

Background Manual

On The

OCCUPANT RESTRAINT ISSUE

**Communications Department
Insurance Institute for Highway Safety
Watergate Six Hundred
Washington, D.C. 20037**

(202) 333-0770

June 1, 1978

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

WATERGATE SIX HUNDRED, WASHINGTON, D.C. 20037 - 202/333-0770

June 1, 1978

Enclosed is the most recent edition of the Insurance Institute for Highway Safety *Background Manual On The Occupant Restraint Issue*.

This issue is important not only because of the huge numbers of lives and injuries involved, but also because the U.S. Department of Transportation has issued a requirement that, starting with some cars in the 1982 model year, new automobiles be designed so that in front and front-angle crashes, the severely injurious forces reaching the front-seat occupants be much lower than they are now.

Contrary to widely made comments to the effect that DOT has required air bags in cars beginning in 1982, this "requirement" is actually a *performance* standard, and manufacturers are free to meet it with air bags, passive belts, or any other system or design that will do the injury reduction job. In fact, two passive restraint systems — air bags and passive belts — have already amassed impressive records in protecting front-seat passengers from death and serious injury in crashes. By March 1978, this real-world experience was so huge that vehicles equipped with passive belts and those equipped with air bags had each accumulated well over half a *billion* miles of operation on American roads. For example, the nearly 12,000 air bag-equipped passenger cars that since 1972 have been driven hundreds of millions of miles, had by March 1978 been involved in 185 reported air bag deployment crashes involving 267 front-seat occupants. The crashes included a very wide variety of violent, single and multiple impact collisions with both fixed objects, such as poles, and with other vehicles. Three in the Southwest even involved high speed impacts with large cattle. The front-seat occupants in the 185 crashes were of many ages — children, teenagers, adults, and the elderly. The injury reductions produced have been highly favorable and entirely consistent with those reported earlier by the Department of Transportation and the Institute.

Since the occupant restraint issue has had an extensive, complex history and involves matters of such importance, we hope that you will find this manual and the extensive documentation it contains a useful resource.

Sincerely,



William Haddon, Jr., M.D.
President

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I.

**The Department Of Transportation's
Passive Restraint Order**

Asks 'Why The Delay?'

Adams Holds Passive Restraint Hearings

Stating dissatisfaction with his predecessor's decision to put off final action on mandatory passive restraints for five to eight years, Secretary of Transportation Brock Adams opened two days of hearings at which he heard more than 70 witnesses give testimony on air bags, mandatory belt use laws, crash experiences and government and industry inaction.

Adams said that he would reach an early decision on whether or not to mandate passive restraints in all new cars so that any such rule could accompany the Congressionally mandated fuel efficiency standards due on July 1.

Adams emphasized that the new fuel efficiency standards will result in smaller, lighter cars. "As the number of smaller cars on our highways increases, the larger risk of death or injury from collision of vehicles of disproportionate weight and size indicates to me that we must address the problem of occupant vehicle safety," Adams said. (See *Status Report*, Vol. 12, No. 6, March 29, 1977.)

The April 27-28 meeting – the sixth Department of Transportation hearing on passive restraints since August 1969 – was called to hear testimony on three options that Adams is considering to provide occupant protection:

- keep the current federal occupant protection standard which allows, but does not require, manufacturers to provide passive – i.e. automatic – protection to vehicle occupants in the event of a frontal crash. Under this standard, most auto makers have provided manual safety belts;
- take action that leads towards state passage of mandatory safety belt use laws;
- require passive protection in all new cars.

WHY THE DELAY?

Adams repeatedly asked one question of witnesses throughout the hearing. He wanted to know why auto makers virtually ceased development of passive restraints in the early 1970's once the government removed rulemaking pressure. Adams pointed out that over the past several years there have been repeated delays in final rulemaking by the federal government on passive restraints and that most auto companies have never voluntarily introduced passive restraints in any of their cars.

Ralph Nader told Adams that the slow down in passive restraints came about because the major auto makers "decided they must be consistent in opposing all federal regulations." Nader said the lack of a standard was due to the "calculated delaying tactics of the concentrated automobile industry."

Ralf Hotchkiss, of the Center for Concerned Engineering, echoed that analysis, saying that auto maker action on passive restraints stopped when the federal government "mysteriously took the heat off."

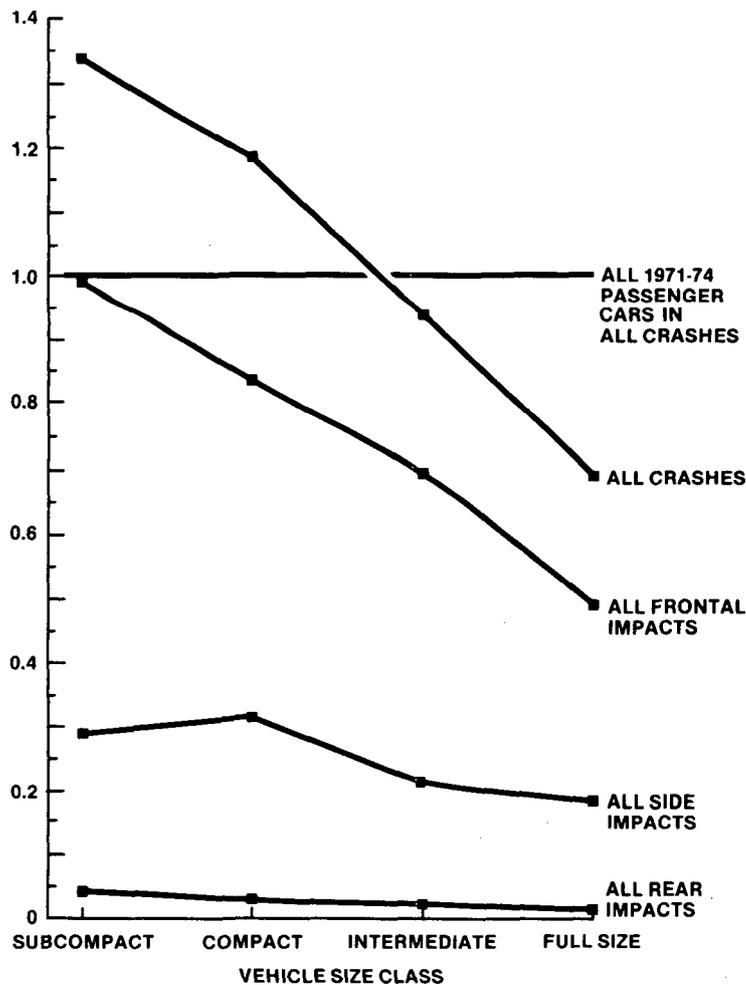
Auto makers' replies to the question shed little light on passive restraint delays. For example, American Motors Corp. said only that it was a "very complex and intricate subject," and then proceeded to recite some of the rulemaking history of the standard.

SMALL CARS

In his opening remarks, Adams emphasized his concern about the need to provide additional protection for the increasing number of small car occupants. He noted that auto maker efforts to meet the new fuel efficiency standards, scheduled to go into effect with 1981 models, are "certain to result in reductions in the size and weight of many passenger cars,"

Data confirming the hazards posed to occupants of small vehicles were presented at the hearing by the Insurance Institute for Highway Safety. The data showed that occupants of "smaller, lighter cars — such as will be coming on the roads in increasing numbers as America moves to cope with its energy crisis — *already* are being killed at far higher rates in frontal crashes than occupants of other cars." The Institute warned, "All other things being equal, smaller, lighter cars simply cannot provide occupant protection in *any* kind of crash as well as larger cars. People in the smaller cars particularly need the most effective, modern restraint systems available — and right away." (See graph below.)

**Relative passenger car occupant death rates
by car size and initial direction of impact—
1971-74 models in calendar year 1975***



* SOURCE: NHTSA FATAL ACCIDENT REPORTING SYSTEM AND R. L. POLK NATIONAL VEHICLE POPULATION PROFILE, JULY 1, 1975.

While some auto makers, such as Nissan and American Motors, talked of the difficulties of providing air bag protection in smaller cars, evidence was provided by equipment suppliers, independent researchers and other vehicle manufacturers to demonstrate that air bags are both practical and effective in smaller cars.

Thiokol, an air bag supplier, testified it had developed air bag systems for sub compact cars that not only meet the 30 mile per hour performance requirements of NHTSA's occupant crash protection standard (FMVSS 208), but perform equally well in 40-50 mph crashes.

Minicars, Inc., which is participating in NHTSA's program to develop a 3,000-lb. research safety vehicle, told Adams that "production-type, 30 mile per hour small car passive restraints exist and . . . advanced air cushion systems when placed in properly designed small cars can eliminate many additional fatalities." Minicars' President Donald Friedman, a former GM official, presented films of a 1974 Chevrolet Vega crash test in which an air bag "protected the driver at 32 miles per hour" and could have provided adequate protection at even higher speeds. Friedman noted that the air bags were able to provide adequate protection for small car occupants even though the Vega has "the worst crash deceleration profile of all the small cars we tested." The air bag in those crashes used "a simple adaptation of 1972 air bag technology," according to Friedman.

The John Z. DeLorean Corp., which is headed by GM's former vice president in charge of car and truck operations for North America, testified that it plans to provide passive restraints in its newly developed "two passenger, sports-type vehicle." It said that because of advancements in air bag design it was "finding plenty of room for the modern air cushion system" in its small vehicle.

One foreign manufacturer of small cars, Toyota, also told Adams that it had developed an air bag system which has "succeeded in satisfying, on an experimental basis, the injury criteria of Motor Vehicle Safety Standard 208 . . ." Toyota, while not committing itself, said it hoped to offer a driver-only air bag system as an option in one of its car lines during the 1980 model year.

SAFETY BELTS

Public health researchers, insurers and citizens' groups urged automatic passive protection be required in all new cars along with increased safety belt use as a means of further reducing crash deaths and injuries. Auto manufacturers and the American Automobile Association argued for increased belt use, required by law if necessary, rather than the installation of automatic restraints.

IIHS President William Haddon, Jr., M.D., said that "active lap-shoulder belts, although inferior to air bags in frontal crashes, are so far superior to *no* restraints — *if they are used*," that Adams should "also do whatever possible to increase belt use."

Belt use laws were supported by an Australian surgeon, Dr. Gordon Trinca, whose patients include many car crash victims, but he stressed that such laws were not an alternative to passive restraints. After describing the drop in deaths and injuries that followed enactment of the Australian safety belt use law, he reported the conclusion of the Sixth International Conference of the International Association for Accident and Traffic Medicine, recently held in Australia, that "governments and other appropriate authorities which had not enacted legislation making seat belt use mandatory were placing the road-using populations under their administration at needless risk."

Kathleen Sheekey of the Consumer Federation of America warned that belt use laws are unlikely to be enacted in the U.S. She said that CFA members "have had broad experience working with legislatures in virtually every state in the Union. All too often state legislators, faithfully reflecting the sentiment of the

people in the state, see mandatory belt legislation as an outrageous and unnecessary intrusion into people's lives. Whether you agree with that view or not, it is a sentiment that is prevalent in the large majority of our states."

All four major domestic auto manufacturers, as well as the Motor Vehicle Manufacturers Association and several foreign manufacturers, called for increased belt use, with mandatory laws if necessary. American Motors Corp. suggested "belt-wearing incentive programs," such as automatic increases in motorists' insurance protection if they wear belts or reduced insurance premiums for belt users. AMC said, "We stand ready to work with the insurance industry to develop a reliable belt use verification device for purposes of awarding user incentives." (When queried about the "verification device," an AMC official told *Status Report* that the vice president who could provide details on such a device was unavailable for comment at that time.)

Ford Motor Co. asked that Adams "enlist the Department of Transportation in a vigorous educational campaign that will raise both voluntary usage rates and public support for mandatory belt use laws." Both Nissan and Toyota supported belt laws in the United States. (A belt use law in Japan has resulted in less than 1 percent use.)

AAA claimed that "seat belt usage has increased significantly in newer model autos with new, improved systems." AAA claimed 40 percent belt usage in new model autos. Trinca pointed out that in no country was belt use high without a mandatory belt use law. Edward N. Cole, former president of General Motors, cautioned that belts were not that effective in preventing head injuries and for particularly large individuals. Allstate Insurance Co. stressed that active belts, unlike air bags, are not subject under Federal Motor Vehicle Safety Standards 208 and 209 to any dynamic test requirements, nor do they have to meet the 208 injury criteria. (See *Status Report*, Vol. 12, No. 2, Feb. 3, 1977.)

INSURERS

Presenting a statement on behalf of insurance companies writing "more than 95 percent of all the auto insurance written in this country," Donald Segraves of the American Mutual Insurance Alliance said, "We join together for the third consecutive year to offer our unequivocal support for a mandatory passive restraint standard."

Commenting on the "insurance cost implications" of a passive restraint standard, Segraves said the "savings will be substantial — not only for auto insurance policyholders, but also for consumers who purchase health, disability and life insurance as well." Nationwide and Allstate Insurance Companies both reminded Adams that they already offer a 30 percent reduction on premiums for certain auto insurance coverages on air bag equipped cars. (On the day of the hearing, Prudential Property and Casualty Co. announced that it would offer a similar 30 percent reduction for air bag equipped cars.)

In response to a question from Adams about product liability coverage for air bag equipped cars, Segraves pointed out that "when we insure a manufacturer of a car for an automobile, you don't insure components, you insure the whole car." An air bag, or other passive restraint, he said, is no different than any other safety device. Segraves added that, in his judgment, "the presence of an air bag on an automobile would in an overall sense reduce the product liability exposure of that car If you have a crash in a car because of the failure of some other part of the car, you run a risk of having a product liability claim, and if you don't get an injury because you're saved by the passive restraint system, you don't get a claim."

Adams also heard testimony strongly supporting the adoption of a passive restraint standard from the American Insurance Association and the National Association of Independent Insurers.

FIELD EXPERIENCE

As at previous hearings, public health researchers and others questioned the need for additional field testing of air bag equipped vehicles – which have now accumulated more than 300 million miles of real-world driving – while auto makers made renewed requests for more testing.

New data concerning the effectiveness of air bags in real-world crashes were presented to Secretary Adams by the Insurance Institute for Highway Safety. That data showed “air bag-protected occupants in severe frontal crashes experience greater reductions in fatal and serious injury (70 percent) than occupants of such crashes wearing lap-shoulder belts (55 percent) when both are compared to unrestrained occupants.”

Ford Motor Co. termed the field experience “anecdotal and insufficient,” while General Motors spoke of the “great need for more field experience.” GM also said its analysis of air bag crashes shows that “in the area of fatalities and aggravated injuries there does not seem to be a very distinct difference between the air bag deployed situation and the unrestrained driver.” American Motors, seemingly ignoring the current field data altogether, said to determine the “real-world worth” of air bags, “Field effectiveness data should be collected.”

Many auto makers supported former Secretary Coleman’s demonstration project as the means to obtain more field experience even though only two domestic and two foreign manufacturers had previously committed themselves to limited participation in that program. Secretary Adams, however, has previously indicated that the DOT-auto makers’ demonstration program agreements are no longer binding since the “decision by Secretary Coleman said that if there was a proposed rulemaking that moved forward, that they [the auto makers] didn’t have to carry out the agreements.”

Debate over projected air bag costs was less intense than at the last two hearings but there was still a wide discrepancy among different cost estimates. John Z. DeLorean, former General Motors vice-president who now heads his own auto company, stuck by his August 1975 retail price figures, of \$90 for full front seat air bags plus lap belts in a four-passenger car and \$111.50 in a six-passenger car. He said these figures might have to be adjusted slightly for inflation. The figures included allowance for both manufacturer and dealer profit. DeLorean said that since auto makers are currently redesigning their cars to be more fuel efficient, it will be less expensive to incorporate air bags into these designs at the same time.

The American Automobile Association and Chrysler Corp. both cited the alleged high cost of replacing air bags that have deployed. AAA quoted a replacement cost of \$629.26. That quotation, however, was for replacement of air bags that were individually installed as an option, rather than mass-produced standard equipment. Insurers have explained that air bag replacement will be covered under auto insurance policies and the savings, because of reduced injuries, will far exceed replacement costs.

In reply to a question from Adams on whether “costs will be reduced by competitive forces” if passive restraints are required, IIHS President William Haddon, Jr., M.D. warned that the Department of Transportation should “monitor with the authority that it presently has any cost statements” by auto manufacturers and suppliers of passive restraints. Haddon said that the “auto companies clearly have used cost arguments as a way to attempt to defeat such automatic protection which would protect the lives of their own purchasers and car users.”

Competitive forces, Haddon noted, had not brought down the cost of seat belts; “You can pay up to as much as over \$160 merely for the replacement of the belts in the front of the automobile.” Haddon also criticized the auto manufacturers’ practice of amortizing “safety equipment over one year, a ridiculously short period.” He pointed out that the manufacturers apparently then continue to price the

equipment at the rates indicated "by that high and very, very short amortization rate." This practice indicated, Haddon said, that "much needs to be done in the way of government surveillance on an issue of this importance."

Control Laser, a manufacturer of a steering wheel air bag, which weighs only three pounds and can be retrofitted on current cars, told Secretary Adams that while it now retails at \$75, mass production could drop that price to \$50. Control Laser said it was willing to offer the government the devices for \$30, which it claimed would be below its own cost, if DOT purchased 10,000 bags for installation on current government cars.

LEADTIME

Calling the air bag "technologically ready and feasible for installation in mass-produced vehicles," Allied Chemical, an air bag supplier, said that a 1981 model year effective date would provide "sufficient leadtime for necessary tooling and production commitments." Similar support for early introduction of mandatory passive restraints was voiced by Rocket Research Co., an air bag inflator manufacturer, and Thiokol, another air bag supplier. Rocket Research told Adams that mass production of air bag components would lead to increased product reliability.

Minicars testified that its extensive crash testing programs have shown that the existing GM passive restraint system, which "was designed five years ago and put into production . . . four years ago and which was in production for several years is adaptable with minor modifications . . . into almost any vehicle in the manufacturers' fleets in the time interval that it takes to put something into production which typically, from the end of the engineering cycle, is two years."

In contrast to the supplier and researcher estimates, Edward Cole, former president of General Motors, told Adams that because of manufacturers' current design cycles it would take "approximately six years" to completely introduce passive restraints in all new cars. (In 1970, while Cole was GM's president, GM told NHTSA that it planned to provide standard equipment air bags on all its passenger cars, most light trucks and some multipurpose passenger vehicles within four years.)

In what one NHTSA official termed an "unexpected reversal," Eaton Corp., an early developer and proponent of air bags and a principal supplier to the auto industry, urged Secretary Adams not to mandate passive restraints, but instead to return to the demonstration program developed by former Secretary Coleman. In addition to Eaton's reversal, Talley Industries, Inc., another air bag component supplier, cancelled its scheduled presentation.

Status Report, Vol. 12, No. 7, May 9, 1977

Haddon Tells Adams: 'Stop The Carnage'

At the April 27 hearing called by Secretary of Transportation Brock Adams to hear testimony on passive restraints, William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety, called on Adams to reverse the decision of his predecessor, William Coleman, who ordered a "demonstration" program of passive restraints rather than their installation in all new cars. (See Status Report, Vol. 11, No. 19, Dec. 13, 1976.)

Following is the text of Haddon's remarks:

Former Secretary Coleman reached the right conclusions but made the wrong decision. If his mistake is not reversed, tens of thousands of Americans will pay for it with their lives, and hundreds of thousands by being severely injured.

Mr. Coleman found that passive restraints “are a reliable and effective means of substantially reducing death and injuries on the nation’s highways;” that if installed on all cars “air bags would probably save over twelve thousand lives annually and prevent or reduce in severity over one hundred thousand moderate to critical injuries per year,” and that passive restraints could be provided to new car buyers as standard equipment “at a reasonable cost to the consumer.”

But he refused to mandate passive restraints.

You have proposed, on the basis of the Coleman record, to require passive restraints in future new cars. Thus we may finally be reaching the end of a process that began years ago with the technological development and perfection of simple, low-cost systems to provide greatly increased levels of passive – automatic – protection for people in cars when those cars are in front or front-angle crashes that otherwise might fatally or seriously injure them.

Early in the process the technological questions about passive frontal crash protection were raised and settled; the efficacy of the principal passive restraint system, the air bag, was demonstrated over and over again in both testing and real-world circumstances, and alleged adverse byproducts of the systems were shown to be either nonexistent or removable.

Yet those who control the technology have continued to resist giving it to the American people, just as in earlier years they resisted letting Americans have safety belts in their new cars, even as options.

Since the Coleman hearing and decision, evidence of the need for and benefits of passive restraints in frontal crashes – the kind that claim the majority of occupant fatalities in car collisions – has grown even stronger. For example, we have attached results of analyses showing that:

1. Air bag-protected occupants in severe frontal crashes experience greater reductions in fatal and serious injury (70 percent) than occupants of such crashes wearing lap-shoulder belts (55 percent) when both are compared to unrestrained occupants. These data are based on studies of real-world air bag crashes that occurred both before and since the Coleman hearing. [A subsequent updated analysis concluded that in the more serious frontal crashes the air bag-protected occupants, 83 percent of whom were wearing *no* belts, experienced greater reductions in the average severity of injuries (64 percent) than occupants of such crashes wearing lap/shoulder belts (55 percent). The study also showed that as the severity of the crashes increased, the role of the restraints became more important. See figure, following page.]

2. Occupants of smaller, lighter cars – such as will be coming on the roads in increasing numbers as America moves to cope with its energy crisis – *already* are being killed at far higher rates in frontal crashes than occupants of other cars.

3. All other things being equal, smaller, lighter cars simply cannot provide occupant protection in *any* kind of crash as well as larger cars. People in the smaller cars particularly need the most effective, modern restraint systems available – and right away.

4. Even if high levels of active belt use could be achieved, the experience of countries with mandatory belt use laws makes clear that the *life-saving and injury-reducing benefits would not be nearly as large as projected in the Coleman report.*

5. Active lap-shoulder belts, although inferior to air bags in frontal crashes, are so far superior to *no* restraints – *if they are used* – that you should also do whatever possible to increase belt use. It must be faced, however, that even mandating belt use by law will still leave very high percentages of occupants unprotected by belts – including, in disproportionately high shares, those in crashes.

As your March 24 notice suggests, “anticipated consumer resistance” is not a proper basis for failing to mandate passive restraints. Air bag-type passive restraints, unlike active belts and interlock devices, are completely unobtrusive and uninterfering. Because auto companies and DOT to date have made so little

accurate information about air bags available to the public, it may be misinformed about passive protection technology, but the public is *not* without a strong view of its own priorities. The only scientific nationwide survey of prospective *new* car buyers – a survey ignored by Mr. Coleman even though presented to him at his hearing – showed that a huge majority (four out of five) *preferred* increased crash protection requiring no action on their part, whether alone or in combination with active crash protection, and were quite willing to pay for such life-saving systems through increased car prices. [See *Status Report*, Vol. 11, No. 16, Oct. 12, 1976.]

Finally, Mr. Coleman declined to mandate passive restraints because, he said, “In instances such as this one, in which the primary purpose is self-protection, I believe that more than usual consideration should be given to maximizing the individual’s freedom to choose his means of protection”

Of all those people – children and adult passengers, second purchasers, car pool passengers, car renters and others – who have no “freedom of choice” to be protected in crashes when an automobile company or a government agency or a new car buyer decides that passive restraints shall *not* be a part of a new car, Mr. Coleman said nothing.

The Pulitzer prize-winning conservative commentator, George F. Will, recently described as follows the view implicit in Mr. Coleman’s position:

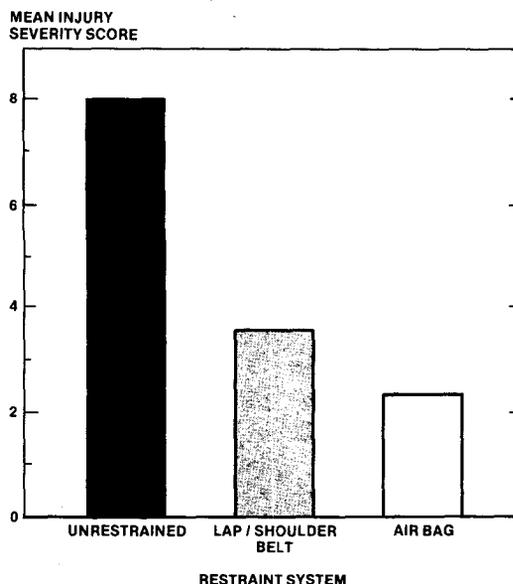
“There is a pitiless abstractness, and disrespect for life, in such dogmatic respect for the right of consenting adults to behave in ways disastrous to themselves. Besides, too many children passengers are sacrificed on that altar. And a large part of the bill for the irrationality of individual drivers is paid by society.

“Most important, society desensitizes itself by passively accepting so much carnage.”

It is time for the needless carnage to stop, and within your power to stop it.

(A complete copy of the Haddon statement with supporting attachments submitted to Secretary Adams is available by writing to “Passive Restraint Statement,” Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C. 20037.

Mean injury severity scores for occupants in severe frontal crashes



Adams Mandates Automatic Protection

After almost eight years of delay, the Department of Transportation has taken action that will eventually lead to the installation of automatic restraints in all new cars. DOT estimated that its action will save 9,000 lives and prevent thousands of crippling injuries each year once all cars are equipped with automatic restraints.

Secretary of Transportation Brock Adams announced that the current occupant protection standard (FMVSS 208) has been amended to require that automatic – i.e., passive – crash protection be provided for front seat occupants in 30 mile-per-hour crashes on the following schedule:

Sept. 1, 1981 – New cars with 115-inch wheelbase or greater,

Sept. 1, 1982 – New cars with 101-inch wheelbase or greater,

Sept. 1, 1983 – All new cars.

Under the terms of the DOT action, auto makers will be required to substantially reduce the forces that reach front seat occupants in severe frontal crashes. Each manufacturer may meet this performance requirement by using any design approach it chooses – including passive belts or air bags – that meets the crash-force-reduction requirement.

Adams estimated that approximately two and a half million cars would be affected in the first phase, an additional five million in the second phase and another two and a half million in the third phase.

DEMONSTRATION PROGRAM

Adams asked auto makers to continue their participation in the passive restraint demonstration program. Under this program (developed by the former Secretary of Transportation, William Coleman, Jr., see *Status Report*, Vol. 12, No. 2, Feb. 3, 1977), several auto makers agreed to produce a limited number of passive-restraint-equipped cars during the 1980 and 1981 model years.

In answer to Adams' request, Volkswagen said it plans to continue to produce its passive belt-equipped Rabbits; Ford has cancelled its participation in the program, and Volvo and General Motors have not yet indicated whether they will participate in the program. (Toyota previously announced that it "hopes" to offer a driver-side only air bag in one of its 1980 model cars.)

SMALL CARS

At the press conference announcing the decision, Adams was sharply questioned over why DOT is allowing small – less crashworthy – cars more time than larger cars to meet the passive restraint rule.

Adams replied, "Our problem was that we did not feel that the technology that was moving forward for the smaller vehicle lent itself as well to the air bag. That's why we have given them more time. But we will be making every effort to get them to come in and produce under the voluntary program earlier."

Adams was also asked why installation of passive restraints will not take place until the 1982-1984 model years.

“We have phased it in with the auto fuel standards and the design changes necessary with the technology that exists now,” Adams answered, “so that it’s an orderly process of moving from zero to 10 million vehicles, and that’s the reason why we have put it in by stages, rather than having anything go wrong or a challenge be made that this was a foolish requirement that couldn’t be met.”

Adams was criticized by the Center for Auto Safety and Ralph Nader, who maintained that auto makers have the capability of installing passive restraints at an earlier date. Both CAS and Nader, however, joined forces with others opposed to Congressional repeal of the Adams decision.

BACK SEAT PROTECTION

At the press conference, Adams also said he is “terribly concerned” about back seat occupants. Increased protection for the back seat “will be one of the jobs that Miss Claybrook, the new head of NHTSA, will have to address next because the testimony that we’ve had on this . . . people come out of the back seat like projectiles and have caused injuries by hitting people in the front seat – the air bag will give a significant amount of protection there, but I am not at all saying it is adequate. So I think we should be addressing that problem next.”

Adams also pledged to closely monitor the price increase caused by the passive protection devices “so that people don’t just say that all the additional cost of the automobile is because of this one factor.”

An NHTSA official told *Status Report* that not only would the agency be monitoring prices, but it would also be monitoring the auto makers’ progress in meeting the standard so that there will be no delays in the scheduled implementation.

Adams also made the following points at his press conference:

- **Congressional Review:** He expects Congress to support the rule and “I will certainly go to the Hill and fight for it.”
- **Maximum Speed:** The Adams rule requires protection in 30 mph crashes into a barrier, but Adams said that this speed might be raised in the future.
- **Car Sales:** “I don’t think it [the rule] will have any effect on car sales, if the automobile manufacturers go out and promote this like they do automatic transmissions, air conditioning, vinyl roofs and the rest. I believe the American public has arrived at a point where they want fuel efficiency and they want safety in their automobiles, and that is an attractive thing to sell to the people.”
- **Reliability of Safety Systems:** “. . . we’ve had no problem with [auto] companies saying they can repair other things on cars, and ‘buy my car’ because it’s easily repaired. When you talk about something that involves safety, they seem to question whether or not they can do the same thing they can in other areas. They can do this as well as they can repair your transmission, repair your carburetion systems, or any other parts of the automobile, and in the same fashion.”

Auto Makers Plan Passive Protection Options

Although Secretary Adams' automatic protection decision will not require installation of the systems until 1982 models of full-sized cars, some auto makers have announced that optional equipment will be available earlier on a limited number of auto lines.

"We propose to make available as soon as practical an automatic-belt restraint option on three representative car lines," T. A. Murphy, General Motors chairman, notified Secretary Adams. "We have already selected a subcompact and a luxury car as two of the cars for the program. The third car line will be selected on the basis of engineering evaluations now being conducted.

"We hope to be able to offer some of these automatic belt restraint options by the start of the 1979 model year, or earlier if possible. Beyond this, we intend to offer an air cushion restraint system as an option across-the-board on our full-size cars as soon as practical. While there are many complex technical problems yet to be resolved in this program, we hope to be able to offer this option at the start of the 1981 model year."

Ford Motor Co. also revealed plans to pursue the option approach. Herbert L. Misch, vice president for Ford's environmental and safety engineering staff, told Congressional committees: "If engineering plans are successful, we will offer a passive belt as a customer option on at least one of our mid-sized car lines in model year 1980. In model year 1981, air bags will be an option on at least one of our full-sized car lines. Also, in model year 1981, we plan to offer the passive belt as an option on a subcompact vehicle It will be in our interest to sell and get as many of these cars on the road as possible."

Both auto makers promised that the passive restraint options will not be contingent on the outcome of current efforts in Congress to override Secretary Adams' mandatory program by concurrent resolutions.

This is not the first time that the major auto makers have announced plans to provide automatic protection systems as a buyer's option. For example, in 1970, General Motors stated to NHTSA:

"For the 1974 model year, the air cushion would be made standard equipment on those 1973 models on which it was an optional item while extending the customer option to several additional models of General Motors passenger cars. We estimate approximately one million 1974 model General Motors cars could be equipped with the air cushion in this second year. In the fall of 1974, the air cushion would be made standard equipment on all 1975 General Motors passenger cars, most light trucks (under 6,000 lbs. GVW) and certain multipurpose passenger vehicles." (General Motors Corporation, comments to NHTSA on Docket No. 69-7, Notice No. 4, August 3, 1970.)

General Motors, after putting only a few more than 10,000 luxury cars of the 1974-76 model years on the road with optional air bag equipment, canceled its production last year, blaming insufficient customer demand for the action.

Hearings Explore Passive Restraint Record

A decade of controversy over increased auto safety climaxed this month with yet another full-scale airing of the need for passive restraints to protect drivers and front-seat occupants from the tragedy of deaths and injuries in frontal car crashes.

This time the discussion spanned two Capitol Hill forums: the Senate Consumer Subcommittee and the House Subcommittee on Consumer Protection and Finance. In overlapping hearings the subcommittees heard advocates and critics of passive restraint systems praise and attack the June 30th decision of Transportation Secretary Brock Adams requiring phasing-in of passive restraints during the 1982-84 model years.

Among those testifying in support of Secretary Adams' ruling were spokesmen for the insurance industry, motorists' service organizations, the President's consumer advisor, the National Committee for Automobile Crash Protection (a coalition of safety advocates), air bag component suppliers, consumer advocates, and executives of the Insurance Institute for Highway Safety. Opponents included some Congressional critics of Secretary Adams' policy, spokesmen for the auto manufacturers, and representatives of the safety belt manufacturing industry.

After two days of hearings, the House subcommittee voted against the resolution sponsored by Rep. E. G. Shuster (R-Pa.) which would overturn the Adams decision. The issue was sent to the House Committee on Interstate and Foreign Commerce for full committee action. In the Senate the subcommittee concluded its fourth day of hearings September 21 on a similar resolution offered by Sen. Robert Griffin (R-Mich.). It was indicated that the subcommittee will pass the matter on to the full Committee on Commerce, Science and Transportation.

President Carter Backs Adams' Decision

The Carter Administration is fully behind Secretary Adams in his decision to require passive restraints on new automobiles starting with the 1982 model year, it was revealed in testimony before the House Subcommittee on Consumer Protection and Finance.

After Esther Peterson, special assistant to the President for consumer affairs, had given a strong endorsement for passive restraints, Chairman Bob Eckhardt asked her "if you feel you are representing the President's views in your testimony?"

"Yes, I do," responded Peterson. "I know that the President fully supports Secretary Adams' position on this."

As the 60-day period for Congressional review of the passive restraint rule neared an end, it was not clear whether the concurrent resolutions will be disposed of in committee or whether one or both will reach the floor for full Senate and House action. Congressional opponents of the Adams ruling are expected to have until October 13 to veto the action by majority vote in both houses.

Even in the event that the concurrent resolutions should be approved by both houses, the action appears unlikely to settle the issue. Ralph Nader and the Center for Auto Safety have raised the question of the Constitutionality of a Congressional veto of an executive agency's action. And Rep. Bob Eckhardt (D-Tex.), chairman of the House Subcommittee on Consumer Protection and Finance, has expressed doubts of Constitutionality on different grounds.

“Any kind of veto that requires concurrence of both houses must certainly itself be subject to a veto,” Eckhardt said while questioning Nader at the House hearings. “Under the provisions of the Constitution it quite clearly states that any action requiring concurrence of both houses must go to the President and must receive his signature before the same can be effective.”

But passive protection proponents made it clear in their testimony that they believe efforts to overturn the Adams decision should be rejected immediately without allowing it to become involved in technicalities.

“I urge the Congress to reject this infamous resolution and concentrate on ways to achieve a humane, efficient automobile and truck fleet that reflects the wisdom of the 1966 law and subsequent enactments,” said Nader. “Congress could start by requiring that the vehicles purchased by the government include passive restraints. It strains the credulity that now one has to urge Congress to avoid blocking the saving of lives on the highway.”

Said William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety: “Were the passive restraint issue not of such overriding importance for the health and safety of the American people, the groundless technical claims by which opponents seek to undermine DOT’s rule might be amusing. But the issue is far too grave, and the outcome of any reversal of the rule far too perilous, for amusement. If Congress were actually to revoke the DOT passive restraint rule, it would be going out of its way to send thousands of Americans each year to hospital beds, wheelchairs and graves.”

Donald L. Schaffer of Allstate Insurance Co. commented: “If Congress is satisfied with belt usage in the 20 percent range, with no achievable programs to substantially increase that factor, with active belts not required to be crash-tested or meet injury prevention criteria, with present levels of vehicle occupant deaths and injuries of 35 percent as we move to lighter and smaller cars to meet our energy goals – it will veto Secretary Adams’ ruling.

“If the Congress is dedicated (as we believe it is) to continued improvements in vehicle safety performance . . . and to get on with the job of saving 9,000 lives and preventing hundreds of thousands of injuries – the Congress will reject the resolutions and thus support Secretary Adams’ efforts.”

Esther Peterson, special assistant to the President for consumer affairs, also agreed with passive restraint advocates. “If this decision is allowed to stand,” she said, “I believe that we will look back upon it as perhaps the single most important accomplishment of the National Traffic and Motor Vehicle Safety Act. The decision is a fair one, and I am convinced that the consumers of this country will support it.”

There was little new of a substantive nature revealed in the Senate and House hearings. Issues raised were familiar to those who have followed passive restraint proposals through the repeated Department of Transportation hearings, climaxing last April with the hearings on which Secretary Adams based his decision. Testimony centered on the laboratory and real-life experience with air bags, alleged problems of inadvertent deployment or failure to deploy, installation costs and replacement costs, product liability coverage for equipment makers, the track record for seat belts and demands for mandatory seat belt use laws, and the philosophical arguments against requiring auto owners to buy safety equipment.

Underlying many of the opponents’ arguments were some false allegations that were quickly set straight on the hearing record. Here is a sampling of the allegations and the facts on the record:

ALLEGATION: “Using the matching case methodology, our present estimate is that the air cushion-lap belt system is only about 10 percent effective in reducing significant injuries.”

*Dr. David S. Potter, General Motors,
in Congressional testimony*

THE RECORD: "When General Motors started making its claims that its own analyses showed very little effectiveness of passive restraints, and considering that GM's claims were directly contrary to the evidence from DOT . . . we asked GM if it would be willing to reveal to us the primary data upon which its conclusions were based. We were assured almost a year ago that the data would be forthcoming. We provided them . . . with all of the primary data upon which our own conclusions were based.

"We finally succeeded in getting the data only three weeks ago. We are still analyzing that data but I can tell you that using GM's own matched comparison files we have already determined that serious head, face, neck and torso injuries (that is, the injuries that produce the overwhelming bulk of fatal and disabling conditions) are down 44 percent. That's a 44 percent reduction in the air bag cars of these major kinds of injuries in comparison with matched non-air bag automobiles."

William Haddon, Jr., M.D.,
Insurance Institute for Highway Safety,
at the Senate hearing

ALLEGATION: Domestic auto makers were unanimous in charging there is insufficient real-world data upon which to mandate passive restraints. The mandate, they contend, is based largely on subjective analysis and overly optimistic assumptions.

THE RECORD: "Air bag cars have been driven approximately 500 million miles and of those only four fatalities occurred. Of those four, three could not have been saved by any kind of system that is known at all.

"Air bags have been installed in more than 12,000 production automobiles. There have been 165 deployments involving 228 front-seat occupants. All of these have demonstrated that the system is consistent, that it works and that it saves the lives of those involved.

"Of the 500 million miles of on-the-road experience there have only been two air bags that have failed to deploy under the design conditions. One of those had been mistakenly disconnected by a mechanic, and the other was a faulty solder connection. Compared with other items on an automobile this has had far more testing than any other thing that I know that has ever been done."

Secretary Adams at the Senate hearing

ALLEGATION: "The success of the Grand Rapids test convinced Motorists Information, Inc. that there is a likelihood that the ultimate objective of increasing the actual use of belts can be achieved."

V. J. Adduci, Motor Vehicle
Manufacturers Association,
in Congressional testimony

THE RECORD: Motorists Information, Inc. — an auto industry-backed organization formed to promote seat belt use — reported belt use jumped from 29 to 41 percent in Grand Rapids, Mich., after a media campaign. But the Insurance Institute for Highway Safety made a direct observation survey to check the results of Motorists Information's telephone interview poll. The scientific survey revealed that only 13 percent of drivers observed were using seat belts.

"It has definitely been shown," Ralph Nader told the House Subcommittee on Consumer Protection and Finance, "that merely exhorting people to wear seat belts and shoulder harnesses, barring some discovery of a new behavioral insight, has not been successful at all. I think the thrust of the 1966 Act

is to build engineering safety in the automobile so that it comes in a more protective manner when the auto is purchased.”

ALLEGATION: Most air bag systems employ sodium azide, which is an explosive, poisonous, “mutagenic and most probably carcinogenic” material that will pose a hazard to the auto owner.

Rep. E. G. Shuster at the House hearing

THE RECORD: “Sodium azide is not an explosive and will not detonate. Sodium azide is also used in pharmaceuticals, herbicides and wood preservatives. Approximately 1.0 to 1.5 million pounds of sodium azide are manufactured annually for these purposes Although sodium azide has been manufactured for over 50 years not one death has been recorded among persons producing it or using it. . . . Talley Industries has used sodium azide in pyrotechnic gas generators since 1970. During this period operators have directly handled several thousand pounds of sodium azide. Operators had daily skin contact with sodium azide without one case of poisoning or even skin rash. . . .”

Talley Industries of Arizona, Inc.,
submission at the Congressional hearings

“Sodium azide is not the only means of inflating air bags. Air bags can be, and have been, inflated with hybrid inflators. A hybrid inflator consists of argon gas [a minor component of the air we breathe] and a small amount of non-azide propellant material.

“Gentlemen, hybrid inflators have a proven track record through their use in all 10,000 passenger-side inflators for the 1974-1976 General Motors optional air cushion restraint program. Hybrid inflators can inflate the bag as well as azide inflators, and can meet the required injury criteria of the passive restraint standard. As a result of recent developmental efforts, the hybrid inflator can now be packaged in the same space as an equivalent azide inflator, and can be produced at roughly the same cost. We believe that hybrid inflators provide the best means of inflating bags that is available today and have proposed this method to the car companies.”

Edgar S. Brower, Allied Chemical Corp.,
at the Senate hearing

ALLEGATION: Air bags are designed to work “only” in frontal crashes.

Rep. E. G. Shuster in Congressional hearings

THE RECORD: “Neither belts nor air bags are considered effective in rear-end crashes. Impacts on the side of the vehicle where the occupant is sitting can cause serious injury to the belted or unbelted occupant. Impacts on the opposite side from the occupant produce a situation where the belt is very helpful and important to prevent the occupant from being pitched in that direction. Side impacts from the opposite side which substantially alter the forward motion of the automobile can inflate air bags – and in a number of cases this has occurred and thrown the driver into the passenger’s air bag protecting against injury.

“Flying glass and debris are a real crash hazard against which belts offer no protection. In many crashes air bags have offered complete protection against flying glass and metal.

“Yet air bag opponents make it sound like buckling up guarantees no deaths and no injuries. The public is entitled to facts.”

Donald L. Schaffer, Allstate Insurance Co.,
in Congressional testimony

ALLEGATION: The air bag system will cost the consumer “approximately \$250 more in today’s dollars than he would pay for proven safety belt protection.”

*S. L. Terry, Chrysler Corp.,
in Congressional testimony*

THE RECORD: “We have broken down each of the components used and the cost involved in each one and that way arrived at the figure of \$25 for passive belt restraint systems and \$112 for air bag passive restraints.”

Secretary Adams at the Senate hearing

ALLEGATION: “The air-bag order chips away needlessly at our individual freedoms.”

*Rep. E. G. Shuster in a statement
attached to his Congressional hearing
testimony*

THE RECORD: “Motor vehicle deaths and injuries are not just a major *health* problem. They are a major *public* problem. They absorb large portions of our tax dollars and our limited public resources, ranging from blood to hospital beds to rehabilitation services and extended care. They involve public highways – our most important public transportation system. As a public problem as well as a health problem, their solution requires that the right decisions be made by public officials.

“I emphasize this point because the question of individual freedom has been raised. APHA is concerned about freedom too, yet some things cannot be left for individual decisions. We have building regulations that keep people from being burned to death, rather than allowing the owner to take chances with the electrical system. Our product safety standards now give parents no freedom to choose a crib with widely-spaced rails that could strangle a baby.

“Yet some people ask, ‘Should the government limit our freedom to buy any kind of car we want?’ If your answer is no, then the public should be free to buy cheap electric tools that can kill us for want of adequate insulation, or to buy new cars with old-style windshields that rip open faces. If your answer is no, then God help us – because you have just forfeited the public’s right to freedom from unreasonable risk of injury.”

Susan P. Baker, M.P.H.,
speaking for the American Public Health
Association, in Congressional testimony

And Donald Schaffer of the Allstate Insurance Co. added in his testimony:

“The adverse reaction to the interlock has also conditioned many people to oppose the air bag as a similar bureaucratic ‘Big Brother’ concept – when, in fact, the air bag is automatic, concealed and involves no compulsion or inconvenience.

“So some allege that the move toward passive restraints raises the specter of ‘Big Brother’ government. We believe just the opposite is true. Present rules require every car purchaser to buy a belt system and pay for it. Eighty percent reject the system by not using it. The 20 percent who use the belts have no proven test of their performance.”

————— *ALLEGATION: “More people are buckling up their safety belts today than ever before.”*

*S. L. Terry, Chrysler Corp.,
in Senate testimony*

THE RECORD: The most recent seat belt usage survey conducted by the National Highway Traffic Safety Administration directly refutes this statement. Observation of about 54,000 drivers in 11 cities revealed that only 19.8 percent of those driving 1977 model cars were wearing their safety belts. This compared with 21.1 percent of those driving 1976 models, 24.2 percent of those driving 1975 models, and 29.2 percent in 1974 models.

————— *ALLEGATION: Rep. John D. Dingell (D-Mich.) charged recent tests conducted by Calspan for the National Highway Traffic Safety Administration “raise extremely serious questions and concerns about the safety of air bag devices.”*

THE RECORD: The tests in question, William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety, told the House Subcommittee on Consumer Protection and Finance, were head-on, off-center collisions between 1973 Chevrolet Impalas at speeds of 30 miles per hour. Various combinations of cadavers and test dummies were placed in the crashing vehicles, some protected by air bags and some with lap/shoulder belts. “Unlike the real-world situation where the inertia reel is used, the belts used were fixed belts,” Haddon explained. “So this was not a test of real-world systems in the first place.”

Results of the dummy tests for both air bags and seat belts were very good, said Haddon, but two of the air bag-restrained cadavers showed injuries. One showed three rib fractures and one a rib fracture and two leg fractures.

“Now, cadavers have been known as long as I have been in medicine to be, as far as their resistance to forces, very, very capricious and unreliable in their performance characteristics,” Haddon explained. “There is no brain working any more to tell the muscles whether or not they should stay tight and brace the joints and so forth.

“The tissues have variously deteriorated. The diseases – and it gets relevant in this case – from which they died, or from which the people whose cadavers they were, were suffering, can often be very relevant and can often mess up test results.

“Now, one of these cadavers – these two in the air bag positions but not in the belt positions – had evidence of external heart massage immediately before or about the time of death. As is well known, as physicians and paramedics, ambulance personnel and so forth are always warned, external cardiac massage – and it is a very small price to pay – can easily and not infrequently does fracture ribs.

“The cadaver in this case, it is said, had been x-rayed. But frequently fractures of this sort are missed on such X-rays beforehand. In other words, there is no assurance that those three rib fractures were not present before rather than as a result of the test, and cadavers are not a good thing to use in the first place

“Now, with respect to the other cadaver in the air bag position, the one that had one rib and two leg fractures, the report states: ‘The cadaver was highly osteoporotic in the lower extremities.’ ”

This condition, as Haddon explained, is a deterioration of the bone structure commonly associated with a calcium deficiency and often is found among the elderly. He also noted that when present it usually involves all of the skeleton.

“So this is an inappropriate set of data, inappropriately obtained,” Haddon concluded, “and should not be taken as far as the cadavers are concerned as opposed to the dummies as the basis of one more attempt to raise a technological red herring on the part of people that are, as I mentioned earlier, philosophically opposed to the government saying to manufacturers, ‘Thou shalt not make cars which are technologically backward and don’t properly protect their users.’ ”

ALLEGATION: “Air bags won’t significantly reduce automobile insurance premiums, and anyone who says otherwise is trying to pull the wool over the public’s eyes.”

*S. L. Terry, Chrysler Corp.,
in Congressional testimony*

THE RECORD: Leslie Cheek, vice president of the American Insurance Association, had this comment:

“Quite clearly, the savings possible on automobile bodily injury coverages alone will heavily outweigh any increase in automobile collision insurance costs resulting from the full availability of passive restraint protection.”

Richard G. Chilcott, senior vice president of the Nationwide Insurance Co., testified:

“How much would policyholders save in auto insurance premium dollars when air bags are installed in all cars? Based on 1975 industry data, our actuarial calculations show that annual auto insurance premium savings to policyholders would approach \$1.9 billion annually, once air bags were installed in all cars for all front-seat occupants. This averages out to nearly \$25 per insured car per year. In less than half the normal 10-year lifetime of a car, the premium savings would pay for the cost of the air bags – estimated at \$112 when mass produced.

“What about air bag repair? Accident damage is paid for by collision insurance. Nationwide provides payment for inadvertent deployments under its comprehensive coverage as a matter of administrative practice. This protection is provided at no additional cost to the policyholder.”

Goldmuntz, GM Studies Analyzed

Responding to a request from the chairman of the House Subcommittee on Consumer Protection and Finance — the subcommittee that earlier completed extensive hearings on the Department of Transportation's passive restraint decision (see story, page 1) — the Insurance Institute for Highway Safety has warned that two studies being cited by opponents of the DOT decision are "seriously defective."

Rep. Bob Eckhardt (D-Tex.), in a letter to Institute President William Haddon, Jr., M.D., asked for comment on a study prepared by Dr. Lawrence Goldmuntz that purported to show air bags less effective than lap/shoulder belts in crashes, and one prepared by General Motors claiming, on the basis of matched crashes of air bag and non-air bag cars, that air bags are only slightly effective in reducing significant injuries.

In his reply, Haddon pointed out that the Goldmuntz study, which attempts to compute deaths and injuries per 100 million miles of travel, "cannot be accepted because crucial items of data used in the computations are little better than uninformed guesses." Among these, Haddon said, were Goldmuntz's estimates of the total number of miles travelled by air bag and non-air bag cars.

"Additional evidence of the unreliability of the data and methodology of the Goldmuntz study is the fact it concluded that lap belts reduce deaths more than lap/shoulder belts. This conclusion is, of course, absurd," Haddon added.

Haddon also pointed out that the Goldmuntz study ignores "well-known biases in the data — for example, it is well known that both the average violence of crashes and, hence, occupant death rates, are much higher in rural than urban areas. Yet, despite the fact that 45 percent of the air bag crashes have occurred in rural areas, Goldmuntz has used for comparison with the air bag crashes a group of crashes involving lap/shoulder, lap-belted and unrestrained occupants that were overwhelmingly in urban areas — only 12 percent of the comparison crashes he used occurred in rural areas. In other words, by his choice of overwhelmingly urban lap and lap/shoulder belt comparison groups, he has biased his analysis against the air bag group, almost half of which was comprised of the more violent, rural crash experience.

NO 'PREDICTIVE VALUE'

The Goldmuntz study is "worthless" and has "no 'predictive value' at all," Haddon concluded.

Turning to the GM study, Haddon noted that the auto manufacturer had failed to validate the study procedure, in which air bag crashes were "matched" for comparison purposes with non-air bag crashes.

Haddon cited a quotation from GM's own description of the "matching case" study, in which a GM official said: "Basically, it involves a comparison of injuries suffered by accident victims in air cushion-equipped cars with injuries sustained by victims who were *unrestrained* in similar type crashes." [Emphasis added.]

Despite this description, Haddon said, GM's own matched cases — chosen by a panel of GM engineers rather than outsiders — included "instances of lap-belted occupants in crashes matched to air bag-restrained occupants who were unbelted. Moreover, there are many other discrepancies between the file of data submitted to us by GM and information from the same matched cases submitted by GM to DOT Until GM demonstrates that its matching methodology is valid, and until it resolves such discrepancies, the GM conclusions must be disregarded."

Congress Rejects Passive Restraint Attacks

Congress has endorsed passive restraints by decisively rejecting efforts to overturn Transportation Secretary Brock Adams' ruling requiring that increased levels of automatic crash protection be provided in new cars, starting with the 1982 model year.

After four days of hearings covering all aspects of the restraints problem, the Senate Consumer Subcommittee voted 5 to 0 to uphold the Adams decision. The Senate Committee on Commerce, Science and Transportation agreed with the subcommittee's findings by a 9-to-7 vote and recommended to the full Senate that the resolution to veto Adams' ruling be rejected. After an hour of floor debate, the full Senate agreed, 65 to 31, that the passive restraint decision should stand and tabled the resolution.

In the House, after two days of hearings, the House Subcommittee on Consumer Protection and Finance decided by a voice vote to recommend disapproval of the resolution to overturn the Adams ruling. Carried on to the full House Committee on Interstate and Foreign Commerce, the resolution twice was disapproved, the second vote of 16 to 14 tabling the matter in committee.

	HOUSE	SENATE
<i>Subcommittee</i>	Voted to recommend disapproval of Shuster resolution to Commerce Committee (vote unrecorded)	Voted 5-0 to recommend disapproval of Griffin resolution to Commerce Committee
<i>Committee</i>	Twice voted down Shuster resolution, the second time tabling it in committee by a 16-14 vote	Voted 9-7 to send Griffin resolution to the floor with recommendation it be rejected
<i>Floor</i>	Not referred for action	Griffin resolution defeated by 65-31 vote

Thus ended efforts on Capitol Hill — at least for this year — to overturn the Department of Transportation requirement for increased automatic protection. (Since the initial federal motor vehicle safety standards came into effect in 1968, auto manufacturers have been required to provide several kinds of automatic protection, for example by means of redundant braking systems, rims that retain blown-out tires, energy-absorbing steering wheels, and minimum amounts of crash padding.) The increased automatic crash protection must be installed in all 1982-model full-sized cars, in mid-sized cars in the 1983 model year and in all new cars starting with the 1984 models.

PASSIVE OPTIONS PROMISED

Passive restraints as an extra-cost option should be available before those requirement deadlines. At the Congressional hearings, both General Motors and Ford representatives announced plans to introduce optional equipment on an earlier schedule. General Motors expects to offer automatic belts in selected

models as early as the 1979 model year, with optional air bags following soon after. Ford plans a passive-belt option in at least one car line the following year. Volkswagen now offers a passive-belt option, and Toyota hopes to have a driver-only air bag by the 1980 model year.

The Department of Transportation has yet to respond to petitions for reconsideration of the passive restraints rule filed by the four domestic auto makers and other interested parties, including Ralph Nader and the Center for Auto Safety. While the department operates under no restriction on when responses must be made, it is agency policy to deal with petitions within 90 days of their filing. In the case of the petitions on passive restraints, the responses would be expected in the first two weeks of November.

The Adams ruling also faces one court challenge, filed by the Pacific Legal Foundation, a public-interest law firm. The group's petition for review is pending in the District of Columbia Court of Appeals, but judicial action is not expected until sometime next year.

Quoted Without Comment

"The passive restraint . . . technology is available and the need is there. I think the only way passive restraints are going to get to first base is making them mandatory. Another test will prove nothing. Let the passive air cushion evolve like all other systems. By mandating the basic performance requirement and not telling the industry how it should be done will get the job done."

—The late Edward N. Cole, president of General Motors from 1967 to 1974, in a letter to William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety, Jan. 20, 1977.

General Motors Plans Automatic Belt Option

General Motors Corp. has announced it will offer an automatic safety-belt system as an item of optional equipment with the 1978-model subcompact Chevrolet Chevette, starting in May.

The system, similar to that now offered as an option with the Volkswagen Rabbit, was described as a "voluntary automatic belt system" by the auto manufacturer. "Automatic systems will not actually insure that occupants will use them since an emergency disconnect buckle is required by law," General Motors said in its announcement.

The automatic belt, which stretches across the passenger's body when the car door is closed, will be accompanied by a lap belt that must be fastened manually, and a knee bar to limit forward movement.

General Motors had revealed earlier that an optional automatic belt system is planned in three car lines – subcompact, luxury and another to be designated – before passive restraints are required by federal standard in the 1982-84 model years.

Quotes From Capitol Hill

Passive restraints drew strong endorsements on Capitol Hill during debate over the veto resolutions. Here are some of those comments:

Sen. Wendell Ford (D.-Ky.): "If the Department of Transportation's rule becomes effective, we can take a major step to end the carnage on our highways."

Sen. Abraham Ribicoff (D.-Conn.): "I believe that these air bag (passive restraint) standards are one of the most important automobile safety advances which the government has ever undertaken. The potential savings in lives and dollars is great. The efficiency and economy of air bags has been well proven."

Sen. John A. Durkin (D.-N.H.): "If we wait for Detroit we will be tired and old before Detroit moves to resolve what is a very serious problem."

Sen. Lloyd Bentsen (D.-Tex.): "I am convinced that future efforts to reduce automobile deaths will find the greatest payoff through improvements in the safety features of the vehicles themselves. Based on the substantial evidence that is presently available, I have concluded that passive restraint systems are the most effective way to improve vehicle safety."

House Consumer Subcommittee report: "When realistic assumptions are made about the potential usage rates for the present active restraint systems, virtually all studies show a substantially greater effectiveness for both passive belts and air bags in saving lives and preventing injuries."

Status Report, Vol. 12, No. 14, Sept. 26, 1977

Foundation Asks Court Review Of Adams' Ruling

The Pacific Legal Foundation, a public-interest law firm with an avowed interest in "limited government," has filed suit in the District of Columbia Court of Appeals to block Transportation Secretary Brock Adams' mandatory passive restraint ruling.

The group filed a petition for review charging "there was insufficient basis for the air bag decision." The Department of Transportation has 40 days from September 1 to submit to the court all pertinent records. Court officials estimate it may take six months to a year to have the case set for argument.

DOT Rejects Protests To Restraints Ruling

By rejecting all petitions for reconsideration of the decision mandating passive restraints in passenger cars starting in model year 1982, Transportation Secretary Adams has issued a "final rule" in the occupant restraints proceedings. (See *Status Report*, Vol. 12, No. 13, Aug. 15, 1977.)

Barring unfavorable court action, the Federal Motor Vehicle Safety Standard (208) will take effect for new cars with wheelbases greater than 114 inches on Sept. 1, 1981, for new cars with wheelbases greater than 100 inches on Sept. 1, 1982, and for all new cars by Sept. 1, 1983.

Adams also rejected an application filed by the Pacific Legal Foundation to have the passive restraint decision stayed pending court action on a petition for review filed in September against the Department of Transportation (DOT). (See *Status Report*, Vol 12, No. 14, Sept. 26, 1977.)

AUTO MAKERS HAD ASKED REVIEW

Petitions for reconsideration were filed with the National Highway Traffic Safety Administration by all four domestic auto manufacturers — General Motors, Ford, Chrysler and American Motors — by Economics and Science Planning, Inc., and by the Center for Auto Safety and Ralph Nader.

The Center for Auto Safety and Ralph Nader, while supporting the Adams decision, called on DOT to accelerate its timetable by having the mandatory passive restraints rule become effective for all new cars by Sept. 1, 1980. DOT rejected that petition, stating that the lead time established was needed to allow the industries involved to design, test and manufacture the required equipment in an orderly manner. DOT noted, however, that "the lead time authorized is required . . . in this particular and complex rulemaking and in no way is to be considered as a precedent"

Nader has said he plans to take DOT to court to force it to move up its timetable.

FAULTY AIR BAG ANALYSIS CITED

DOT also rejected the Economics and Science Planning petition, which asked the department to modify its decision by requiring passive belts in all passenger cars with two front seats on or after Sept. 1, 1981, with passive restraints for other cars "to follow only after further evaluation of air bag effectiveness." Adams said, "ESP's preference for passive belts is grounded in its air bag analysis which . . . seriously underestimates air bag effectiveness."

Adams again emphasized that "Standard No. 208 is a performance standard that can be met by several designs, including the air bag and passive belt that have already been shown to be commercially feasible."

DOT denied General Motors' petition to suspend the decision while a third party analyzed DOT and General Motors effectiveness estimates for the air bag. DOT expressed confidence in its own estimates and cited major analytical weaknesses in the manufacturer's methodology.

Petitions by Ford, Chrysler and American Motors were rejected out of hand because, DOT said, they "raised no points that have not already been addressed"

In refusing to stay the passive restraint decision until a suit filed by the Pacific Legal Foundation is adjudicated, Adams said the items listed in the suit had "no merit."

In an effort to encourage development of passive restraints, Adams said a number of new perfecting amendments, primarily dealing with the positioning of test dummies, will become effective immediately and not next July as previously announced.

UPDATE . . .

Status Report, Vol. 13, No. 2, Feb. 7, 1978

AUTOMATIC RESTRAINTS: Ralph Nader and the consumer rights group, Public Citizen, have filed suit against Transportation Secretary Brock Adams, charging that his order for a phase-in of automatic restraint systems (see *Status Report*, Vol. 12, No. 12, July 26, 1977) is illegal. Nader, who has been a strong advocate of air bags, used the same arguments in his suit that he did earlier in asking the Department of Transportation for reconsideration of the rulemaking (see *Status Report*, Vol. 12, No. 14, Sept. 26, 1977). He contended that Adams had no authority to phase in automatic restraints over a three-year period, and that the plan was merely a strategy to avoid a threatened Congressional veto of the order.

Status Report, Vol. 13, No. 3, March 2, 1978

PASSIVE RESTRAINT ORDER: Suits against Secretary Adams' passive restraint ruling filed by Ralph Nader's Center for Auto Safety and the Pacific Legal Foundation have been consolidated for review by the U.S. Court of Appeals for the District of Columbia because of the similar interests involved. Nader petitioned against the Department of Transportation on the grounds that making the order effective in 1981 represents an arbitrary and unnecessary delay. The suit also charged that the phase-in period, allowing the smallest cars more time to comply with the restraint order than larger cars, is contrary to the purpose of FMVSS 208. The Pacific Legal Foundation, a public-interest law firm, petitioned against the ruling by claiming there was "insufficient basis for the air bag decision." (See *Status Report*, Vol. 12, No. 14, Sept. 26, 1977.) On February 13, Ford Motor Co. filed a motion to intervene in the Nader suit as an "interested party" since as a manufacturer of motor vehicles which would be **subject** to the Secretary's order, Ford said, it would have to make "substantial expenditures and extensive commitments of resources and employees" to meet the standard.

II.

Air Bags And Passive Belts

Air Bags: A Statistical Sketch

AIR BAG EQUIPPED CARS PRODUCED TO DATE:¹

1972 Mercurys	831
1973 Chevrolets	1,000
1975 Volvos	75
1974-76 General Motors – Cadillacs, Buicks, Oldsmobiles	<u>10,062</u> (as of April 30, 1976)
	11,968 Total Cars

MILES DRIVEN IN AIR BAG EQUIPPED CARS²

Approximately 558 million

REPORTED CRASH DEPLOYMENTS³ 185 Total

Front Seat Occupants Involved	267
Occupants Surviving	263
Occupants Not Surviving	4*

FATALITY REDUCTION ESTIMATES⁴

Lives saved annually by front seat lap and shoulder belts (at current belt use rates)	3,000
Lives saved annually by front seat air bags with lap belts (at current belt use rates, and if all cars were equipped with air bags)	12,100

*“Of the 4 fatalities resulting from crashes in air bag-equipped cars, one was a 7-week old unrestrained infant who sustained a fatal head injury from being thrown into the dash as a result of emergency braking before the actual crash. In two others, the crash was so severe the occupant compartment was destroyed; in these two crashes no restraint system would have been of any help. The cause of the fourth fatality is uncertain; it appears the driver was slumped across the steering wheel (either passed out or dead) at the time his vehicle impacted a tree; an autopsy was not performed to determine the actual cause of death.” (Source: Former Transportation Secretary William Coleman, *Federal Register*, June 14, 1976)

¹(Source: NHTSA, “Air Bag Accident Statistics,” April 30, 1976 and General Motors, Office of Public Relations, June 29, 1976)

²(Source: NHTSA, Office of Multidisciplinary Accident Investigation, February 1978)

³(Source: NHTSA, Office of Multidisciplinary Accident Investigation, March 16, 1978)

⁴(Source, DOT, Adams Decision, June 30, 1977)

Air Bags: Two Decades Of Development And Debate

In 1952, the first of a series of patents was filed for automatically inflating air cushions to protect occupants of crashing vehicles. In 1968, prototype development became advanced enough to signal the start of active federal government interest. In that year, Eaton Yale and Towne, Inc., a major air bag developer, demonstrated it to the then National Highway Safety Bureau (NHSB) and said such a system "could be ready in three to four years." Following is a chronology of passive restraint developments from 1952 through February 1978.

- 1952 Patent filed by J. W. Hetrick for an air cushion which automatically inflates when the vehicle suddenly decelerates.
- 1953 Patent filed by R. H. Hodges for inflatable bag to be stored in instrument panels.
- 1955 Patent filed by H. A. Bertrand for inflatable devices to be stored at strategic positions throughout the vehicle.
- Patent filed by P. M. Maxwell for an air bag actuation system.
- 1957 Ford Motor Company begins experiments with air bags, terms results "disappointing."
- 1961 William Haddon, Jr., M.D., coins the terms "active" and "passive" to describe a fundamental distinction in strategies to reduce human and other losses in a wide range of disease and injury-producing situations. Totally "passive" loss reduction strategies include all those which require, for their effectiveness, no action on the part of the individuals being protected (for example, purification of water supplies, sprinkler systems in buildings, air bags in vehicles). Totally "active" measures include all those which require substantial and/or repeated action by individuals for their effectiveness (for example, boiling drinking water, provision of fire extinguishers, fastening seat belts). Many loss reduction measures fall between these two extremes.
- 1964 Eaton Yale and Towne, Inc., begins development of air bags.
- 1965 Dr. Carl Clark of Martin Aircraft outlines his work and cites similar work by U.S. Rubber Co., Goodyear, Douglas Aircraft, Ling-Temco-Vought and private inventors.
- 1966 Dr. Clark produces design for prototype "safety vehicle" which includes an air bag system.
- Daimler-Benz begins investigating air bag development possibilities.
- 1968 Eaton Yale and Towne, Inc., shows air bag to NHSB* Deputy Director Dr. Robert Brenner.
- Eaton Yale and Towne, Inc., says such a system "could be ready in 3 to 4 years."

*National Highway Safety Bureau, now National Highway Traffic Safety Administration (NHTSA).

- (July) NHSB Director Dr. William Haddon, Jr., meets with auto manufacturers' representatives and Eaton Yale and Towne, Inc., representatives to emphasize the federal interest in accelerating air bag development and use.
- Rocket Research Co., Thiokol Corp., and Volkswagen each begin development work on air bags.
- 1969 Eaton Yale and Towne, Inc., announces that air bags it has developed, working "closely with Ford, General Motors, Chrysler and American Motors as well as many foreign manufacturers" have been subjected to "over two million miles of testing."
- (April) NHSB Acting Director Dr. Robert Brenner supports air bag concept in Senate hearing.
- (June) NHSB issues Advance Notice of Proposed Rulemaking for "Inflatable Occupant Restraint System," proposed effective date Jan. 1, 1972.
- (August) NHSB holds public meeting on proposed rule; manufacturers ask for postponement of effective date.
- 1970 (May) NHSB proposed deadline deferred to Jan. 1, 1973.
- NATO-sponsored international conference in Milford, Mich., demonstrates air bag state-of-the-art; auto makers oppose Jan. 1, 1973, deadline.
- (June) NHSB holds second public meeting on passive restraints; General Motors promises standard equipment air bags on one million 1974 model cars.
- 81 members of Congress sign letter to DOT Secretary Volpe urging that January 1, 1973, effective date for passive restraint rule be retained.
- (October) NHSB proposes to delay effective date of passenger car front seat passive restraint requirements from January 1, 1973, to July 1, 1973, and to delay till July 1, 1974, the effective date of requirements for passive restraint in all seating positions for passenger cars, multi-purpose vehicles and trucks under 10,000 pounds.
- 1971 (March) In response to auto makers' petitions, NHTSA revises requirements for passive protection in crashes and allows – for cars manufactured between August 15, 1973, and August 14, 1975 – two options for compliance: full passive systems for all seating positions, or passive protection for front occupants and seat belts at each seating position and a warning system. Mandatory passive protection in angled, side and rollover crashes is postponed from July 1, 1974, to August 15, 1975. Starting August 15, 1975, the revised rule requires full passive protection for all positions.
- (April) Chrysler, followed by other manufacturers, seeks court review of NHTSA's passive restraint rule.
- 1972 (February) NHTSA publishes amended rule providing third option for vehicles manufactured between August 15, 1973, and August 15, 1975: installation of ignition interlock systems instead of passive protection.

- (May 23) Air bag fails in demonstration for press, sponsored by National Motor Vehicle Safety Advisory Council.
- (June 2) Eaton Corporation advises Council that the test was conducted with "obsolete . . . left-over elements."
- (June) Field testing initiated with 831 1972 Mercurys equipped with air bag systems.
- (Dec. 5) U.S. Court of Appeals for the Sixth Circuit sends passive restraint standard back to the National Highway Traffic Safety Administration, ordering the federal agency to revise test specifications, and amend rules so it does not eliminate convertibles and sports cars.
- (Dec. 29-30) Southfield, Mich.: Professional stuntman and model deliberately crash air bag equipped cars at nearly 25 m.p.h. into concrete barrier with no ill effects in demonstration at Eaton Corp.
- 1973 (Feb. 7) General Motors completes assembly of 1,000 air bag equipped 1973 model Chevrolets saying "production plant experience contributed greatly to the planning facilities and methods for higher volume air cushion system production."
- (March 28) NHTSA publishes proposal for new test-dummy specifications, designed to overcome objections of federal court ruling.
- (June 22) General Motors' President Edward Cole writes Transportation Secretary Claude Brinegar, warning of delays in large scale plans to equip cars with air bags.
- (Aug. 1) Effective date for new NHTSA regulation on test dummies.
- General Motors tells Congressional hearing GM will offer air bags as options on luxury cars around the first of the year.
- Allstate Insurance Co. testifies that GM study favoring lap-shoulder belt systems over air bags in reducing fatal injuries "must be disregarded" because of its basic approach and unrepresentative sample.
- (Aug. 10) General Motors' President Edward Cole writes Transportation Secretary Claude Brinegar cutting planned production of air bag equipped cars from more than 1,000,000 to no more than 150,000, blaming DOT standard-making procedures and GM tooling problems.
- (Oct. 16) Allstate Insurance Co. announces a 30 percent discount on medical and no-fault personal injury coverage for cars with air bags. A number of other insurance companies subsequently offer similar discounts.
- 1974 (Feb. 15) NHTSA announces modification of passive requirements to permit introduction of passive belt system.
- (March 19) NHTSA proposes passive restraints for passenger cars as of Sept. 1, 1976; also seeks comments on 45 or 50 m.p.h. crash protection effective Sept. 1, 1980.

- (Aug. 27) NHTSA releases cost-benefit study that “clearly shows the superiority of passive restraint systems compared to belt systems presently required,” according to Administrator James Gregory.
- (Dec. 4) NHTSA releases revised cost-benefit analysis of FMVSS 208 that shows air bags still superior to belts, after taking into account criticism of earlier study.
- 1975 (April 27) GM tells NHTSA that it will not offer air bags after 1976 models.
- (May 19-23) At a 5-day public meeting, NHTSA hears testimony from more than 40 witnesses concerning passive restraints.
- (Aug. 8) NHTSA amends rule to delay effective date of requirement for full passive protection from 1976 model year to 1977 model year.
- 1976 (March 12) NHTSA Administrator James Gregory promises at a Congressional hearing that the agency will issue a passive restraint rule by August 1976.
- (May 24) GM announces it is “reconsidering” decision to eliminate air bags as optional equipment.
- (June 9) Transportation Secretary William Coleman proposes revised occupant restraint standard and announces an Aug. 3, 1976, public hearing to take comments on various restraint options. Says he will announce decision on or before Jan. 1, 1977.
- (Aug. 3) Transportation Secretary William Coleman holds public hearing to quiz auto makers, consumer groups, insurers, researchers and others on various approaches to restraining vehicle occupants in crashes. Most witnesses favor increased automatic protection.
- (Sept. 17) Docket closes with more than 7,000 comments in response to Coleman’s proposal.
- (Nov. 23) *Washington Post* interview quotes former president of General Motors Corp., Edward N. Cole: “I am very much in favor of it [the air bag] for a couple of reasons. It’s passive, you don’t need to do anything. Particularly for the most severe [injuries] to the head . . . It protects the head and neck, the most vulnerable part of your body. The shoulder belt does not.”
- (Dec. 6) Transportation Secretary William Coleman declares that air bags in all cars would “probably save over twelve thousand lives annually and prevent or reduce in severity over one hundred thousand moderate to critical injuries per year.” He states that “passive restraints are technologically feasible, . . . and can be produced economically.” However, rather than requiring passive restraints, he opts for a “demonstration program” of “approximately one-half million automobiles” beginning in September 1978.
- 1977 (Jan. 4) Rep. John M. Murphy (D-NY) introduces legislation to require passive restraints.
- (Jan. 7) Transportation Secretary designate Brock Adams says during confirmation hearings that he intends to “review most carefully” Coleman’s handling of the passive restraint issue.

- (Jan. 18) Transportation Secretary William Coleman announces an agreement that commits, beginning in September 1979, General Motors and Ford to manufacture a minimum of 60,000 air bag equipped cars, substantially fewer than promised in his December announcement. Mercedes-Benz agrees to manufacture 2,250 air bag equipped cars.
- (March 21) Transportation Secretary Brock Adams announces at press conference that he is voiding agreements with auto makers to produce a demonstration fleet and will hold a public hearing on passive restraints April 27, 1977.
- (March 24) DOT proposes three occupant crash protection alternatives: continuation of the current standard; mandatory passive restraints, beginning with 1981 models; or mandatory safety belt use laws aimed at achieving a belt usage rate of 80-85 percent.
- (April 27-28) Transportation Secretary Brock Adams presides at public hearing and promises to announce by July 1, 1977, whether he will require passive restraints.
- 1977 (June 30) Transportation Secretary Brock Adams announces his decision to require front-seat passive protection for all new autos on the following schedule:
Sept. 1, 1981 – New cars with 115-inch wheelbase or greater,
Sept. 1, 1982 – New cars with 101-inch wheelbase or greater,
Sept. 1, 1983 – All new cars.
 Rep. Bud Shuster (R-Pa.) and Sen. Robert Griffin (R-Mich.) introduce bills to overturn the DOT action.
- (July 5) National Committee for Automobile Crash Protection announces its formation.
- (Aug. 4) The four domestic auto makers file petitions with DOT to withdraw or revise the passive restraint rule.
- (Aug. 7) Ralph Nader and Center for Auto Safety petition DOT to amend passive protection standard to require restraints in all new cars by the 1981 model year.
- (Sept. 1) Pacific Legal Foundation, a public interest organization promoting “limited government,” files suit in U.S. Court of Appeals to block passive restraint rule, asserting that DOT had “insufficient basis for the air bag decision.”
- (Oct. 12) Congress rejects resolutions by Sen. Griffin and Rep. Shuster to overturn passive restraint rule.
- (Dec. 5) Secretary Adams rejects all petitions for reconsideration of passive restraint standard and issues “final rule.”
- 1978 (Jan. 13) Ralph Nader and consumer rights group, Public Citizen, file suit in U.S. Court of Appeals, seeking ruling that DOT’s scheduled phase-in of restraints – instead of requiring all new vehicles to provide passive restraints at same time – is illegal.
- (Jan. 25) U.S. Court of Appeals consolidates suits filed by Pacific Legal Foundation, Ralph Nader, and Public Citizen.
- (Feb. 24) U.S. Court of Appeals permits Ford Motor Co. to intervene in consolidated suit as “an interested party.”

The Costs Of Air Bags

Excerpt from Letter from National Highway Traffic Safety Administrator Joan Claybrook to Rep. John E. Moss, July 21, 1977

"On the question of cost, the Agency stated in its rulemaking document published in the *Federal Register* on July 5 that it estimates the cost of air bags to the new car buyer at \$112, and the operating costs *over the lifetime* of the typical automobile, including the insurance cost to replace a deployed air bag, at \$28." (See below.)

Department of Transportation Incremental Cost Estimate for Full Front Air Cushion (As of June 1977)

INITIAL COST

Equipment —

Sensor	\$ 4 (1)
Warning/diagnostics	1
Driver module	29
Passenger module	48
Equipment tools	<u>.3</u>

Total Equipment \$ 82.3

Vehicle Changes —

Covers	\$ 4
Wiring	3
Steering column	1
Instrument panel	4
Padding	4
Vehicle change tools	4.7 ^{a/}
Engineering	1
Installation	5
Warranty	4
Facilities & launching	<u>4</u>

Total Vehicle Changes \$ 34.7

Markups —

Manufacturer profit	\$ 3
Dealer profit	10
Removed belts	<u>-18</u>

Total Initial Costs \$112

a/ Padding \$1.0, covers \$ negligible, steering column \$1, and instrument panel \$2.5

In May 1977, General Motors estimated \$193 for a newly designed system. In May 1977, Ford resubmitted their July 1976 estimate of \$235. The differences between these estimates and the DOT estimate are:

	<u>GM</u>	<u>FORD</u>
(a) Designs that exceed the requirements of FMVSS 208 (e.g., extra sensor, diagnostic system, excess padding, steering assembly modifications, etc.)	+\$46	+\$44
(b) Tooling & engineering amortized over 3 rather than 5 years	+ 5	0
(c) Special overhead costs not included in the costs of other safety standards, unanticipated contingencies	0	+ 16
(d) Markup from manufacturer cost to consumer cost	+ 21	+ 44
(e) Removal of shoulder belt system	- 2	+ 8
(f) Miscellaneous and unexplained differences	<u>+ 11</u>	<u>+ 11</u>
Totals	+\$81	+\$123

OPERATING COSTS

	<u>GM</u>	<u>FORD</u>	<u>DOT</u>
Repair/replace air bag system after deployment	\$ 9	\$ 9	\$ 5
Added fuel due to added weight lifetime	26	88	23
Inspection	0	27	0
Maintenance	<u>18</u>	<u>63</u>	<u>0</u>
Totals	\$53	\$187	\$28

The summary below is an attachment to a letter from National Highway Traffic Safety Administration Administrator Joan Claybrook to Representative John E. Moss (July 21, 1977). Claybrook was responding to Moss's request for detailed information concerning air bag operation.

Field Effectiveness Of Air Bags

The NHTSA believes that the most reliable method of evaluating the field effectiveness of the air bag-equipped cars is to compare the number of injuries, at various levels, sustained by their occupants with the number that is experienced in the general population of vehicles of this type. The vehicles in question are not a sampling of the general vehicle population; they are relatively new, and mostly in the largest, "luxury" size class. Some adjustment must be made for these factors.

The adjustment for the size of the vehicles has been made by multiplying the overall injury figures by a factor of 0.643, which has been found in one study (Joksch, "Analysis of Future Effects of Fuel Storage and Increased Small Car Usage Upon Traffic Deaths and Injuries," General Accounting Office, 1975) as the ratio of fatalities per year for this size of vehicles to the figure for the general population. The newness of the vehicles has a double-edged aspect. Newer vehicles are evidently driven more miles per year than older ones, but they also appear to experience fewer accidents per mile traveled (Dutt and Reinfurt, "Accident Involvement and Crash Injury Rates by Make, Model, and Year of Car," Highway Safety Research Center, 1977). These two factors can be accounted for if it is assumed that they cancel each other, by using vehicle years, rather than vehicle miles, as the basis of comparison. With these adjustments, the expected number of all injuries of AIS-2 (an index of injury severity) and above in severity for conventional vehicles equivalent to the air bag-equipped fleet during the period considered was 91. The actual number experienced was 38, indicating an effectiveness factor for these injury classes of 0.58.

A possibility of bias in these estimates exists in that injuries that have occurred in the air bag fleet may not have been reported, despite the three-level reporting system (owners, police, and dealers) that has been established. This bias is less likely to be present in frontal accidents, where the air bag is expected to (and generally does) deploy. For frontal accidents only, the number of injuries expected is 60, or 66 percent of the total ("Statistical Analysis of Seat Belt Effectiveness in 1973-1975 Model Cars Involved in Towaway Crashes," Highway Safety Research Center, 1976); only 29 have been experienced, indicating an effectiveness factor of 0.52.

The Insurance Institute for Highway Safety purchased two 1975 Oldsmobile 98 sedans – one with and one without air bags. The barrier crash test of the car without air bags, at 35.3 miles-per-hour, is shown in the sequence of high-speed photographs below. The barrier crash of the car with air bags, at 37.5 miles-per-hour is shown on the opposite page. Elapsed time from first to last photo in both sequences is less than 0.5 seconds.

Without Air Bags



1



2



3



4



5



6

With Air Bags



1



2



3



4



5



6

The Insurance Institute for Highway Safety crash tested two 1975 Volvos. One was equipped with air bags from an experimental Volvo fleet; the other was not. The following six photographs – taken at parallel moments in the two tests – show how air bags intervene to provide a buffer between people and potential harm. In the Volvo without air bags, the test dummies – as is the case with more than 70 percent of occupants of all kinds of vehicles – are not wearing seat belts; they impact the injury promoting steering wheel, instrument panel and windshield.

With Air Bags



1



2



3

Without Air Bags



1



2



3

Air Bag Reliability In High Mileage And Older Vehicles

At Secretary Adams' April 1977 hearing, some witnesses expressed concern about the reliability of air bags as vehicles age *The facts are as follows:*

1. Of the 185 air bag deployment crashes, 42 were crashes of vehicles with over 40,000 miles at the time of the crash.
2. Eighteen of these 42 high mileage deployments occurred in vehicles with over 60,000 miles.
3. The highest mileage vehicle involved in a deployment had travelled 115,000 miles at the time of the crash.

[Supporting material follows.]

(Source: NHTSA, Office of Multidisciplinary Accident Investigation, March 16, 1978.)

**AIR BAG EQUIPPED CRASH INVOLVED VEHICLES WITH MILEAGES GREATER THAN 40,000
AT THE TIME OF AIR BAG DEPLOYMENT**

<u>Make and Model</u>	<u>Location of Crash</u>	<u>Date of Crash</u>	<u>Mileage at Time of Crash</u>
1973 Chevrolet Impala	Highland, Michigan	2-15-74	54,999
1972 Mercury Monterey Custom	Valdosta, Georgia	8-22-74	63,084
1974 Oldsmobile 98 Regency	Mayhew, Mississippi	2-19-75	53,754
1973 Chevrolet Impala	Houston, Texas	3-15-75	63,695
1973 Chevrolet Impala	Somerville, Alabama	3-18-75	90,445
1973 Chevrolet Impala	San Antonio, Texas	5-08-75	61,030
1973 Chevrolet Impala	Dalton, Georgia	5-09-75	50,663
1973 Chevrolet Impala	Landover, Maryland	5-21-75	48,795
1973 Chevrolet Impala	Needles, California	6-07-75	67,333
1973 Chevrolet Impala	Milford, Michigan	7-09-75	49,320
1973 Chevrolet Impala	Seattle, Washington	1-01-76	57,165
1973 Chevrolet Impala	West Bloomfield, Michigan	4-11-76	69,255
1974 Oldsmobile Delta 88	Moorpark, California	4-21-76	48,975
1975 Oldsmobile Toronado	DuPage County, Illinois	6-03-76	55,846
1974 Oldsmobile 98 Regency	Amarillo, Texas	7-13-76	45,837
1974 Buick Riviera	Lakewood, Ohio	7-17-76	43,095
1974 Oldsmobile 98 Regency	Madison, Wisconsin	8-17-76	69,147
1974 Buick Electra Limited	Alberta, Alabama	9-08-76	59,603
1973 Chevrolet Impala	Erie, Pennsylvania	9-14-76	66,031
1974 Buick Riviera	Atchison, Kansas	9-25-76	55,460
*1973 Chevrolet Impala	Houghton Lake, Michigan	9-26-76	56,289
1974 Cadillac Eldorado	Mercer, Pennsylvania	10-23-76	43,193
1974 Oldsmobile 98 Regency	Red Oak, Iowa	10-25-76	75,020
1974 Buick Electra Custom	Montrose, Michigan	11-21-76	41,744
1973 Chevrolet Impala	Brighton, Michigan	1-21-77	82,354
†1972 Mercury Monterey Custom	Rockville, Maryland	3-08-77	69,809
1974 Oldsmobile Luxury 98	Hartford, Connecticut	3-18-77	73,582
**1973 Chevrolet Impala	Hicksville, New York	3-27-77	114,958
1974 Oldsmobile Regency 98	Cumberland Gap, Tennessee	4-20-77	47,060
1975 Oldsmobile Toronado	Cortland, New York	4-25-77	51,694
1975 Cadillac Eldorado	Chattanooga, Tennessee	5-23-77	41,890
1975 Cadillac Eldorado	Port Orchard, Washington	6-07-77	48,857
1973 Chevrolet Impala	La Mirada, California	6-14-77	67,066
1973 Chevrolet Impala	Detroit, Michigan	7-05-77	83,811
1974 Oldsmobile Regency 98	Independence, Missouri	6-25-77	44,195
1974 Buick Riviera	Quito, Ecuador	8-17-77	48,531
1973 Chevrolet Impala	Delano, California	9-06-77	93,788
1975 Cadillac DeVille	Akron, Ohio	7-15-77	61,114
1975 Oldsmobile Regency 98	Langhorn, Pennsylvania	9-17-77	55,000
1974 Oldsmobile Delta 88 Royale	Atchison County, Missouri	10-19-77	50,508
1973 Chevrolet Impala	Boaz, Alabama	11-07-77	71,878
1973 Chevrolet Impala	San Antonio, Texas	12-13-77	101,946

*Non-deployment of passenger bag due to poor electrical solder joint connection.

†Non-deployment of driver bag due to missing fuse.

**Non-deployment of driver bag due to improper servicing.

Air Bag Performance In A Range Weather Conditions

At the April hearing, Secretary Adams asked the Thiokol representative a question concerning the performance of air bag systems “in varying weather conditions such as the Alaskan conditions where it goes down to considerably below zero, or New Mexico where it goes considerably above 100 degrees” *The facts are as follows:*

1. There have been at least 18 real world air bag deployment crashes at temperatures below 30° Fahrenheit.
2. There have been at least two air bag deployment crashes in which the temperature was below 0° Fahrenheit.
3. There have been at least two air bag deployment crashes in which the temperature was at or above 90° Fahrenheit.
4. In Needles, California, on June 7, 1975, an air bag deployed appropriately in a crash where the temperature was 94° Fahrenheit.
5. Among the bad weather air bag deployment crashes, one occurred in a heavy snow storm in Canada when the air bag equipped vehicle pulled out to overtake a slow moving snow plow and crashed head-on with a tractor trailer. The air bags deployed appropriately.
6. In response to Secretary Adams’ question, the Thiokol representative stated:

. . . We as a matter of practice subject our units to environmental testing very similar to what is done with a rocket motor or a military item such that it is fired and evaluated at low temperatures, high temperatures, under high humidity conditions, under vibration conditions, it’s a very sensitive program which we subject our units to – we feel it applies to this product as well

[Supporting material follows.]

(Source: NHTSA, Office of Multidisciplinary Accident Investigation, March 16, 1978.)

TEMPERATURE AT TIME OF AIR BAG DEPLOYMENT CRASHES

<u>Make and Model</u>	<u>Location of Crash</u>	<u>Date of Crash</u>	<u>Temperature at Time of Crash</u>
1973 Chevrolet Impala	Highland, Michigan	2-15-74	19°
1974 Oldsmobile Delta 88 Royale	Schiller Park, Illinois	2-08-74	20-29°
1975 Oldsmobile Regency 98	Cabano, Quebec	11-21-74	20°
1974 Buick Electra Custom	Columbus, Ohio	2-06-75	20's
1974 Oldsmobile Toronado	Syracuse, New York	3-14-75	27°
1975 Buick Electra Limited	Ashland, New York	12-04-75	24°
1975 Oldsmobile Regency 98	Vaughan, Ontario	12-18-75	12°
1975 Oldsmobile Toronado	Lombard, Illinois	1-08-76	<0°
1975 Cadillac DeVille	Bay City, Michigan	1-21-76	Lower 20's
1974 Oldsmobile Delta 88 Royale	Lake Villa, Illinois	3-11-76	20-29°
1976 Cadillac Fleetwood	Elmhurst, Illinois	12-01-76	0-19°
1975 Oldsmobile Regency 98	Faribault, Minnesota	12-05-76	<0°
1974 Cadillac DeVille	Sterling Heights, Michigan	12-23-76	0-19°
1975 Cadillac Eldorado	Detroit, Michigan	12-28-76	24°
1976 Oldsmobile Regency 98	New York, New York	1-15-77	26°
1975 Oldsmobile Luxury 98	Columbus, Ohio	2-22-77	20-29°
1975 Oldsmobile Toronado	Culver, Oregon	4-02-77	20°
1975 Oldsmobile Regency 98	Fairfield, Pennsylvania	12-09-77	9°
1974 Buick Riviera	Houston, Texas	8-21-74	90°
1973 Chevrolet Impala	Needles, California	6-07-75	94°

(Source: NHTSA, Office of Multidisciplinary Accident Investigation, March 16, 1978.)

Air Bag Performance In Multiple Impact Crashes

“In addition, it was necessary to evaluate the restraint system capability in multiple impacts; that is, in the case of an accident which included an initiating collision sufficient to deploy the air cushions followed by a second collision a period of time later.

“The GM Safety Research and Development Lab people at the Proving Ground devised such a test The primary vehicle was driven down the barrier test track into the rear quarter panel of a parked car, forcing that car out of the way, then traveling on to strike the fixed barrier. The primary car was traveling at approximately 50 miles per hour when the first impact occurred, deploying the air cushion systems, then continued on for approximately 2 seconds before striking the barrier at 30 miles per hour. Both the driver’s and the passenger’s air cushion systems remained deployed for both collisions and satisfactory occupant restraint was accomplished. The main concern was that the cushions would be depleted by the first collision or lose their restraint capability by leakage between the two collisions.”

(Source: “Front Passenger System – Design and Production,” by David Campbell and Edwin Klove, General Motors Corp., June 1973)

(See also letter from Washington State Sen. C.W. “Red” Beck on page 63.)

Safety Of Material Used To Inflate Air Bags

Under Secretary Adams' decision the choice of what approach to use to reduce the crash forces reaching front seat occupants is entirely left to individual vehicle manufacturers. Similarly, the designs the manufacturers decide to use to implement their approaches are entirely up to them. In illustration, if manufacturers choose an automatic ("passive") belt approach, it is their decision as to what belt materials they will use, as long as they meet the Department of Transportation standard. Similarly, if manufacturers choose to use air bags, the choice of inflation devices for the bags is left up to them, so long as they meet the standard.

During the years of development and successful laboratory and real-world testing of air bags, a number of designs have used nitrogen – the gas that makes up 78 percent of the air we breath, to inflate the bags. This has been accomplished either by the crash-actuated release of nitrogen stored in small cylinders or by use of sodium azide based compositions. Since most people are not familiar with this substance, and because erroneous public statements have been made concerning its safety, the following is quoted from the statement of Mr. S. M. Istvanffy, Canadian Industries Ltd. (for nearly 40 years a principal manufacturer of sodium azide), to U. S. Secretary of Transportation William T. Coleman, Jr., in his passive restraint hearing, August 3, 1976.

With regard to chemicals used to produce the gases to fill air bags, my comments are limited to those pyrotechnic systems containing sodium azide as the base chemical for the composition. With the experience we have in handling the material, we can be of benefit to the industry. When we first became aware that various generator manufacturers were proposing to use sodium azide based compositions, we were quick to point out to the auto industry the toxic nature of the material they were handling. It was only when we became convinced that it is virtually the only type of compound capable of meeting the performance standards required, while at the same time producing a gas free of toxic materials, that we as a company undertook to put it in the form such as can be handled safely by all concerned while at the same time performing as required. A number of years of research have been directed to this end, and we now believe that materials exist which meet all the criteria for performance while at the same time guarding the public interest with regard to safety.

Reviewing first the reasons why sodium azide has been chosen as the primary ingredient, it is stable to 250 degrees centigrade, decomposes reliably at a rate which can be adjusted, produces pure nitrogen, is safe to handle and use, it cannot be made to detonate, it is stable, and any reaction products can be filtered out. The toxicity question can be divided into two parts: one concerning the reactants, the other the products. We have been handling the product ourselves, as I indicated before, for 39, 40 years and the only incidents of the nature of headaches or discomfort, which disappear after a short period of fresh air, no medication and no after effects. Techniques obviously exist for handling it safely. As far as public exposure is concerned, we are talking about a sealed generator, and the public exposure, in effect, is nil.

... Though a large amount of time and energy was spent in our laboratory trying to cause the composition to detonate, using shock waves, powerful detonation primers, electric current, et cetera, we were unable to make the material explode.

In addition, there are alternative substances that can be used to effectively inflate air bags that do not use sodium azide. One such generator was "ready for installation" in March 1975, "in the steering wheel passive restraint system of General Motors or any other builder which can accept the General Motors design. Since March 1973 we have been conducting tests on small European cars which have proved satisfactory with this generator." (Statement of Société Nationale des Poudres et Explosifs presented at the National Highway Traffic Safety Administration's Occupant Crash Protection meeting, May 19-23, 1975.)

In Compared Frontal Crashes

Bags Better Than Belts, Study Finds

More lives could be saved and greater reductions in injury severity achieved in frontal crashes by having standard-equipment front-seat air bags in all cars than by even 100 percent safety belt use, a new comparison of restraint system effectiveness has found.

The comparison was carried out by the Insurance Institute for Highway Safety and, in a detailed report, transmitted to Secretary of Transportation William Coleman, Jr. The report contains a scientific study of three groups of real-world frontal crashes:

- those in which front-seat occupants were using *no restraints*;
- those in which they were wearing *lap/shoulder belts*;
- those in which they were *automatically restrained by air bags*.

The study found that both air bags and lap/shoulder belts substantially reduced the likelihood of death and serious injury to front seat occupants of full-size and luxury cars involved in the compared frontal crashes. In the more severe crashes, however, the air bags gave better protection than lap/shoulder belts.

COMPARISON DATA: IIHS used data from three basic sources to prepare its comparison of restraint system effectiveness: National Highway Traffic Safety Administration's multidisciplinary accident investigation (MDAI) team reports on crashes of air bag equipped vehicles, the University of Michigan Highway Safety Research Institute's file of MDAI reports on crashes involving lap and shoulder belt restrained occupants and NHTSA's restraint effectiveness file on lap/shoulder belted and unrestrained occupants involved in crashes.

Only data on full-size and luxury cars involved in crashes were used, since virtually all of the present on-the-road air bag equipped vehicles fall into these two vehicle classes. The study noted that since vehicle size "is an important determinant of the likelihood of injury once a crash has occurred, it would have been inappropriate to compare restraint performance among vehicles of substantially different size."

In addition, only frontal and front angle crashes were studied since "these are the principal crash modes in which the air bag restraint system is designed to protect occupants" and because such crashes are "the source of the majority of occupant deaths." For the comparison, the crashes were grouped by severity using a collision classification system developed by the Society of Automotive Engineers.

Only data for front seat occupants were analyzed because present air bag systems are only used for those occupants. Infant occupants of two years or younger were also not included in the comparison because "neither production lap/shoulder belts nor present air bag systems are designed to provide adequate impact protection for infants," according to the study. The overall severity of the occupants' injuries were assessed by use of the Injury Severity Score, which classifies injuries based on both the severity and number of the injuries. The ISS has been shown to be strongly related to likelihood of death, length of hospitalization and extent of disability. (See *Status Report*, Vol. 9, No. 7, April 9, 1974.)

INJURIES REDUCED: In the less severe crashes studied, the average injuries to occupants, regardless of restraint, were "very minor, for example, aches, stiffness, bruises, scrapes, superficial cuts and

sprains of the hand or finger.” But, as the severity of the crashes increased, the average severity of the injuries to the unrestrained occupants “increased dramatically.” For air bag protected occupants in severe frontal crashes, however, the average injury severities were reduced by 66 percent, as compared to 55 percent for the lap/shoulder belted occupants. The reduction in likelihood of death in such crashes was 79 percent for air bag protected occupants and 72 percent for lap/shoulder belted occupants.

These injury comparisons “tend to confirm the laboratory testing results, indicating that air bags can offer better protection in frontal crashes than lap/shoulder belts when worn and substantially improved protection over no restraint,” the study concluded.

The study, *Air Bags and Lap/Shoulder Belts – A Comparison of Their Effectiveness in Real World, Frontal Crashes*, by Dinesh Mohan, Paul Zador, Brian O’Neill and Marvin Ginsburg can be obtained by writing to: “Bag-Belt Comparison,” Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C. 20037.

Status Report, Vol. 11, No. 16, Oct. 12, 1976

Passive Protection Below Air Bag Deployment Speeds

It is noteworthy that regardless of the crash speeds at which manufacturers variously design their air bags to deploy, the passive protection they provide is an addition to – a strengthening of – the passive protection already present as a baseline because of prior DOT minimum standards and manufacturer’s initiatives. Much of this already-present protection – for example, in the case of crash padding and strong door locks – functions below the 12 mile per hour speed mentioned in the Hearing, as well as above. It is not as if a passive restraint requirement would start passive crash protection at the air bag deployment speed, leaving the occupants unprotected at lower speeds, but rather that they already have several kinds of passive protection at lower speeds to which the proposed passive restraint requirements would be an additional and substantial improvement.

From the Insurance Institute for Highway Safety
Transmittal to Secretary Coleman

Air Bag Suppliers Ready To Go

Several manufacturers of air bags and air bag components have indicated that they are ready for mass production earlier than the 1982 model year specified in Transportation Secretary Brock Adams' mandate.

In meetings with the National Highway Traffic Safety Administration prior to the Adams announcement, Allied Chemical, Rocket Research, Eaton Corp. and Talley Industries recommended a phase-in of air bags starting as early as 1980. (Secretary Adams' mandate will require passive restraints starting with large and luxury cars in the 1982 model year.)

Allied Chemical, which has supplied air bags to General Motors and Ford and reports a capacity for handling 30 percent of a total mandated passive restraint market, stated that it requires only a 24-month lead time, which could feasibly be reduced to 18 months if there is an adequate supply of propellant. Rocket Research said it could meet production requirements with only a two-year lead time, and Eaton Corp. assured NHTSA that it could meet a 1980 partial mandate.

Talley Industries, the largest manufacturer of solid propellant gas generators in the United States and largest manufacturer of pyrotechnic air bag inflators for production cars, told NHTSA that it was prepared to meet production standards necessitated by a passive restraint mandate for the 1981 model year.

In a subsequent statement congratulating Secretary Adams on his decision, the Eaton Corporation emphasized the reasonableness of a phase-in as opposed to a total mandate covering the entire market. The company also applauded his decision to ask the automobile manufacturers to continue to participate in the voluntary agreement established by former Secretary Coleman. (See *Status Report*, Vol. 12, No. 2, Feb. 3, 1977.)

Product liability insurance questions have been resolved for at least two suppliers. In a submission to DOT, the American Insurance Association explained that Thiokol and Allied Chemical Corp. are currently insured against product liability losses by Aetna Life & Casualty and The Travelers, respectively. AIA said the insurers have pledged to continue this coverage. AIA told DOT that it understood that "the major [auto] manufacturers [will] self-insure their liability exposure, and . . . that this exposure is minimized through the use of 'hold harmless' agreements pursuant to which suppliers are required to indemnify the manufacturers in cases involving the suppliers' products. . . . it seems unlikely that the promulgation of a passive restraint standard would significantly alter the product liability posture of motor vehicle manufacturers."

The companies who will be the major suppliers of air bag components are listed below; the majority are major corporations listed in *Fortune* magazine's top 500 companies.

- *Eaton Corp.* (variety of air bag components),*
- *Thiokol* (inflator units),
- *Allied Chemical Corp.* (air bag systems),
- *Rocket Research* (inflator units),
- *Talley Industries* (inflator units).

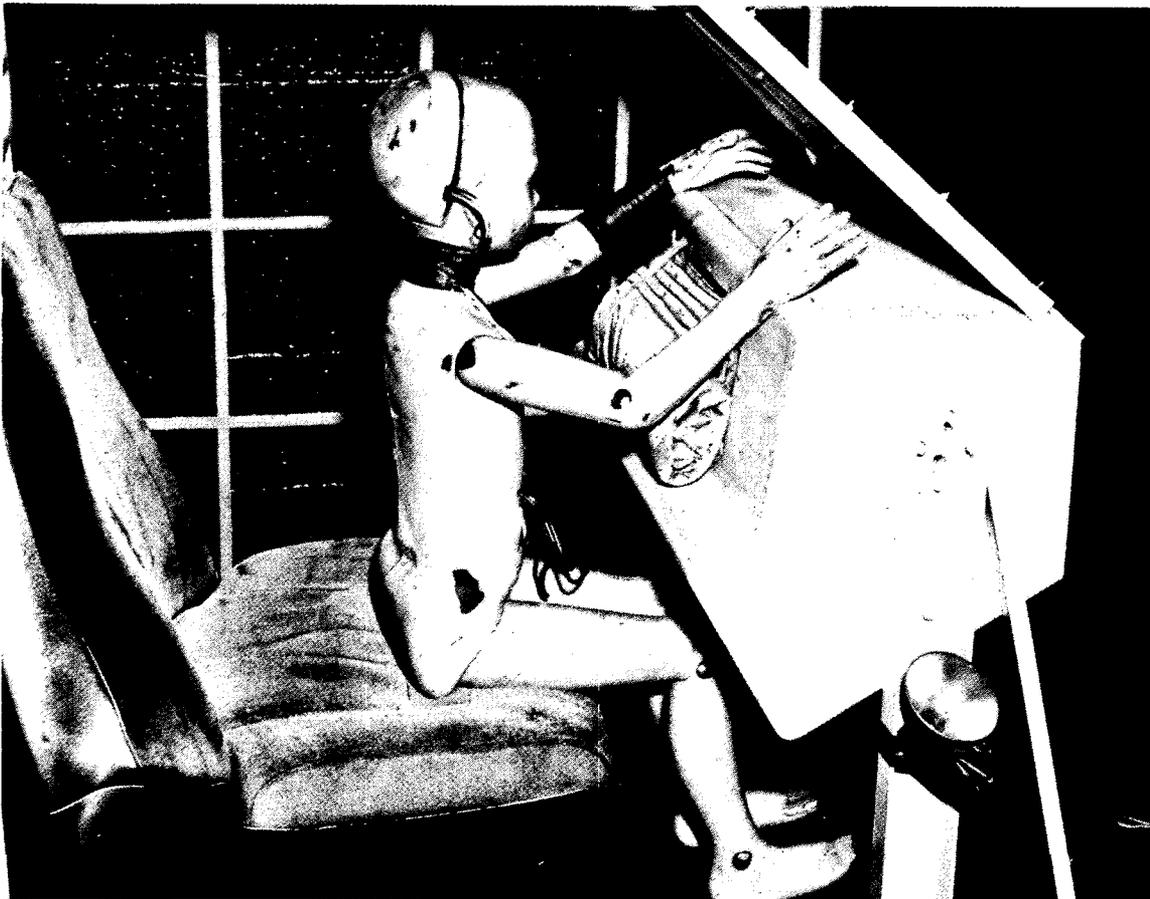
*The Eaton Corporation announced in January 1978 that it would no longer make air bags. In a letter to the Department of Transportation, Eaton said its decision was based on "business and economic considerations and does not reflect any lack of confidence by Eaton in the air bag as a technologically sound automotive passive restraint system."

New Air Bag System Designed For Compact Cars

Development of a new compact car air bag restraint system that is designed to offer increased protection to "out-of-position" children as well as adults has been announced by the Calspan Corp. of Buffalo, N.Y. The system was developed in a 2½-year research program for the National Highway Traffic Safety Administration.

"Our extensive tests of the new air bag system show that it may be capable of providing protection from death or serious injury to adult front-seat passengers in small cars at impact speeds of up to 45 miles an hour," said David J. Romeo, Calspan's program manager. "In addition, the system provides a much safer crash environment for a small child standing or seated out of a normal position, or seated in a conventional manner."

The so-called aspirator air bag is partially filled on impact by drawing air from the passenger compartment into the bag. The inflator is designed to "stall" and adjust the rate of inflation when the bag contacts a fixed body, such as an out-of-position passenger. The design incorporates a crushable knee bar for added protection.



Child dummy representing a 6-year-old is seated out of position prior to a test of the new type of small-car air bag passive restraint developed by Calspan. The air bag is contained in the glove compartment.

1980-Model Fleet Cars: An Air Bag Market?

A potential demand for about 39,000 air bag equipped cars in the 1980 model year has been indicated by auto fleet owners, raising the possibility that the automatic restraints may be available two years before they first are expected in compliance with government standards.

Transportation Secretary Brock Adams last June ordered auto manufacturers to provide increased occupant protection automatically in new standard-size cars beginning with the 1982 model year, and in all new cars by the 1984 model year. This may be in the form of air bags, passive belts or some other approach. (See *Status Report*, Vol. 12, No. 12, July 26, 1977.)

RESPONSES TO NHTSA INQUIRY

The potential fleet market was revealed in responses to an inquiry from Joan Claybrook, head of the National Highway Traffic Safety Administration (NHTSA). In a letter to 875 fleet operators, Claybrook asked for indications of "an interest on the part of your company in purchasing air bag equipped vehicles in model year 1980 and 1981 if they are offered at a reasonable price in a size and type of vehicle that meets your needs." She explained the agency's reasoning:

"The most effective means of providing incentive to the automobile manufacturing industry to continue the early introduction of air bag equipped vehicles is to assure them that there is a substantial demand for air bag equipped 1980-81 model automobiles. In this regard, the Department of Transportation is working with the General Services Administration [GSA] and the Office of Management and Budget [OMB] to require that automobiles purchased by the federal government be equipped with air bags starting in 1980. Additionally, we are encouraging various segments of the public and private sector, public utilities, states, insurance companies, taxicab fleets, rental car agencies, business fleets and driver training schools, among others, to purchase air bag equipped 1980-81 model automobiles."

To provide a government stimulus for the air bag program, NHTSA is negotiating with GSA and OMB to ensure that GSA's annual replacement fleet of 20,000 cars be equipped with air bags beginning in the 1980 model year. Although budget difficulties have been encountered at OMB, a NHTSA official expressed confidence that the federal government is prepared to set an example for private fleet operators. NHTSA also is urging the Department of Justice to assist in the purchase of 150,000 replacement police vehicles with air bags in 1980.

Responses received so far from fleet operators have ranged from commitments to order "a few" air bag equipped cars for experimentation to tentative commitments for hundreds by companies such as General Dynamics, American Telephone & Telegraph Co., Monsanto Co. and Dow Chemical. Among the comments by some of the "seriously interested" fleet operators:

Dow Chemical — "We certainly feel that air-bag protection would be an excellent lifesaving, injury-reducing benefit."

Heinz U.S.A. — "Based on all the information we have received to date, the air bag certainly does look like a desirable safety feature."

Minnesota Mining & Manufacturing Co. — "We once again will go on record to support DOT in their endeavor to get the manufacturers of automobiles to offer air bags in 1980, providing the cost, as mentioned, is not prohibitive."

STATE RESPONSES

Some state governments indicated that they would be willing to make a firm commitment if federal funding assistance could be guaranteed. These states include Maryland, Pennsylvania, Wisconsin and New York, all of whom operate substantial car fleets. NHTSA spokesmen explained that federal funds available for state and local highway safety programs could be used for such projects at the discretion of the governor's highway safety representative. One governor, John V. Evans of Idaho, commented in his response to NHTSA, "I strongly urge the automobile industry to respond as quickly as possible to this critical need."

Many of the responding fleet owners said they had been impressed by the performance of the air bag in one of NHTSA's 12 air bag demonstration vehicles. Aubrey Hamilton of the Home Savings and Loan Association in North Hollywood, Calif., wrote that shortly after participating in one such demonstration he "called General Motors to see if it were possible to have air bags installed in our executive Cadillacs and Buicks this year - 1978. They said 'no.'"

Included among the respondents NHTSA reported as rejecting Claybrook's request were Owens-Illinois, Inc.; Montgomery Ward; Shell Oil; and Consolidated Edison Company of New York. Some companies gave as their reason for rejecting the request the fact that they favor passive or active seat belts over air bags. These included E. I. Du Pont De Nemours & Co., which said that the company requires its employees to use existing lap-and-shoulder belt systems.

The letters generated by Claybrook's request originally were intended to "be used to approach the auto industry by early January 1978 with this indication of demand." The period has been extended through the end of February.

NHTSA still is soliciting letters from fleet owners. Such communications should be addressed to: DOT/National Highway Traffic Safety Administration, Attention: Joseph T. Bolos, NAD-30, 400 Seventh St., S.W., Washington, D.C. 20590.

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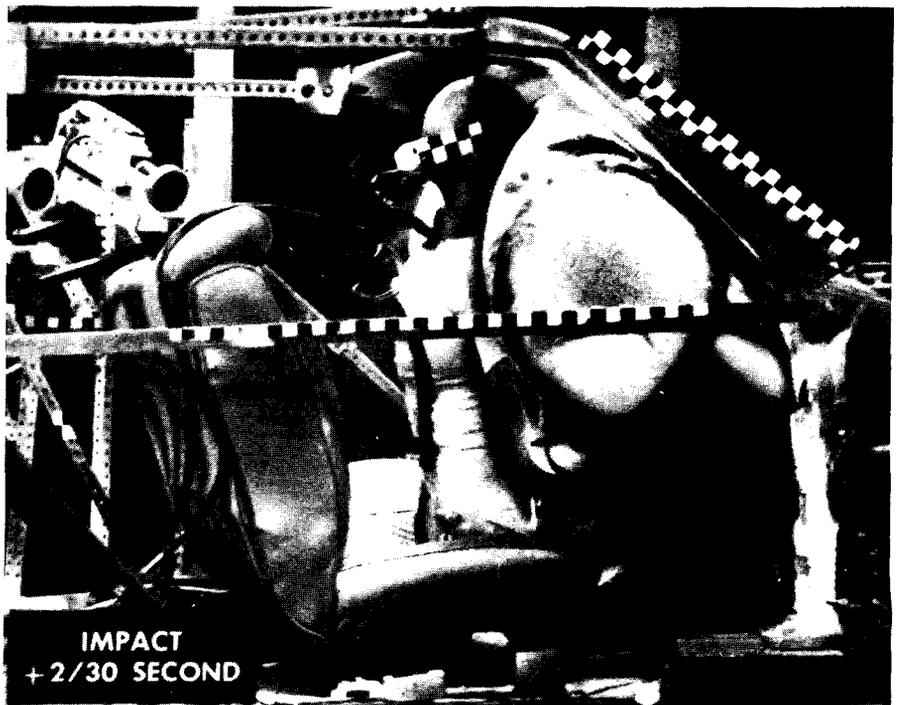
The New York Times, March 5, 1978.

An Unexpected Acceptance of Airbags

The airbags are coming, willy-nilly, under order of Transportation Secretary Brock Adams; they'll be on standard-sized cars starting with the 1982 model year. But the crash protection devices still face technical obstacles and uncertain consumer acceptance — all of which helped explain the enthusiasm with which the Department of Transportation last week reported the response to its survey of more than 100 private fleet operators and more than 50 state and local government agencies. The readiness to buy airbag-equipped vehicles was impressive.

“Even I am surprised at that kind of favorable response,” said Joan Claybrook, administrator of the National Highway Traffic Safety Administration and a longtime supporter of automatic crash protection. Those surveyed indicated a readiness to buy more than 40,000 of the vehicles. The Federal Government would buy 20,000 more.

Responses showed an eagerness for the airbags among many fleet operators, including major corporations, insurance companies and highway patrol squads. And Governor Carey wrote to Miss Claybrook: “All state agency heads contacted to date are in general agreement on the potential for reducing highway fatalities and serious injury.” He said New York would be ready to buy as many as 1,200 cars a year equipped with airbags.



Passive Belts Lower Frequency Of Injury Claims

Volkswagen Rabbits equipped with passive belts have substantially lower injury claim frequencies than Rabbits with active belts, a Highway Loss Data Institute report shows.

The HLDI findings, which are preliminary, provide "encouraging evidence that the use of passive belts is substantially higher than active belts and as a result is producing substantial reductions in the frequency of crash injuries to the occupants of the relatively small number of vehicles so equipped," according to the report.

HLDI compared injury insurance claim frequencies (the number of claims per 1,000 insured vehicle years), as well as the percentages of collision coverage claims with associated injury claims for 1975 and 1976 VW Rabbits with active and passive belts. The injury coverages used were medical payments coverage (Medpay) and Personal Injury Protection (PIP, which is utilized in states with no-fault insurance).

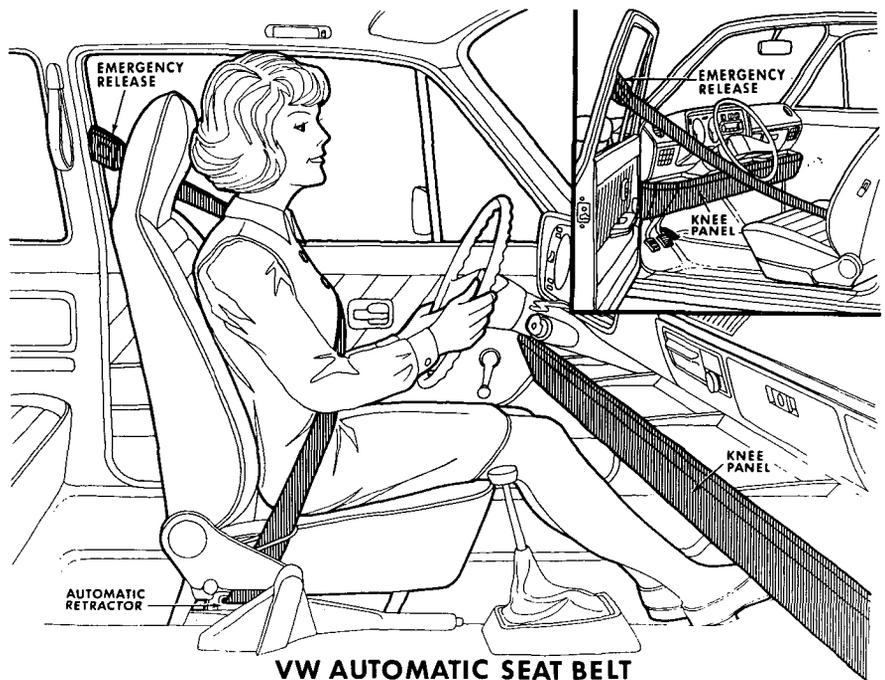
It found that for injury insurance claim frequencies, vehicles with passive belts had reductions of 19 percent (Medpay) and 24 percent (PIP). The reductions in the percentages of collision coverage claims with associated injury claims were 20 percent (Medpay) and 27 percent (PIP) compared with active belt equipped vehicles. The report "emphasized that the results presented in this report are preliminary since they are not based on large amounts of exposure and that more exposure will be needed to confirm the conclusions."

These findings were released by HLDI and provided to DOT the week before Secretary Brock Adams announced his decision mandating passive restraints (air bags or passive belts) in all cars by 1984.

There are currently more than 60,000 passive belt equipped VW Rabbits on the road.

Copies of the report, *A Preliminary Comparison of Results from Volkswagen Rabbits with Passive and Active Seat Belts, 1975 and 1976 Models* (HLDI A-8), can be obtained by writing to the Highway Loss Data Institute, Watergate Six Hundred, Washington, D.C. 20037.

Volkswagen equips some models of the VW Rabbit with automatic safety belts for the two front seats. As the door is closed, the shoulder belt automatically goes across the occupant. The belt is connected to an inertia reel which allows freedom of movement but locks in the event of an emergency. A padded knee panel provides additional protection. (Sketch provided by Volkswagen.)



VW AUTOMATIC SEAT BELT

NHTSA Says Passive Systems In Rabbits Cut Front-Seat Deaths

A study by the National Highway Traffic Safety Administration (NHTSA) has verified earlier indications that the Volkswagen Rabbit's automatic-belt restraint system cuts front-seat fatalities below the level experienced in similar models equipped with active belt systems.

"Results indicate that the death rate of front seat occupants with this passive system is still only one-third of the death rate of front occupants with active (manually fastened) belts in the same basic car," said NHTSA.

The analysts found 0.78 front-seat deaths per 100 million miles for Rabbits equipped with the passive system, compared to 2.34 deaths for Rabbits equipped with the manually fastened belts.

The data were gathered through NHTSA's Fatal Accident Reporting System (FARS). Volkswagen supplied NHTSA with vehicle identification numbers of all cars sold in the United States, indicating which ones are equipped with passive or active systems. Since 1975, FARS has reported a total of 79 front-seat fatalities in Rabbits equipped with the manually fastened system, contrasted to 8 deaths during 1976 and 1977 in Rabbits equipped with passive systems.

The Costs Of Passive Belts

"Passive belts have been estimated in the past by the Department [of Transportation] to add \$25 to the price of an automobile, relative to the price of cars with present active belt systems. The increased operating cost over the life of a vehicle with passive belts is estimated to be \$5. These figures are assumed valid for purposes of this review, and were not contested in the comments received."

(Source: Transportation Secretary Brock Adams' Decision, June 30, 1977.)

U. S. Department of Transportation

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NHTSA 79-77
Tel: (202) 426-9550

AUTOMATIC CRASH PROTECTION SHOWS DRAMATIC RESULTS

Newly compiled accident data collected by the U.S. Department of Transportation indicates a dramatic reduction in highway deaths in cars equipped with automatic crash protection.

The latest survey by the Department's Fatal Accident Reporting System (FARS) shows the death rate for Deluxe Model Volkswagen Rabbits equipped with the automatic shoulder belt is about one-third the rate for other VW Rabbits equipped with ordinary seat belts.

The VW Rabbits provide for the first time a direct comparison between automatic restraint systems and regular seat belts because the cars are otherwise identical. The automatic shoulder belt automatically goes into place when the door is closed.

FARS, operated by DOT's National Highway Traffic Safety Administration, keeps a comprehensive file of fatal accident reports obtained from the states. The latest data show:

- There are approximately 79,000 Rabbits with automatic crash protection on the nation's highways. These cars have traveled about 1.2 billion miles.
- Nearly 300,000 Rabbits with regular seat belts have traveled about 4.8 billion miles.
- There have been only six reported fatalities in the cars with automatic crash protection -- a rate of .50 per 100 million miles -- compared with 81 deaths in regular seat belt cars, for a rate of 1.7 per 100 million miles.

The VW type automatic crash protection is one system that can be used by auto manufacturers to meet the requirements of the Transportation Department's recently announced standard on occupant crash protection.

The standard, issued by Transportation Secretary Brock Adams on June 30, 1977, requires the installation of automatic restraint systems to protect front seat occupants in crashes beginning with all full-size passenger cars in model year 1982. All intermediate and compact cars will have to have such equipment by model year 1983, and all passenger cars will be required to provide passive protection systems by model year 1984.

"We are seeing a preview of the expected improvement in highway safety that will come when all cars on the road have automatic occupant crash protection systems," said Joan Claybrook, the NHTSA administrator. "The information gleaned from accident reports from across the nation confirms the department's expectation of the enormous payoff of automatic restraints in reducing deaths and serious injuries in automobile crashes."

She said a recent agency study showed that only 20 percent of vehicle occupants wear their safety belts and that restraints such as automatic belts or air bags could save 9,000 lives and prevent tens of thousands of injuries a year once they are installed in the entire U.S. auto fleet.

The NHTSA noted that there have been other indications of the improved safety in Volkswagen Rabbits with automatic restraints. In a preliminary analysis of insurance claims data released last July, the Highway Loss Data Institute found a reduction of between 19 and 27 percent in the frequency of claims in these Rabbits compared with Rabbits having only seat belts, both overall and as a function of collision claims associated with injury.

III.

Endorsements Of Passive Restraint Mandate

Letter from Washington State Sen. C. W. 'Red' Beck to Transportation Secretary Brock Adams

Washington State Senate

June 18, 1977

The Honorable Brock Adams
Secretary of Transportation
Department of Transportation
Washington, D. C. 20590

Dear Brock:

. . . The news media has called to my attention that you soon will be making a recommendation to the Congress on whether to make Air Cushion Restraint Systems (ACRS) available on new automobiles. For whatever it is worth, I feel compelled to make my personal experience with air bags known to you and ask you to give it favorable consideration.

On Tuesday, June 7, 1977, I was involved in a two-car collision on a perfectly clear, warm, dry day at the intersection of two Kitsap County arterials in which the lady who was driving the other car was

Washington State Sen. "Red" Beck with his air bag-equipped Cadillac. Note telephone pole in foreground that was sheared off by Sen. Beck's vehicle, which first struck the car in the background, in this multiple impact collision.



killed. I am able to be sitting here today writing to you without a scratch, bruise, ache or pain because my car was equipped with an ACRS. I'm sure I owe my life to this device.

You may not recall the car but you rode in it about two years ago for a short distance in Seattle to the Olympic Hotel. It was a 1975 Gray Cadillac El Dorado and was new then. It now has about 49,000 miles on it. It is no more, both cars were totalled out.

My only reason for writing you is to give you firsthand information based upon my own personal experience on the value of the so-called "air bags."

I was driving in a 40 mph speed zone with my cruise control set at 39 mph. Only two cars were visible to me, one coming towards me and the one which I hit. It had pulled up to a boulevard stop sign and made what looked to be a legal stop.

When I was about 50-75 feet from the intersection, the other car suddenly darted out, fast. I applied my brakes and swerved to the right but could not prevent the impact. I hit the right side of the other car head-on with my brakes set and skidding trying to swerve to the right.

After the impact, both cars were diverted, mine to the right and the other to the left. My car had a multiple impact; it hit a telephone pole and sheered the pole off at the ground level.

The sudden explosion and puff from the (General Motors Air Cushion Restraint System) inflator assembly was heard and the bag inflated before I felt the impact and sudden stop of the vehicles. The inflation of this air bag was astounding. I worked as an engineer during the war and for many years with the tools as an instrument maker and I couldn't believe the sensors from the bumper could actuate the inflators so fast.

Normally, I wear seat belts but this time I neglected them. This did not impair the air bags from performing their duty. The lap belt would have prevented me from being thrown around in the front seat.

The bag in the steering wheel was the most effective; the passenger air cushion inflated and prevented me from being thrown to the floor on the passenger side. In fact it shoved me back into an upright position behind the wheel. I was protected by both bags.

The glass in the right door shattered and flew all over the car. I was shielded and protected from the flying glass by the passenger air bag.

At no time was my vision impaired by any part of the ACRS. In rolling around with the lower part of my face in the steering wheel bag, I knocked my glasses off and they fell to the floor but they were not broken and I put them on before I got out of the car. I did have a tendency to close my eyes when the bags inflated but as soon as I opened them, I had perfect vision.

Brock, you have a most important position and will have to make many momentous decisions but it is my opinion you will go down in history as the one person who saved more lives than any other American if you will only order every new automobile sold in this country to be equipped with "air bags." Our country has the technology and they can be made to work. I know from personal experience.

If there is any way that I can be of service to you in helping to make the value of this piece of equipment known, please do not hesitate to call on me.

Best of luck in your new position.

Very sincerely yours,

C. W. "Red" Beck
State Senator

(This column by conservative political analyst George F. Will appeared in The Washington Post, April 14, 1977. Will was awarded the 1977 Pulitzer Prize for commentary. © 1977/1978 by The Washington Post Company. Reprinted by permission.)

George F. Will

Driving Without Restraint

CHEVY CHASE VILLAGE—Thinking he heard thunder, my neighbor went to close his car windows. Actually, he had heard a commonplace tragedy, the making of a statistic. A woman died and a man nearly did in an occurrence shocking but routine: an automobile accident.

The car veered out of control on Connecticut Avenue, hit trees, fragmented, broke in half. Three of us arrived immediately. Emergency equipment arrived quickly. Cleaning up took hours.

In 1900, this "village," six miles from the White House, was where Washingtonians came for country breezes. Today, it is a small incorporated area near the center of a sprawling metropolis. It is divided by Connecticut Avenue, which passes around a traffic circle as it enters Maryland. Trees on the circle are heavily scarred. Crumpling steel and crying sirens are common sounds here as on many urban thoroughfares.

Increasingly, American driving reflects, I think, the sublimated fury of persons heading for infuriating jobs, the animal spirits of persons whose lives allow little scope for such spirits. As Daniel Moynihan wrote years ago, the automobile is "both a symbol of aggression and a vehicle thereof. . . . It is a prime agent of risk-taking in a society that still values risk-taking, but does not provide many outlets."

The endless epidemic of accidents is one of the nation's gravest public health problems. Automobile deaths and injuries have costs beyond counting, and are a special plague to the young. Of every 100,000 males at age 15, about 1,100 will die in accidents, most involving automobiles, before age 25—a

death rate 20 times worse than polio inflicted at its worst.

As Moynihan notes, the social life of most Americans "now primarily takes the form of driving to a place where alcohol is consumed." And because traffic laws are widely ignored, almost everyone is a lawbreaker, and the incidence of arrest in America may be the highest of any nation in history. Repairing and replacing wrecked cars may provide 20 per cent of the business for the automobile industry, the nation's most important.

Such statistics are as lifeless as the woman who lay beneath blankets on the Connecticut Avenue median strip. But they describe a river of sorrow flowing from monstrously irrational behavior.

Most drivers frequently exceed speed limits, only 25 per cent use seatbelts, only four per cent use harnesses. Because slaughter behind the wheel is deeply rooted in aggression and other irrationality, it is very difficult to substantially reduce accidents by reforming drivers. So government has tried to reduce the severity of injuries received in accidents.

The public disliked, and the government quickly disconnected, the ignition "interlock" system that prevented cars from starting when safety belts were unfastened. Today, new cars just make a brief buzz of disapproval.

Government may yet require "passive restraints"—air bags that instantly inflate to cushion passengers in collisions. There is evidence that they would save many thousands of lives annually and may be one answer to what

Moynihan has called "the seeming incompatibility of safe driving and mass driving." That is a considerable problem in a nation where more people drive than pay taxes or vote.

Air bags require no forethought by drivers, so they are suited to the American driving public. The air bags would probably cost manufacturers less than \$100, a fraction of what car buyers exuberantly spend when loading their cars with snappy wheel covers and other options.

Long before the most recent Connecticut Avenue death, I regretted having once argued that government has no business requiring drivers to buy and use inexpensive devices that might save them from self-destruction. There, is a pitiless abstractness, and disrespect for life, in such dogmatic respect for the right of consenting adults to behave in ways disastrous to themselves. Besides, too many children passengers are sacrificed on that altar. And a large part of the bill for the irrationality of individual drivers is paid by society.

Most important, society desensitizes itself by passively accepting so much carnage.

On Connecticut Avenue that evening, the police operated with the weary patience normal to those who are paid to look unblinkingly at what people do to themselves. "Go home," a policeman finally said, with barely noticeable disgust, to people milling around the debris. "Go home and watch television." After a while, we did.

(This editorial, "The Freedom to Choose Safety," by Colman McCarthy, appeared in The Washington Post, July 10, 1977. © 1977/1978 by The Washington Post Company. Reprinted by permission.)

AS A LISTENER to nearly every meaningful syllable uttered in the current debate on air bags, I have yet to hear from the one citizen I've been waiting for: a crash victim saved by an air bag but who is against air bags. I have listened to other opponents, from those who see the Department of Transportation's favorable ruling on this passive restraint system as Big Brotherism on the march again to others who believe air bags are being imposed as unproven and costly gimmicks that represent still another theft of what one congressman calls "our individual freedoms."

Many have been persuaded by these arguments, but for myself nothing would be more convincing than the words of a man who should be dead but who lives to denounce the federal government for denying him the individual freedom to be killed in his car. I would be persuaded by a man who walked away from a head-on collision livid that he had to pay \$100 or even \$200 to have his life saved.

If we haven't heard from this person, assumptions can be safely made, as our cars are not, that he doesn't exist. It is hard to imagine the automobile industry — the air bag's most stubborn opponent — not searching out, and then gleefully exploiting, at least one negative reaction from the one group of motorists whose knowledge of air bags is experiential, not theoretical.

This group is not large but it is alive, well and has seen the gore in crashes from Mercer, Pa., to Needles, Calif. Although no air bag cars are currently on sale, about 12,000 vehicles so equipped — mostly General Motors cars from 1974 to 1976 — have been on the highways. As of July 1, 153 crashes have occurred, involving 219 front-seat occupants.

Of the 219 crashers, 215 survived, and nearly all of those without major injuries. From a sampling of the survivors' sentiments, an ardency for air bags is evident.

The most recent partisan is C. W. Beck, a state senator from Port Orchard, Wash. On June 18, he wrote a letter to his friend Brock Adams, the Secretary of Transportation, who was then in the process of deciding favorably on air bags and hoping his decision would not be vetoed by Congress. Beck reported the details of his crash:

"On Tuesday, June 7, 1977, I was involved in a two-car collision on a perfectly clear, warm, dry day at the intersection of two Kitsap County arterials in which the lady who was driving the other car was killed. I am able to be sitting here today writing to you without a scratch, bruise, ache or pain because my car was equipped with an ACRS [air cushion restraint system]. I'm sure I owe my life to this device.

"You may not recall the car, but you rode in it about two years ago for a short distance in Seattle to the Olym-

pic Hotel. It was a gray Cadillac Eldorado and was new then. It now has about 49,000 miles on it. It is no more, both cars were totaled out . . .

"I was driving in a 40 mph speed zone with my cruise control set at 39 mph. Only two cars were visible to me, one coming towards me and the one which I hit. It had pulled up to a boulevard stop sign and made what looked to be a legal stop.

"When I was about 50-75 feet from the intersection, the other car suddenly darted out, fast. I applied my brakes and swerved to the right but could not prevent the impact. I hit the right side of the other car head-on with my brakes set and skidding to swerve to the right.

"After the impact, both cars were diverted, mine to the right and the other to the left. My car had a multiple impact; it hit a telephone pole and sheared the pole off at the ground level.

"The sudden explosion and puff from the inflator assembly was heard and the bag inflated before I felt the impact and sudden stop of the vehicle. The inflation of this air bag was astounding. I worked as an engineer during the war and for many years with tools as an instrument maker and I couldn't believe the sensors from the bumper could actuate the inflators so fast.

"Normally, I wear seat belts, but this time I neglected them. This did not impair the air bags from performing their duty. The lap belt would have prevented me from being thrown around in the front seat.

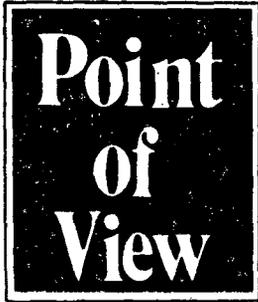
"The bag in the steering wheel was the most effective; the passenger air cushion inflated and prevented me from being thrown to the floor on the passenger side. In fact, it shoved me back into an upright position behind the wheel. I was protected by both bags . . .

"At no time was my vision impaired by any part of the [air bag]. Rolling around with the lower part of my face in the steering wheel bag, I knocked my glasses off and they fell to the floor but they were not broken and I put them on before I got out of the car."

Similar testimony has come from other survivors, including a movie stunt man. He told the Department of Transportation last year that "when you look at a 44-ton brick wall and you know it is coming at you, you think of a whole lot of things, but the least of which is how much this air bag costs you."

FOR ME, THESE voices are the most credible, and therefore the most persuasive. But even then, a judgment on air bags can be made in the area of the debate in which its opponents are most comfortable, the so-called "individual freedom" issue: The individual motorist must be free of the government's excessive power to restrict his liberty, even if government officials mean to keep you from danger. A Pennsylvania congressman, Bud Shuster, says "this air bag edict is a very small piece of a heavy and dark blanket, gradually being lowered over a free people by their paternalistic government."

Put that way, the question becomes ever broader. Whom do we choose to trust and believe: Big Brother in Washington or Big Cousin in Detroit? Both relatives



have their nasty habits, but if I had a choice to disown either, it would be Big Cousin. Not only have automakers repeatedly resisted safety innovations but they have raised the cost of cars by heavily promoting those features of their products that do nothing at all to protect motorists.

When pressed by the gory consequences, auto executives plead their case with the argument of innocence: Don't blame us, we just give the customer what he wants. If that's the case, the showrooms of America are jammed with customers clamoring for cars that are incessantly being recalled for safety defects, that poison the air and can cost up to \$686 in repairs for a front-end crash at 10 mph.

One who trusted Detroit more than the pro-air bag advisers in his own department was former Transportation Secretary William E. Coleman Jr. Last December, when he decided not to decide on air bags, Coleman struck an agreement with GM, Ford and Mercedes to offer air bags as options on a small number of cars. The agreement was a curious one, in light of earlier industry promises:

In 1970, General Motors said, as quoted in a recent report from the Insurance Institute for Highway Safety, "In the fall of 1974, the air cushion would be made standard equipment on all 1975 GM passenger cars . . ." Chrysler said, "We hope to be in a position to provide passive restraint systems in volume production by Jan. 1, 1975." Ford said in 1970 that "air bags for the front right and center occupants could be installed in all 1975 model cars . . ."

Now it is 1983 before citizens can buy air bags as standard equipment on all cars. Tens of thousands of men, women and children will be killed before then. Few of these potential victims are likely to have strong ideological feeling one way or the other about air bags and the moral responsibility of government or industry to provide them. Most people probably assume that whatever is in the marketplace has to be safe or else it wouldn't be there. We have safety laws, don't we? And isn't there competition?

But the carnage occurs daily. The emotional cost to bereaved families is beyond counting. Estimates of other costs are more easily figured: Nationwide Insurance says air bags would mean an annual reduction of \$2.5 billion in insurance premiums. The hospital care for citizens crippled in car crashes exceeds \$1 billion a year.

Neither I nor anyone I know expects to be killed or maimed in a car crash, either today, this year or this century. But this is an expectation of the heart, not the head, because somewhere in America more than 100 people die every day in car crashes. The issue is less whether the government should protect lovers of liberty like Rep. Shuster than what it should do about the safety of countless citizens. Cars have become love objects, dream fulfillments, as well as common transporters, but who except the rare citizen suspects them of being potential exterminators? The air bag is merely the best system yet devised to give an individual the freedom to get in his car and drive off without suspecting that he may be killed. Such a freedom is worth preserving.

Air Bags Endorsed By Those In Crashes

People who have been in car crashes — both with and without passive protection — told Adams that he should require passive restraints in all new cars. These witnesses included five people who suffered spinal cord injuries in crashes of cars *not* equipped with air bags and six people, two of them stunt drivers, who had experienced crashes in which an air bag deployed to prevent serious injury.

Eric Mohn, of Maryland, told Adams about the car crash 14 years ago that left him a quadriplegic. Mohn said he required two and a half years of hospital treatment at “incalculable costs.” Mohn said, “My parents have taken care of me for the last 12 years. They know everything that has happened in my accident and they know the consequences of an individual not wearing his or her seat belt. Yet, to this day, I cannot badger my mother into wearing her seat belt. I don’t think she is an exception.”

Phil Draper of the Center for Independent Living said that he had been hospitalized for four and a half years following the car crash that left him a quadriplegic. He did not know the total cost of his hospital stay but one eleven month period cost, in 1969 dollars, \$84,000. He pointed out that he is now totally dependent on the state, and thus “taxpayers’ money” for all his medical and living expenses. (The Insurance Institute for Highway Safety recently published an extensive study of the losses society sustains each year from the more than 5,000 spinal cord injuries that occur in motor vehicle crashes — 70 percent of which are to motor vehicle occupants. See *Status Report*, Vol. 11, No. 20, Dec. 15, 1976.) Two other members of the Center for Independent Living, Ron Washington and Kathy Kenworthy, also testified about the spinal cord injuries they received in car crashes, as did Judy Taylor of the Physically Disabled Student Project of Berkeley, California.

Ralf Hotchkiss of the Center for Concerned Engineering said, “Many of our disabled brothers and sisters know that their injuries could and would have been prevented by federal action in the early ‘70’s. If you decide to further delay passive protection we would appreciate your help in persuading thousands of us that our disabilities are necessary and in the national interest.” John Wilkin, representing the National Paraplegia Foundation, also urged Adams to require passive restraints in all new cars.

Debra Bell, from New York, told Adams of the two crashes she had experienced in her air bag equipped Cadillac. After the first crash, in which the air bags deployed and she was uninjured, her car was repaired and the air bags were replaced. In the second crash, she said, the car “was damaged beyond repair. However, I walked away from the accident without a scratch or a bruise thanks to the effectiveness of the air bags.” She said she would like to buy a new car equipped with air bags but was told that they are no longer available even as an option.

Kenneth Gnaster, from Chicago, told Adams that after his major crash in an air bag equipped car he was back at his office within one hour. He said he would like to buy a new compact size car that would get better gas mileage but “I want an air bag in a small car for protection. If I can’t purchase this, then my only choice is to stay with the big car.” Russ Parrish, from Louisiana, said he believed the air bag in his 1973 Chevrolet Impala saved him from serious injury in a head-on crash with another car. Adams also heard testimony from Helen Brosche, of Bloomfield Hills, Michigan, about her crash in an air bag equipped car and from two Hollywood stunt drivers, Hal Needham and Vic Rivers, who have both driven air bag equipped cars into concrete barriers.

**Letter from D. A. Fraser, President,
International Union, United Auto Workers to
Secretary of Transportation Brock Adams** _____

June 16, 1977

The Honorable Brock Adams
Secretary of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. Secretary:

I understand you will be making a ruling shortly with respect to automobile passenger restraints. I am writing to give you my views on that subject.

I believe we can reduce significantly the number of highway deaths and serious injuries by the adoption of mandatory passive restraint devices in future auto production. A review of the evidence in the record makes it clear to me that passive restraints could save thousands of lives now lost needlessly each year.

Automakers should provide the consumer with the option of a front seat air bag system or a seat belt system that requires no buckling and moves into place automatically as the car occupant enters and closes the door.

The auto companies should be given realistic deadlines for providing passive restraints to insure adequate lead time for design and production. But those deadlines must be firm and not subject to postponement. Time after time, the auto industry has dragged its feet on safety issues until forced to act by the government and the American people.

In addition, I am convinced that it is unrealistic to assume a sufficiently high utilization of the present type of seat belt even if use was mandated by law. Passive restraints provide the most acceptable method of reducing highway fatalities and injuries.

I strongly urge that you rule in favor of the passive restraint options. I hope these comments will be useful and I will be happy to discuss the matter further if you, or your staff, wish to do so.

Sincerely,

Douglas A. Fraser, President
International Union, United Auto Workers



NEWS RELEASE

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AAA SUPPORTS DECISION TO REQUIRE
PASSIVE CRASH PROTECTION IN AUTOS

WASHINGTON, D.C., July 1 -- The American Automobile Association has added its support to U.S. Transportation Secretary Brock Adams' decision to mandate installation of passive restraint crash-protection systems in all automobiles by model year 1984.

John de Lorenzi, AAA's managing director for public policy, said that the motoring federation "applauds" the decision. "In fact," said de Lorenzi, "if possible, we would like to see passive restraint systems installed in all models sooner."

He said that the important ingredient in Adams' plan is that "the auto buying public will now have a choice of crash-protection systems, either automatic safety belts or air bags."

The AAA official added that the staggered phase-in proposed by Adams will encourage manufacturers to develop more fully the relatively new and less expensive automatic safety belt and also allow them to solve the problem of the subcompact for which air bags are not yet available.

75 years serving millions

With more than 18 million members, the American Automobile Association is the largest motoring and travel organization in the world. AAA's nearly 920 affiliated clubs and branches are spread throughout the U.S. and Canada. AAA is a fully tax-paying, non-profit organization offering a wide range of member services and working for improvement of motoring and traveling conditions.

Adams announced his decision yesterday. He ordered that either automatic safety belts or air bags be installed in standard and luxury cars by model year 1982. This would affect approximately 2.5 million cars, he said.

The following year, intermediates and compacts would be required to have the passive restraint safety systems. Adams said this would include about five million cars.

By model year 1984, subcompact automobiles would be included, adding about 2.5 million cars.

The AAA spokesman said the federation "hopes that this new performance standard will further lower the number of traffic fatalities."

Transportation Secretary Adams has estimated that as many as 10,000 lives a year might be saved if the entire fleet of cars in the United States, now about 109 million, were equipped with some sort of passive restraint system.

Automatic safety belts are relatively new on the market and are particularly useful on smaller cars. The best example available now is the Volkswagen Rabbit. The belts are automatically put in place as the driver or front seat passenger enters the car and closes the door. There is no extra effort required to buckle up as with most safety belt systems on other cars.

Air bags are compressed into the dash or a compartment in the steering wheel. In a frontal crash, a measuring device senses the impact and triggers the mechanism that inflates the bag, providing the occupants with a pillow of air to keep them from slamming into the dash or windshield. For best operation, the air bag system requires that the occupants also use a seat belt.

Pro-Passive Coalition Forms

Shortly after Shuster and Griffin announced their repeal measures, several public interest groups, medical and insurance organizations and others formed an organization to fight the Congressional repeal measures and support the Adams decision. This coalition is the National Committee for Automobile Crash Protection. Counsel for the organization is S. Lynn Sutcliffe, former counsel to the Senate Commerce Committee. The executive director is Ralph Hoar, formerly with the Insurance Institute for Highway Safety.

At a press conference announcing the formation of the committee, representatives explained that "although members of the committee may differ over aspects of the Adams decision, there is unanimity in the conviction that Congress must sustain that decision . . . its members will attack the canards that have been raised about passive restraints, such as air bags."

Membership in the committee includes:

Aetna Life and Casualty Insurance Company	National Association of Independent Insurers
Allstate Insurance Companies	National Association of Mutual Insurance Companies
Alliance of American Insurers	National Conference of Governors' Highway Safety Representatives
American Academy of Pediatrics	Nationwide Insurance Companies
American Congress of Rehabilitation Medicine	Physicians National Housestaff Association
American Insurance Association	Prudential Property and Casualty Insurance Company
American Nurses Association	Safeco Insurance Company of America
Automobile Club of Missouri	State Farm Insurance Companies
Susan P. Baker, Associate Professor, Johns Hopkins School of Hygiene and Public Health	Travelers Insurance Companies
Center for Auto Safety	United Automobile, Aerospace, and Agricultural Implement Workers of America (UAW)
Center for Concerned Engineering	
Consumer Action Now	
Epilepsy Foundation of America	
Ralph Nader, Attorney	

The New York Times, July 24, 1977.

Don't Deflate the Air Bag

Transportation Secretary Brock Adams's recent ruling that automobiles produced in the early 1980's must contain automatic safety systems to protect drivers and front-seat passengers during crashes has provoked opposition from the automobile industry and in Congress. But the opponents should proceed with caution because the automatic restraint systems offer genuine promise of saving lives on the nation's highways.

Although traffic fatalities have generally declined in the past decade, some 46,000 Americans died in motor vehicle accidents in 1976. Another 1.8 million were injured. And as cars are made smaller to reduce gasoline consumption, injuries and fatalities may climb.

The chief protection currently offered to crash victims is the seat belt. Unfortunately, only about 20 percent of the driving public takes the trouble to buckle up. A mechanism that made it impossible to start cars unless the belts were fastened caused such an uproar several years ago that Congress revoked the requirement.

Thus attention has focused on passive restraint systems that protect automobile occupants without annoying them. Former Transportation Secretary William Coleman concluded that passive restraints were feasible and effective but, in the anti-regulation atmosphere of the Ford Administration, he shied away from requiring their use. Now Secretary Adams would require all new cars to provide passive protection for front-seat occupants under a three-year phase-in schedule starting with the 1982 models.

Two systems are most apt to meet the proposed standard. One is the air bag, a cushion that fills with gas the instant a crash occurs, thus protecting the occupant from smashing into the steering wheel or dashboard. The other is a passive belt system, which wraps around the occupant as the door closes.

Both systems have proved effective in tests and in

actual use. The Transportation Department estimates that the air bag would save 9,000 lives over and above those now saved by seat belts. The air bags offer better protection in high-speed frontal crashes, but little or no protection in lateral crashes, rear-end crashes or roll-overs. Thus a combination of air bag and lap belt is deemed best.

The cost of the devices seems reasonable. The Transportation Department estimates the purchase price of air bags at \$112 and the lifetime operating cost at \$29 more. Although the claim should be viewed skeptically, some insurance companies predict, as highway losses subside, that drivers will save most of that cost in insurance premium reductions.

Some opponents of passive restraints argue that drivers ought to be allowed to risk their necks without interference from a paternalistic Government. But it is hard to see how, in principle, passive restraints differ from safety devices already mandated by the Government such as shatterproof glass, energy-absorbing steering columns, padded dashboards, strengthened bumpers and seat belts. In any event, those who purchase an automobile are seldom the only persons at risk. Teen-age drivers, young children and others who have had no voice in choosing safety options may find their lives endangered. Nor are drivers who get hurt needlessly harming only themselves. Their fellow citizens pick up the tab for police officers, ambulances, hospital care, insurance payments and government benefits.

To judge by a new Gallup Poll, the public as a whole—and especially the young-adult group which experiences the highest accident rate—now favors air bags. The new rule on passive restraints will take effect unless both the House and Senate veto it. Let both houses practice some active restraint.

Detroit News, July 4, 1977.

'Passive restraint' ordered

It could have been worse for industry and motorists

If Congress permits Transportation Secretary Brock Adams to have his way — and there is doubt about this — every new American automobile by Sept. 1, 1983, will be equipped with a mandatory "passive restraint" system — either two air bags that inflate in a crash or a safety belt that automatically wraps itself around driver and front seat passenger.

Adams said "passive restraints" — protective systems that operate automatically without the motorist doing anything — must go on the luxury and large size cars at the start of the 1982 model year on Sept. 1, 1981, on 1983 model intermediate and compact cars and on 1984 model subcompacts. Thus, the policy would be fully operational by Sept. 1, 1983.

In his own statement, Adams estimates that air bags will add from \$100 to \$300 to the price of a new car. Nothing is said about the cost of reinstalling air bags after they inflate. Chrysler Corp says that bill could be as much as \$600. The automatic lap and shoulder belt system, as used by Volkswagen on a luxury model, would put the price up by \$25 to \$40 per car.

These figures are controversial. The industry says bags would cost as much as \$500 a car and the VW belt system sells in Germany as an extra option for \$40, not \$25.

Adams says the use of "passive restraint" systems could save 9,000 lives a year. An angry Chrysler spokesman reminded the secretary that Transportation Department files contain study reports which say that present manual belt systems would save at least 13,000 lives a year and they are therefore superior. However, that is only so if people lock them up and other studies show 70 to 80 percent do not.

There are faults in both the air bag and automatic belt systems.

Air bags inflate in a crash of 12 miles per hour or greater, cushioning front seat occupants. They do not keep passengers within the car's structure and offer no protection from the sides. Adams says manual lap belts will still be required in cars equipped with bags. Further, the bags cannot readily be installed in small cars because there isn't room for them under the instrument panel.

Automatic belts require reels which are mounted between the front seats — a mechanical feat that is impossible with the popular one-piece American bench seat.

The ruling is already under attack in Congress. Sen. Robert Griffin, R-Mich., and Rep. E.G. "Bud" Shuster, R-Pa., have introduced resolutions to disapprove.

The resolutions will bring both houses of Congress back to the vital principle — whether government should interfere such an extent in the life of a citizen. Griffin calls the Adams ruling "big brotherism" and rails at the idea that a free American should be deprived of choice.

However, if Congress puts freedom of choice aside and passive restraint systems are going to be ordained, then the Adams report is fair and something of a victory for motorists and industry.

Since automatic belts cost only about one-fourth as much as the bags, the cost-conscious auto industry can be expected to go for the belts, even if this means doing away with the traditional bench seat.

However, the Adams ruling is flawed. The transportation secretary would begin the program at the wrong end of the car market.

It is well established by a number of studies that the danger of injury or death in a crash is much higher in a smaller car than in a normal sized one. Why, then, start the program by installing the system in the safest cars? Why not in the more dangerous, smaller models?

The Arizona Daily Star, June 27, 1977.

Yes, we need air bags

By MIKE SMITH
The Arizona Daily Star

The air bag controversy is one of those issues that bobs up from time to time and then sinks back, never quite submerging.

The participants in the controversy have been pretty much the same since serious talk began about air bags in 1972. There are the automakers, who have tested thousands of air-bag-equipped cars through millions of miles of reliable service, and yet remain curiously cool to the idea of equipping all cars with the safety devices.

Ford, General Motors and Mercedes Benz have agreed to sell 440,000 cars with air bags starting in 1979, but their hearts aren't really in it.

There is consumer advocate Ralph Nader, who has called the failure to use air bags in all cars "a massive act of irresponsibility." There is the insurance industry, which has tantalized the public with visions of 30 per cent reductions in auto insurance premiums if air bags are installed. And there is the government, which has hemmed and hawed from one non-decision to the next.

Last year Transportation Sec. William T. Coleman praised air bags for the marvelous safety devices they are, then proposed a weak, voluntary installation program that won't start until 1978. Within the next couple of weeks, Brock Adams, the new transporta-

tion secretary, will announce whether the Carter administration will require air bags on all cars.

It should do exactly that. While no new car buyer will welcome the \$50 to \$100 surcharge mass-produced air bags would add to the price of an automobile, the security the bags would provide is compelling.

An estimated 15,000 lives would be saved each year by the decision to make air bags standard equipment. A million injuries would be prevented. In the meantime, no motorist would be inconvenienced by the bags as millions of motorists are now harassed by the array of belts, buzzers and other safety gadgets that now make getting into a car an intimidating experience.

The air bags simply sit under the dashboard, like docile watchdogs, until they are needed. Then, at the moment of impact in a front-end crash, they spring into action and subside just as quickly, leaving passengers' noses, teeth and skulls intact.

In the future, cars without air bags will probably be looked on as suspiciously as cars stripped of bumpers or boats without life preservers. Air bags are a proven product, guaranteed to save lives, and well worth the price of installation.

Sec. Adams should make sure they are a part of all our lives.

Michael Smith is a Star editorial writer.

Other editorials favoring the passive restraint decision included the following:

- “Air Bag Order Deserves Support,” *Austin American-Statesman*, July 8, 1977
- “Flimsy Anti-Airbag Arguments,” *The Baltimore Sun*, September 9, 1977
- “Don’t Block the Safety Step,” *Chicago Sun-Times*, September 12, 1977
- “Bags and Rights,” *Little Rock Democrat*, July 8, 1977
- “Enforcing Auto Safety,” *Oregon Journal*, July 7, 1977
- “Air Bags in Stages,” *St. Louis Post-Dispatch*, July 8, 1977
- “The Air Bag Will Save Lives,” *San Francisco Examiner*, September 22, 1977
- “Air Bags for Saving Lives,” *San Francisco Chronicle*, September 26, 1977
- “A Dispute That’s Not Passive,” *Los Angeles Times*, October 4, 1977
- “Blunt Griffin’s Air Bag Needle,” *Chicago Sun-Times*, October 4, 1977
- “Air Bags Will Save Lives,” *Philadelphia Inquirer*, October 9, 1977
- “The Inflated Case Against Air Bags,” *The Washington Post*, October 12, 1977
- “Restraints Not Passive in Air Bag Debate,” *The Baltimore Sun*, September 19, 1977
- “Seat Belt Neglect Key to Air Bag Decision,” *Kansas City Star*, October 17, 1977
- “Air Bag Decision Will Reduce Fatalities,” *Scranton Times*, July 13, 1977
- “Living with Air Bags,” *Detroit Free Press*, July 5, 1977
- “A Decision for Highway Safety,” *St. Petersburg Times*, July 2, 1977
- “Air Bag Decision Was Sound, But the Timetable Is Too Slow,” *Louisville Courier-Journal*, July 6, 1977
- “Bags in the Air,” *Honolulu Advertiser*, July 28, 1977
- “Removing Air Bags from Unknown,” *Detroit Free Press*, September 6, 1977
- “On, Wisconsin: Let’s Crack Down on Seat Belt Laggards,” *Milwaukee Journal*, August 24, 1977
- “Air Bag Decision,” *Kennebec Journal*, July 29, 1977
- “Toward More Responsible Autos,” *The Baltimore Sun*, July 5, 1977
- “Because You Won’t Buckle Up,” *Lincoln Journal*, July 9, 1977
- “Mr. Adams Opts for Life,” *Philadelphia Inquirer*, July 5, 1977
- “No Longer a Trial Balloon,” *Kansas City Star*, July 5, 1977
- “Air Bags or Passive Belts,” *Roanoke Times & World News*, July 7, 1977
- “Freedom and Air Bags,” *Trenton Evening Times*, July 8, 1977
- “Air Bags: Time to Push for Greater Acceptance,” *Salt Lake City Deseret News*, June 21, 1977
- “An Order to Save Lives,” *Philadelphia Evening Bulletin*, July 5, 1977
- “Saving Lives,” *Bridgeport Post*, July 9, 1977
- “Why Delay Auto Safety Devices?” *Burlington Free Press*, July 4, 1977
- “... Adams on Air Bags,” *Honolulu Advertiser*, July 1, 1977
- “It’s Best System to Protect Motorists—and It’s Proven,” *Chicago News*, October 12, 1977

IV.

Most Of The Injured Aren't Vehicle Purchasers

Opponents of passive restraints frequently argue that safety equipment should be optional, leaving it up to the vehicle buyer whether or not to have it included in the new vehicle. A recent study by the Insurance Institute for Highway Safety, described in the following excerpt from *Status Report*, revealed the fallacy in that argument.

Status Report, Vol. 13, No. 5, April 12, 1978

Most Of The Injured Aren't Vehicle Purchasers

Fewer than one-fourth of those injured in auto crashes were both owners and original purchasers of the vehicles in which they were injured, a research study of crash data has revealed.

The findings "refute arguments that safety equipment should be optional and left to the discretion of the person purchasing a vehicle, on the assumption that it is the purchaser whose protection is in question," said the authors of the report, Susan P. Baker of the Johns Hopkins University faculty and William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety.

Their analysis of car ownership was based on the records of 137 crashes that caused injury to 172 occupants of 147 cars and station wagons in Baltimore County, Maryland, last year. Of the injured it was found that about half were occupants of vehicles that were no longer owned by the original purchaser, 59 percent did not own the vehicles in which they were injured, 21 percent of the drivers and 74 percent of the passengers apparently were not related to the owner, and 30 percent were less than 21 years of age.

AN ARGUMENT AGAINST AUTOMATIC PROTECTION

"An argument often used *against* requiring vehicles to meet various safety standards is that purchasers should be free to decide whether or not to invest in their own protection," the report noted. "Since it is *their* lives that are at stake, the argument runs, safety features should be optional. This argument has been made prominently and repeatedly, for example by some members of the Congress, editorial writers, and vehicle manufacturers opposed to the federal motor vehicle safety standard that, beginning in the 1980's, will require new passenger cars to provide front seat occupants with automatic ("passive") crash protection in the form of either air bags, seat belts that are automatically positioned without needing to be fastened, or other designs that meet the crash-force-reduction requirements of the standard."

The argument that purchasers should be free to reject such "passive protection" options is based on the premise that the person injured in a vehicle is usually the one who initially bought the vehicle and exercised the choice of optional safety equipment, the researchers noted. But the validity of the premise has never been measured, they explain, "despite frequent use of the argument and the simplicity of the point."

USED-VEHICLE BUYERS HAVE LITTLE CHOICE

The initial purchaser is the one who determines for all future users of the vehicle which optional equipment will be available. A person buying a used vehicle is restricted in his choice of desired options and, therefore, less likely to benefit from optional safety features.

Other people make the decisions determining protection given to age groups with very high injury and death rates, the research study observed. Young people rarely choose the optional features on cars their

parents buy, and car owners under 30 usually are not the original purchasers. “The important question,” the researchers pointed out, “is whether those ‘others’ making crucial decisions on occupant protection should be the original purchasers of new cars – or the National Highway Traffic Safety Administration, the federal agency charged with this responsibility.”

The report concludes that, “As a result of the federal motor vehicle standards, many safety features – including outside mirrors, high penetration resistant windshields, energy absorbing steering columns, padded instrument panels, and seat belts – have been standard in all new cars in the U.S. since the late 1960’s. It is estimated that the 1966-1970 vehicle standards prevented more than 25,000 deaths between 1966 and 1975. Only a fraction of that benefit could have been realized had these and other safety features been optional. Clearly, it is important that federal standards continue to be set for *all* new cars, rather than allowing the presence or absence of important safety features to be determined by the original purchasers.”

The study, “Ownership of Motor Vehicles in Which People Are Injured,” may be obtained from the Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

V.

Public Opinion

Gallup Poll: Public Approves Of Air Bags

By a vote of 46 percent to 37 percent a public sample interviewed by the Gallup Poll has endorsed the installation of air bags in all new cars.

The polling interviews, conducted in early June, preceded by nearly a month the decision by Secretary of Transportation Brock Adams to require phasing in of automatic-protection devices in new models from 1982 through 1984. The Adams order sets a performance standard for crash-force reduction and permits the auto manufacturer to choose any type of equipment that will meet the requirement.

The poll indicates that young adults from 18 to 29 years of age are strongest in their support of air bag use. This age group, which has a high injury and death rate on the highways, voted 65 percent to 27 percent in favor of air bags. This compares to 31 percent of those 50 years and older who favor air bags, and 44 percent who disapprove.

Women of all ages support the air bag plan by the substantial margin of 51 percent to 27 percent, the poll reports, while men voted against it by a 47 percent to 42 percent margin.

On a geographical basis, those in the East support the air bag by the largest margin, reports the Gallup Poll. They favor the equipment by a 53 percent to 29 percent vote. Those in the South and West also approve by large margins. Only in the Midwest does support for air bags trail by a 41 percent to 47 percent tally.

In responding to the poll, those interviewed were asked to answer the question: "Would you favor or oppose requiring car manufacturers to equip all new cars with air safety bags?"

The poll reports this national distribution of public sentiment:

	FAVOR	OPPOSE	NO OPINION
<i>National</i>	46%	37%	17%
Men	42	47	11
Women	51	27	22
College	49	39	12
High School	48	37	15
Grade School	35	32	33
East	53	29	18
Midwest	41	47	12
South	48	33	19
West	44	38	18
18-29 Years	65	27	8
30-49 Years	48	37	15
50 and Older	31	44	25

In the same survey, the Gallup pollsters sampled public opinion on mandatory seat belt use, asking the question: "Would you favor or oppose a law that would fine a person \$25 if he did not wear a seat belt when riding in an automobile?"

The negative answer was overwhelming in all survey categories. While the proposal fared best in the East and among those interviewed who have a college background, the rejection was decisive. These are the results reported by the poll:

	FAVOR	OPPOSE	NO OPINION
<i>National</i>	17%	76%	7%
Men	17	78	5
Women	18	74	8
College	21	76	3
High School	15	79	6
Grade School	16	67	17
East	21	71	8
Midwest	13	83	4
South	18	75	7
West	17	76	7
18-29 Years	19	77	4
30-49 Years	18	76	6
50 and Older	15	76	9

The poll was conducted June 3-6 in more than 300 "scientifically selected" localities across the country, based on interviews with 1,526 adults, all 18 years or older.

Status Report, Vol. 11, No. 13, Aug. 17, 1976

National Survey

Automatic Protection Favored By New Car Buyers

A great majority of car buying Americans prefer automobiles with increased crash protection that is completely or at least partly automatic — such as air bags, or belts and bags in combination — rather than crash protection that the driver and passengers must activate each time they get into a car, such as standard safety belts.

Moreover, these car owners are willing to pay for such protection. Less than half believe that states should pass laws to require that people wear their safety belts each time they travel.

William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety, released these results of a nationwide scientific public opinion survey at the Department of Transportation hearing on passive restraints.

The results of the Institute's public opinion survey were based on interviews of 1,017 people who said they intend to buy new cars within the next three years.

The survey was directed by Dr. Leon Robertson, the Institute's senior behavioral scientist. Results included the following:

- Nearly 80 percent of those interviewed prefer crash protection that requires no activation by drivers and passengers each time they travel, whether alone or in combination with some kind of active protection. Only 15 percent preferred completely active protection, such as standard safety belts. The remainder expressed no opinion.

- Half of those interviewed oppose passage of laws requiring that drivers and passengers use active safety belts each time they travel, 47 percent favored such laws, and the rest have no opinion. Although attempts to have such laws passed in U.S. states have consistently failed, such a law did take effect in the province of Ontario, Canada, on January 1. After an initial rise following the effective date, belt use in Ontario dropped so severely that by June, almost half of the drivers were not using lap belts. The law had no effect on belt use of teenage drivers, who are disproportionately involved in fatal crashes. Use of shoulder belts in pre-1974 model cars was exempted because of public protests. (See *Status Report*, Vol. 11, No. 10, June 28, 1976.)

- In order to obtain increased automobile crash protection that would save 6,000 lives a year, the interview respondents say they are willing on average to add \$12 per month, or \$144 per year, to their car payments. For crash protection to save 12,000 lives a year they are willing to add \$17 per month (\$204 a year), and \$20 per month (\$240 a year) for such protection if it could save 18,000 lives per year.

The amounts that interviewees are willing to pay are far above the government's estimated additional cost of \$103 per car – less than \$4 per month based on 36 monthly payments with interest – for air bag systems that automatically provide increased protection for front seat occupants in front and front-angle crashes.

No statistically significant differences were found in preferences for types of crash protection, amounts they were willing to spend for increased protection, or opinions of belt use laws when comparisons were made among men and women, regions of the country, or members and nonmembers of the American Automobile Association or other automobile clubs.

The data were collected by Chilton Research Services in July 1976. A scientific, national sample of households was chosen by computer-generated random telephone numbers. Using this method, all the telephone numbers are eligible and there is no bias because of unlisted numbers.

Interviewers questioned adults in the households to determine whether or not the families intended to purchase cars within three years and, if so, whether they would be new or used. If the families planned to buy new cars, the persons most likely to buy the cars were interviewed.

"In total, 5,382 households were contacted. Of these, 164 (3 percent) refused the interview and 100 (2 percent) could not be interviewed because of language problems. Of the 5,118 remaining households, 3,776 (74 percent) did not plan a new car purchase in the next three years and 325 (6 percent) could not

be interviewed because the person most likely to buy the new car was not available in two callbacks. Interviews were completed with the 1,017 persons who intended new car purchases," Robertson said.

In discussing the results of the interviews, Robertson said the survey clearly indicates "that new car buyers prefer crash protection that reduces injuries without the driver or passengers having to do anything, to crash protection that must be activated every time the vehicle is used These results are very similar to those of a 1974 Louis Harris poll regarding product safety that found automobiles among the top four products that concerned the public. More than three-quarters of the respondents in that poll said the government should do more in developing standards for those products."

Statements that the public is opposed to mandatory installation of air bags have been based on responses solicited in mailed questionnaires, newsletters and newspapers. For example, at the August 3 hearing on occupant restraints, Sen. Bob Packwood (R-Ore.) released the results of a poll of his constituents rejecting the mandating of either air bags or mandatory belt use laws. Packwood indicated, however, that only 7 percent of the people he polled responded to his mailed questionnaire. (Scientific pollsters consider results invalid when dependent upon such small response and upon respondents mailing in their responses both because there is no way to determine reliably the extent, if any, that the answers of those who respond are statistically representative of all of those addressed, and because there is normally no way to determine whether the identities given on the responses correspond to those of the people who actually responded.)

The IIHS survey avoided such scientifically well known polling pitfalls. Moreover, it did not pose the question of whether people preferred active belts or passive air bags. Instead, the IIHS survey questions were cast to describe automatic and non-automatic protection systems. This was done to eliminate the possibility that respondents would be forced to choose among terms or systems, such as "passive restraints" or "air bags," with which they might be unfamiliar.

"It is doubtful that new car buyers are aware of the effectiveness of air bags in saving lives or their costs," Robertson said. "Thus, public opinion of air bags cannot be taken as evidence that the public does not want increased automatic crash protection. Nonetheless, some automobile clubs have claimed that their members oppose the mandatory installation of air bags. That position, however, is not supported by the results of the national survey which finds that the members of auto clubs prefer crash protection that they do not have to activate every time they travel and are willing to pay substantially more for increased crash protection, like nonmembers of such clubs."

Robertson concluded that, "The results of this study indicate that increased automatic protection is the public's preference. The public's willingness to pay substantially more for increased crash protection than the cost of that currently proposed should spur not only the adoption of standards currently feasible but also the development of more advanced technology."

Copies of the full report, *Increased Motor Vehicle Crash Protection, Public Preferences and Willingness to Pay*, can be obtained by writing for "Public Preferences," Communications Department, Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C. 20037.

MVMA Poll: Air Bags 'Least Objectionable'

The Motor Vehicle Manufacturers Association (MVMA) submitted to Secretary Coleman a public opinion survey of licensed drivers conducted during May and June. In it, respondents were asked to rate three alternative "courses of action toward safer driving:" a mandatory seat belt usage law, mandatory air bags, and nonpayment of automobile insurance for not wearing a seat belt.

Among respondents who said they knew what an air bag was, air bags were the least objectionable alternative. Only 41 percent would "certainly vote no" on a "mandatory air bag law," compared to 49 percent who would "certainly" vote against mandatory belt use and 66 percent against nonpayment of insurance.

A recent Insurance Institute for Highway Safety survey of drivers intending to buy new cars, described passive protection by *function* rather than identifying it as a specific mechanism such as an air bag. It found that nearly 80 percent of those interviewed prefer crash protection that requires no activation by drivers and passengers each time they travel, whether alone or in combination with some kind of active protection. (See *Status Report*, Vol. 11, No. 13, Aug. 17, 1976.)

In the MVMA poll, 50 percent of those interviewed agreed with the statement that "driving should be made more safe than it is today by building more safety devices into cars which cannot be ignored, turned off or removed."

Roper Reports

"On the question of auto and driving safety Roughly 6 in 10 think experts should set speed limits and decide what safety features should be required in cars. Whatever protests the public has made about certain inconvenient or expensive auto safety devices, they don't want the decision to be left in the public's hands. And while they may exceed speed limits, they recognize that experts should set limits to freedom on the road."

*Roper Public Opinion Research Center
Poll (77-4) conducted in March 1977*

VI.

Active Belts

Belt Use Increase 'Unlikely'

Secretary Coleman's decision states, repeatedly and in detail, that seat belt use cannot be substantially increased above present levels.

Despite this, Coleman said in the decision that he is "not prepared to surrender the prospect of substantially increasing belt use."

Here are excerpts from Coleman's decision making it clear there is no prospect of increased belt use:

"It is highly unlikely that the Federal government could persuade many state governments to pass mandatory seat belt usage laws. . . . At present, I know of no other means of increasing belt usage to gain safety benefits equal to those available through passive restraints."

It is "politically infeasible" for the federal government to require states to adopt mandatory belt use laws. "Both the public record and our past experience with Federal efforts to encourage the enactment of belt use laws indicate that a highway safety standard mandating that each state take action to increase belt use to a specified level could not be sustained."

It "has been estimated that a highly successful program to encourage belt usage would result in no more than 35 percent lap and shoulder belt plus an additional 5 percent lap belt usage. None of the comments submitted to the docket has caused me to revise these estimates of belt usage."

"The best available information indicates that even an all out effort would be unlikely to produce voluntary seat belt use above about 40 percent."

"I believe that there are Federal and state actions which can be taken to encourage significant increases in the level of seat belt use. However, I have tentatively concluded that even with such an effort voluntary use is unlikely to rise above about 40 percent."

"I have concluded that a Federal requirement that states enact laws to increase to a specified level seat belt use would not at this time be publicly acceptable."

Status Report, Vol. 11, No. 16, Oct. 12, 1976

Estimates Of Maximum Belt Use

Current estimates of about 30 percent belt use are based on observations of drivers in later model cars in urban areas. The evidence strongly suggests that this low percentage is about the maximum likely to be achieved in the U.S., since:

- Belt use tends to decline as cars get older.
- Passengers are less likely to use belts than drivers, and children far less so.
- Belt use in small cities has been found to be considerably less than in metropolitan areas.

From the Insurance Institute for Highway Safety
Transmittal to Secretary Coleman
(References omitted.)

Effects Of Belt Use Laws

At the Sixth International Conference of the International Association for Accident and Traffic Medicine in Melbourne, Australia during February 1977, reports from provinces, states and countries with belt use laws indicated that about a 10 to 20 percent reduction in vehicle occupant deaths and severe nonfatal injuries resulted from such laws. These results are in agreement with the study of deaths in Victoria, Australia, that most carefully controlled for other factors affecting motor vehicle deaths.

The reductions are far less than would be expected from the known effectiveness of belts worn voluntarily. In Australia and New Zealand, researchers are finding that belts are often being worn too loosely resulting in greatly reduced belt effectiveness. Moreover, in Ontario where mandatory belt requirements came into effect in early 1976, the reduction in deaths has been far below the amount predicted. Placed in effect simultaneously with reduced speed limits, vehicle-occupant deaths have decreased 15.5 percent. Since pedestrian deaths decreased 14.6 percent, it is likely that much of the occupant decrease has been due to factors *other than* belt-use per se.

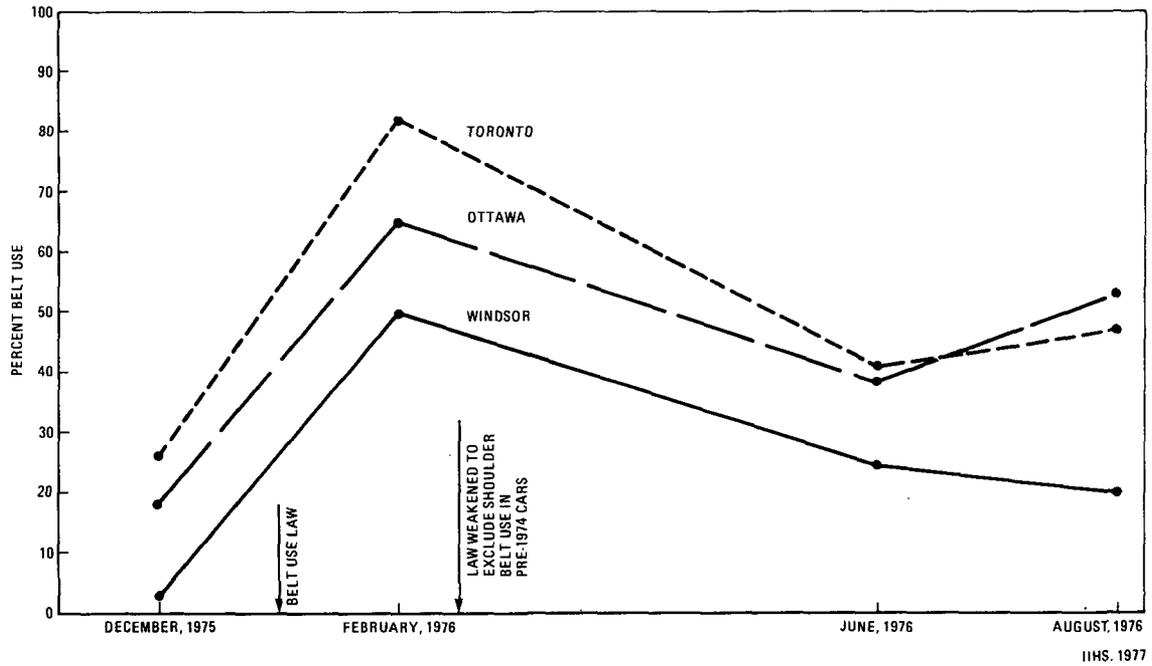
Motor Vehicle Crash Deaths, Ontario

		<u>Percent Change</u> <u>1975-1976</u>
Vehicle Occupants	Drivers -16.2	-15.5
	Passengers -14.6	-14.6
Pedestrians		-14.6
Motorcycle Drivers		-19.6
Bicyclists		-16.1

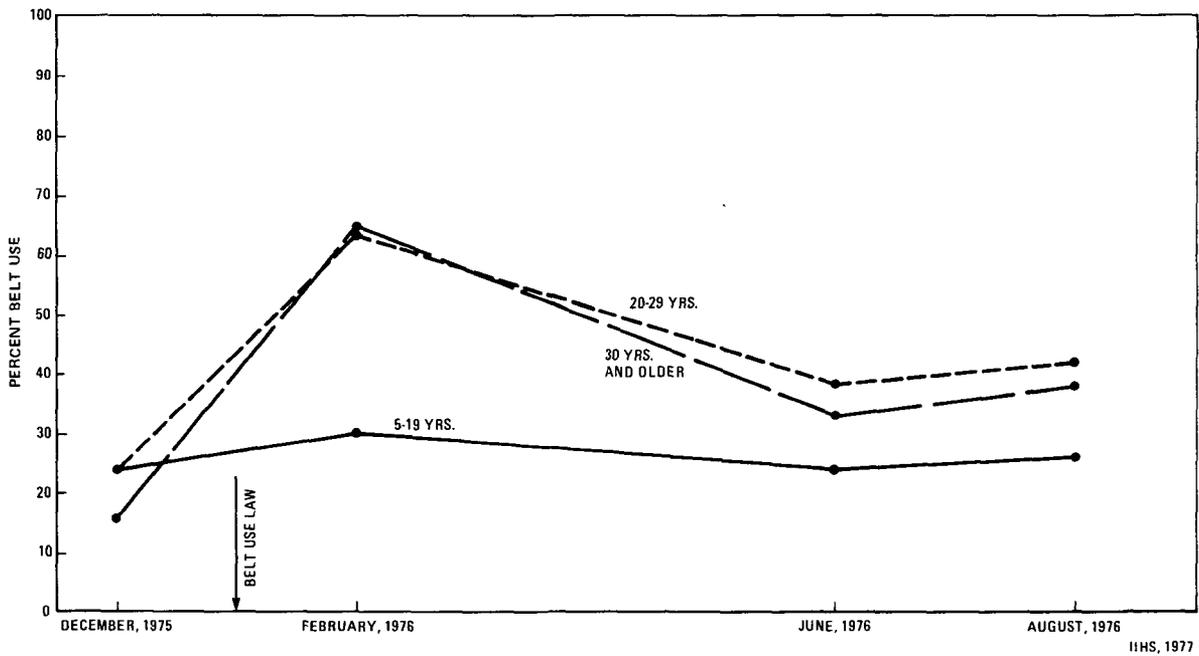
Belt use in Ontario has varied greatly in time, and has been consistently lowest in Windsor, the city among those observed closest to the United States. And, the law has failed most miserably with the most important group; belt use in the 5-19 year old group did *not* increase as a result of the law (see figures opposite page).

The DOT estimate that belt use laws would have the same benefits as air bags is incorrect since it assumes that belts would be worn properly and would be worn by teenagers and others disproportionately involved in severe crashes as much as by others. In contrast to the observed 10 to 20 percent reduction in deaths in countries with belt laws, air bags alone – without any belt use – would reduce occupant deaths 40 percent.

PERCENT DRIVER AND RIGHT FRONT PASSENGER SHOULDER BELT USE IN EQUIPPED CARS BEFORE AND AFTER A MANDATORY BELT USE LAW WENT IN FORCE JANUARY 1, 1976 IN ONTARIO, CANADA, BY METROPOLITAN AREA.



PERCENT DRIVER AND RIGHT FRONT PASSENGER SHOULDER BELT USE IN EQUIPPED CARS BEFORE AND AFTER A MANDATORY BELT USE LAW WENT IN FORCE JANUARY 1, 1976 IN ONTARIO, CANADA, BY ESTIMATED AGE.



Lives Saved By Bags, Belts Not Entirely Same Lives

The crash injury deaths that would be prevented by adopting Alternative IV are *not* entirely the same deaths that would be prevented by adopting Alternative II – even if sufficient belt use could be achieved under Alternative II. In other words, accomplishing either Alternative *alone* would allow some people to be fatally or seriously injured who would not die or be seriously injured if the other Alternative were accomplished. This is because air bag passive crash protection, even to the level required by the present 208 option, is better than that provided by belts in *frontal* crashes (the source of the majority of occupant deaths), and vice versa for belts in other crash modes. For these reasons, Alternative IV should be adopted, augmented by efforts to substantially increase supplemental *lap* belt use

From the Insurance Institute for Highway Safety
Transmittal to Secretary Coleman

Status Report, Vol. 11, No. 16, Oct. 12, 1976

Public Acceptance: Safety Belts

Letters to Secretary Coleman from public officials, safety organizations, auto makers, insurance companies and others voiced overwhelming support for belt use. But most of them also raised serious doubts about the federal government's ability to convince states that they should enact mandatory belt use laws.

ELECTED OFFICIALS: Federal and state officials were vociferous in their criticism of a federal safety standard that would make belt use mandatory. Speaker of the House Carl Albert wrote Coleman, "Apart from the obvious impracticality of enforcing such a law, the infringement on the liberties of our citizens must be considered I am concerned that enactment of mandatory federal [belt wearing] standards would encroach on these liberties."

Governors, as well as state representatives and senators, criticized what a number of them called federal "blackmail." Governor Robert Straub of Oregon said, "Since the federal government does not have the power under the Constitution to directly pass traffic safety laws, such as a mandatory safety belt use law, it should not have the authority to coerce a state to pass this law under threat of the loss of federal funds."

Wendell Anderson, Governor of Minnesota, called such a federal requirement "damaging" because it "would once again put the federal government in an adversary role with several states."

Governor Patrick Lucey of Wisconsin said that he personally supported mandatory belt use laws but pointed out that "opponents – who see such attempts as 'big brotherism' – are very vocal. Chances of getting a law of this kind in the near future are dim, if not nil."

The Governor of Montana, Thomas Judge, said that the policy of his state "when applied to traffic laws dictates that 80 percent compliance to a specific requirement should be attained before a law is

enacted to mandate the requirement. From our experience, it is also apparent that a law mandating a requirement beneath this percentum level is not enforceable. Consequently, my administration would be opposed to a national standard requiring State mandatory belt usage laws.”

SUPPORT FOR LAWS: Support for mandatory use laws did come, however, from several safety and consumer organizations. The National Safety Council proposed a federal standard “which would give the states the option of mandating safety belt usage or bringing usage up to an acceptable level through education or some other means. The level of acceptability should be no lower than 70 percent.”

Consumers Union supported mandatory passive restraint systems *and* mandatory state safety belt use laws. CU said these were “the only two of the five listed alternatives that promise significant reduction of highway deaths and injuries.”

The Insurance Institute for Highway Safety said that mandatory belt use laws are “desirable” and do not conflict with a passive restraint standard.

The California Traffic Safety Foundation pointed out that while it favored mandatory belt use laws, “Honestly, we do not believe such a law can be passed at the present time in the State of California.”

The American Mutual Insurance Alliance explained that it had worked for several years to promote such legislation, but “our many years of experience in state legislatures have caused us to reach the conclusion that while such laws may be desirable, their widespread adoption is unlikely. Even if some such laws were passed, the prospect of practical enforcement or even the acquisition of adequate funds for such enforcement is not bright. In short, we don’t have much confidence that either voluntary action or statutory compulsion can get American motorists to buckle up their seat belts in adequate numbers to provide an acceptable level of protection.”

Another supporter of such laws also raised doubts about their effectiveness. Susan Baker, associate professor at the Johns Hopkins University School of Hygiene and Public Health and a member of the National Highway Safety Advisory Committee, told Coleman that it would be a mistake to assume that an observed daytime 70 percent belt usage rate equals a 70 percent usage rate in potentially fatal crashes. She explained that people “driving at night, for example, are more likely to be involved in life-threatening crashes – yet seat belt legislation may be least effective at night when non-use is hardest to detect.”

She also pointed out that Canadian belt use laws had little effect on teenage drivers – another high risk group. “I make this point not because I oppose seat belt legislation (on the contrary, I have worked hard for such laws and still believe we need them), but because inflated estimates of potential benefits will lead to disappointment if legislation is ever enacted. Even more important, the published estimates could mislead you and others into believing that seat belt laws offer a reasonable alternative to passive restraints,” Baker said.

AUTO MAKER SUPPORT FOR BELT LAWS: Auto makers continued to support public education programs and the eventual passage of mandatory belt use laws. Ford Motor Co. called for “a program for immediate industry-government action to increase public knowledge of the benefits of using seat belts, and pave the way for adoption of mandatory belt usage laws”

General Motors Corp. expressed doubts that such legislation could now be enacted. “Accordingly,” GM said, “we believe that it would be appropriate to carry out a public education program of sufficient

duration and scope to effect a significant attitudinal change before enacting such a law." GM also called for insurance premium reductions for belt use.

On the subject of belt use and "unreasonable risk," American Motors said that motorists do not assume an unreasonable risk of death on the nation's highways. GM, agreeing, said that the interiors of current passenger vehicles incorporate a number of occupant safety features to "establish a reasonable minimum level of protection." According to GM, seat belts provide an occupant "with a convenient means of further protecting himself."

Renault, however, said that the "reluctance of automobile users to wear seat belts exposes them to unreasonable risks, and the government should therefore take some action . . . individual freedom does not include the right to suicide; neither does it include the right to crowd hospitals because of accidents which could have been avoided, not to impose on society the burden of caring for the dead and injured who could have been saved by mandatory belt usage."

Safety Belt Ads Have 'No Effect'

A nine-month saturation campaign of television commercials urging safety belt use had "no effect whatsoever, according to a recently completed research project to evaluate the effectiveness of such public service television announcements.

The study, conducted by the Insurance Institute for Highway Safety in a medium-size American city, "adds to the growing body of evidence that behavior modification is an inefficient and often ineffective means of reducing highway losses," according to the authors of the project report. "Passive approaches, those which reduce the frequency and severity of damage to people and property irrespective of voluntary action, show greater promise of reducing highway losses," the researchers concluded.

"In spite of the number of campaigns urging safety belt use, the proportion of vehicle occupants using them is so low that much of the reduction in death and injury that should be achieved by their use is not being realized," the report said.

"Campaigns promoting the use of safety belts have been based on inadequate knowledge of the factors contributing to lack of use. Slogans such as 'buckle up for safety,' 'lock it to me,' 'what's your excuse' and the like have been the hallmarks of these campaigns. If the campaigns have been evaluated at all in terms of effectiveness, the evaluations have been faulty in design and execution. Even with public service time and space contributed by television, radio and newspapers, the cost of these campaigns has usually been high and the results inconclusive," the researchers claimed. They reported that in 1968 alone a campaign by the National Safety Council, which has traditionally sponsored such "buckle-up" drives, used the equivalent of \$51,509,034 in public service time and space in various media.

During a nine-month period in 1971 and early 1972 the Institute sponsored a television advertising campaign consisting of six professionally produced commercials. During the same period observations were made of cars at numerous locations throughout the city in which the campaign was conducted to determine whether safety belt use levels changed from previously observed levels and whether any changes that might occur could be attributed to the television campaign.

At the end of the nine-month period the researchers "concluded that the television campaign did not affect the use of safety belts." In fact, they pointed out, during the time of the campaign the observed level of belt use actually declined. However, they speculated that the decline was not related to the campaign but rather may have been due to seasonal conditions that caused added inconvenience in "having to adjust them (belts) to fit over bulky winter clothing."

The Institute project, which began in 1970, consisted of two parts. The first part of the study, conducted in several other cities, involved roadside observations to determine the extent of belt use. Persons who were observed were later surveyed to determine what influenced them to wear or not to wear safety belts. The results of the first portion of the project were reported earlier. (See *Status Report*, Vol. 6, No. 18, Oct. 4, 1971.)

The initial phase of the Institute project found that the level of lap belt usage varied from a level of 16 per cent of late model car drivers in large metropolitan areas to nine per cent of such drivers in small cities.

Combination lap-and-shoulder belt usage was found to vary from a level of six per cent to one per cent between the same types of areas. By surveying observed belt users and nonusers, the researchers determined that knowing a person who was injured—but not killed—in a car crash, not smoking while driving, having a “higher education” and believing that lap belts are “comfortable and convenient” are all typical of belt users.

That information was used as a partial basis for the six television commercials used in the second segment of the research project. The safety belt messages were developed and produced by a highly-regarded agency with experience in producing public service material as well as product marketing. One of the advertisements, entered in an advertising industry competition, won an award for superiority.

The messages each employed a theme emphasizing possible injuries that could result from nonuse of belts. Some included such product advertising devices as family responsibility and physician endorsement. Each commercial was directed toward one or more specific population segments, including young married adults, parents, small children, teenagers and sports fans.

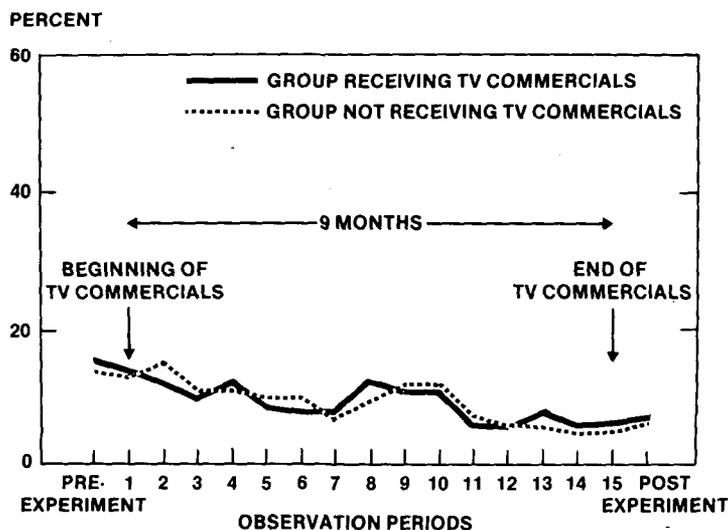
The messages were broadcast over cable television in a medium-size American city that is frequently used for test marketing. The cable has “dual broadcast” capability. The cable system serves about 13,000 households, of which approximately 6,500 were shown the safety belt commercials. The other half of the cable subscribers served as a control group and did not receive them.

The messages were given a level of exposure equivalent to that of major advertising efforts used by companies to promote new products, the researchers said. Unlike many public service announcements, they were broadcast during periods that are considered “prime time.”

The researchers estimated that the average viewer on the cable which broadcast the messages saw one or more of the messages two to three times per week over the nine-month period.

The project report, entitled, “A Controlled Study of the Effect of Television Messages on Safety Belt Use,” was written by Leon S. Robertson, the Institute’s senior behavioral scientist, and other members of the Institute staff. Single draft copies are available on request to “Television,” Insurance Institute for Highway Safety, Suite 300, Watergate Six Hundred, Washington, D.C. 20037.

Seat belt use in group shown television commercials and comparison group



The Six Safety Belt Commercials In Test Project



“Honey, I love you anyway” An attractive woman applies her make-up at a mirror, her back to the camera. Her husband enters, and she asks him not to look at her without make-up. He says, “Honey, I love you anyway.” She turns to him, revealing her scarred face. An off-camera announcer tells how her car crashed while she was driving carefully; but she was not wearing safety belts. Unbuckled safety belts are shown through a shattered windshield. The announcer says: “It’s much easier to wear safety belts than to hear your husband say” Husband’s voice: “Honey, I love you anyway.”



“I make them drive without their safety belts” A “Wicked Car Witch” appears from a puff of smoke beside a car and says she makes parents drive without safety belts. She hides safety belts in a car seat and tangles others as a mother and father get into the car. The “Good Fairy” appears and admonishes children to tell their parents, “Mommy! Daddy! If you love me, wear your safety belts!” The Witch and the Good Fairy argue, and a child runs out on the porch of the house and calls, “Mommy, Daddy! Wear your safety belts.” The Good Fairy again tells children to urge their parents to demonstrate their love by wearing safety belts.



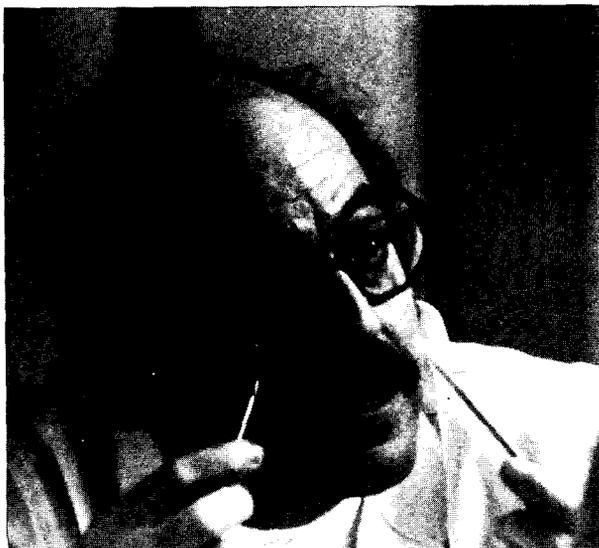
“He was better protected playing football” A father lifts his son from a wheelchair into a car. Safety belts are fastened. Father and son are going to a football game. The father’s thoughts reveal that it is the boy’s first time in a car “since the crash.” He contrasts a football coach’s insistence that players wear padding with his own failure to teach his son to wear safety belts. “I’ve never said anything to him about safety belts, before or since the crash,” the father reminds himself.



“It doesn’t hurt anymore” A pretty girl sits in a rocking chair holding a stuffed toy. She says, “I could go out more, but since the car crash, I just don’t.” She says she goes for walks with her father after dark. “That way I don’t get, you know, stared at.” She turns slowly to reveal a large scar on what was the hidden side of her face. She says, “It doesn’t hurt anymore.” An off-camera announcer says, “Car crashes kill two ways: right away and little by little. Wear your safety belts.”



“Hey, what kind of father are you . . . ?” A young girl is thrown against the dashboard when her father brakes hard to avoid a crash with a car entering from a side street. A policeman arrives and the father complains about the other driver. The officer notices the car is equipped with safety belts and asks why the daughter wasn’t using them. He asks, “Hey, what kind of father are you?” Then, walking away, “When are people gonna learn?” The announcer says off-camera, “It doesn’t take brains to wear safety belts, but it sure is stupid not to.”



“Why in the name of God don’t they put ’em on . . . ?” At a coffee counter a physician complains to colleagues about another crash victim who was not wearing safety belts. A nurse asks if the victim will live and the doctor says, “I guess you could call it living.” He says he is “getting sick” of the crash injuries resulting from non-use of belts. “They’ve got safety belts in the cars. Why . . . why in the name of God don’t they put ’em on?” A waitress asks if the belts make a difference. The doctor smashes a thermometer case to the counter and shows that the thermometer inside is unbroken, protected by its case. The waitress asks, “Really?” and, in disgust, the doctor smashes it to the counter again, unprotected, and the thermometer shatters.

Auto Industry Push Fails To Boost Belt Use

An auto industry effort to promote seat-belt use through an advertising and publicity campaign has failed to get drivers and passengers to buckle up, reports Leon Robertson, senior behavioral scientist for the Insurance Institute for Highway Safety.

Motorists Information, Inc. – an organization formed by the domestic auto industry to promote seat-belt use – conducted a media campaign in Grand Rapids, Mich., in April and May to increase belt awareness, then interviewed a random sample of drivers by telephone to test the results. The survey sponsors reported in June that based on interview samples, those using belts “always” or “most of the time” increased from 29 to 41 percent during the campaign.

Robertson, using direct observation rather than personal interviews, checked traffic in Grand Rapids in July and found 87 percent of the drivers observed not using either lap or shoulder belts.

“Motorists Information failed to note research – well-known among professionals in the field – that found people often claiming to use belts when they have in fact been observed not doing so,” said Robertson.

SEAT BELT USE IN GRAND RAPIDS, MICHIGAN AND MILWAUKEE, WISCONSIN
AFTER AN ADVERTISING CAMPAIGN IN GRAND RAPIDS

	Grand Rapids		Milwaukee	
	Number	Percent	Number	Percent
Drivers				
Lap Belt Only	57	6	54	5
Shoulder Belt	72	7	69	7
None	891	87	894	88
Total	1,020	100	1,017	100
Passengers				
Shoulder Belt Used	14	5	9	3
Shoulder Belt Unused	274	95	329	97
Total	288	100	338	100

Attempting to compare campaign results with normal belt use in another city untouched by the media campaign, Motorists Information also conducted telephone interviews in Milwaukee, Wisc. There, 48 percent of a random sample of drivers claimed belt use “always” or “most of the time.” But Robertson’s survey by personal observation in that city found 88 percent of the drivers using no belts.

“Shoulder belt use was only 7 percent among drivers in each city,” Robertson said, “and even less among passengers – 5 percent in Grand Rapids and 3 percent in Milwaukee.”

In both Grand Rapids and Milwaukee, Robertson selected 10 sites on major thoroughfares. From sidewalk locations at traffic lights or at stop or yield signs, surveyors could check slow-moving vehicles in the right lane of traffic, observing both lap and shoulder belt use of drivers and shoulder belt use of front-seat passengers. More than 1,000 drivers were checked in each city.

NO DIFFERENCE

“It is reasonable to conclude that there is no difference in belt use between Grand Rapids and Milwaukee,” Robertson reported. “No pre-campaign observations were obtained and, therefore, it is impossible to say what effect, if any, the campaign had on belt use in Grand Rapids. It is clear, however, that belt use in Grand Rapids was as abysmally low, despite the advertising campaign, as in Milwaukee, where no campaign was conducted.

“The campaign failed to achieve sustained high belt use if indeed it had any effect. This result is consistent with prior, carefully controlled studies of advertising campaigns which have found no increase in belt use, comparing actually observed belt use before, during and after the campaigns.

“The claims by Motorists Information, Inc., and others that more than 40 percent of drivers are using belts is a myth based on claimed use rather than actually observed use.”

Surveys in 1976 in Baltimore, Detroit, Houston and Los Angeles found 10 percent shoulder belt use in Baltimore and Houston, 11 percent in Detroit and 18 percent in Los Angeles. “The lower use observed in the present study of Grand Rapids and Milwaukee is not surprising,” Robertson commented, “since it has long been known that belt use is lower in smaller cities. The Motorists Information, Inc., campaign is another illustration of the fact that there are no prospects for increasing and sustaining high belt use by persuasion.” (Copies of the report, *Auto Industry Belt Use Campaign Fails*, can be obtained by writing to “Motorist Info Study,” Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C. 20037.)

Detroit Belt Use Push Not Working

A \$1.75 million campaign by auto companies to increase safety belt use in Detroit, Mich., is not working, the Insurance Institute for Highway Safety reported.

The Institute measured belt use at ten sites in Detroit, as well as along many miles of highways in the city. At the sites, it found only 5 percent of drivers wearing lap belts and 8 percent wearing lap and shoulder belts, and only 6 percent of passengers wearing shoulder belts.

Along the highways, it found driver shoulder belt use at 12 percent and passenger use at 9 percent.

The measurements were taken at the mid-point of the auto industry safety belt use campaign announced late in August. The campaign is being conducted by Motorists Information, Inc., organized by the four domestic auto companies last December to conduct educational programs — including media blitzes such as the one now in progress in Detroit — to increase belt use.

In announcing the Institute's findings of continued low belt use in Detroit, William Haddon, Jr., M.D., the research group's president, noted that the current levels of observed belt use at the Detroit sites are "even lower than safety belt use levels observed by us in Detroit at the same sites in the spring of 1976. Despite its great cost and the intensive publicity surrounding it, the Motorists Information blitz has had no positive effect whatsoever."

Haddon said the results "should surprise nobody. The best research has consistently shown, and for years, that even well designed, well intentioned advertising and educational campaigns to increase belt use in America do not work.

"The most recent proof of this was a huge media campaign carried out earlier this year by Motorists Information itself in an attempt to increase belt use in Grand Rapids, Mich. The campaign was a flop; after it ended, we found that 87 percent of drivers in Grand Rapids were wearing neither lap nor shoulder belts. Our findings were, of course of *actually observed* belt use and not of belt use *claims* based on interview or other faulty measuring techniques."

In announcing the Detroit campaign, spokesmen for Motorists Information, Inc., had said that it would cost \$1.75 million, would continue from August 29 to November 7 and would cover, in addition to Detroit, the towns of Flint, Saginaw, Bay City, Midland, Lansing and Jackson, Mich. The Institute's measurements were taken October 3, or about midway through the campaign.

NHTSA Finds Low Usage Of Safety Belts

Safety belts are being used by only 18.5 percent of the nation's drivers, the National Highway Traffic Safety Administration (NHTSA) has reported after a nationwide survey.

Checking more than 84,000 drivers in 16 cities across the country, a NHTSA research contractor found that in cars equipped with lap/shoulder belt combinations there was 22 percent use. However, this usage rate dropped to 15.7 percent in cars equipped with separate lap and shoulder belts, and to 10.4 percent in vehicles having only lap belts.

SURVEY STUDIES PATTERNS OF USE

The survey, conducted from August 1976 through March 1977, attempted to discern patterns of safety belt use and arrived at these conclusions:

- While 29 percent of subcompact car drivers and 20.7 percent of the drivers of compact models use seat belts, the usage rate drops off in larger models such as intermediates (16.2 percent) and standard-sized cars (17.3 percent).
- More foreign car drivers use safety belts than drivers of domestic models. The peak use observed was 44.6 percent by drivers of Volvos.
- In western cities 27.3 percent of drivers were observed using safety belts, while in the East the usage rate was only 12 percent.
- Only 17.3 percent of male drivers observed were using belts, but 20.6 percent of women drivers used them.
- More young drivers (18.8 percent) were observed using belts than drivers over 50 (15.4 percent).
- Heaviest use of safety belts was found in evening rush-hour traffic, where 22.1 percent usage was observed.

The overall usage rate of 18.5 percent observed was consistent with earlier research findings and was particularly significant because of claims of much higher usage that were made by passive-restraints opponents during the recent Congressional hearings. Again, a somewhat higher usage rate (25.2 percent) was found in 1974 model cars, which originally were equipped with the starter interlock and continuous light-buzzer reminder systems.

FINDINGS SUPPORT RESTRAINTS RULING

"It is certainly discouraging to know that less than one in five American drivers are willing to take the simple life-saving step of buckling a safety belt," commented Joan Claybrook, NHTSA administrator. "These findings clearly support the decision to mandate passive restraint systems — a decision based on low belt usage rates and lack of available options to increase such usage."

In related research, the teams who noted safety belt use also checked the proper use of adjustable head restraints in the cars observed. They found a correlation between use of the two items of equipment. Where the head restraints were properly adjusted, 22.9 percent of the drivers were wearing their safety belts. Where the head restraints were not properly set, only 12.4 percent of the drivers used belts.

The safety belt survey was conducted in Atlanta, Baltimore, Birmingham, Boston, Chicago, Dallas, Fargo, N.D.-Morehead, Minn., Houston, Los Angeles, Minneapolis-St. Paul, New York, Phoenix, Pittsburgh, San Diego, San Francisco and Seattle.

Government Survey Disputes Safety Belt Gains

Sponsors of an intensive belt-use advertising program in Michigan have said that it modestly increased auto safety belt use, but their findings are disputed in a study commissioned by the National Highway Traffic Safety Administration.

Motorists Information, Inc., (MII), a safety belt promotion group financed by the domestic auto makers, announced that before-and-after surveys showed an increase of 6.3 percentage points in belt use. The group's surveys, based on more than 40,000 observations of driver belt use at 222 locations in southeastern Michigan, said belt use increased to 21 percent from 14.7 percent as the result of the campaign.

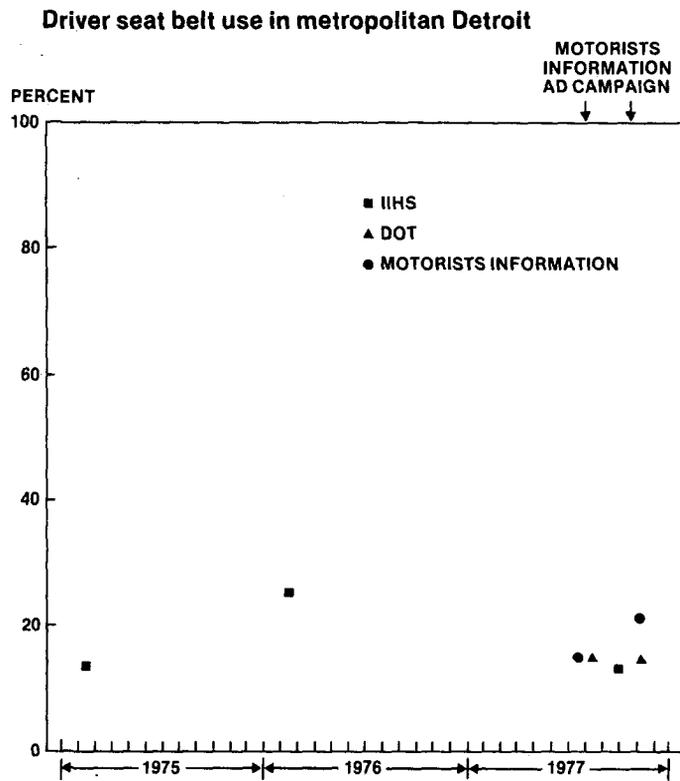
Such an increase meant that more than 387,000 additional Michigan drivers were using safety belts after the statewide campaign, Motorists Information estimated.

However, a NHTSA contractor carried out similar surveys, based on more than 30,000 observations in three Michigan cities, and the Department of Transportation said the result "disputes these findings." In Detroit the NHTSA study showed 15 percent use both before and after the advertising campaign, indicating no response to the "Somebody Needs You" advertising plea. In Marquette the NHTSA survey showed a 12 percent belt use rate both before and after the campaign dates, and in Traverse City belt use declined one percentage point from the pre-campaign level of 17 percent.

Even the more optimistic MII findings showed that "79 percent of the public refused" to use seat belts, observed William Haddon, Jr., M.D., president of the Insurance Institute for Highway Safety. "What the MII results once again demonstrate is not only the need for automatic protection," said Haddon, "but also that manufacturers should speed up their provision of it to the purchasers of their automobiles.

"We're talking about human life, and 21 percent protection of human life is not adequate."

The following figure shows rates of lap belt use by drivers in Detroit, Michigan, during a three-year period. The surveys depicted in this figure are described in the preceding excerpts from *Status Report*.



June 1, 1978

SAFETY BELT USE: A FACT SHEET

Today, according to the latest U.S. Government survey of observed safety belt use, less than 20 percent of Americans are wearing their safety belts -- even in the newest-model cars with the most convenient-to-use belt systems.^{1/}

Is there any conceivable way, whether dependent on voluntary or mandated belt wearing, to increase this clearly unacceptable level of belt use?

Here is a summary of past efforts to increase belt use, as well as research into the failure of such efforts. Also included is a brief discussion of an associated problem, i.e., that even when observed belt use has been increased -- as in some foreign countries which mandated belt wearing by law -- decreases in fatal and serious injuries have not been nearly as impressive as expected.

Mandatory Belt Use Laws: The federal government may not mandate belt use within states; only an individual state government may do so. Advocates of increased belt use have secured, in recent years, introduction of mandatory belt use laws in about 30 states. However, in not one state has such a law been adopted.^{2/}

It seems clear from this pattern of state legislative resistance or indifference to the mandating of belt use that such a course is unacceptable to legislators and their constituents. That conclusion has been bolstered, furthermore, by the findings of public opinion polls, including:

-- A Gallup poll, conducted early in June of 1977, in which 76 percent of those interviewed opposed "a law that would fine a person \$25 if he did not wear a seat belt when riding in an automobile." (In the same poll, 46 percent endorsed the mandatory installation of air bags in new cars while 37 percent opposed the idea and 17 percent had no opinion.)^{3/}

-- A poll conducted by the Motor Vehicle Manufacturers Association in May and June, 1976, in which those interviewed were asked to rate three alternative "courses of action toward safer driving:" a mandatory belt use law, mandatory air bags and nonpayment of auto insurance for not wearing a belt in a crash. Among those interviewed who said they knew what an air bag was, only 41 percent said they would "certainly vote no" on a required air bag, while 49 percent said they would "certainly vote" against mandatory safety belt use and 66 percent said they would vote against nonpayment of insurance.^{4/}

(In the MVMA poll, 50 percent of those interviewed agreed with the statement that "driving should be made more safe than it is today by building more safety devices into cars which cannot be ignored, turned off or removed.")

-- A poll conducted by the Insurance Institute for Highway Safety in July 1976, in which half of those interviewed said they opposed passage of laws requiring that drivers and passengers use active safety belts each time they drive. (In the same poll, a great majority said they would prefer automobiles with increased crash protection that is completely or at least partly automatic -- such as air bags, or active belts and bags in combination -- rather than

crash protection that the driver and passengers must activate each time they get into a car, such as standard safety belts.)^{5/}

While the federal government cannot require belt use within states, it may encourage states to do so. However, after the 1973 Highway Safety Act authorized DOT to make available incentive funds for states passing belt use laws, the House of Representatives voted to deny funds for the grants — thus effectively killing the program. The House action prevailed in the final appropriations bill.^{6/}

Congress's reluctance to promote belt use laws at the state level is consistent with its reversal, in the 1975 Federal-aid Highway Act, of a DOT standard to encourage state passage and maintenance of motorcycle helmet use laws. To date 22 such state laws have been repealed.^{7/}

Voluntary Belt Use Programs: Over the past decade a variety of media and related educational campaigns have been carried out to increase safety belt use; these have cost many millions of dollars. They have had little or no measurable effect on belt use levels. (Since it is well known that even the most successful product advertising results in marketplace shifts of only a few percent at best, this should come as no surprise.)

Below are described some of the more significant belt use campaigns:

-- Most recently, Motorists Information, Inc., an organization formed by the four domestic automobile manufacturing companies specifically to promote belt use, undertook a \$1.75 million media blitz in Detroit and surrounding towns to increase belt use.^{8/} The campaign involved both the electronic media and billboard ads. Highly touted by Motorists Information and the manufacturers as having a high chance of success, the campaign's results were measured on October 3, just midway through the life of the ten-week campaign.

The measurements, by the Insurance Institute for Highway Safety, were of actually observed safety belt use at 10 representative Detroit sites and along many miles of the city's highways. They found that:

-- At the sites, only five percent of drivers were wearing lap belts, and eight percent were wearing lap and-shoulder belts, and only six percent of passengers were wearing shoulder belts. (Because of the observation technique, lap belt use for passengers not wearing shoulder belts — as in older cars, with separate lap and shoulder belts — could not be observed.) This was "even lower than safety belt use levels observed by us in Detroit at the same sites in the spring of 1976," the Institute reported.

-- Along the highways in and around Detroit, shoulder belt use was measured at 12 percent for drivers and 9 percent for passengers.

-- Motorists Information earlier last year conducted a similar campaign in Grand Rapids, Michigan and claimed that its result was to increase belt use there from 29 to 41 percent. However, it turned out that the claim was based on telephone interviewing of motorists — a technique well known to researchers as totally unreliable in assessing belt use — rather than on actually observed belt use. Subsequently the Insurance Institute for Highway Safety, on the basis of extensive observations in Grand Rapids, reported that belt use levels there at the conclusion of the campaign were so low that only 13 percent of ^{9/} drivers were wearing any belts at all.

-- The U.S. Department of Transportation, among other activities intended to promote belt use, has spent \$750,000 over the past five years to develop, print and distribute ten different pamphlets on belt usage, which have been made available to elementary schools, driver education teachers, college and

university administrators of driver education preparation programs, audio-visual centers, insurance companies and others, with no discerned effect of increasing belt use. In addition the Department expended \$82,500 on combined safety belt use-drunk driving television spot commercials, and undisclosed amounts on promotion of safety belt use in DOT films, slide shows and public service radio commercials. The value of public service media time and space devoted to showing such DOT materials is estimated to be in the many millions of dollars. ^{10/}

-- The National Safety Council, American Safety Belt Council and other organizations have spent large sums of money in attempts to promote belt use in recent years. For instance, a 1968 campaign by the National Safety Council, similar to ones it carried out also in 1972 and 1973, used more than \$51 million worth of public service media time and space, and cost the council \$50-60,000 in direct costs. ^{11/}

Research Into Belt Use Promotion: During a nine-month period in 1971-72, a definitive study of the effect of safety belt use commercials on television was carried out by the Insurance Institute for Highway Safety. ^{12/} In the study, a package of top-quality television commercials — of such excellence that they subsequently won a number of awards in advertising industry competitions — was developed to promote belt use. The messages were shown intensively during prime and other selected time on one cable of a dual cable television system, designed for marketing studies, in a medium-sized middle Atlantic city. In other words, while one cable of 6,400 households in the city received the messages, another cable of similar size, serving households only a few doors away from the message recipients, did not.

Before and during the life of the campaign, widescale measurements were taken of observed belt use not only in the city as a whole, but specifically for households on the two cables. These observational measurements

continued through the life of the campaign — which, had it been sponsored on a national basis, would have cost approximately \$7 million.

The campaign had no effect whatsoever on safety belt use. Before, during and at the close of the campaign, belt use levels were virtually identical for those on the cable carrying the commercials and those on the other cable — as well as for others in the city not receiving either cable. In all cases, belt use did not increase and was less than 20 percent throughout.

(The Institute has spent, on this and a range of other belt use research, approximately \$500,000 in direct expenditures.)^{13/}

Increased Belt Use Vs. Injury Reduction: In another Institute study, belt use in automobiles was observed in 19 cities in five countries. In jurisdictions with belt use laws, belt use ranged from a high of 83 percent (in Sydney, Australia) to a low of less than one percent (at expressway exits in Japan). Prior to the belt law in Ontario and in Quebec, Canada — and in the United States with a continued lack of such laws — belt use ranged from a high of 33 percent in Los Angeles to a low of four percent in Windsor, Ontario. Persons less than 20 years of age were observed using belts less often than adults and many people were wearing belts too loosely for them to be effective in crashes.^{14/}

Estimates of reductions in injuries and fatalities have varied widely. In Sweden, belt use rose from less than 50 percent before a law to more than 80 percent afterwards, but the deaths and injuries changed little in the subsequent two years compared to the prior five years. A 10 to 20 percent reduction in fatal injuries has been reported in some countries when belt use laws were introduced — a reduction not as large as would be expected from the known effects of belts and the belt use levels resulting from the laws. This is because when usage becomes mandatory the increases in belt

usage occur disproportionately among people who are less likely to be involved in severe crashes — belt usage among young people and persons with high blood alcohol concentrations, for example, remains low. In addition belt usage is lower at times and places where severe crashes are more likely — at night and in rural areas, for example. Finally, mandatory belt laws increase the rate of improper belt usage — for example, belts are worn much too loosely, and consequently their effectiveness is reduced substantially. ^{15/}

FOOTNOTES

1. United States Department of Transportation/National Highway Traffic Safety Administration. DOT/NHTSA Belt Usage Survey Results, Washington: United States Department of Transportation, September 1, 1977.
2. Telephone Conversation with public relations representative for the American Safety Belt Council, November 8, 1977.
3. Gallup, George. "Public Votes 46 to 37% in Favor of Required Air Bags," The Gallup Poll, released Sunday, July 24, 1977. Chicago: Field Newspaper Syndicate.
4. Insurance Institute for Highway Safety. "MVMA Poll: Air Bags 'Least Objectionable'," Status Report, Vol. 11, No. 16, October 12, 1976, p. 4. Washington: Insurance Institute for Highway Safety.
5. Robertson, Leon S. "Car Crashes: Perceived Vulnerability and Willingness to Pay for Crash Protection." Journal of Community Health, Vol. 3, No. 2 (Winter 1971), pp. 136-141.
6. Insurance Institute for Highway Safety. "House Would Cut Funds for Belt Law Incentives," Status Report, Vol. 9, No. 13, July 8, 1974, p. 12. Washington: Insurance Institute for Highway Safety.
7. Insurance Institute for Highway Safety. "Bills Would Cripple Safety Standards," Status Report, Vol. 10, No. 21, December 23, 1975, p. 1. Washington: Insurance Institute for Highway Safety.
8. Insurance Institute for Highway Safety. "Detroit Belt Use Push Not Working," Status Report, Vol. 12, No. 15, October 13, 1977, p. 8. Washington: Insurance Institute for Highway Safety.
9. Robertson, Leon S. Auto Industry Belt Use Campaign Fails, Washington: Insurance Institute for Highway Safety, August 1977.

Insurance Institute for Highway Safety. "Auto Industry Push Fails to Boost Belt Use," Status Report, Vol. 12, No. 13, August 15, 1977, p. 1. Washington: Insurance Institute for Highway Safety.
10. Telephone Conversation with Department of Transportation Office of Public Affairs, October 1977.
11. Telephone Conversation with National Safety Council Staff, October 1977.
12. Robertson, Leon S., Ph.D.; Kelley, Albert B.; O'Neill, Brian; Wixom, Charles W.; Eiswirth, Richard S.; Haddon, William, Jr., M.D. "A Controlled Study of the Effect of Television Messages on Safety Belt Use," American Journal of Public Health, Vol. 64, No. 11 (November 1974) pp. 1071-1080.

13. Letter from Ben Kelley, Insurance Institute for Highway Safety, to The Honorable Robert O. Griffin, U.S. Senator (R-Mich.), Member of Committee on Commerce, Science and Transportation, September 23, 1977. (Letter written in response to Senator Griffin's inquiry at the Senate Consumer Subcommittee hearings of September 9, 1977, on the passive restraint decision by the U.S. Department of Transportation.)
14. Robertson, Leon S. Automobile Seat Belt Use in Selected Countries, States and Provinces with and without Laws Requiring Belt Use, Washington: Insurance Institute for Highway Safety, April 1977.
15. Robertson, Leon S. and Williams, Allan F. Some International Comparisons of the Effects of Motor Vehicle Seat Belt Use and Child Restraint Laws. Presented at University of Tennessee, Nashville, Tennessee, May 10, 1978.