, NTSB concluded it could not advise people to wear rear seat lap belts.

Many members of the highway safety research community believed the Board did not have sufficient grounds for questioning rear seat lap belt effectiveness. The Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, asked GAO to review the NTSB report paying special attention to the methodology the Board used to develop its conclusions. GAO also examined several recent studies prepared in response to the NTSB report, which reached a different conclusion as to the likely benefit from wearing lap belts. On the basis of an assessment of the available evidence, GAO sought to determine whether NTSB had sufficient basis for rejecting prior research that showed lap belts to be beneficial.

Background

In 1984 NTSB began an in-depth investigation of about 200 accidents to learn how well all types of restraint systems were performing in today's driving environment. Shortly after that study began, NTSB investigators came across several cases in which serious or fatal injuries were caused by lap belts. In response to this phenomenon, the Board shifted the focus of its study to lap belts and the July 1986 study reported on 26 accidents in which at least one occupant was wearing a lap belt. NTSB found that the belts themselves often caused death or serious injury to occupants who, the Board concluded, would have fared better had they been wearing lap/shoulder belts or even if they had been unbelted.

The Board recognized that to measure the overall effectiveness of rear seat lap belts, a larger, statistically representative database was necessary. However, the Board concluded that the databases used by the National Highway Traffic Safety Administration (NHTSA) and other highway safety researchers to analyze seat belt performance were so seriously flawed that they could not be relied on to demonstrate the effectiveness of rear seat lap belts. NTSB noted that most of the databases are derived from information contained in police accident reports and that these reports are often inaccurate when it comes to reporting belt usage and accident severity. The Board concluded that, given the

evidence of possible harm it observed in many of the accidents it investigated and the problems with the available data, it was unable to say whether or not passengers in the rear seat should be advised to wear lap belts. The Board recommended that all new cars be equipped with lap/shoulder belts and that older cars be refitted with them.

The critics of the Board's study claim that NTSB looked only at very severe accidents in which restraint systems are much less effective, and did not focus on cases in which lap belts might provide protection. With one exception, NTSB examined only frontal accidents, but one-half of all fatal accidents are nonfrontals. A more representative sample, they believe, would have shown that the net effect of rear seat lap belts is to save lives and reduce the number and severity of injuries.

Results in Brief

GAO does not dispute NTSB's finding that lap belts, in some instances, can cause death or serious injury to rear seat occupants wearing them. As the Board notes, this information has been known to the accident research community for many years. GAO agrees with NTSB that there may be inaccuracies in the data researchers have used to analyze rear seat lap belt effectiveness, but GAO believes that before rejecting all of these analyses and the widely held belief that lap belts protect rear seat passengers, NTSB must do more than simply point to the existence of limitations in the databases.

The Board has not shown that the various databases are so flawed they cannot be used to analyze rear seat lap belt effectiveness. A number of recent studies employing different methodologies and different databases, while finding that rear seat lap belts are less effective in the types of accidents investigated by NTSB, concur in finding that rear seat lap belts protect wearers more often than they harm them.

Principal Findings

The Board's Report

The 26 cases NTSB examined demonstrate that a performance problem exists with rear seat lap belts in severe frontal crashes. NTSB believes that the "conventional wisdom" that holds that rear seat lap belts are effective in reducing death and injury severity is based on highly unreliable data. Most highway safety research uses data originating in police accident reports which, according to NTSB, are riddled with inaccuracies.

The Board notes that databases that do not rely on police accident reports also are inadequate because they contain relatively few cases in which lap-belted occupants were involved. NTSB does not claim to have shown that lap belts are, on balance, ineffective, but that their overall effectiveness cannot be substantiated by analyzing the existing databases.

Criticism of the Report

Although researchers do not dispute the NTSB finding that lap belts sometimes can cause death or serious injury, critics of the report claim that the Board examined a biased sample of accidents, which made lap belts appear to be less effective than they would have been had it studied a more typical collection of accidents. Several recent studies employing different databases and different analytical techniques all conclude that lap belts reduce the risk of death and serious injury to rear seat occupants. These studies also suggest that the protection afforded by rear seat lap belts is greater in nonfrontal accidents and at lower impact speeds. This is consistent with NTSB's finding that lap belts are less effective in frontal, high-impact accidents.

GAO's Analysis

NTSB has identified a number of possible limitations in the data used by traffic safety researchers to analyze seat belt effectiveness. However, identifying possible limitations in the data is not sufficient to demonstrate that the data are unusable. GAO believes that before NTSB can dismiss all the research supporting the "conventional wisdom" that rear seat lap belts are, on balance, effective, it must demonstrate that the data problems are so extensive that the data cannot be used to determine rear seat lap belt effectiveness. Although little research has been done in this area, the analysis that has been done does not support the view that police reporting problems, such as presuming belt use by the uninjured and nonuse by injured occupants, are so severe as to render the data useless for analysis. Until research is done that contradicts this evidence, GAO concludes that it is imprudent to dismiss the evidence that lap belts in the rear seat are an effective safety countermeasure. NHTSA is studying ways to improve the quality of its data. Finally, GAO does not dispute NTSB's conclusion that lap/shoulder belts offer superior protection for rear seat passengers. Even those who have been most critical of the Board's study acknowledge that lap/shoulder belts provide better protection than lap-only belts.

Recommendations

Since the purpose of GAO's review was to analyze and comment on NTSB's report, GAO is making no recommendations.

Agency Comments

GAO briefed NTSB staff on the results of the review and took into account their comments and suggestions where appropriate. However, GAO did not obtain official agency comments on this report.

Contents

Figures

Abbreviations

AIS	Abbreviated Injury Scale
DOT	Department of Transportation
FaAA	Failure Analysis Associates
FARS	Fatal Accident Reporting System
FMVSS	Federal Motor Vehicle Safety Standards
GAO	General Accounting Office
HSRC	Highway Safety Research Center at the University of North Carolina
KABCO	Scale of Injuries (K = killed; A,B,C = level of injuries; 0 = uninjured)
NASS	National Accident Sampling System
NCSA	National Center for Statistical Analysis
NCSS	National Crash Severity Study
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
RSEP	Restraint Systems Evaluation Program
TAD	Traffic Accident Damage Scale

Chapter 1

Introduction

In July 1986 the National Transportation Safety Board (NTSB) released a report, The Performance of Lap Belts in 26 Frontal Crashes, which questioned the overall effectiveness of rear seat lap belts in passenger cars and vans. Lap belts are single straps that are brought across the pelvis and are usually found in the rear seat of passenger cars. (Figs. 1.1 and 1.2 show examples of lap and lap/shoulder belts.) In its study NTSB uncovered a number of cases where lap belts did more harm than good to passengers who wore them. NTSB also is highly critical of the data used in other studies that purport to show lap belts to be an effective device for protecting rear seat occupants. In this chapter we review the roles and responsibilities of the two federal agencies concerned with highway safety, NTSB and the National Highway Traffic Safety Administration (NHTSA); briefly describe the NTSB lap belt study; and outline our objectives, scope, and methodology in preparing this report.

NTSB and Its Mission

The NTSB is an independent agency charged with determining the probable causes of transportation accidents and with promoting transportation safety. The Board investigates accidents, conducts safety studies, and evaluates the effectiveness of other government agencies' programs in preventing transportation accidents. The Board makes safety recommendations based on its studies to federal, state, and local government agencies and to the transportation industry regarding actions that should be taken to prevent accidents.

The Board's charter is the Independent Safety Board Act of 1974, but its origins trace back to the Air Commerce Act of 1926, which gave the U.S. Department of Commerce the responsibility for determining the causes of civil aviation accidents. The Board investigates accidents involving all modes of transportation. NTSB has 325 employees, 100 of whom are stationed in 10 field offices around the nation.

The lap belt study was done by NTSB's Bureau of Safety Programs. The Bureau was established as a part of NTSB in 1982 when the Board decided to place more emphasis on evaluating the performance of safety systems. The Bureau develops an annual work plan that must be approved by a majority of the five Board members.

Figure 1.1: Lap Belt

Figure 1.2: Lap/Shoulder Belts

NTSB generally does not undertake statistical analyses of accident causality; rather, it conducts in-depth analyses of individual accidents. In general, the Board investigates only those accidents brought to its attention by police or other highway safety agencies. Specially trained accident investigators make a thorough examination of the scene of an accident to determine, as precisely as possible, what occurred. NTSB highway accident investigators try to get to the scene of the accident

and to the vehicle within a few days before the evidence is disturbed by highway maintenance crews or motor vehicle repair shops. The highway accident investigator makes a number of measurements to calculate the force and direction of impact and the events that occurred inside the vehicle. In addition to examining the physical evidence at the scene, the investigator interviews witnesses, vehicle occupants, police, and emergency medical personnel. The investigator also reviews medical information on those injured when it is available. Using all the information available, the investigator attempts to reconstruct the accident and determine why the accident occurred and how the occupants were injured.

Genesis of the NTSB Lap Belt Study

In the fall of 1984, the Board approved a plan to investigate the crash performance of seat belts in a sample of approximately 200 accidents. Initially, the Board was interested in evaluating the performance of all types of seat belts and did not intend to concentrate on lap belts. The Board wanted information on the real world performance of seat belts because it was concerned that recent changes in automobile design, such as downsizing, might be compromising seat belt effectiveness. In addition, the Board was concerned about the lack of dynamic testing of seat belt systems. The Board believed that not enough was known about how current belt systems performed in real world accidents.

After about a quarter of the approximately 200 investigations had begun, NTSB investigators noticed that in several frontal accidents, rear seat, lap-belted occupants were seriously injured, and that the injuries to the abdominal region sustained by those wearing the lap belts were caused by the belts themselves. After learning about this unexpected phenomenon, NTSB decided to refocus its effort and concentrate on the performance of lap belts. In the lap belt report, NTSB concluded not only that conditions could exist under which lap belts could be harmful but also that the data used by the National Highway Traffic Safety Administration (NHTSA) and other researchers are not sufficiently reliable to show that lap belts are effective. The Board recommended that NHTSA initiate a rulemaking immediately to require lap/shoulder belts in the rear outboard (side) seats of passenger vehicles. (See ch. 2.)

The Role of the National Highway Traffic Safety Administration

NHTSA is an agency within the U.S. Department of *Transportation* (DOT) responsible for improving the safety performance of motor vehicles. Predecessor agencies created in 1966 were transferred in 1967 to the newly created Department of Transportation. The Federal-Aid Highway Act of 1970 established NHTSA as a separate administration within DOT.

To carry out its responsibilities, NHTSA promulgates and enforces regulations, including the Federal Motor Vehicle Safety Standards (FMVSS), dealing with the performance of vehicles and equipment. For nearly 20 years NHTSA has required that new automobiles sold in the United States be equipped with lap/shoulder belts in the front outboard seating positions and with lap belts in all other seating positions. In addition, since the late 1960s, NHTSA regulations have required manufacturers to provide anchorages for refitting the rear seats with lap/shoulder belts should the car owner want to install them.

In 1984 NHTSA was petitioned to require lap/shoulder belts for the rear outboard seats. At that time NHTSA refused to open a rulemaking, noting that the available data showed that lap belts reduced the likelihood of death and serious injury by 50 to 60 percent and that requiring lap/shoulder belts would provide little additional benefit. In 1986 NHTSA required automobile manufacturers to provide a diagram in the owner's manual showing the location of the shoulder belt anchorages for the rear seat.

NHTSA relies on the information contained in its major databases in deciding whether to open a rulemaking hearing and in formulating its regulations. Within NHTSA, the National Center for Statistics and Analysis (NCSA) collects and analyzes motor vehicle and traffic safety data. NCSA's most important data collection systems are the Fatal Accident Reporting System (FARS) and the National Accident Sampling System (NASS). FARS contains data on every fatal motor vehicle crash since 1975. NASS, established in 1979, contains detailed studies of a selection of crashes that, NHTSA believes, are statistically representative of all police-reported crashes occurring in the United States. In addition to the currently active FARS and NASS programs, NCSA also uses accident data gathered in two earlier studies, the Restraint Systems Evaluation Program (RSEP) and the National Crash Severity Study (NCSS). These accident data programs preceded NASS, but NHTSA still uses the information in them to study the performance of safety systems.

Objectives, Scope, and Methodology

In August 1986 the Chairman of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, requested that GAO examine the basis for the Board's conclusions and recommendations regarding lap belts and the basis for the criticisms of the report by other researchers. We met with the Chairman's representatives and agreed to focus our study on how NTSB selected accidents for its sample and whether it had demonstrated that NHTSA and other accident databases cannot be used to evaluate the benefits of lap belts in reducing the risk of death and serious injury in motor vehicle accidents. We also agreed it would not be feasible for us to undertake an independent analysis of lap belt effectiveness. Instead, we agreed to examine the NTSB study and the analyses performed by others. In addition, we agreed to review the available literature and to interview NTSB personnel, including staff who worked on the lap belt report.

In addition to NTSB staff, we interviewed highway safety researchers at NHTSA, including those at NCSA. We interviewed several members of the highway safety research community who have worked in the area of restraint system effectiveness, including B.J. Campbell of the Highway Safety Research Center at the University of North Carolina in Chapel Hill; Frank Conley of the New York State Department of Motor Vehicles in Albany, New York; and Ken Campbell of the Transportation Research Institute at the University of Michigan. We also interviewed individuals from Physicians for Automotive Safety, the Center for Auto Safety, the American Association for Automotive Medicine, and representatives of both foreign and domestic automobile manufacturers. We attended a symposium sponsored by the Society of Automotive Engineers in Detroit in February 1987 that focused on the issues raised in the NTSB report. We also reviewed several critiques of the NTSB report, the Board's response to those critiques, and subsequent replies to the Board's responses. We did not independently verify the data used in cited research nor did we certify the accuracy of the statistical programs used to analyze the data.

We did not attempt to answer the question of how effective lap belts are for passengers riding in the rear seat. Instead, we tried to determine whether NTSB has shown that the problems with the available data are so severe that they cannot be used to support the "conventional wisdom" that wearing a lap belt is better than wearing no belt at all. NTSB does not claim to show that lap belts are ineffective but that the effectiveness is overstated and conceivably could be zero or negative. The Board contends that it is impossible to determine the effectiveness of lap belts through statistical analyses of the existing databases.

We performed the review in accordance with generally accepted government auditing standards. We discussed the results of our review with agency officials and their views are incorporated as appropriate. In accordance with the request of the Chairman's office, we did not obtain official agency comments on the report.

Chapter 2 presents the details of the NTSB report. Chapter 3 contains several critiques of the NTSB report and several recent attempts to demonstrate the effectiveness of lap belts. Chapter 4 reports NTSB's response to these recent efforts. Chapter 5 summarizes our observations and conclusions on the NTSB report.

Chapter 2

The NTSB Study of the Performance of Lap Belts

In the course of a study of the performance of both the lap and lap/shoulder seat belts, NTSB investigators encountered several cases in which a person wearing a lap belt was seriously injured by the device. The Board refocused its study to concentrate on the lap belt issue and found that in frontal accidents lap belts could be detrimental instead of beneficial. When the Board sought to determine whether lap belts were beneficial in other types of accidents, and thus beneficial overall, it concluded that the available data are inadequate to make such a determination. NTSB decided that it could not advise people to wear lap belts when riding in the rear seats of passenger cars, and it recommended that rear seat occupants have the same protection as front seat occupants—lap/shoulder belts.

NTSB Study Methodology

The NTSB report consists of two parts. The first is the Board's analysis of 26 accidents in which at least one vehicle occupant was wearing a lap belt. Other occupants may have been unbelted or wearing a lap/shoulder belt. The second part focuses on the Board's critique of the large accident databases that other researchers have used to support the position that lap belts provide reasonable protection to rear seat passengers who wear them.

With regard to the collection of data for the accidents it investigated, the Board directed its highway field investigators in eight cities to set up accident notification procedures with local law enforcement agencies, emergency medical services, and any other organizations or individuals who might be in a position to notify them immediately of any accidents that met the following criteria:

1. The vehicle must be a post-1974 car, light truck, or van.

2. At least one vehicle occupant must have been using a seat belt.

3. The crash must have been of sufficient severity to require that the vehicle be towed from the scene.

4. The crash must not have been so severe as to be deemed unsurvivable for belted occupants.

These criteria were employed primarily to ensure that the sample consisted of accidents where seat belts might be expected to influence the injury outcome. At first the regions were instructed to collect cases in a

50-mile radius from the regional offices. However, because some regions had difficulties obtaining cases, the geographic limits were expanded.

In addition to the accident analysis background that NTSB investigators usually bring to a study, the highway accident investigators who were to be involved in the seat belt study attended a 1-week training course to learn how to determine whether or not people involved in motor vehicle accidents were actually wearing seat belts. To verify belt use, the investigators were trained to look for evidence such as loading marks on the rings holding the belts or on the belts themselves that would indicate whether they had been worn during the accident. Thus, an NTSB investigator's conclusion about whether a person involved in an accident was wearing a seat belt is based not only on an occupant's testimony, but also on whether the physical evidence supports that testimony.

When the Board decided to emphasize cases involving lap belts, it did not change its accident notification criteria. Instead, the Board instructed its field staff to look especially carefully at potential cases involving occupants restrained by lap belts in the rear seat. By the end of the data collection period, NTSB had been notified of 26 accidents, involving 31 vehicles and 139 occupants, in which at least 1 occupant was wearing a lap belt and which also met the notification criteria.

Because the Board was aware that the 26 accidents it investigated were not representative of the range of real world accidents (nearly all 26 were frontal collisions and none were rollovers), it examined other studies that have been used in attempts to determine seat belt effectiveness. The Board did not attempt its own estimate of rear seat lap belt effectiveness.

Synthesis of the 26 Cases NTSB Examined

When NTSB investigators went to the accident scenes and documented how occupants were injured in the 26 crashes, they found lap belts more often than not caused more harm than good. Among the 50 persons who were reported to be wearing lap belts, NTSB found that 32 would have fared substantially better had they been wearing a lap/shoulder belt. The Board found that lap belts had caused a number of severe or fatal injuries that probably would not have occurred had the person not been wearing a lap belt. Moreover, the Board observed that the lap belt-induced injuries were not the result of improper use; even properly

employed belts were causing a problem. Twenty-six lap-belted occupants sustained serious to fatal injuries in crashes where other occupants, including those in the more vulnerable front seat, were less seriously injured or not injured at all.

Table 2.1: Distribution of Accident Severity in 26 Crashes

		Injury severity							
Belt use	Number of persons	Uninjured	Minor	Moderate	Serious	Severe	Critical	Maximum	Fatal
No belt	57	4	20	17	11	1	2	2	(4)
Lap belt	50	1	16	5	7	6	13	2	(13)
Lap/shoulder belt	32	2	12	10	3	4	1	0	(1)

The injuries sustained as a result of the lap belts were often among the most dangerous types of injuries: those to the head, spine, and abdomen. The distribution of the injuries sustained in the 26 crashes is shown in table 2.1. Of the 50 persons wearing lap belts in these crashes, only 1 was uninjured. Although 13 were killed, little or no evidence existed of intrusion or compression of the occupant space in the areas surrounding those fatally injured. All received their fatal injuries as a result of wearing the lap belt, according to the Board's investigators. The Board noted that of the 33 lap-belted persons who sustained moderate injuries or greater, 30 received one or more of these injuries as a direct result of the lap belt. Of the 29 persons who received injuries designated as serious or worse (or died later),[1] 21 sustained more than 1 injury at this level caused by the lap belt, and 3 persons received 10 such lap belt-induced injuries.

NTSB officials told us that they reviewed the literature on highway accidents and found that the problem of lap belt-induced injuries is one that has been known to the medical profession and highway safety researchers for more than 20 years. In addition, a number of studies by NHTSA and other highway safety researchers, both in the United States and abroad, have discussed the problem of lap belt-induced injuries. These injuries often are internal and not immediately discernible to police or emergency medical personnel at the accident scene. As a result, some accident victims, who initially appear to be uninjured, later die because of a lap belt-induced injury that went undetected and untreated in time.

[1]The Board told us that one person was recorded as having suffered only minor or moderate injuries, but later died from internal injuries the Board believes were caused by the lap belt.

Limitations of Existing Databases

The 26 cases that NTSB examined led it to question whether lap belts are an effective countermeasure against death or injury, especially in frontal collisions. Because the 26 cases examined were not a statistically representative sample of all accidents in which rear seat lap belts might make a difference, the Board turned to prior analyses of the national accident databases to answer the question of the overall effectiveness of rear seat lap belts. After it reviewed a number of government reports and studies by highway safety researchers, the Board concluded that very few studies had specifically addressed the effectiveness of lap belts, and what studies had been done were based on highly unreliable data.

NHTSA and others had previously estimated that lap belts were as much as 60 percent effective in preventing death or serious injury for wearers of rear seat lap belts.[2] NHTSA believes that this percentage was about the same for lap/shoulder belts. NTSB believes that these estimates are greatly exaggerated. Pointing out that the research claiming that rear seat lap belts are very effective is based on information originally recorded in police accident reports, NTSB believes that these reports often omit or misclassify important information, contain imprecise measures of accident and injury severity, and suffer from other drawbacks that limit severely their usefulness in evaluating rear seat lap belt effectiveness. NTSB is especially critical of the large national databases developed by NHTSA.

Omitted and Misclassified Data in Police Accident Reports

NTSB points out in its study that the primary source of accident information used by NHTSA and others is the reports filled out by the police at the accident scene. Some databases are augmented by information from medical personnel and witnesses, but the police reports form the heart of most databases used in analyzing accidents. NTSB believes that an accurate database is critical to an assessment of seat belt effectiveness.

In police accident reports, the Board notes, it is often unclear whether an occupant was actually wearing a seat belt or what type of belt was being worn. Given the need for the police to focus on who was at fault in an accident and whether any laws were broken, the officer usually has little time to assess accurately whether the occupants were wearing seat belts. Furthermore, NTSB claims the officers are generally not trained to examine the physical evidence that would allow them to determine

[2]By "percent effective," highway safety researchers mean the percent reduction in deaths or injuries from using the safety device.

whether or not belts were worn. We examined the accident report forms used by the individual states and found that some do not even include a place to record belt use. In these cases belt-use information appears in computerized data files only if the officer included it in the narrative of the accident. In addition, accident reporting forms differ from state to state. Among states specifically recording belt use in accidents, some simply request the officer to record whether or not a restraint device was used while others ask the officer to code the restraint system available from a menu of six or seven different systems. NTSB officials told us that even when the form calls for recording belt use, individual officers sometimes do not record use or record the wrong type of system.

The Board cited several examples to show how extensive the problem of omitted data is. In the National Crash Severity Study undertaken by NHTSA from 1977 to 1979, seat belt use was reported as "unknown" in 33 percent of the cases. One large state had an "unknown" rate of 85 percent, while another state recorded 96 percent as unknown. NTSB claims that in some cases NCSS investigators appear to have changed recorded restraint use from "unknown" to "known" when entering the information into the database. There was also evidence in the FARS database of substantial misreporting as to the type of restraint system in place. For example, according to the Board, lap belts were frequently miscoded as lap/shoulder belts.

Even when belt usage is reported and the restraint system available appears to be properly identified, NTSB believes that there is a systematic bias in the data caused by the tendency of police to presume belt use by the uninjured and nonuse by injured occupants when, in fact, the police do not know if the belts were worn or not. This bias, to the extent it exists, produces an exaggerated estimate of the benefits from wearing seat belts.

Imprecise Measures of Crash Severity

In addition to inadequacies in reporting belt use, NTSB points to a number of other problems with databases derived from police accident reports. It is important to know accident severity because seat belt use usually will play a more important role in serious accidents than in minor ones. Most reports rely on police officers' subjective evaluations of vehicle damage in deciding crash severity. NTSB investigators, on the other hand, calculate the change in velocity (delta V) as the measure of crash severity. Measurements of deformation from the crash are taken at several places near the point of impact; given information on the vehicle, the

investigator can calculate delta V. This is a more refined estimate of the seriousness of a crash than that made by the police at the scene.

NTSB notes that a correlation exists between restraint use and accident severity that needs to be controlled for in analyzing restraint system effectiveness. Recent evidence suggests that restrained drivers are less likely to be involved in collisions, especially serious ones. It has been estimated that unrestrained drivers have a 57 percent greater likelihood of being involved in collisions of sufficient severity to kill them than do restrained drivers. Estimates of seat belt effectiveness based on accident involvement are likely to be inflated because of marked differences in exposure between restrained and unrestrained occupants, particularly in terms of injury severity. Therefore, estimates of seat belt effectiveness must correct for collision severity or they will overstate the benefits.

Imprecise Measures of Injury Severity

The Board also is critical of the broad injury classification system, known as the KABCO scale (K = killed; A, B, C = degrees of injury; and O = no injury), used by most states to record injury severity. To assess whether seat belts reduce injury severity, accurate data are needed on how seriously injured belt wearers and nonwearers are. The Board believes that the KABCO scale does not adequately differentiate between serious, life-threatening injuries and those that are relatively minor. For example, both a broken arm and a broken skull are "A" level injuries. Without accurate measures of injury severity, it is difficult to compare injury outcomes of belted and unbelted persons. In its report, the Board used the Abbreviated Injury Scale (AIS), which is based on the survivability of the injuries sustained.

The Board also questions the ability of police officers to assess injury severity accurately. This is particularly true with respect to the source of injuries. The Board believes that police officers are simply not trained to determine whether a lap belt caused an injury. Further, police accident reports often provide no information (such as age, sex, or seating position) on uninjured occupants or those who sustain only minor injuries, especially in cars with fatally or seriously injured persons. According to NTSB, these problems with injury reporting further limit the usefulness of data from police accident reports for estimating restraint system effectiveness.

Limitations of NHTSA Databases

NTSB is highly critical of the databases used by NHTSA—the 1977-79 National Crash Severity Study (NCSS); its successor, the National Accident Sampling System (NASS); and the Fatal Accident Reporting System (FARS). According to NTSB the data contained in NCSS are dated and incomplete, while the data in NASS are largely irrelevant and include too few cases. NTSB believes FARS data are inaccurate because they rely completely on police accident reports. For example, in the case of FARS, the Board notes that in 1984 25 percent of rear seat-belted fatalities were recorded as being lap/shoulder-belted. However, because very few cars had lap/shoulder belts in the rear seats at this time, it is extremely unlikely that this many rear seat fatalities were wearing lap/shoulder belts.

NHTSA has estimated that rear seat lap belts are up to 60 percent effective in reducing injuries and fatalities. However, because of the weaknesses in the databases, NTSB claims that it is not possible to estimate even a range of effectiveness. NTSB believes that because the databases were not designed to permit analyses of belt-induced injuries, they are inappropriate bases for making such assessments. The Board believes that its detailed accident analysis offers a method of determining when lap belts fail to protect an occupant or induce an injury, something the existing databases cannot do.

NTSB's Conclusions

NTSB's investigation of 26 accidents showed that lap belts can sometimes cause death or serious injury to those wearing them. The Board acknowledged that the 26 cases were not a statistically reliable sample for determining whether rear seat lap belts are effective overall; however, when the Board turned to the existing databases to answer the question of overall effectiveness, it found them too flawed to be used to answer the question raised by the 26 cases. Therefore, NTSB concluded that it is unable to make a recommendation as to whether or not rear seat occupants should wear lap belts. The Board did, however, recommend four actions by NHTSA:

1. Encourage manufacturers to provide retrofit assemblies for lap/shoulder belts and make their availability widely known.

2. Initiate a rulemaking immediately to require manufacturers to install lap/shoulder belts in the rear outboard (side) seats of new vehicles.

3. Until the new rule is effective, encourage manufacturers to equip all new vehicles with lap/shoulder belts in the rear outboard seats.

4. Determine the feasibility of three-point lap/shoulder belts for every seating position (i.e., including front and rear center seats) and, if feasible, require manufacturers to install them in all new vehicles.

GAO Observations

We do not dispute the NTSB finding that, in a number of accidents, occupants wearing lap belts were seriously or fatally injured by the devices that were supposed to protect them. However, this problem, as the Board itself points out, has been known for many years. The Board did not need the evidence of the 26 accidents it studied to make the case that lap belts offer less protection than lap/shoulder belts and that in some types of accidents lap belts can kill or seriously injure the wearer.

NTSB says in its study that the 26 accidents it investigated were not meant to be representative of all accidents, but the Board also claims that these 26 accidents were neither particularly severe nor unusual ones. Therefore, while acknowledging that the 26 were not a scientific sample, the report suggests that the problem of lap belt-induced injuries may be more common than heretofore suspected. This possibility is what triggered the Board's search of the literature to decide net effectiveness.

NTSB offers a number of reasons why it believes the existing databases are flawed and provides a number of examples of data misreporting, but NTSB does not undertake any analysis to show that the data are so flawed as to be unusable.

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Chapter 3

Reactions to the NTSB Report

Many members of the highway safety research community criticized the NTSB report on lap belt performance. They believe that NTSB exaggerated the shortcomings in the databases used in statistical analyses of seat belt effectiveness, while making serious methodological errors in its own analysis. In addition, they believe that in publicizing its findings, the Board may have undermined the public's confidence in seat belt systems generally. Highway safety researchers recently completed several studies that reexamined the question of lap belt effectiveness. Although they found lap belts to be less effective than did earlier studies and less effective in high-impact frontal accidents than in rollovers and other types of accidents, they all found that lap belts, on balance, make a positive contribution to rear seat occupant protection.

In this chapter we first review some of the general concerns raised by the critics of the NTSB report and then present analysis by several highway safety researchers who recently examined the evidence on lap belt effectiveness. These researchers employed several different databases and undertook different approaches to analyze these data.

Overall Concerns of the Critics

Several critics of the report told us that although they agree with the NTSB's conclusion regarding the superiority of lap/shoulder belts, they believe the Board should have anticipated that its findings could be misinterpreted. They believe that not everyone would make the distinction between lap belts and lap/shoulder belts, and many people might mistakenly abandon all restraint systems. The critics also argue that the public might not understand that NTSB questioned only the reliability of the data supporting lap belt effectiveness; in other words, the public might read into the report that the Board had proved that rear seat lap belts are not effective. According to these critics, when a federal transportation safety agency questions the "conventional wisdom" about the effectiveness of such a widely accepted safety device as lap belts, there is the potential for misunderstanding.

Some critics also have expressed concern that the Board's report might influence the outcome of efforts to repeal mandatory seat belt use laws. Although the principal issue in the referenda on belt use laws has been "personal freedom," the critics note that voters in Nebraska and Massachusetts elected to repeal their mandatory use laws in November 1986, 4 months after the release of the Board's study. Although we were unable to find any evidence that the NTSB report influenced the outcome of either election, the vote in Nebraska was decided by less than 1,000 votes out of more than 500,000 cast.

Responses to the NTSB Report by Highway Safety Researchers

NHTSA and several other traffic safety researchers who rely on police accident report-based data to analyze highway safety programs responded almost immediately to NTSB's lap belt study. They recited the results of earlier studies that had found lap belts to be effective in reducing traffic deaths and injuries. In addition, several highway safety researchers prepared new analyses of lap belt effectiveness for a symposium sponsored by NHTSA and the Society of Automotive Engineers in Detroit in February 1987. Most of the analyses discussed in this chapter were prepared for presentation at this conference, but the authors briefed GAO staff on the progress of their research during the months preceding the conference.

Dr. B.J. Campbell of the Highway Safety Research Center

Perhaps the leading critic of the NTSB study has been Dr. B.J. Campbell, Director of the Highway Safety Research Center (HSRC) at the University of North Carolina at Chapel Hill.[1] Dr. Campbell is a widely known expert on motor vehicle safety and restraint systems and has himself called for lap/shoulder belts in the rear seats of passenger automobiles. Campbell is highly critical of the research methods the Board used in its report and of its challenge to the accuracy of databases underpinning the conventional wisdom that lap belts are an effective restraint system for rear seat passengers. Because Campbell's arguments are shared by and have been cited by others, we discuss them here in some detail.

According to Campbell, NTSB dismisses the existing evidence of lap belt effectiveness without any scientific basis for doing so. NTSB alleges a number of shortcomings in the databases that he and other researchers use; but, Campbell argues, the Board has not demonstrated that these shortcomings are so severe as to render invalid the use of these data for statistical analysis of lap belt effectiveness. Campbell says that if NTSB wants to discredit previous investigations, it must employ research methods at least as rigorous as those used in the studies it dismisses. Furthermore, he claims that the shortcomings that plague some databases do not affect all to the same degree. He notes that some data, including the North Carolina State data used by HSRC, are generally regarded by the highway safety research community as being more reliable than other state and national databases. HSRC staff have worked with North Carolina officials to improve the quality of police accident reporting.

[1] B.J. Campbell, The Effectiveness of Rear-Seat Lap Belts in Crash Severity Reduction, University of North Carolina Highway Safety Research Center (Chapel Hill: Nov. 1986).

Campbell notes that although NTSB advocates lap/shoulder belts as an improvement over lap belts, it bases its recommendation on much of the same evidence it dismissed when the same evidence was applied to lap belts. Campbell argues that if existing data and research are adequate to demonstrate the effectiveness of lap/shoulder belts, they are adequate for lap belts as well. Campbell believes that there is ample evidence in the literature to demonstrate that lap belts in the rear seat are an effective, if second-best, countermeasure.

Critique of the NTSB 26 Cases

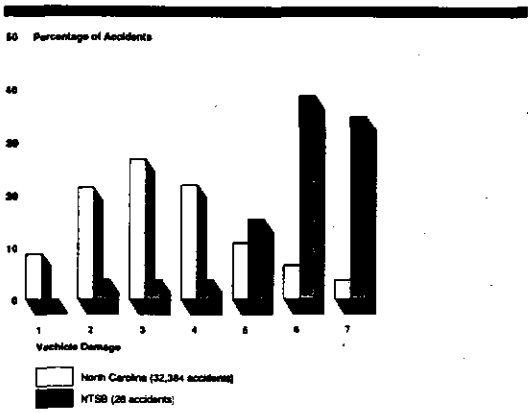
Campbell claims that the 26 cases that comprise the NTSB database on lap belts are examples of extraordinarily severe crashes. He notes that the stated criteria used by NTSB to select candidate crashes for investigation could have yielded many thousands of cases, yet the Board only investigated 200, of which 26 involved lap-belted occupants.[2] Campbell searched the North Carolina database (which derives from police accident reports) and uncovered 60,951 crashes that occurred over the 1979-85 period in North Carolina that met the NTSB criteria. About one-half of these (32,384 crashes) were also frontal collisions.

Campbell compares the 26 NTSB cases with the experience of the North Carolina drivers and passengers in his much larger sample and concludes that the 26 accidents examined by NTSB are extraordinarily severe and thus not representative of the range of accidents passengers may experience. Because NTSB and North Carolina employ different systems to measure accident and injury severity, Campbell transforms the NTSB case data into HSRC equivalents. With respect to crash severity, North Carolina uses a vehicle-deformation rating system, called the Traffic Accident Damage (TAD) scale, which relies on police officers to rate a crash on a 7-point scale based on vehicle crush. The officers are supplied with a pictorial guide to help them in making their ratings. NTSB investigators calculate "delta V," an estimate of the change in velocity at the time of impact. Roughly, this is the speed at which a passenger would be moving toward a point in a car's interior after the vehicle collided with an unyielding object. Delta V is a more sophisticated measure of impact forces and crash severity, but it cannot be used in rollovers or in sideswipe accidents. HSRC personnel reviewed photographs of the 26 NTSB accidents and assigned each a TAD rating.

[2]The Board told GAO that geographic limitations on the survey and the inability to undertake a detailed analysis of every eligible accident explain why it only investigated a small proportion of the total population of accidents that met the reporting criteria.

Campbell compares the frequency distribution of accident severity in the 26 NTSB crashes with that of the North Carolina crashes meeting the NTSB case selection criteria. He finds that the NTSB accidents are very skewed toward the high end of the accident severity distribution. A statistical test shows that the odds are more than 10,000 to 1 against drawing a sample with such an extreme distribution of accident severity. This suggests that the NTSB sample is unrepresentative of the distribution of accident severity found in the population of accidents meeting the Board's stated selection criteria (see fig. 3.1).

Figure 3.1: Vehicle Deformation (TAD) Ratings in North Carolina Crashes and 26 NTSB Crashes



Source: J. Campbell, The Effectiveness of Rear-Seat Lap-Belts in Crash Injury Reduction, 1986.

Campbell also compares the injury distribution in the 26 NTSB cases with the North Carolina experience. The scales employed to gauge injury severity also differ. NTSB uses the Abbreviated Injury Scale of injury severity in which a numerical rating of 1 through 6 is assigned to each injury received based on its threat to the victim's life. Thus, an AIS 1 injury would include superficial abrasions, while an AIS 5 would involve

spinal cord injuries, second or third degree burns, or a cerebral concussion where the victim is unconscious for more than 24 hours. AIS 1 through 5 injuries are usually survivable, while AIS 6 injuries are considered virtually unsurvivable. These ratings are based on medical evaluations of the accident victims. The state of North Carolina employs the more commonly used, but less precise, KABCO scale. This scale classifies injuries with visible signs of seriousness. A wound involving bleeding, a broken bone, or a dislocation would be rated "A." Other signs of injury, such as bruises and abrasions, would be rated "B." Complaints of pain or momentary unconsciousness with no visible sign of injury would be classified as "C." The KABCO rating is made by the police officer at the accident scene.

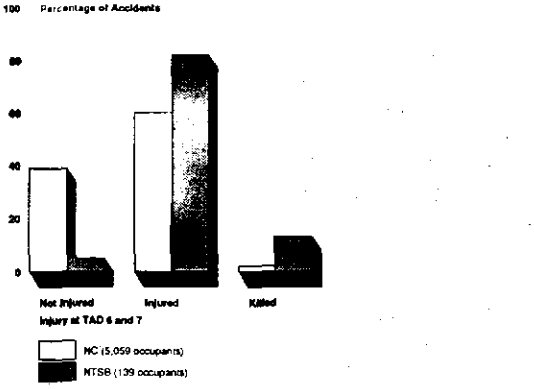
The only comparison that Campbell is able to make is on the basis of no injury, injury, or killed. Yet, even if the analysis is limited to only the most severe accidents in the North Carolina database—TAD-6 and -7 level crashes—the distribution of injuries experienced by more than 5,000 North Carolinians is again very unlike that experienced by the 139 occupants in the 26 NTSB cases. For example, only 2 percent of drivers in the severe North Carolina crashes were killed while 13 percent of the occupants in the NTSB vehicles died. Similarly, although almost 39 percent of the drivers in the North Carolina crashes escaped uninjured, only 5 percent of those in the NTSB crashes did so. The chance of differences in the proportions of fatalities, injured, and uninjured as great as those between the North Carolina and NTSB samples occurring randomly is very small. Figure 3.2 shows the differences in percentages of injured, uninjured, and killed from the North Carolina and NTSB samples. A statistical test shows that the probability of such differences resulting from random selection is also 1 in 10,000.

Evidence of Lap Belt Effectiveness From North Carolina Data

Dr. Campbell believes that these differences offer strong evidence that the 26 accidents investigated by NTSB are extraordinarily severe. In very serious accidents both lap belts and lap/shoulder belts reach the limits of their effectiveness. To demonstrate this, Campbell compares the injury outcomes of lap/shoulder-belted and lap-belted drivers in crashes of different severity (TAD scale). He finds that the benefit for both systems declines as crashes become more serious. Nonetheless, he reports a significant positive reduction (27 to 32 percent depending on whether 1975-85 or 1972-85 model cars are included) in the frequency of serious injury for lap/shoulder belted drivers even in the most serious frontal accidents (TAD 7). Lap belts, on the other hand, reach the limit of their effectiveness in TAD 6 accidents; and in the most severe frontal accidents

(TAD 7), there appears to be no significant difference between wearing lap belts and wearing no belt at all.

Figure 3.2: Injury Comparisons of 5,059 North Carolinians and 139 Occupants in the 26 NTSB Crashes



Source: B.J. Campbell

Campbell believes that those who reported accidents to the NTSB study probably chose to report only very serious accidents where belted persons were injured. He believes that cases where lap belts were beneficial were inadvertently screened out, and as a result, the Board was left with the impression that lap belts were of questionable benefit. But, according to Campbell, even those wearing lap/shoulder belts fared little better than those wearing no belt at all in the 26 accidents examined by NTSB. For example, about 16 percent of lap/shoulder-belted occupants received injuries rated AIS 4-6, while only 9 percent of unrestrained occupants received such serious injuries. Similarly, roughly the same proportion of lap/shoulder-belted and unrestrained occupants were uninjured or received only minor (AIS 1) injuries. A more representative sample, Campbell believes, would have shown that both lap- and lap/shoulder-belted passengers fared better, and that although lap belts

sometimes cause injury, they more often help reduce injury and injury severity.

Campbell also points out that the NTSB report focuses on cases where a lap-belted person fared worse than an unbelted occupant in the same vehicle. Again using North Carolina data, Campbell tries to demonstrate that such "wrong way" outcomes are to be expected even with lap/shoulder belts but that they do not predominate. The North Carolina data show that occupants wearing lap or lap/shoulder belts are injured more seriously than unbelted ones in the same vehicle 11 to 14 percent of the time. But injuries to belted occupants are less severe in an even greater proportion of the cases. For 314 accidents in which one person in the rear seat of a vehicle was wearing a lap belt and the other was unbelted, he finds that in 11.5 percent of the cases, the lap-belted person was more seriously injured, but in 19 percent of the cases, the lap-belted person fared better. In addition, on average, in the cases where lap-belted occupants fared better, they fared better to a greater degree than in cases where the unbelted occupant was better off. He arrives at similar results when he compares lap/shoulder-belted occupants with unbelted ones in the same vehicle. However, Campbell offers no evidence of the statistical significance of these findings.

Outcomes that are the reverse of what is expected are not unusual, according to Campbell, and give evidence to the uniqueness and complexity of each accident. Seat belts will not always be effective in preventing death or injury, and unbelted people will sometimes escape a serious accident unscathed. However, Dr. Campbell believes that the data support the finding that belted occupants, whether they wear a lap belt or a lap/shoulder belt, will, more often than not, fare better than unbelted occupants.

Finally, with respect to the allegation that police officers are unable to tell whether or not someone was wearing a seat belt, he argues that the existence of uncertainty in the data does not mean that the data are useless. He agrees with the Board that police sometimes presume belt use when a person is uninjured and sometimes presume nonuse when a person is injured, but he does not believe that this type of misreporting occurs frequently enough to rule out using the data for assessing lap belt effectiveness. Campbell cites earlier studies that attempted to measure police bias in reporting restraint use. These studies concluded that bias exists, but different studies found that the bias went in different directions, and none found that the bias was so pronounced that the data could not be used to analyze seat belt effectiveness.

Failure Analysis Associates

An engineering consulting firm, Failure Analysis Associates (FaAA), also reviewed the NTSB study and issued a report critical of the Board's data collection procedures and the way the data were presented.[3] FaAA interviewed NTSB field staff and Washington officials, undertook a detailed analysis of the full record of the accidents in NTSB's sample, and contrasted NTSB's data with other databases. FaAA believes that NTSB's case accidents "are a seriously biased selection which is unrepresentative of any population of motor vehicle accidents in the United States." FaAA finds that NTSB violated its own selection criteria in choosing cases for investigation, received a biased distribution of cases with some regions reporting only very severe accidents, and selectively ignored pertinent information on the accidents it investigated that was readily available. Database entries on the accidents in the NTSB sample contradict the Board's assertion that police misreporting makes it impossible to determine belt effectiveness through statistical analysis of large accident databases.

FaAA notes that NTSB analyzed information from 30 case vehicles in 30 accidents (the 26 with lap-belted occupants and 4 others the Board later added for comparative purposes), but omits results from 25 other (non-case) vehicles involved in these accidents because they failed to meet one or more of the selection criteria. But, according to FaAA, NTSB did not consistently adhere to its selection criteria. For example, a 1967 Pontiac was included as a case vehicle despite the NTSB's stated criterion that vehicles were supposed to be post-1974 models. In addition, although NTSB claimed that its investigation began in the fall of 1984, several case accidents occurred in the late spring and summer of 1984.

FaAA found that the distribution of accident reporting by the NTSB regional offices was highly skewed with adverse consequences for the representativeness of the NTSB sample. Three regions reported only fatal accidents while the others reported mostly nonfatal ones. A statistical test showed that the odds of this distribution occurring by chance are less than 1 in 200. The implication is that different field offices interpreted the selection criteria differently and some reported only accidents where someone was killed. FaAA notes that field offices reporting only fatal accidents contributed a disproportionate share of lap-belted occupants.

[3] R.L. McCarthy, C.S. Davis, and J.A. Padmanaban, An Evaluation of the NTSB Report Entitled "Safety Study - Performance of Lap Belts in 26 Frontal Crashes," Failure Analysis Associates (Palo Alto, CA: July 1987)

FAA is also critical of the way NTSB used the data it collected. For example, FAA analysis of the full record of the 30 accidents revealed that 30 percent of the unbelted occupants in noncase vehicles were killed. This experience, FAA observes, represents the worst record of any group of occupants in the sample accidents. NTSB does not even report this severe outcome in the noncase vehicles and focuses instead on how poorly lap-belted occupants fared in case vehicles.

Finally, although NTSB believes that police misreporting of belt use and injury severity seriously limit the usefulness of statistical analysis of large databases to measure belt effectiveness, it never examines the database entries of its accident sample to test its hypothesis. FAA compared NTSB investigator reports of belt use with belt use reported for these 30 accidents in the FARS database. Both police and NTSB investigators recorded restraint use by 132 occupants. FAA analysis of the record revealed that in only 5 cases (3.8 percent) was there disagreement between the police and NTSB investigator coding of belt use. Moreover, FAA notes that the differences are balanced as to the direction of the coding error and injury level so that no bias can be inferred. With regard to injury reporting, police and NTSB investigators coded 176 injured occupants by injury level in both case and noncase vehicles. In only 13 of these cases (7.4 percent) was there disagreement between police accident reports and NTSB investigator determination of injury severity, according to FAA. (The rate of disputed cases rises to 8.6 percent if only the records for nonfatally injured occupants are compared.) Nearly all of the differences in injury assessment are small and they go in both directions.

The FAA study, therefore, is consistent with B.J. Campbell's conclusion that the NTSB accident sample is not representative of the accident population at large and that the NTSB conclusion is unfounded that the value of lap belts as an effective safety countermeasure is uncertain. In addition, FAA analysis of the details of the accidents included in the NTSB report does not support NTSB's conclusion that police misreporting of belt use and injury severity is widespread.

Dr. Leonard Evans, General Motors Research Labs

Dr. Leonard Evans, Senior Staff Research Scientist at General Motors Research Laboratories, recently evaluated restraint systems generally, and rear seat lap belts in particular.[4] He used a statistical procedure he recently developed called the double pair comparison method. (This procedure is described in app. I.) Because it examines only fatalities and nonfatalities in the same vehicle, Evans' approach reduces the problem caused by the relationship between belt use and accident severity.

Evans uses FARS data for 1975-84 to assess rear seat belt effectiveness on reducing fatalities. Because the information contained in FARS does not distinguish by type of restraint system employed, Evans must assume that all rear seat belted occupants are wearing lap belts. By confining his analysis to adults (16 years old or over), he eliminates cases where child seats were the restraint system. His assumption that all rear seat restraints are lap belts is plausible for two reasons: (1) child seats are excluded and (2) few cars are equipped with rear seat lap/shoulder belts.

Evans estimates that rear seat lap belts reduce fatalities by 18 percent. He finds that the probability that rear seat lap belts have a positive impact in reducing fatalities is almost 98 percent. However, when Evans examines only frontal accidents, the estimated benefit becomes negative, although as Evans notes the sample size is too small to conclude much more than that rear seat lap belts are probably less effective in frontal crashes than in crashes overall. Therefore, like Campbell, Evans finds that the available evidence shows that rear seat lap belts, on balance, are beneficial. Both Campbell and Evans find evidence to suggest that lap belts are less effective, and perhaps even negatively effective, in serious frontal accidents, the type that comprised the NTSB sample.

National Highway Traffic Safety Administration

NHTSA also rejects the conclusions of the NTSB report as they pertain to the usefulness of police accident report data in deciding seat belt effectiveness. NHTSA officials point out that NTSB admits that it did not attempt to measure overall effectiveness, but rather examined the performance of lap belts under certain accident conditions. NHTSA officials believe that there are ample data showing that lap belts in the rear seat are effective, although they too agree that lap/shoulder belts are better and that lap belts can cause injury in some cases.

[4]Leonard Evans, "Rear Compared to Front Seat Restraint System Effectiveness in Preventing Fatalities," Restraint Technologies: Rear Seat Occupant Protection, Society of Automotive Engineers (Detroit, Feb. 1987).

NHTSA officials, like B.J. Campbell, claim that the 26 NTSB accidents are very severe. The distribution of delta V for these 26 cases was very different from what NHTSA encountered for towaway crashes in the National Crash Severity Study (see table 3.1).

Table 3.1: Frequency Distribution of Delta V in Towaway Crashes

Figures in percent	NCSS	NTSB
Delta V (mph)		
1 - 10	49.6	6.7
11 - 20	40.3	13.3
21 - 30	7.5	43.3
31 - 40	1.7	33.3
41 - 50	0.6	3.3
Over 50	0.3	0.0
	100.0	100.0

Source: NHTSA.

NHTSA officials told us that NTSB is an agency that usually analyzes failures and serious crashes and therefore it is not surprising that the Board obtained such an unrepresentative sample.

NHTSA also defends the databases it uses to study restraint system effectiveness. The agency believes that, although some of the NTSB criticisms are valid, a chain of evidence from a number of databases developed over the past 10 years demonstrates the effectiveness of rear seat lap belts. NHTSA agrees that effectiveness estimates contain some bias because of misreporting, but previous investigations of this bias by HSRC have concluded that it is not fatal to the usefulness of the data.

Evidence From the Restraint Systems Evaluation Program

The Restraint Systems Evaluation Program was the first and only large, detailed database developed by NHTSA exclusively to evaluate occupant restraint system performance. Data were collected for RSEP in 1974 and 1975 for 1973-76 model year passenger cars. Accident investigation teams in five diverse and geographically representative areas of the country (Michigan, California, New York, Florida, and Texas) selected accidents for study through a probability sampling plan. More than 15,000 accidents were investigated and detailed data were collected on a number of variables, including injury type and severity using AIS codes. The investigators followed an elaborate procedure for determining

restraint use, including examining the belt system for evidence of loading; interviewing police, witnesses, and occupants; and studying occupant injury patterns. Like NTSB investigators, the RSEP investigators made a careful determination of belt use.

The RSEP data were examined by HSRC researchers. After controlling for confounding factors such as crash severity, car size, impact location, and occupant age, analyses determined that both lap and lap/shoulder belts were effective. Lap belts reduced moderate injuries (AIS 2) by 29 percent. Comparable analyses for lap/shoulder belts determined that they were 52 percent effective. For more serious injuries (AIS 3), lap belts were found to be 43 percent effective, while lap/shoulder belts were found to reduce serious injuries by 46 percent. All estimates were statistically significant.

The RSEP data have also been examined to determine the extent of police reporting bias. Belt use according to occupant testimony, police reports, and investigator analysis were compared. Analysis by G.Y.H. Chi,[4] formerly with HSRC, showed that police did underreport belt use generally, and more so for injured occupants, as NTSB has alleged. Still, for AIS 2 injuries, Chi found that lap belts were effective, although effectiveness estimates derived from police accident reports were much higher than those from investigator reports (see table 3.2). Chi's results suggest that although police reports may overstate belt use, they are not so biased so as to make a harmful system appear effective.

Table 3.2: Effectiveness of Lap and Lap/Shoulder Belts in Reducing Serious Injuries According to Police and RSEP Investigator Reports

Figures in percent

	Investigator	Police
Lap belt effectiveness	23	34
Lap/shoulder belt effectiveness	53	56

Note: Differences between Chi and HSRC estimates result from the fact that Chi was able to include only three of the five states in his analysis.

Source: G.Y.H. Chi, The Effects of Belt Usage Misclassification Errors on Seat Belt Effectiveness Estimates, 1980

NHTSA acknowledges, however, that there are reasons why the RSEP data cannot provide the final answer to rear seat lap belt effectiveness. First, the data are old. Today's cars are different and seat belts have changed

[4]G.Y.H. Chi, The Effects of Belt Usage Misclassification Errors on Seat Belt Effectiveness Estimates, HSRC (Chapel Hill: Feb. 1980).

over the past decade. Second, RSEP investigated only front seat passengers, so the lap-belted passengers in the data were in the front seat rather than the rear seat. With regard to the extent of seat belt use misreporting by the police, NHTSA believes that these limitations might affect the size of the effectiveness estimate, but not whether it is positive or negative.

Evidence From the National Crash Severity Study and the National Accident Sampling System

Following RSEP, NHTSA began the National Crash Severity Study, which examined 12,000 towaway accidents between 1977 and 1979. Although it was not focused on restraint system effectiveness, NCSS recorded belt use from three sources: police accident reports, occupant interviews, and investigator determination. Analysis of the data showed that front seat belt effectiveness estimates were consistent with RSEP findings. There were few rear seat lap-belted cases in the NCSS file, but one examination of the data found that lap belts were equally effective, between 50 and 60 percent, for front and rear seat occupants.

The National Accident Sampling System succeeded NCSS in 1979. This is a broad sample of police accident reports designed to produce a statistically representative sample of the nation's accidents. While both NCSS and NASS used investigator determination of belt use, neither employed the protocols of RSEP and both relied more heavily on the police accident reports. Small sample sizes for specific population subgroups, such as injured rear seat occupants wearing lap belts, also limit the application of statistical analysis to NCSS and NASS data to estimate effectiveness. In addition, when there are only a few cases, it is not possible to control for confounding factors such as accident severity.

Despite these limitations, a March 1986 NHTSA analysis pooled the NCSS and NASS files to examine the question of rear seat lap belt effectiveness. Because there are relatively few injured rear seat belted occupants, even in the combined data sets, it is not possible to undertake rigorous statistical analysis. Nevertheless, a simple comparison of accident rates showed that rear seat lap belts were 39 percent effective in reducing fatalities and 57 percent effective in reducing serious injuries.

Dr. Charles Kahane's Analysis of Fatal Accident Reporting System and Pennsylvania State Accident Data

Dr. Charles Kahane of NHTSA recently estimated the fatality-and injury-reducing effectiveness of lap belts for rear seat passengers using data from the 1975-86 Fatal Accident Reporting System and 1982-85 Pennsylvania State accidents.[6] Like Evans, Kahane used the double pair comparison method to analyze the data (see app. I). Kahane's analysis of the FARS data differed from Evans' in that Kahane used only drivers as a control group. Kahane's analysis also differed from Evans' in that he included 1986 FARS cases, children between the ages of 5 and 15, occupants in the center rear seat, and passengers in vans and light trucks.

FARS contains nearly 500 records of fatally injured rear seat, lap-belted occupants. On the basis of the 1975-86 data, Kahane calculated that the reduction in fatalities for lap-belted, rear seat occupants compared with unbelted occupants is 17 percent. Kahane notes that lap belt use by rear seat passengers may have been underreported in the earlier years of FARS. He told us he believes that usage rates were so low that police may have ignored their use except when the occupant was killed in the crash. This type of underreporting would bias estimates against the restraint system because belt use would more likely be reported when the system failed. In fact, during the 1975-82 period, lap belt effectiveness was negative in 4 of the 8 years. However, effectiveness was consistently positive in the past 4 years, averaging 26 percent. Kahane believes that police today are more likely to record belt use in all types of crashes, and the more recent data are therefore more accurate.

Kahane estimated ranges of rear seat lap belt effectiveness from both 1975-86 and 1983-86 FARS data. For the 1975-86 data, he estimated that rear seat lap belts were between 3 and 31 percent effective in reducing fatalities. For the 1983-86 data, estimated effectiveness increased to between 15 and 37 percent. Kahane subdivided the data into frontal and nonfrontal crashes, and found that lap belt effectiveness is close to zero in frontal crashes when the experience of rear seat lap belt wearers is compared with that of nonwearers. As with the analyses of Campbell and Evans, this result is consistent with NTSB's finding for frontal accidents. The results appear in table 3.3.

[6]Charles Kahane, "Fatality and Injury Reducing Effectiveness of Lap Belts for Back Seat Occupants," Restraint Technologies: Rear Seat Occupant Protection, Society of Automotive Engineers (Detroit: Feb. 1987).

Table 3.3: Fatality Reduction Through Employment of Rear Seat Lap Belts—Double Pair Comparison

Figures in percent

Type of accident	Data set 1975-86	1983-86
Frontal	-8	+1
Nonfrontal	+34	+43

Source: Charles Kahane, "Fatality and Injury Reducing Effectiveness of Lap Belts for Back Seat Occupants," Restraint Technologies: Rear Seat Occupant Protection, 1987

However, when compared with front seat drivers, both restrained and unrestrained rear seat passengers fare better. In fact, Kahane finds that the back seat is such a relatively benign environment in frontal crashes that an unrestrained, rear seat occupant is as safe or safer than a lap/shoulder-belted driver or lap-belted rear seat occupant. However, in nonfrontal crashes the unrestrained rear seat occupant is only 16 percent safer than the unrestrained driver and is at much greater risk than the restrained driver, according to Kahane's analysis. Approximately one-half of all fatal accidents are frontals. He finds that the lap belt is especially valuable in nonfrontal crashes because it can prevent occupant ejection. On the basis of 1983-86 data, he estimated that lap belts provided a 43 percent reduction in the likelihood of being fatally injured compared with being unrestrained in the rear seat in nonfrontal accidents.

Kahane also examined injury data from the Pennsylvania accident file for the 1982-85 period. Pennsylvania records contain over 2,000 cases in which occupants wearing lap belts in the rear seat were injured. Conventional analysis, that is, comparing injury rates of belted and unbelted occupants, yields an effectiveness estimate of 63 percent for serious injuries, 51 percent for moderate injuries, and 21 percent for injuries overall. On the basis of his own research experience, Kahane believes these estimates are too high. The double pair comparison method yields effectiveness estimates just over half as large as those from the conventional approach.

Kahane notes that NTSB was particularly concerned about lap belts increasing the risk of abdominal injury. He undertook a separate double pair comparison analysis of the Pennsylvania data for each of the major body regions. Since Pennsylvania does not code abdominal injuries separately, they are included under "torso." As indicated in table 3.4, the Pennsylvania data are consistent with NTSB's conclusion that lap belt-restrained occupants have an increased risk of abdominal injuries.

Table 3.4: Effectiveness Estimates of Rear Seat Lap Belts Using Double Pair Comparison of 1982-85 Pennsylvania Accident Data

Figures in percent

Body region	Rear seat lap belt effectiveness		
	Serious	Moderate	Overall
Head	63	31	4
Torso	−86	−16	−21
Neck/back	49	39	16
Arm/leg	55	58	28

Source: Charles Kahane.

Kahane also finds that lap belts are more effective in reducing injury in nonfrontal than frontal crashes, except at the minor injury level. Kahane believes that lap belts are not as effective in frontal crashes because even unrestrained rear seat occupants have a lower injury risk than restrained drivers. However, the back seat offers no such advantage in nonfrontal crashes. These are the types of accidents in which rear seat lap belts may do the most good, and these types of accidents, which account for one-half of all fatal accidents, were not included in the NTSB study.

Evidence From Canadian Experience

D. Dalmotas and J. Krzyzewski of Transport Canada (Canada's federal Department of Transportation) analyzed provincial accident data to assess the effectiveness of rear seat lap belts.[7] They used a variety of approaches ranging from direct comparison of injury and fatality rates for restrained and unrestrained occupants to Evans' double pair comparison approach. They found that both lap belts and lap/shoulder belts reduced the likelihood of serious or fatal injury. The likelihood of such injuries was found to be reduced by 40 to 55 percent for front seat occupants wearing lap/shoulder belts and by 20 to 50 percent for rear seat occupants wearing only lap belts. Lap/shoulder belts were found to be slightly more effective in frontal accidents than in nonfrontal while the reverse was true for rear seat lap belts. These findings were based on data from Ontario, the most populous province and one that has had a mandatory use law since 1976, and Alberta, which does not have a mandatory use law.

Although Dalmotas and Krzyzewski find the belt systems to be effective, they do find limitations in the available data, especially adequate size

[7] D. Dalmotas and J. Krzyzewski, "Restraint System Effectiveness as a Function of Seating Position," Restraint Technologies: Rear Seat Occupant Protection, Society of Automotive Engineers (Detroit: Feb. 1987).

samples. They are especially sensitive to the problem of bias due to police misreporting of belt use. They performed a sensitivity analysis that showed that if police overreport restraint use by survivors by 10 percent, a 20 percent difference in the effectiveness estimate could result. They believe that such a level of misreporting is entirely possible.

Dalmotas and Krzyzewski believe that the NTSB study is timely and that rear seat occupant protection for adults has been largely overlooked. They believe that the Canadian data they examined clearly indicate that increasing the wearing rate of rear lap belts will result in further reducing the number of occupants killed or injured annually in motor vehicle crashes. However, they also believe that the NTSB case studies show that further improvements in the design of rear seat occupant protection are required.

Evidence From New York State

Frank Conley of the New York Department of Motor Vehicles examined New York State's police-reported accident data.[8] He made a straightforward comparison of the injury and fatality experiences of belted and unbelted occupants, which revealed that people fared better if they were restrained. Since 1982, New York State has required that children under 5 years be protected by a restraint, and has required other occupants, except for rear seat occupants 10 years and older, to buckle up since 1984. The state also requires that all accidents involving more than $600 in damage be reported to the Division of Motor Vehicles. These provisions result in a large database with a fairly large number of cases in which restrained individuals are injured.

However, there are some obvious problems with the data. For example, the police-reported restraint usage is 80.1 percent, and this percentage is much higher than that recorded by belt use observers. Use by seating position raises even more questions about the accuracy of police reports. In New York almost 10 percent of rear seat passengers were recorded as wearing lap/shoulder belts, as were 22 percent of passengers riding in the middle front seat. These percentages do not correspond at all with the availability of such systems for these seating positions. These numbers, representing thousands of cases, suggest that problems of misreporting and miscoding are commonplace. These problems raise questions

[8]Frank Conley, "An Analysis of Safety Restraint Use and Effects in Passenger Vehicle Accidents in New York State," Restraint Technologies: Rear Seat Occupant Protection, Society of Automotive Engineers (Detroit: Feb. 1987).

about the accuracy of the data and, by implication, the validity of analysis based on them.

Evidence From Michigan

Ken Campbell of the Transportation Research Institute of the University of Michigan analyzed police-reported accident data from the state of Michigan to determine the effectiveness of lap belts for rear seat occupants. Michigan has had a mandatory use law since 1985. The unanalyzed data on rear seat belt use and injury suggest that lap belts are highly effective (see table 3.5).

Table 3.5: 1985 Michigan Accidents—Rear Seat Occupants' Injury Severity by Belt Use

Figures in percent

Injury level	Belted	Unbelted	Belt effectiveness
Fatal	0.05	0.12	62
A	0.46	1.93	76
B	1.72	4.09	58
C	4.89	8.52	43
None	92.88	85.34	
Total	**100.00**	**100.00**	
Number of occupants	33,022	28,467	

Source: Ken Campbell.

However, when the data for the postmandatory use law period are examined separately, it is clear that police accident reports have substantially overreported belt use. Tables 3.6 and 3.7 contrast use rates recorded by observers in belt use surveys with those recorded by police in Michigan accidents.

Table 3.6: Observed Belt Use of Rear Seat Occupants by Age in Michigan—Selected Months

Age	Dec 84	Apr 85	July 85	Dec 85
Children, ages 4-15	28.0%	36.5%	50.3%	36.8%
Number	468	586	1,006	483
Adults, ages 16+	7.2%	9.7%	18.6%	6.9%
Number	423	532	688	429

Source: Ken Campbell.

Table 3.7: Police-Reported Rear Seat Occupant Belt Use in 1985 Michigan Accidents by Age and Quarter

Age	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Children ages 4-15	24.6%	28.5%	58.0%	52.5%
Number	574	575	631	767
Adults, ages 16+	14.0%	17.3%	46.3%	43.1%
Number	965	1,034	1,065	1,185

Source: Ken Campbell.

Ken Campbell concludes that postmandatory use law data from police accident reports cannot be used to determine seat belt effectiveness without taking a time series approach, i.e., examining the change in injury experience over time after smoothing for other trends. He told us that he has chosen not to do this, but instead he plans to go back and examine experience prior to the passage of the mandatory use law. This work is still in progress.

Finally, Ken Campbell told us that he is more confident in police accident report data than is the NTSB. He believes that if miscoding or misreporting in the past were common, then reported belt use would have been much higher than observed rates. However, older data show a closer correspondence between actual observed rates and those reported by police in accidents. Therefore, he believes that the Board went too far when it concluded that the data could not be used to support lap belt effectiveness estimates because of misreporting problems.

GAO Observations

Although some of the studies we examined agree with NTSB that there are problems, such as police misreporting of belt use, in the databases supported by NHTSA and others, they do not agree that the problems are so extensive as to make it impossible to undertake statistical analysis or to draw valid conclusions about the contribution of lap belts to rear seat occupant protection. The analyses consistently show that lap belts are a positive countermeasure against death and injury in motor vehicle accidents. The data do suggest that the belts are less effective in frontal collisions and when impact speeds are high. These are the types of accidents that made up the NTSB database.

The evidence from B.J. Campbell and NHTSA indicates that NTSB's sample of 26 accidents are unusually severe. For example, even if one accepts the Board's claim that many who receive minor injuries are often misreported as uninjured in police accident reports, the NTSB distribution remains very different from that found in larger databases such as

North Carolina's. Reclassifying Campbell's North Carolina cases that meet the NTSB reporting criteria into fatalities and nonfatalities still yields a distribution significantly different from NTSB's.

The evidence from several studies, employing different methods and data, indicates that lap belts are less effective in frontal, high-impact crashes—the type of crash that NTSB investigated—but are effective overall. Although the data these analysts used to estimate lap belt effectiveness do suffer from many of the drawbacks identified by NTSB, the analysts reach the consistent finding that lap belts are effective, although perhaps less so than originally believed.

Although prior studies have identified the problems of lap belt-induced injuries and exaggerated effectiveness estimates due to police misreporting, they are in general agreement that, on balance, a person in the rear seat is better off wearing a lap belt than riding unrestrained. NTSB's contention that none of these analyses are valid rests largely on its belief that the data contain a systematic bias—that the police tend to record those who are uninjured as belted and those who are injured as unbelted when, in fact the officer at the scene did not know whether or not a belt had been worn. This is one type of misreporting, but other types are also possible. For example, Kahane points out that police apparently underreported rear seat belt use in prior years, causing effectiveness to be understated.

NTSB dismisses the only previous attempt to measure reporting bias, the RSEP study, because it dealt with front seat occupants. However, NTSB has not explained why the focus on the front seat in RSEP should make a difference in the misreporting phenomenon, and the difference it might make is not apparent. Chi's analysis of the RSEP data concluded that although bias exists, police errors in the classification of belt use do not have a major impact on effectiveness estimates. Chi admits the data used were not fully representative, but it remains the most ambitious attempt to date to deal quantitatively with the problem.

Chapter 4

NTSB Response to the Critics

NTSB officials have responded to the critics of the lap belt study. They have defended their approach to the question and have rejected the notion that they examined only very serious accidents. NTSB staff have reiterated their concerns about the quality and usefulness of police accident report based data and believe that the recent studies suffer from most of the same problems as earlier analyses. Finally, they believe that they had a moral obligation to publish their findings and doubt that their study played any part in the outcome of the seat belt repeal referendum in Nebraska.

The Board's Defense of Its Methodology

Board officials maintain, as said clearly in NTSB's report, that they never intended to and, in fact, did not perform a statistically reliable analysis of the effectiveness of rear seat lap belts and further, that they included the appropriate caveats in their study. They acknowledge that statistical reliability would have required a much larger and more fully representative sample. However, Board personnel in Washington and in the field reject the notion that they examined only very serious accidents. They point out that the average delta V in the studied accidents was 27 mph, below the NHTSA crash test standard for safety belt effectiveness of 30 mph. They point out that NHTSA crash tests are, in fact, performed at 35 mph.

The Board's staff also reject FAAA's allegation that criteria other than those stated were used for reporting accidents. While NTSB did not refute FAAA's specific criticisms of its sample, the Board claims that nothing in its notification criteria asked those reporting accidents to report only those in which injuries occurred or in which a belted person was injured. NTSB officials claim that no attempt was made to screen out cases where lap belts were effective. In fact, they note that in a number of situations in the cases they reviewed, an occupant was wearing a lap/shoulder belt and benefited from it. In response to the criticism by FAAA for omitting the outcome for occupants in noncase vehicles, these officials note that crucial sets of facts were not documented for most of the noncase vehicles. Thus, without information on occupant kinematics, occupant injuries, and other salient factors, they believe that a simple comparison of fatality rates would yield little insight into the efficacy of restraint systems.

NTSB Views of Other Databases

With respect to the other databases, NTSB personnel believe that their criticisms are still valid. They maintain that police at the accident scene do not have the time, the training, or the inclination to assess and report

seat belt use accurately. They believe it is self-evident that data reliability is impaired if a state police accident report form lacks a space to record restraint use or the type of system available. Even when such a space is provided, the officer often miscodes belt use. For example, they note that there are reports of air bag systems in the rear seat when no such systems were available. They believe that police often code lap/shoulder belt use when only lap belts were available. The Board's researchers related to us a number of anecdotes about police misreporting based on their experience with this study and on their earlier experiences as accident investigators. However, they reject the FAAA suggestion that the cases they examined for their study be used to test the extent of police misreporting.

NTSB officials claim that they have too few cases to answer the question of lap belt effectiveness. They point out that they never claimed their sample to be a statistically valid representation of belt effectiveness. Furthermore, they claim that a variety of weaknesses exists in the available accident databases, other than simple police misreporting of belt usage, which limits their usefulness in estimating belt effectiveness. They claim that no one knows the error rates on police report forms and that errors in reporting the occurrence of injury, seating position, and the severity of injury are all factors that limit the usefulness of databases built on these reports.

NTSB staff emphasize that even those who have been critical of their report admit to the paucity of data supporting the estimates of rear seat lap belt effectiveness. They note that some studies overstate belt effectiveness because they did not correct for the correlation between belt use and accident severity. Other studies, while using methods that overcome this problem, often are plagued by small sample sizes. For example, NTSB staff noted that Evans' analysis of rear seat belt effectiveness in reducing fatalities yields widely different effectiveness estimates, depending on which seating position is used in the analysis.

Many of the drawbacks that limit the ability to analyze lap belts also affect the analysis of lap/shoulder belts. However, NTSB staff argue that there is a larger pool of data showing lap/shoulder belt effectiveness and there are logical reasons why lap/shoulder belts might be expected to be more effective. In an accident, the body of a belted person is propelled forward while being restrained by the belt. A lap belt concentrates the restraining forces on the abdomen, while lap/shoulder belts allow the forces to be distributed over a wider area and thereby reduce the pressure on any one area. In addition, the Board's investigation

found cases in which the lap belt caused serious injury, but found no cases of lap/shoulder belt-induced injuries.

Problems With Federal Databases

The Board's staff believe that the FARS data, used by both Evans and Kahane, are unacceptable for estimating rear seat lap belt effectiveness for three reasons:

- The outcomes of occupants in fatal crashes cannot predict outcomes in nonfatal crashes.
- The rear seat occupant numbers are extremely small.
- FARS data are merely police-reported accident data and are not reliable in a number of crucial respects (discussed in ch. 2).

NHTSA also relies on evidence from NCSS and NASS databases to refute NTSB's findings. However, Board officials argue that their report raised a number of problems with NCSS and NASS databases which have not been addressed by NHTSA. NCSS data were not national estimates from a random sample and there may be large sampling errors. In any case, the Board staff believe that both NCSS and NASS contain too few rear seat lap belt cases to allow accurate assessment of their effectiveness.

NTSB Response to Analyses Using State Data

At the heart of NTSB's critique of the reports based on state or provincial data is the fact that they are derived almost entirely from information in police accident reports. NTSB officials argue that the reliability of any effectiveness estimates using police accident report data depends on at least three factors:

- The police classification of the severity of the crash.
- The police classification of the severity of the injury.
- The police classification of the occupants' use or nonuse of the seat belts and, if used, the type of system used.

Although the Board's staff believe that the inability to (1) adequately control for crash severity and (2) accurately rate injury severity limit the ability to assess belt effectiveness, they believe that the second factor may be the most important.

The Belt Use Reporting Issue

NTSB officials point to the studies using state accident data by Frank Conley and Ken Campbell as further proof of the futility of trying to work with police-reported accident data. They claim the obvious misreporting of the type of system employed that appeared in the New York and Michigan data makes it impossible to place any confidence in analysis using such police accident report-based data. NTSB staff also cite prior research, including that performed by B.J. Campbell and others at HSRC, that documents the problem of systematic reporting bias on the part of the police. Board officials claim that no examination has been made of the problem of bias in any representative sample of police-reported accidents. They claim that the oft-cited RSEP study was not representative because it was not a national sample and about 40 percent of the occupants actually were belted—a very high percentage for the mid-1970s. In addition the data are old and they relate only to front seat occupants.

NTSB staff argue that a bias as small as 5 percent can have a significant impact on effectiveness estimates. Using B.J. Campbell's North Carolina data, they reestimated seat belt effectiveness assuming that 5 percent of those reported unbelted were, in fact, belted. The result of this adjustment is to reduce the effectiveness of lap/shoulder belts from a range of 32 to 58 percent (depending on accident severity) to 3 to 29 percent. For lap belts, however, a 5 percent reporting bias makes the effectiveness estimates negative except for the least severe accidents. NTSB staff note that the estimates of lap belt effectiveness become highly negative, -51 and -58 percent, for TAD 6 and TAD 7 accidents. They do not allege that the bias is, in reality, 5 percent, but only that a bias this large would eliminate the estimated benefit of lap belts, but not of lap/shoulder belts, and that the bias could quite plausibly be five percent or more.

Finally, the Board staff answer Campbell's contention that "wrong way" cases are to be expected in accident analysis because of the complexity of individual accidents. They say that their assessment explains why the accident outcome for belted occupants went the "wrong way." Lap belts have been shown as a cause of death and injury.

The Board's Justification for Publishing the Report

NTSB officials told us that they had a moral obligation to publish their findings. While it might be true that the highway research and the medical communities were aware of the problem of lap belt-induced injuries, they believe that highway police and emergency medical service personnel were not. They believe that they have provided an important service if their report has made the people who are the first at an accident scene aware of a previously little-known problem.

With respect to how the report was publicized, NTSB officials believe that the print media gave a reasonably accurate portrayal of the findings. The appropriate caveats were recorded and the coverage stressed the Board's call for lap/shoulder belts in the rear seat. Some TV coverage was less accurate and highlighted the Board's calling into question the effectiveness of lap belts. The Board could not withhold publication of the report, in any event, because it had been leaked to the press. The Board then held a press conference in an effort to make sure that its findings were not misunderstood.

In response to the criticisms that the report was badly timed and that it might have influenced the outcome of the seat belt repeal referenda in Massachusetts and Nebraska, NTSB staff point out that there is no evidence that the report was employed by opponents to the mandatory belt use laws in either of these two situations.

NTSB officials also note that some support has been voiced for their conclusion that lap/shoulder belts are more effective than lap belts. They believe that, in the long run, the report will have played a positive role in enhancing automobile occupant protection. They point out that the "big three" American car manufacturers have all announced plans to provide lap/shoulder belts in the rear outboard seating positions on some 1987 models and on all models by 1990. They do not believe this would have happened if the Board had not undertaken its investigation. In addition, NHTSA has published an advance notice of proposed rulemaking on the issue. This reversed a 1984 NHTSA decision denying a petition to hold hearings because the agency believed that the added benefits from requiring lap/shoulder belts in the rear outboard seating positions were minor.

GAO Observations

NTSB believes that its case selection was unbiased and that its cases were not unduly severe. NTSB notes that NHTSA requires that a crash be survivable by belted occupants at delta V of 30 miles per hour, as evidence that the crashes in its sample with a mean delta V of 27 mph are not extreme. However, crashes at delta V slightly less than 30 mph, while survivable, are still severe. Moreover, NHTSA data show that relatively fewer than 3 percent of crashes experience delta V's of more than 30 mph, and nearly 90 percent are at 20 mph or less. On the basis of the studies prepared by B.J. Campbell and FAAA, we believe the evidence strongly suggests that the cases in the NTSB sample were very severe and not representative of the accident population described by the Board's selection criteria.

With regard to NTSB's criticisms of the other databases, it is true that not a great deal of research has been specifically aimed at rear seat lap belt effectiveness. However, research based on the data that do exist reached the same conclusion—that lap belts reduce the likelihood of death or serious injury for rear seat occupants. The RSEP data satisfy most of the Board's criteria for an adequate data base: belt use was accurately determined, the analysis was controlled for accident severity and other factors, injury data were coded accurately and precisely, the datafile was large, and the data collection procedures allowed for few or no missing cases. Although the data are old and refer only to the front seat, NTSB has not shown why these results would not be applicable to current vehicles and rear seat passengers. In the absence of convincing evidence to the contrary, we do not see the basis for rejecting the findings from the analysis of the RSEP study that police reporting bias exists but it is not so severe as to invalidate the conclusion that lap belts are effective.

Moreover, B.J. Campbell, in response to NTSB's claim that a 5 percent error can switch lap belt effectiveness estimates from positive to negative, makes such an adjustment to the RSEP data analyzed by Chi. Adjusting the RSEP data to account for a 5 percent error in police misreporting would reduce the effectiveness estimates from 40 percent to 25 percent, which would indicate a lower lap belt effectiveness rate than that identified through detailed investigator analysis. The results of his adjustment appear in table 4.1.

Table 4.1: Belt Effectiveness in RSEP

Figures in percent

	Effectiveness estimate
Police source	40.3
Investigator source	31.6
Police source adjusted for 5 percent reporting bias	24.9

Source: B. J. Campbell.

Finally, as FAAA notes, the Board's own sample fails to support its contention that the large databases are unusable due to police misreporting of belt usage and injury severity.

Chapter 5

GAO Observations and Conclusions

On the basis of our review of the NTSB report, other studies and analyses, and interviews with individuals expert in traffic safety research, we have developed observations and conclusions on the two basic questions posed to us by the Chairman: how NTSB developed the data on the 26 cases in its sample and whether its rejection of the databases underlying statistical analyses of rear seat lap belt effectiveness was justified.

GAO Observations on the 26 Cases

The NTSB sample of 26 accidents was not a representative sample of highway accidents, but a statistically representative sample is not necessary to show that a problem exists. NTSB usually takes a case study, rather than a statistical, approach to analyzing accident causality or system performance. The sample of accidents NTSB examined was biased toward more severe types of accidents, and while the sample results triggered the Board's decision to look to other databases to judge overall rear seat lap belt effectiveness, it was not the Board's sole basis for questioning how the belts performed. Highway safety researchers already were well aware that lap belts sometimes can cause serious injuries and that lap/shoulder belts provide superior occupant protection.

However, even if NHTSA required all new cars to be equipped with lap/shoulder belts in the rear seat, more than 100 million cars currently on the road do not have these belts. The question NTSB has raised is whether NHTSA and other highway safety agencies should continue to advise rear seat occupants to wear lap belts when they are the only restraint system available. The Board says the data are insufficient for making such a recommendation. NHTSA and most other highway safety researchers do not agree. This then, not the adequacy of NTSB's evaluation of the 26 cases, is the key issue.

GAO Observations on the Usability of the Databases

The point of controversy between NTSB and its critics is the matter of data accuracy. NTSB has concluded that prior highway safety research showing that rear seat occupants are, on balance, better off wearing lap belts than no belts at all, is not reliable because the data it was based on contain inaccuracies. NTSB offers a number of reasons why it believes the data underlying studies showing lap belts to be effective are flawed, including

- omitted or misclassified data in police accident reports,
- imprecise measures of crash severity,
- imprecise measures of injury severity, and
- inadequate sample sizes.

We do not believe that NTSB's concerns about the data provide a sufficient basis for dismissing either the results of other research in this area or the databases themselves. No database is perfect. The question an agency that intends to use data *must address* is whether the data are sufficiently accurate to yield valid findings about the thing being analyzed. Possible inaccuracies or limitations in the data should be evaluated to determine how likely it is that they would significantly affect any conclusions based on the data. NHTSA investigated the flaws in the data it uses to analyze seat belt effectiveness and concluded that the problems were not sufficient to invalidate the data for research. NTSB did no analysis of its own to demonstrate that NHTSA's findings about the usability of the data were incorrect.

Therefore, we find that while NTSB has highlighted some important limitations in widely used accident databases, it has not shown that these databases cannot be used to show that lap belts, on balance, protect rear seat passengers in automobile crashes. The presence of inaccuracies in the data is not a sufficient reason for dismissing the findings of all the research that has used that data.

Finally, NTSB's criticisms of the principal databases researchers used to analyze the performance of different types of safety systems have not been fully answered. While we believe that NTSB has not shown the data to be useless for analysis, there are, nonetheless, shortcomings in the quality of databases that rely on police accident reports. NHTSA is working on several programs that might improve the accuracy of police reporting and provide more current information on the relationship between police reports and investigator analysis of accidents.

Appendix I

Description of the Double Pairs Comparison Procedure

The method focuses on two occupants, a "subject" occupant and an "other" occupant. The probabilities of a fatality to the subject occupant under two conditions—for example, restrained and unrestrained—are compared. The "other" occupant essentially serves a normalizing, or exposure estimating, role. The procedure uses two sets of fatal crashes. The first set consists of crashes involving cars containing a subject occupant of interest (such as a restrained right rear passenger) and an "other" occupant (such as an unrestrained driver), at least one of whom is killed. From the numbers of subject and other occupant fatalities, a subject/other fatality ratio is calculated (such as the restrained right rear passenger to unrestrained driver fatality ratio). From a second set of crashes involving cars where the subject occupant and the other occupant are unrestrained, another fatality ratio is calculated (such as the unrestrained right rear to unrestrained driver ratio). Dividing the first fatality ratio by the second yields the probability that a restrained right rear passenger is killed compared with the corresponding probability that an unrestrained right rear passenger is killed. This ratio is the effectiveness of the restraint system defined as the fraction (or percent) reduction in fatalities that would accrue to a currently unrestrained population if the population were to change to universal restraint use, all other factors remaining unchanged.

Appendix II

Major Contributors to This Report

Resources, Community, and Economic Development Division	Herbert R. McLure, Associate Director JayEtta Hecker, Group Director Francis P. Mulvey, Evaluator-In-Charge Patricia Loach, Evaluator Michael Karson, Special Assistant to the Comptroller General

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U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the
Committee on Energy and Commerce
Washington, DC 20515

June 7, 1988

JUN 13 RECD

The Honorable Cardiss Collins
Chairman
Subcommittee on Government Activities
and Transportation
U.S. House of Representatives
Washington, D. C. 20515

Dear Cardiss:

Since writing to you a few days ago about your proposed seat belt investigation, our Subcommittee received the enclosed letter from the State of Nebraska's Department of Motor Vehicles. The letter helps to confirm the cautions I expressed to you in my first letter. The Nebraska letter states:

> It was unfortunate that our safety belt law was rescinded by the voters in the November, 1986 general election. However, of the total 535,071 votes cast on the issue, it was decided by only 1,183 votes. The primary reason for opposition involved the freedom of choice and individual rights arguments. The urban metropolitan areas supported belt use, while the rural population tended to support the opposition position. A study conducted after the election revealed that while individuals who opposed the safety belt law used the freedom of choice argument, there were in fact other underlying reasons such as the fear of being trapped by safety belts, etc. that were the actual reasons for their opposition.
>
> The National Highway Traffic Safety Administration was extremely supportive by providing technical assistance, workshops, and information to support safety belt use. However, one particularly damaging event was the release of a study by the National Transportation Safety Board regarding the questionable benefit of rear seat belt use. The timing in accordance with our vote on the issue couldn't have occurred at a more inopportune time. (Underlining supplied.)

I also observe that the June 6, 1987 edition of Automotive News indicates (page 58) that the Iowa Supreme Court has "agreed to consider a constitutional challenge to the State's seat belt law." The article indicates that the challenger who "has been convicted of two" seat belt violations "heads a statewide drive to overturn the law." The organization is "Freedom First in Iowa." This article illustrates once again why I am extremely concerned from the standpoint of public safety that the rear seat belt issue not again be the catalyst that helps these rescission efforts and that delays enactment of laws in more States.

With best wishes.

Sincerely,

JOHN D. DINGELL
Chairman
Subcommittee on
Oversight and Investigations

Enclosure

cc: The Honorable Thomas J. Bliley, Jr., Ranking Minority Member
Subcommittee on Oversight and Investigations

STATE OF NEBRASKA
DEPARTMENT OF MOTOR VEHICLES
KAY A. ORR
GOVERNOR
MARGARET L. HIGGINS
DIRECTOR

June 2, 1988

The Honorable John D. Dingell
U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the Committee of Energy and Commerce
Washington, DC 20515

Dear Congressman Dingell:

Governor Orr has asked me to provide you with the information regarding the repeal of Nebraska's safety belt law and the efforts by governmental and private sector organizations to promote safety belt use.

It was unfortunate that our safety belt law was rescinded by the voters in the November, 1986 general election. However, of the total 535,071 votes cast on the issue, it was decided by only 1,183 votes. The primary reason for opposition involved the freedom of choice and individual rights arguments. The urban metropolitan areas supported belt use, while the rural population tended to support the opposition position. A study conducted after the election revealed that while individuals who opposed the safety belt law used the freedom of choice argument, there were in fact other underlying reasons such as the fear of being trapped by safety belts, etc. that were the actual reasons for their opposition.

The National Highway Traffic Safety Administration was extremely supportive by providing technical assistance, workshops, and information to support safety belt use. However, one particularly damaging event was the release of a study by the National Transportation Safety Board regarding the questionable benefit of rear seat belt use. The timing in accordance with our vote on the issue couldn't have occurred at a more inopportune time.

Because this was a political referendum issue, our office was not able to take an active participatory role in supporting the safety belt law. However, special efforts were made to promote the benefits of safety belt use and their effects on drivers and passengers. However, private sector support by organizations and individuals, including the Traffic Safety Now effort, were highly visible in supporting retention of the law.

A current effort is underway in Nebraska to collect signatures to have the issue placed on the November, 1988 general election ballot. If enough signatures are collected and the issue is adopted by the voters, the safety belt law would be reinstated. Should this fail it is difficult to speculate when the issue will again be considered by the Nebraska Legislature.

BOX 94789, LINCOLN, NEBRASKA 68509-4789, PHONE (402) 471-2281

One area of caution should be considered. The safety belt use laws were promoted and adopted using the arguments of the lifesaving benefit however, using state traffic fatality counts as a measure of success or failure of safety belt use laws is marginal at best. In fact, Nebraska's traffic fatality count increased during the period the law was in effect while at the same time the injury rate in passenger vehicles declined dramatically. Too much emphasis is placed on the lifesaving issue and not enough on the injury reduction. Until usage rates reach 70% or more it is estimated that significant reductions in fatalities in passenger vehicles will not occur.

Enclosed for your information and review, is a collection of newspaper articles regarding the safety belt law repeal effort. If you have any further questions, please contact me.

Sincerely,

Margaret L. Higgins
Governor's Highway Safety Representative

MLH:fz:bj

Enclosures

Star
Lincoln, NE
Dr. D 31,139

FEB 2 7 1986

UNIVERSAL Press Clipping Bureau

Poll shows support of seat belt law up

61% would keep it if vote held today

By Bruce Weible
of The Lincoln Star

Nebraska's controversial seat belt law is gaining support, according to a poll conducted recently for The Star.

It showed 61 percent of Nebraskans surveyed would vote to keep the law if a referendum scheduled for November were held today. Thirty-six percent said they would vote against the law.

The poll, which sampled 449 Nebraskans from Feb. 14-19, was conducted by Research Associates of Lincoln. It has a confidence level of 95 percent, meaning that if the poll were repeated 100 times, the results would fall within the stated accuracy range 95 times. The accuracy range is plus or minus 4.8 percent.

A SIMILAR POLL, conducted in November, showed 51 percent of Nebraskans for the law and 46 percent against it.

Bob Corner, program coordinator for the Nebraska Highway Safety Office, said a deluge of publicity following the passage of the law has resulted both in greater support for it and in more widespread use of restraints.

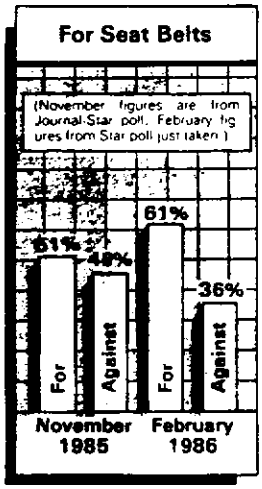
He said highway safety officials have sponsored educational programs on safety belts since the mid-'60s. Two decades of such programs, prior to the law's passage, convinced only 11 percent of Nebraskans to wear restraints, he said. Less than a year after mandatory seat belt use became law that number has increased fivefold, he said.

"For a logical person . . . the only conclusion you can come to is you're better off with the law," Corner said.

Robert Cashioli, attorney for Citizens Against Mandatory Seatbelts, agreed with some of Corner's comments.

Cashioli said support for the law may be increasing because people are discovering wearing seat belts is not a great inconvenience.

He said the poll may indicate that his group will have to make a greater effort to stress it does not oppose the law on the basis of any inconvenience involved in wearing restraints.



Cashioli said his group opposes the law because of "a lot of inherent problems" in the manner in which it is written and implemented.

It is also "too much of an intrusion on privacy," Cashioli said.

HE SAID the financially strapped anti-seat belt law movement will not give up if support for the law continues to grow. However, the amount of resources devoted to the effort may be reduced if future polls indicate the law's supporters have obtained an overwhelming margin, he said.

The Research Associates poll indicated that sentiment about the law is similar among nearly all segments of the state's population.

Democrats, Republicans and independents supported or opposed the law in approximately the same proportions.

The difference in support on the basis

Turn to: Seat belt, Page 7

From Page 1

Seat belt

of age was within the poll's margin of error. Nebraskans aged 18 to 29 supported the law by approximately the same percentage as those 65 and older.

The only significant splits in levels of support on the issue seemed to be based on geography and gender.

Female respondents supported the law by 66 percent to 29 percent. The margin was closer among males surveyed — 56 percent in favor and 42 percent against. Corner said the difference is probably less attributable to a masculine anti-seat belt bias than some people believe.

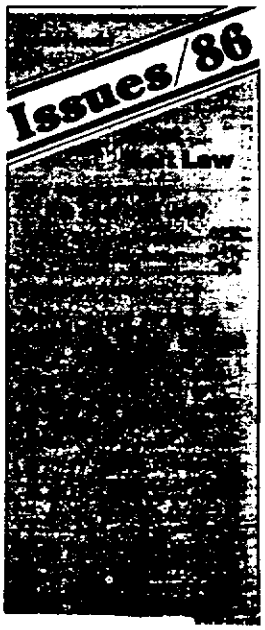
CORNER SAID women tend to spend more time driving with children. Women are reminded to use seat belts when they strap infants into child restraint devices, which are also required by law, he said.

Women are also concerned about setting a good example for older children by wearing restraints, he said.

Opposition to the law was greater in the state's 3rd Congressional District, which includes some of Nebraska's most rural counties.

Most Nebraskans Surveyed Approved Seat Belt Law

World Herald 4-3-86



Margin of error ... plus or minus 3.3

Sixty-two percent of adult Nebraskans surveyed last week in a World-Herald Poll said they approved of the state law that requires drivers and front-seat passengers to wear seat belts.

That compares with 49 percent of Nebraskans who approved of the law when asked in a World-Herald Poll taken last June, after the measure had been passed but before it became effective.

Forty percent of those interviewed in the latest poll said they wore belts every time they drove or rode in the front seat of a vehicle. Last June, only 16 percent said they wore seat belts all the time. However, last June, 53 percent said they would always wear belts after the law became effective.

The latest World-Herald Poll was conducted March 25-27 by SRI Research Center Inc., a subsidiary of Selection Research Inc., of Lincoln. SRI Research interviewed 783 registered Nebraska voters. Percentages are given in round numbers.

The seat belt law took effect in September. Because of a successful petition drive, Nebraskans will vote in November on whether the law should be repealed.

Under the law, all drivers and front-seat passengers in motor vehicles built in 1973 or after must wear their seat belts or face a $25 fine. A driver and passenger cannot be charged with a violation, however, unless the vehicle they are in has been stopped by a police officer for another traffic infraction.

Approval of the seat belt law ran highest in Nebraska's urban areas. Seventy percent of those polled in Lincoln and 72 percent of those in Omaha said they supported the law.

In the more rural 3rd Congressional District, 36 percent said they approved of the seat belt law, while 38 percent said they opposed it.

In the 2nd Congressional District outside Omaha, 56 percent said they supported the law and 42 percent said they didn't. In the 1st District outside Lincoln, 54 percent said they approved and 45 percent said they did not.

Among Democrats, 65 percent said they supported the law. Among Republicans, 63 percent said they approved. Among independent voters, the approval rate was 55 percent.

Seventy-two percent of college graduates and 61 percent of high school graduates that were polled said they approved.

Thirteen percent in the latest poll said they never wear their seat belts, compared with 45 percent before the law took effect.

Of those polled, more men, 18 percent, than women, 8 percent, said they never wear belts.

For the latest poll, the Nebraskans were asked:

"Do you approve or disapprove of the law that requires drivers and front seat passengers in motor vehicles to wear seat belts?"

"Out of every 10 times that you ride in the front seat or drive a motor vehicle, how many times do you typically fasten the seat belt?"

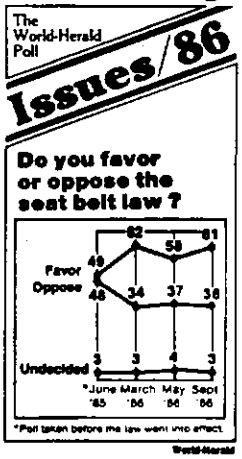
The overall response to the questions carries a margin of error of plus or minus 3.3 percent.

62% Approved Of Seat Belts

●Continued from Page 1

61% in Poll: Nebraskans Should Stay Buckled Up

9-15-PC WH



Results of . . . four seat-belt polls.

Nebraska's seat-belt law should be retained, not repealed, in the view of 61 percent of the Nebraskans surveyed last week for The World-Herald Poll.

The results of the poll were consistent with two previous surveys conducted last spring. In each of the two previous surveys, slightly more than a third of those questioned wanted to unbuckle the 1985 law.

Of the 903 registered voters questioned Sept 9-11, 61 percent said they wanted to keep the law requiring those in the front seat to buckle up, and 36 percent said they wanted to repeal it. Three percent said they had no opinion.

The seat-belt law will be on the Nov. 4 general election ballot.

Women, those with higher incomes and college degrees and residents of the more urban, eastern part of the state were most supportive of the seat-belt law.

Farmers and ranchers made up the only occupational category in which more of those surveyed favored repeal than opposed it. Two-thirds of those surveyed who hold professional-managerial or secretarial-clerical jobs said they want the law kept.

In the 3rd Congressional District, 44

Seat-Belt Law Backed by 61%

•Continued from Page 1

percent of those polled said they wanted to repeal the law and 54 percent wanted to retain it. In the 1st District, the law had 63 percent support, and in the Omaha-dominated 2nd District mandatory belts were backed by 66 percent.

Those surveyed for The World-Herald Poll by SRI Research Center, a subsidiary of Selection Research Inc. of Lincoln, were asked:

One issue on the November ballot would repeal the seat- belt law that makes it mandatory for front seat passengers in motor vehicles to wear seat belts. If the election were held today, would you favor repealing the seat belt law, or would you be in favor of keeping the seat belt law?

When the same question was asked in May, 36 percent of those questioned said they wanted to retain the law and 37 percent wanted it repealed. In a March World-Herald Poll, 62 percent said they supported the seat-belt law and 34 percent disapproved.

Before the law was implemented, those surveyed in June 1985 were virtually evenly split, with 49 percent approving it and 48 percent wanting repeal.

The poll carries a plus or minus margin of error of 3.1 percentage points.

Evening Journal
Lincoln, NE
Cir. 45,067

AUG 19 1966

UNIVERSAL Press Clipping Bureau

NEBRASKA

63% favors retaining state's seat-belt law

By Fred Knapp
Journal Statehouse Bureau

If the election were held today, 63 percent of Nebraskans would vote to keep the state's mandatory seat-belt law, and 35 percent would vote to get rid of it. Only 2 percent are undecided.

Those are the results of a poll conducted for the Lincoln Journal by Research Associates of Lincoln Aug. 8-12. The poll of 449 people has an accuracy range of plus or minus 4.6 percent.

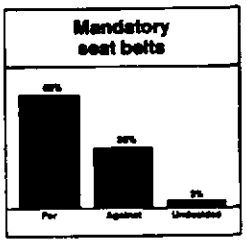
Doug Evans of Research Associates said the results appear to mark a leveling off of support for the law, the repeal of which will be the subject of a question on the ballot this November.

Last November, 51 percent of people polled said they would vote to keep the law, while 46 percent said they would not. By February, the percentages had changed to 61 percent in favor of the law and 36 percent against.

In the new poll, the highest level of opposition to the law came from people describing themselves as liberal, of whom 41 percent were opposed and 57 percent in favor. Among moderates 70 percent favored the law and 27 percent opposed it. Respondents who consider themselves to be conservative endorsed it by a margin of 63 percent to 36 percent.

Support for the law also varied by congressional district. In the 1st District, which includes Lincoln, it was favored 68 percent to 31 percent. The 2nd District, including Omaha, endorsed it 64 percent to 35 percent. In the 3rd District, including central and western Nebraska, 57 percent expressed support and 40 percent were opposed.

Lincoln Journal
POLL



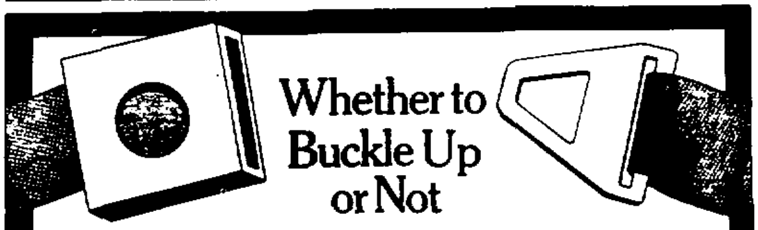
Females favored the law 66 percent to 33 percent, while males were for it 59 percent to 39 percent.

People with lower incomes were less enthusiastic about the law than those with higher incomes. Respondents with incomes of less than $15,000 favored it 56 percent to 39 percent, while those making $15,000 to $30,000 were 66 percent to 33 percent in favor. People with incomes exceeding $30,000 supported the law 62 percent to 36 percent.

Political party made practically no difference in the way people responded. Republicans were for the law 63 percent to 34 percent, Democrats 63 percent to 35 percent and independents 65 percent to 35 percent.

OCT 1 9 1986

Focus About Voting on Seat Belt Law



Whether to Buckle Up or Not

Nebraskans to Decide If Seat Belt Law Retained

Nebraskans will vote Nov. 4 on four statewide ballot issues — two are constitutional amendments and two are referendums.

The stories on this page examine one of the referendums — the issue of repealing the state's year-old seat belt law.

Traffic Injuries in Nebraska Last 5 Years

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	7.16 Billion	[illegible]	[illegible]	[illegible]	132.3
[illegible]	6.93 Billion	[illegible]	[illegible]	[illegible]	143.6
[illegible]	6.91 Billion	[illegible]	10,887	[illegible]	160.1
[illegible]	6.84 Billion	[illegible]	[illegible]	[illegible]	148.8
[illegible]	6.51 Billion	[illegible]	[illegible]	[illegible]	151.1
5-Year Average	[illegible] Billion	[illegible]	10,013	[illegible]	147.2

Source: Nebraska Office of Highway Safety

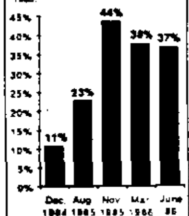
Fatalities Up, but Injuries Down Since Seat Belt Law Took Effect

By Henry J. Cordes

Repeal Leader: Law Is Invasion

Safety Belt Use

Percentage of Nebraskans observed wearing motor vehicle safety belts. Law took effect September 1, 1985.



Source: Nebraska Office of Highway Safety

More Wearing Seat Belts

Hub
Kearney, NE
Cir. 17,443

OCT 21 1986

UNIVERSAL Press Clipping Bureau

205

Nebraskans uphold tradition

State's voters go to ballot box to settle social issues battles

LINCOLN (AP) — Nebraskans this year are living up to a tradition of using the ballot box to settle battles over social issues.

Nebraska is one of a minority of states with a constitutional provision that allows the people to enact laws and constitutional amendments through the initiative process, and to repeal the same through the referendum process.

Voters will decide two major social issues with the referendum process.

IN NEBRASKA, subjects like mandatory use of seat belts and mandatory consolidation of school districts can get an argument going anywhere from the high plains of the Panhandle to the shores of the Missouri.

The issue of mandatory consolidation or affiliation of school districts has been a central issue in the gubernatorial race between Republican Kay Orr and Democrat Helen Boosalis.

The Legislature passed the law as Initiative 300 opponents gathered sufficient petition support to put the issue — retention or repeal of the measure — on the ballot.

Orr notes that the increased sales tax the law would mandate isn't earmarked specifically to provide property tax relief. She favors its repeal.

"THOSE WHO oppose repeal of the law have told us, over and over, that it will ease the tax burden on property owners, but I have yet to hear any rational explanation of how this is to be accomplished," she said recently.

Those who favor the law say it would do away with artifical tax havens provided by school districts that don't include high schools, and would also provide property tax relief and a better secondary education system.

Boosalis said she doesn't view the increased sales tax as a tax increase because, she contends, it would be used for property tax relief. If the additional state aid to schools wasn't used to reduce local property taxes, she said, she would veto appropriations to avoid overspending.

Orr responds that "if she doesn't consider it a tax increase, I'd be very interested in knowing what she does consider a tax increase. There is no provision for property tax relief in that legislation ... and no formula for tax relief."

See editorial on page 4A

THE LAW WOULD require the consolidation or affiliation of school districts having only elementary schools with districts that include high schools. It would limit property taxes to 45 percent of statewide public school expenditures — a provision Orr has said is so vague as to possibly be unenforceable.

Opponents and proponents of the law planned to use advertising blitz tactics in the weeks just prior to the election.

Gov. Bob Kerrey admitted the law was "flawed" when he signed it, but said he hoped it eventually could be improved through amendments by the Legislature. Kerrey favors retention of the law.

ALSO FACING the verdict of the voters is legislation that would retain a measure that requires drivers and front-seat passengers to wear seat belts. Violators face a $25 fine, but authorities must stop motorists for some other alleged violation before they can check for seat-belt compliance.

Nebraskans for Safety planned to send some $134,000 to boost support for the law.

Citizens Against Mandatory Seat Belts planned to raise only some $1,000.

Proponents of the law generally cite statistics that they say show that seat belts save lives. Opponents contend that the use of seat belts should be an individual decision.

Once passed by the Legislature, a constitutional amendment can only be enacted with approval of the voters.

THE MAJOR constitutional amendment facing voters stems from the impeachment proceedings that involved former Attorney General Paul Douglas. During those proceedings, lawmakers decided several related constitutional provisions needed to be changed.

The amendment proposes to reduce the burden of proof needed to convict a state official.

The amendment also specifies impeachment cases must be brought in the name of the Legislature, managed by two senators and tried as a civil case. It bars a defendant from invoking any privilege against self-incrimination. It would also allow a conviction so long as evidence showed "clear and convincing evidence" of guilt.

The other constitutional amendment before voters would allow the Legislature to convene in December to organize for its 90-day, or "long" sessions.

At the beginning of a 90 day session the Legislature reorganizes, elects committee chairmen, and performs a host of other organizational duties.

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Star
Lincoln, NE
Cir 35,245

OCT 27 1986

UNIVERSAL Press Clipping Bureau

Safety vs. free choice focus of seat belt issue

By Nancy Hicks
of The Lincoln Star

Nebraska voters will have a chance Nov. 4 to decide if Nebraska should retain its year-old mandatory seat belt law.

On the ballot the issue is labeled Referendum 401. It reads "Shall section 1 of Legislative Bill 496, enacted by the 89th Legislature of the state of Nebraska in its first session, the purpose of which is to require any driver and front seat passenger of a motor vehicle operated on a street or highway in the state of Nebraska to wear a safety belt, be retained?"

A vote "for" will retain the seat belt law. A vote "against" will repeal it.

STATE SENATORS approved the mandatory seatbelt bill during the 1985 Legislative session. The measure, which took effect that September, requires drivers and front seat passengers to buckle up or face a $25 fine.

But drivers and passengers can be cited for a seat belt offense only if the car has been stopped for another traffic violation.

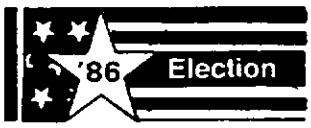
The law has been controversial from the start. Within a few weeks after its passage, opponents began organizing a drive to repeal the measure.

The grass roots drive, lead by Lincoln resident Clarence Olberding, succeeded in getting 27,286 registered voters' signatures — enough to get repeal of the law on the statewide ballot. Opponents did not gather enough signatures to keep the law off the books until that election decision.

THE ISSUES are fairly simple: safety vs. freedom of choice.

Countless studies have proved that wearing a seat belt reduces the risk of death by 50 percent and the risk of injury by 40 percent, according to Fred Zwonechek, administrator for the Nebraska Office of Highway Safety.

And mandatory safety belt laws work, Zwonechek says. Though the state's law is fairly weak



— drivers lose no points on their violation records — seat belt useage in the state increased from 11 percent to between 37 percent to 46 percent after the law took effect.

Government has a right to force people to act responsibly, seat belt supporters contend. It is often government money that pays for rehabilitation of those injured and helps support the families of those killed in accidents.

Nebraskans for Safety, a pro-seat belt group, plans to spend as much as $134,000 for advertising on television, radio , newspapers and billboards in the state.

OPPONENTS OF mandatory seat belt laws expect to raise about $1,000. "I feel like I'm David against Goliath," says Olberding, chairman of the group working to repeal the law.

Olberding believes that education not government intervention into private lives is the best policy. Freedom of choice is at the heart of the opposition.

"There's no need for the law. I feel people will wear seat belts if they're given the facts and if they're treated like intelligent beings and not dumb animals that have to be prodded along," Olberding says.

Opponents also believe that new car dealers and manufacturers have provided the money and impetus for the mandatory seat belt laws now operating in 26 states and the District of Columbia.

The Department of Transportation has said it will lift its requirement that future cars be equipped with air bags if two-thirds of the states adopt mandatory seat belt laws by 1989.

UPI CB | World-Herald, Omaha, NE

NOV 6 1986

UNIVERSAL

Fasten Your Seat Belt: Tally Turns Cliffhanger

By Henry J. Cordes
WORLD-HERALD BUREAU

Lincoln — Clarence Olberding, who led the effort to repeal Nebraska's safety belt law, said Wednesday that a lot of people didn't believe him when he said the vote would be close.

When the ballots stopped trickling in from western Nebraska Wednesday, the results could hardly have been closer.

The vote tally reported by The Associated Press had a [illegible]-vote margin in favor of repealing the law out of more than a half-million votes cast. One Cheyenne County precinct with computer problems was the only one of the state's 1,[illegible] precincts not reporting.

A United Press International tabulation had a margin of [illegible] votes in favor of repeal.

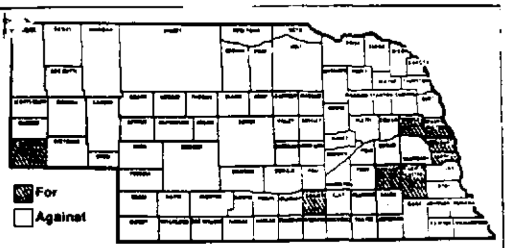
Officials said several thousand absentee ballots and the official canvass of votes early next week will determine whether the controversial law remains on the books.

"It's too close to call," said Nebraska Secretary of State Allen J. Beermann. "It could go either way."

[illegible]

"We did real well here in the east," said Doug Koebernick of the pro-belt Nebraska Traffic Safety Now organization. "The western part of the state ap-

Please turn to Page 11, Col. 1



Here are the latest, unofficial returns by county in the race for Referendum 401, the proposal to repeal or retain Nebraska's seat belt law. (TP stands for total precincts; PR stands for precincts reporting.)

County	TP	PR	For	Against
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Fasten Seat Belts: Tally Turns Cliffhanger

Continued from Page 1

parently doesn't want anyone telling them they have to wear them."

"Obviously it was not really expected, and it's not something encouraging," said Jack Merritt, coordinator of Nebraskans for Safety.

Officials said apparently only eight counties — Adams, Dodge, Douglas, Lancaster, Kimball, Sarpy, Seward and Washington — had majorities in favor of the measure.

Olberding, the Lancaster who led the petition drive to repeal the law, said those results indicate that people from small areas of the state apparently agree that mandatory safety belt use is an infringement on their rights.

[illegible]

"It'll be sitting on the edge of my seat," he said.

Fred Zwonechek, who is administrator of the State Office of Highway Safety, [illegible]

Loss of the law would be a tremendous blow to efforts to get more people to buckle up, he said.

"It's going to be a long, uphill struggle should it not be kept," he said. "If the law is not kept, a great opportunity will have passed."

Zwonechek said the law's safety value could make the final vote a matter of life or death for some people.

"That's the sad part," he said.

Tribune
Fremont, NE
Cir 11,645

NOV 1 0 1986

UNIVERSAL Press Clipping Bureau

Nebraska voters repeal state seat belt law

Earlier count reported wrong

Associated Press

Nebraskans repealed the mandatory seat belt law by a margin of about one-tenth of 1 percent, unofficial Associated Press figures show.

The margin Saturday was 561 votes. Some absentee ballots were still uncounted, but not enough to reverse the outcome.

Due to clerical errors in the tabulation of votes, the AP reported Friday that the law had been retained.

The vote was 267,486 against the law and 266,925 for it. The law was opposed by 50.052 percent and favored by 49.948 percent.

Totals were from all 1,812 precincts in Nebraska. The latest tabulations were of absentee ballots postmarked by Tuesday and received since then.

Unofficially, 85 counties voted to repeal the law and eight voted to retain it. The eight were Adams, Dodge, Douglas, Kimball, Lancaster, Sarpy, Seward and Washington.

The law, passed by the Legislature last year, was receiving up to 81 percent of the votes in early returns Tuesday. The margin narrowed as votes in western Nebraska were tabulated.

The law required drivers and front-seat passengers to wear seat belts. Violators faced a $25 fine, but authorities had to stop motorists for some other alleged violation before checking for seat belt compliance.

Secretary of State Allen Beermann said the final vote on the seat belt referendum must be certified by the state Canvass Board before the repeal goes into effect.

Beermann said the board will meet Dec. 1 in Lincoln to certify the outcome of the seat belt referendum and all other statewide votes.

If the board confirms that the seat belt law was repealed, the head of the Nebraska State Patrol would then notify all law enforcement authorities in the state to stop enforcing that law, he said.

Beermann said he has asked Attorney General Robert Spire to review the vote certification procedure and issue a written opinion on it.

The state wants to make sure "all it's bases are covered" to avoid possible legal action by the losing side in the seat belt vote, Beermann said.

UPCB Telegraph
North Platte, NE
Cir. D 16,773

NOV 18 1985

UNIVERSAL Press Clipping Bureau

Opinion

Editorial

Seat-belt law defeated, not seat-belt use

On the issue of whether Nebraska should keep a mandatory seat-belt law, 267,486 voted against and 266,925 vote for. That is pretty close to an even split.

While there was a law, a lot of people got in the habit of buckling up, even if they grumbled about it. And a lot of people said that they believed in seat belts, but didn't like being told what to do.

If all of the people who voted for the seat-belt law would continue to buckle up even though the law is to be repealed when the official vote canvass is complete, we would still save a lot of lives. If even half the people who voted against the law would buckle up because they aren't being told they have to do it, the percentage of seat-belt use would be higher than it ever was when the law was in effect.

We don't expect those "ifs" have much chance of being realistic, but perhaps there will be at least some movement in that direction.

We'd like that. It would mean more readers and fewer obituaries. Law or no law, buckling up still makes sense.

Election results certified

12-1-86 - Journal

State seat-belt law officially repealed

By Journal Writers and News Wires

Wearing seat belts became a matter of personal choice at 10:37 a.m. Monday as the state Board of Canvassers certified the results of the Nov. 4 general election.

Voters repealed the state's mandatory seat-belt law by a margin of 1,183 votes, chose Republican Kay Orr as governor and repealed a school district consolidation and finance law.

The official canvass showed 577,916 Nebraskans cast votes from a pool of 848,782 registered voters — a turnout of 68 percent.

That will rank Nebraska fifth or seventh in the country for voter turnout, Secretary of State Allen Beermann said.

He noted there was a 98.2 percent voter turnout in Blaine County, where 502 of the county's 511 registered voters cast ballots.

Sarpy County had a record turnout for a non-presidential election, he said. Sixty-five percent of the county's 34,267 registered voters went to the polls.

71% turnout here

In Lancaster County the turnout was 71 percent — 73,733 of 103,521 registered voters. In the state's most populous county, Douglas, turnout was 67 percent, 197,682 out of 295,884 registered voters.

The vote on the seat-belt law, which had been passed by the 1985 Legislature and placed on the ballot by petition, was 288,127 to repeal it and 286,944 in favor of retention.

Although the margin for repeal of the seat-belt law was thin, repeal of the school consolidation measure was overwhelming. There were 344,445 votes for repeal and 173,498 votes for retention.

Results of the canvass showed that Orr and Sen. William Nichol of Scottsbluff won the gubernatorial election by 33,169 votes. They garnered 298,325 votes, compared with 265,156 for Democratic candidate Helen Boosalis and her running mate, Lt. Gov. Donald McGinley.

Board members

The canvassing board is chaired by Gov. Bob Kerrey. Its other members are Beermann, Orr (as state treasurer), Attorney General Robert Spire and State Auditor Ray A.C. Johnson.

Here are results of federal and statewide races:

Governor		
Kay Orr (R)	298,325	53%
Helen Boosalis (D)	265,156	47%
Secretary of State		
*Allen Beermann (R)	366,876	69
Harold Stein (D)	164,425	31
Auditor		
*Ray A.C. Johnson (R)	279,452	56
David Wilson (D)	218,529	44
Treasurer		
Frank Marsh (R)	274,818	53
DiAnna Schimek (D)	248,300	47
Attorney General		
*Robert Spire (R)	313,431	61
Bernie Glaser (D)	200,218	39
Change Legislature starting date?		
Yes	223,473	49.6
No	226,988	50.4
Change impeachment procedure?		
Yes	257,396	60
No	173,281	40
Retain LB662?		
Yes	173,498	33
No	344,445	67
Retain seat-belt law?		
Yes	286,944	49.9%
No	288,127	50.1%
1st Congressional District		
*Doug Bereuter (R)	121,772	65%
Steve Burns (D)	67,137	35%
2nd Congressional District		
*Hal Daub (R)	99,569	59%
Walter Calinger (D)	70,371	41%
3rd Congressional District		
*Virginia Smith (R)	126,988	70%
Scott Sidwell (D)	57,182	30%

*—incumbent.

Omaha World-Herald
Tuesday, December 2, 1986 17

State Unbuckles Its Seat Belt Law After 15 Months

By James Allen Flanery
World-Herald Staff Writer

Nebraska's nearly 15-month-old seat belt law — debated, praised and sometimes cursed — expired with barely a whisper at 10:37 a.m. Monday.

But Bellevue Police Chief Hines Smith and Grand Island Police Chief Howard Bacon are among those who say they hope its spirit lives on.

"I was one of the bad violators to start with," Bacon, 61, said Monday. "But after the law went into effect, I started to use seat belts. Now it's automatic. I hope that happened with other drivers."

Nebraska police departments and the State Patrol say they will continue to promote seat belt use as the wise thing to do. But no longer will they have a hammer to back up their words.

Final returns certified Monday by the State Board of Canvassers show Nebraska's seat belt law was repealed in the Nov. 4 general election by a margin of 1,183 votes — 270,127 against and 268,944 in favor.

Late Monday morning, a state trooper carried an executive order to State Patrol Superintendent Robert Tagg, directing him to advise law enforcement agencies throughout Nebraska to no longer enforce the seat belt law. The law had been in effect since Sept. 6, 1985.

Rigorous enforcement actually ended after the election, law enforcement officers in Omaha, Bellevue, Lincoln and Grand Island said Monday.

"A lot of us didn't write them (seat-belt citations), because we felt the law was moot," Omaha Police Officer Frank Sobran said. "We felt the person would appeal, and the ticket would likely get dismissed."

Bellevue's Smith said, "The vote of the people usually dictates. There's not a lot of incentive to go out and actively enforce a law when you know in the very near future it will be changed."

The State Patrol "deferred to officers' judgment" on whether to ticket since Nov. 4, said Lt. Richard Reitz,

Please turn to Page 18, Col. 2

Seat Belt Law Unbuckled After a Run of 15 Months

•Continued from Page 17

administrative lieutenant for the patrol's traffic division headquarters in Lincoln. "If anything was written, it almost certainly would have been a warning," he said.

Grand Island police have issued only one seat belt citation since Nov. 3, Bacon said.

"I know some people could hardly wait for today," he said. "Their comment is, 'We hate to be told what we have to do.'"

Motorists entering Nebraska from adjacent states soon will not be greeted by border signs that proclaim: "Buckle Up, State Law."

The signs will be coming down within the next few weeks, said Ken Gottula, traffic engineer for the Nebraska Department of Roads.

He said the department considered "Buckle Up For Safety" signs.

But, he said, that was deemed inconsistent with Federal Highway Administration guidelines saying state highway signs should deal with regulations, warnings, construction and maintenance.

Erecting a "Buckle Up For Safety" sign, Gottula said, "in effect becomes an opinion of the State Department of Roads, which is an opinion shared by slightly less than half of the people that voted."

Ballot Measures

Issue	For	Against
Safety belt law	268,944	270,127
LB 662	173,480	344,446
Early session	223,673	278,808
Change impeachment	287,300	173,281

State Highway Safety Administrator Fred Zwonechek said he was saddened to see Nebraska lose what he described as "one of the most significant traffic safety legislative measures in the past 20 years."

In the final week of October 1986, 40 percent of Nebraska's drivers and front-seat passengers were using seat belts in compliance with the state law, Zwonechek said.

That was up from 11 percent before the law took effect.

"I seriously doubt we'll ever see usage rates that low again," Zwonechek said. "But I wouldn't be surprised that usage rates won't drop 10 to 15 percent."

Nebraska law still requires vehicle seat restraints in two other situations: Children under the age 1 must be secured in infant seats, and children between ages 1 and 4 must be belted in, Reitz said.

Twenty-four states and the District of Columbia still have seat-belt laws, Zwonechek said. At one time, 26 states had such laws, but last month Massachusetts joined Nebraska in repealing its statute.

"I'm a strong believer in safety restraint devices," Smith said. But, he said, a law must be believed in by a majority of those it affects.

Wednesday, October 15, 1986 — Lincoln Journal and Star · [illegible]

Sections 6, 20 to 32, 34, 36, and 39 of this act shall become operative September 1, 1986. The remaining sections shall become operative on their effective date.

Sec. 38. That original sections 79-402.07, 79-411, 79-426.11, 79-486, and 79-13,104, Reissue Revised Statutes of Nebraska, 1943, and also sections 79-403.01 to 79-403.04, 79-407, and 79-478 to 79-485, Reissue Revised Statutes of Nebraska, 1943, and sections 79-403 and 79-406, Revised Statutes Supplement, 1984, are repealed.

Sec. 39. That original sections 79-426.23, 79-426.25, 79-426.26, 79-451, and 79-1107, Reissue Revised Statutes of Nebraska, 1943, and section 79-701, Revised Statutes Supplement, 1984, are repealed.

Respectfully submitted,

ALLEN J. BEERMANN

Secretary of State

[illegible]

LEGAL NOTICE OF MEASURE TO BE VOTED UPON NOVEMBER 4, 1986 BALLOT TITLE AND TEXT OF A REFERENDUM PETITION.

REFERENDUM ORDERED BY PETITION OF THE PEOPLE # [illegible]

A vote "FOR" will retain a statutory provision generally requiring any driver and front seat passenger of a motor vehicle operated on a street or highway in the State of Nebraska to wear a safety belt.

A vote "AGAINST" will eliminate a statutory provision generally requiring any driver and front seat passenger of a motor vehicle operated on a street or highway in the State of Nebraska to wear a safety belt.

"Shall section 1 of Legislative Bill 496, enacted by the Eighty-Ninth Legislature of the State of Nebraska in its First Session, the purpose of which is to require any driver and front seat passenger of a motor vehicle operated on a street or highway in the State of Nebraska to wear a safety belt, be retained?

☐ For

☐ Against"

TEXT OF L.B. 496 BEING REFERRED BY REFERENDUM PETITION

AN ACT relating to rules of the road; to amend sections 39-669.26 and 39-6,171, Reissue Revised Statutes of Nebraska, 1943; to require the use of safety belts as prescribed; to define a term; to change a provision relating to the point system; to correct internal references; to change equipment requirements; to change what constitutes a violation; to limit enforcement; to provide a penalty and exceptions; to provide for the use of certain evidence; and to repeal the original sections.

Be it enacted by the people of the State of Nebraska,

Section 1. Any driver and front seat passenger of a motor vehicle operated on a street or highway in this state shall wear a safety belt, except that the number of front seat passengers required to wear a safety belt shall not exceed the number of safety belts which were installed in the front seat of such motor vehicle by the manufacturer [illegible]

call or other notification to the appropriate peace officers shall be deemed to be a report;

(5) Driving a motor vehicle while under the influence of alcoholic liquor or any drug or with ten-hundredths of one per cent or more by weight of alcohol in body fluids in violation of any city or village ordinance or of section 39-669.07 — 6 points;

(6) Willful reckless driving in violation of any city or village ordinance or of section 39-669.03 or 39-669.05 — 6 points;

(7) Careless driving in violation of any city or village ordinance or of section 39-668 — 4 points;

(8) Negligent driving in violation of any city or village ordinance — 3 points;

(9) Reckless driving in violation of any city or village ordinance or of section 39-669.01 — 5 points;

(10) Speeding in violation of any city or village ordinance or of section 39-662, 39-663, or 39-666: (a) Not more than five miles per hour over the speed limit — 1 point; (b) more than five miles per hour but not more than ten miles per hour over the speed limit — 2 points; (c) more than ten miles per hour over the speed limit — 3 points, except ~~PROVIDED~~, that (i) no points shall be assessed upon conviction of exceeding by not more than ten miles per hour the speed limit on any part of the National System of Interstate and Defense Highways~~, AND PROVIDED FURTHER, that~~ and (ii) one point shall be assessed upon conviction of exceeding by not more than ten miles per hour, two points shall be assessed upon conviction of exceeding by more than ten miles per hour but not more than fifteen miles per hour, and three points shall be assessed upon conviction of exceeding by more than fifteen miles per hour, the speed limits provided for in subdivision (2)(c) or (d) of section 39-662 or subdivision (1)(c), (d), or ~~(e) [illegible]~~ or (3)(c) or (d) of section 39-664 except as provided in ~~the first proviso in~~ subdivision (i) of this subdivision;

(11) Failure to yield to a pedestrian not resulting in bodily injury to a pedestrian — 2 points;

(12) Failure to yield to a pedestrian resulting in bodily injury to a pedestrian — 4 points; and

(13) All other traffic violations involving the operation of motor vehicles by the operator, ~~for which~~ reports to the Department of Motor Vehicles are required under sections 39-669.22 and 39-669.23, not including violations for not wearing a safety belt as prescribed in section 1 of this act, parking violations, violations for operating a motor vehicle without a valid operator's license in the operator's possession, muffler violations, overwidth, overheight, or overlength violations, motorcycle protective headgear violations, or overloading of trucks — 1 point.

All such points shall be assessed against the driving record of the operator as of the date of the violation for which conviction was had. Points may be reduced by the department under section 39-669.27.

In all cases, the forfeiture of bail, not vacated, shall be regarded as equivalent to the conviction of the offense with which the operator was charged.

Sec. 2. That section 39-6,171, Reissue Revised Statutes of Nebraska, 1943, be amended to read as follows:

39-6,171. Every new motor vehicle designated by the manufacturer as ~~1964~~ 1973 year model or later, except ~~motor trucks~~ motorcycles, mopeds, and buses, ~~and tractors, sold in this state and~~ operated on any highway, road, or street in this state shall be equipped with two front seat safety belts of a type which ~~has been approved by the Department of Motor Vehicles~~ (1) meets the requirements of [illegible]

☐ For
☐ Against

TEXT OF L.B. [illegible]
BEING REFERRED BY
REFERENDUM PETITION

AN ACT relating to rules of the road; to amend sections 39-669.26 and 39-6,171, Reissue Revised Statutes of Nebraska, 1943; to require the use of safety belts as prescribed; to define a term; to change a provision relating to the point system; to correct internal references; to change equipment requirements; to change what constitutes a violation; to limit enforcement; to provide a penalty and exceptions; to provide for the use of certain evidence; and to repeal the original sections.

Be it enacted by the people of the State of Nebraska,

Section 1. Any driver and front seat passenger of a motor vehicle operated on a street or highway in this state shall wear a safety belt, except that the number of front seat passengers required to wear a safety belt shall not exceed the number of safety belts which were installed in the front seat of such motor vehicle by the manufacturer. Any driver transporting a child who is four years of age or more but is less than sixteen years of age shall be responsible for securing such child in a safety belt if the child is riding in the front seat of the motor vehicle. All safety belts so worn shall be properly adjusted and fastened and shall (1) be of a type which meets the requirements of 49 C.F.R. section 571.208 as such regulation currently exists or as the regulation existed when the safety belts were originally installed by the manufacturer or (2) if the safety belts have been replaced, be of a type which meets the requirements of 49 C.F.R. section 571.208 that applied to the originally installed safety belts or of a more recently issued version of such regulation. Requirements for a child under the age of four are provided in sections 39-6,103.01 to 39-6,103.[illegible]

As used in sections 1 and 4 to 7 of this act, motor vehicle shall mean a vehicle required by section 39-6,171 to be equipped with safety belts.

Sec. 2. That section 39-669.26, Reissue Revised Statutes of Nebraska, 1943, be amended to read as follows:

39-669.26. In order to prevent and eliminate successive traffic violations, there is hereby provided a point system dealing with traffic violations as disclosed by the files of the Director of Motor Vehicles. The following point system shall be adopted:

(1) Conviction of motor vehicle homicide — 12 points;

(2) Third offense drunken driving in violation of any city or village ordinance or of section 39-669.07, as disclosed by the records of the director, regardless of whether the trial court found the same to be a third offense — 12 points;

(3) Failure to stop and render aid as required under the laws of this state in the event of involvement in a motor vehicle accident resulting in the death or personal injury of another — 6 points;

(4) Failure to stop and render aid as required under the laws of this state or any city or village ordinance in the event of a motor vehicle accident resulting in property damage if such accident is reported by the owner or operator within twelve hours from the time of the accident — 4 points, otherwise — 6 points, and for purposes of this subdivision a telephone

[illegible] not including violations for not wearing a safety belt as prescribed in section 1 of this act, parking violations, violations for operating a motor vehicle without a valid operator's license in the operator's possession, muffler violations, overwidth, overheight, or overlength violations, motorcycle protective headgear violations, or overloading of trucks — 1 point.

All such points shall be assessed against the driving record of the operator as of the date of the violation for which conviction was had. Points may be reduced by the department under section 39-669.37.

In all cases, the forfeiture of bail, not vacated, shall be regarded as equivalent to the conviction of the offense with which the operator was charged.

Sec. 3. That section 39-6,171, Reissue Revised Statutes of Nebraska, 1943, be amended to read as follows:

39-6,171. Every new motor vehicle designated by the manufacturer as ~~1964~~ 1973 year model or later, except motor trucks, motorcycles, mopeds, and buses, ~~and campers sold in this state and~~ operated on any highway, road, or street in this state shall be equipped with two front seat safety belts of a type which ~~has been approved by the Department of Motor Vehicles~~ (1) meets the requirements of 49 C.F.R. section 571.208 as such regulation currently exists or as the regulation existed when the safety belts were originally installed by the manufacturer or (2) if the safety belts have been replaced, meets the requirements of 49 C.F.R. section 571.208 that applied to the originally installed safety belts or of a more recently issued version of such regulation. The purchaser of any such vehicle may designate the make or brand of or furnish such belts to be installed. Any person selling a motor vehicle in this state not in compliance with this section shall be guilty of a Class V misdemeanor.

Sec. 4. Enforcement of section 1 of this act by state or local law enforcement agencies shall be accomplished only as a secondary action when a driver of a motor vehicle has been detained for a suspected violation of some other offense.

Sec. 5. Any person who violates section 1 of this act shall be guilty of a traffic infraction as defined in section 39-[illegible] and shall be fined twenty-five dollars, but no court costs shall be assessed against him or her nor shall any points be assessed against the driving record of such person.

Sec. 6. Section 1 of this act shall not apply to (1) a driver or passenger who possesses written verification from a physician that the driver or passenger is unable to wear a safety belt for medical reasons and (2) a rural letter carrier of the United States Postal Service while performing his or her duties as a rural letter carrier between the first and last delivery points.

Sec. 7. Evidence that a person was not wearing a seat belt at the time he or she was injured shall not be admissible in regard to the issue of liability or proximate cause, but may be admissible as evidence concerning mitigation of damages, except that it shall not reduce recovery for damages by more than five per cent.

Sec. 8. That original sections 39-669.26 and 39-6,171, Reissue Revised Statutes of Nebraska, 1943, are repealed.

Respectfully submitted,

ALLEN J. BEERMANN

Secretary of State

[illegible]

ONE HUNDREDTH CONGRESS

Congress of the United States

House of Representatives

GOVERNMENT ACTIVITIES AND TRANSPORTATION
SUBCOMMITTEE
OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
RAYBURN HOUSE OFFICE BUILDING, ROOM B-349A-C
WASHINGTON, DC 20515

June 8, 1988

The Honorable John D. Dingell
Chairman
Subcommittee on Oversight and
Investigations of the Committee
on Energy and Commerce
Room 2323 Rayburn House Office Building
Washington, D.C. 20515

Dear John:

Thank you for your exceedingly helpful and thoughtful letter regarding rear seat shoulder belts.

I totally agree that it is important not to discourage persons from using rear seat safety belts that do not include shoulder belts.

The subcommittee in its planned review will continue to focus on the alleged failure of certain car companies to provide rear seat shoulder belts for existing vehicles, the cost of purchasing and installing such belts and the apparent failure of the automobile industry to advise consumers of their availability.

Based on your letter I am pleased to note the mutuality of our interests relative to seat belt safety, including the need for state mandatory seat belt use laws.

With best wishes always.

Sincerely,

Cardiss

CARDISS COLLINS
Chairwoman

CC:JG:eg

ONE HUNDREDTH CONGRESS

JOHN D. DINGELL, MICHIGAN, CHAIRMAN

ROOM 2323
RAYBURN HOUSE OFFICE BUILDING
PHONE (202) 225-4441

U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the
Committee on Energy and Commerce
Washington, DC 20515

June 27, 1988

The Honorable Cardiss Collins
Chairwoman
Subcommittee on Government
Activities and Transportation
U.S. House of Representatives
Washington, D. C. 20515

Dear Cardiss:

I appreciate greatly your June 8, 1988 reply to my letters in which you indicate a "mutuality" of "interests relative to seat belt safety, including the need for state mandatory seat belt use laws." I also applaud your agreement that it is "important not to discourage persons from using rear seat safety belts that do not include shoulder belts."

At the same time I was disturbed to learn from the enclosed article about your Subcommittee hearings that one of the witnesses was a lawyer representative of an Institute founded only this year by "attorneys involved in product-injury litigation" who released a study that seems inconsistent with the views expressed in your letter to me. I am particularly concerned because I wonder how statistically valid the study is. You will recall that the 1986 study of the National Transportation Safety Board was criticized extensively because the study was not statistically valid. I fear that the study could be viewed as rather self-serving for these attorneys and their plaintiffs and be harmful to efforts in Nebraska to gain again passage of a seat belt law and cause people to question the usefulness and safety of these belts. I feel certain, in light of your comments, that you would not want either possibility.

I hope that you will ask the Board and the National Highway Transportation Safety Administration to examine the study to determine its validity or that either or both agencies will voluntarily undertake that review. I will certainly be interested in the results.

Incidentally, I would appreciate your including in the Subcommittee's hearing record our exchange of correspondence, including the attachments to my earlier letters to you.

Again I commend you for your concern for safety and for your support for such State laws.

With best wishes.

Sincerely,

JOHN D. DINGELL
Chairman
Subcommittee on
Oversight and Investigations

cc: The Honorable Thomas J. Bliley, Jr., Ranking Minority Member
Subcommittee on Oversight and Investigations

The Honorable Howard C. Nielson, Member
Committee on Energy and Commerce

The Honorable Diane K. Steed, Administrator
National Highway Traffic Safety Administration
Department of Transportation

The Honorable James E. Burnett, Chairman
National Transportation Safety Board

QUESTION 1: Please describe in detail the petition process and what role if any the private sector plays in the process.

ANSWER: The defect petition process is described in detail in the enclosed copy of "Control Plan for the Processing of Defect Petitions." Since our publication of the Control Plan, we have made a few minor changes in the way we process petitions. The plan is currently being revised to reflect these minor changes in the process. The regulations for carrying out the petition process are specified under 49 CFR Parts 552 and 557 and in NHTSA Order 800-2, "Procedures for Processing Petitions," dated November 20, 1978.

In summary, the defect petition process involves the following:

1. When a petition is received, it is reviewed and assigned to a staff engineer or analyst to gather and analyze information from all possible sources. This usually includes an information request to the manufacturer.

2. Upon assignment of a petition, the petition analyst:

   - Reviews the petition for content. In some cases, the petitioner must be contacted for clarification of the requested investigation, for more information on the incidents cited in the petition, or for clarification of technical points made in the petition. Frequently, those cited in the petition as having experienced the consequences of the alleged defect must be contacted for more information.

   - Accesses the computerized data base for similar complaints, and for any service bulletins or recall notifications pertaining to the subject vehicle.

   - Analyzes the material received from the data base. This includes review of all complaints, which frequently involves contacting the complainant, and analysis of the relevance to the alleged defect of service bulletins issued by the manufacturer and the precedence of prior recalls.

   - If necessary, conducts an analysis of reports of the same problem in similar, peer vehicles.

   - Prepares an information request (IR) to the subject vehicle manufacturer. The manufacturer is requested to provide a response within 30 working days of receipt of the IR but frequently extensions are requested due to translation problems and the magnitude and/or complexity of the information desired.

   - If testing of vehicles or components is necessary, prepares test requirements and objectives, prepares documents necessary to implement the tests, monitors the tests, and analyzes the resulting data.

- o Receives and analyzes the manufacturer's response to the IR and, if necessary, makes further inquiry to the manufacturer. Frequently, those identified by the manufacturer as having experienced the consequences of the alleged defect are contacted for more information.

- o For petitions based on alleged accident overinvolvement in which few, if any, complaints have been received by the agency or the manufacturer, statistical data on crash involvement, and that of peer vehicles, will be requested from the agency's data center and analyzed.

- o Occasionally, the petitioner will submit additional information. This is normally reviewed and included in the analysis, unless it is received at the very end of the process. Even then, it is reviewed to see if the petition processing should be delayed to consider the new information.

- o Analyzes all information received and developed. Prepares a report and recommendations.

- o Prepares a response to the petitioner.

3. If a petition is granted, an investigation is initiated. If a petition is denied, a Federal Register notice of the denial is issued.

4. The agency normally makes a determination and notifies the petitioner within 120 days of receiving the petition. However, this is not always possible if testing is needed or if there are delays in the receipt of information from the manufacturer. Delays are also encountered if complainants must be contacted or if extensive analysis of crash statistics is necessary.

5. The Technical Reference Division of the agency makes available and supplies to members of the public upon request all publicly available documents concerning the petition.

The private sector may participate in the process by providing substantive information concerning the subject of a petition and can review the publicly available information during the agency consideration of a petition. If the information is provided within the first 60 days after the agency has received a petition, the agency will normally consider it. The agency does not release any business confidential information or any of its own test results and analyses, if testing was conducted, to the private sector during the process. The agency considers the petition processing as the first step in a law enforcement action. Consistent with the common practice for law enforcement actions, the agency does not reveal the results of its investigation while in progress. After completion of the petition, any test results pertaining to the petition are available to the general public.

QUESTION 2: Since the release of the National Transportation Safety Board's 1986 report, how many other States have followed or may soon follow Nebraska's example in rescinding all or part of their mandatory seat belt laws?

ANSWER: We believe **there was a noticeable loss of momentum for safety** belt use and belt laws following the release of the NTSB report on rear-seat lap belts in August 1986. Belt laws in both Massachusetts and Nebraska were repealed by voter referenda in November 1986. While no other State has since repealed its safety law, we *note that repeal* bills have been introduced in many States, with varying degrees of action. In Wisconsin, for example, the legislature approved a proposal to accelerate the scheduled "sunset" of the safety belt law; that provision was line-item vetoed by the Governor. In addition, two States will hold voter referenda on the issue this November: Montana, on whether to repeal the belt law already in effect, and Oregon, on whether the belt law should be allowed to go into effect. It should also be noted that safety belt bills will continue to be considered in many of the 18 States currently lacking such laws; and that many of the other 32 States will continue to consider various proposals to amend, strengthen or weaken their safety belt laws.

Those ongoing legislative and public reviews may well be influenced by publicity about the performance of safety belt systems, including rear-seat lap belts. In that regard, we are concerned that stories such as the recent ABC-TV "20/20" report on rear-seat lap belts (July 22, 1988) may raise public doubts about the effectiveness of safety belts generally, and thus as to the value of safety belt usage and of safety belt use laws. The content of the "20/20" program appeared to be based largely on the NTSB's 1986 report, and focused on cases where lap belts had induced injury, rather on the overwhelming majority of cases where lap belts prevented or reduced injuries. Although "20/20" did counsel viewers to wear lap belts, it nonetheless suggested that they are inferior to lap/shoulder belts; and the report's title ("Cutting corners, costing lives") may have left viewers with an unfavorable impression of safety belts generally.

QUESTION 3: Was NHTSA aware of the concern about lap-only rear seat belts prior to the recent publicity surrounding the Garrett case?

ANSWER: The agency has always been aware that safety countermeasures, *under* certain crash conditions, can occasionally cause occupant injury, but that fact does not negate the overall effectiveness of those safety features.. In this regard, NHTSA has long recognized that lap belts can induce injury in some crashes. Of course, this is even true of lap-shoulder belts. But focusing solely on belt-induced injuries sustained by restrained occupants is highly misleading; those same occupants, if unrestrained, might well have been injured or killed (thru ejection, for example). So even where a belted passenger is injured, one should not automatically assume that belt use was necessarily detrimental. Moreover, the evidence is clear that, on balance, lap-belt usage prevents or mitigates far more injuries than it causes.

The issue of the crash protection provided by rear-seat lap belts was highlighted in August 1986 when the National Transportation Safety Board released its report. That report questioned whether rear-seat lap belts were effective. In response to the report and the discussion it stimulated, NHTSA and other safety researchers reviewed numerous analyses on the effectiveness of lap belts, which confirmed the value of those systems. In February 1987, the Society of Automotive Engineers sponsored a symposium on rear-seat occupant crash protection. The findings of the researchers that participated in the symposium overwhelmingly supported the conclusion that, over the spectrum of crashes, rear-seat lap belts are effective in reducing the risk of occupant injury or death.

QUESTION 4: Of the rear seat passenger fatalities that have occurred over the last several years, how many have been attributed to lap-only safety belts and how many to the passenger wearing no restraint device?

ANSWER: Motor vehicle crash experience indicates that a rear seat occupant who wears a lap belt has a significantly smaller risk of death or injury than an occupant who is unrestrained. In its study of lap belt effectiveness, NHTSA has found that rear seat lap belts, when worn, are approximately 32 per cent effective in reducing the risk of fatality.

Without a detailed investigation of each fatality, it is not possible to determine the exact cause of death for persons who wear lap belts and those who do not. However, we believe the difference in fatality experience speaks for itself: a lap-belted occupant is safer than an unrestrained occupant.

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