

Belt Use Laws Have Limited Effect For Children

Belt use laws, which have brought some limited benefits in preventing death and serious injury to adults in auto crashes, have not extended the same protection to child passengers, a new research study has explained.

Allan F. Williams, Ph.D., of the Insurance Institute for Highway Safety research staff, has pointed out that various countries other than the United States have enacted seat belt use laws in recent years. Many have resulted in moderate increases in belt use, and some are credited with 10 to 20 percent reductions in vehicle occupant deaths. However, all the legislation in force through 1975 exempted children of various ages and sizes from restraint use requirements.

The exemptions often were made, Williams observed, because of "scientifically unfounded" beliefs that differences in structure and biological makeup between adults and children make seat belt systems designed for adult use unsuitable — and even dangerous — for children. "The empirical evidence now available from several countries indicates that infants and children *can* be protected by seat belts," the researcher reported. "There is increasing recognition that this is so, and that infants and children should not be exempted from belt use requirements on this basis."

BELTS HELP CHILDREN TOO

For example, Swedish research based on 683 crashes involving at least one child under the age of 15, found that belted children were less likely than unbelted children to be injured, that children were protected by seat belts to the same degree as adults, and that neck injuries resulting from shoulder straps passing close to the necks of child occupants were not a problem.

"In some European countries that require belt use in front seats," Williams said, "children are required to sit in back seats, where belts are usually not available."

The result of such laws, the researcher said, has been that most children who have outgrown or do not have child restraints are, in effect, required to be unrestrained. "Although back seat travel is preferable to front seat travel for unrestrained as well as restrained children," Williams pointed out, "it has been found that restrained child passengers — whether in front or back seats — are less likely to be injured than unrestrained children even in back seats."

In recent months there has been a movement toward extending restraint use legislation to cover children and infants, but there are shortcomings in the laws that limit their potential effectiveness, and early results of their application, Williams observes, are modest. "For example, the Australian child

restraint legislation [which in most cases prescribes use of either child restraints or seat belts for children] has been much less effective in increasing child use rates than Australian belt use laws for adults . . . ,” he notes.

CHILDREN ALLOWED ON LAPS

Although no state in the United States has passed a belt use law for adults, Tennessee has had a child restraint law since Jan. 1, 1978. A study of the early effects of the law indicated that while child restraint use increased, more than 80 percent of the child passengers still were unrestrained. (See *Status Report*, Vol. 13, No. 7, May 31, 1978.) It was particularly noted that a loophole in the law allowing children to travel on the laps of adults was dangerous. (See *Status Report*, Vol. 13, No. 5, April 12, 1978.)

“The 10 to 20 percent reductions in occupant fatalities estimated to result from some of the belt use laws for adults is probably the maximum effect achievable,” Williams commented. “At the worst, child restraint laws may have no positive effects on fatalities, and possibly even negative effects, e.g., in cases such as Tennessee where the law may promote harmful practices.”

This being true, the researcher concluded, it is likely that significant improvements in the protection of children in automobiles are achievable only through requirements for passive protection systems, rather than relying on active restraints that require action by the individual.

A copy of the study, “Restraint Use Legislation: Its Prospects for Increasing the Protection of Children in Cars,” is available from the Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

Even When Colliding With Each Other

Small Cars Show The Greater Injury Risks

Small-car drivers run twice the risk of being seriously injured or killed in crashes as drivers of larger cars, a study from the University of North Carolina has concluded. In a research study performed for the National Highway Traffic Safety Administration, the Highway Safety Research Center found that approximately 25 percent of the drivers of the smallest cars “receive injuries in crashes, while 14 percent of the drivers in the heaviest weight cars receive injuries.”

Overall, the researchers found that 4.4 percent of the drivers of cars weighing 2,000 lbs. or less were killed or seriously injured, contrasted to 2.1 percent of the drivers in cars weighing more than 3,950 lbs.

The study noted that the outcome of a crash depended upon a variety of factors, including whether the driver was belted, the rate of speed, and the angle at which the car struck an object. However, in line with findings from other studies, vehicle size and weight played an important role in the severity of a vehicle-to-vehicle crash, particularly in crashes between trucks and cars. (See *Status Report*, Vol. 10, No. 12, July 9, 1975.) The researchers emphasized the importance of “distinguishing between vehicle size and vehicle weight” as a factor in crashes because “weight is essentially a ‘hostile’ property and size a ‘protective’ property in crashes.”

(Researchers for Minicars, Inc., under contract with the Department of Transportation, have shown that it is possible to make cars that weigh less than 3,000 lbs. but retain enough size and energy-absorbing characteristics to provide adequate crash protection for occupants. See *Status Report*, Vol. 13, No. 6, May 8, 1978.)

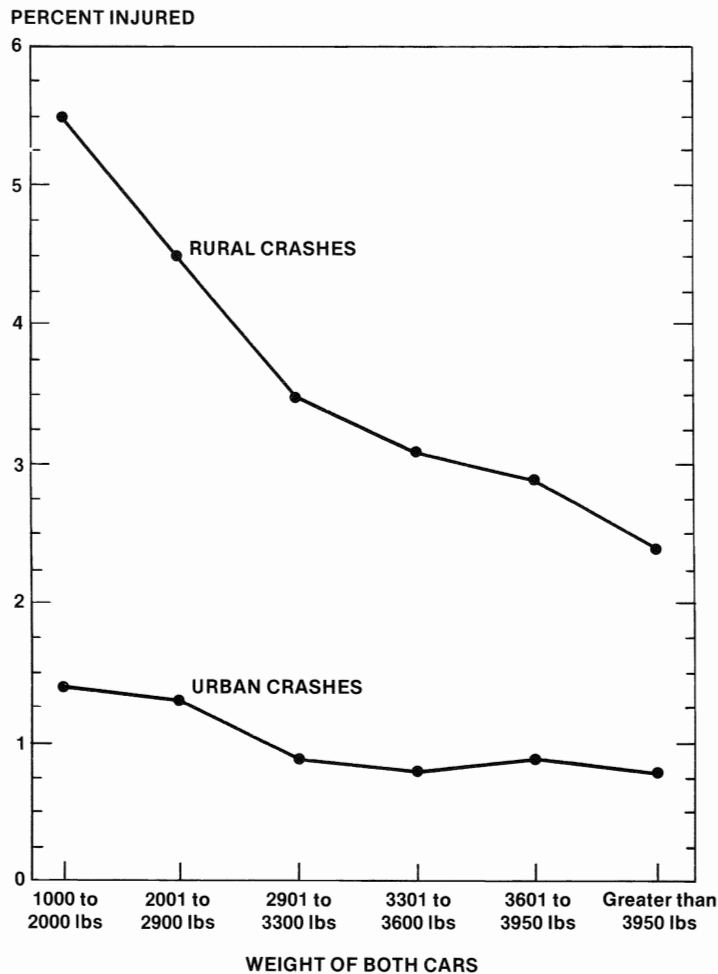
The North Carolina study showed that even in crashes between vehicles of the same weight, drivers of light cars were twice as likely to be injured or killed as drivers of heavier cars. (See accompanying graph.)

The researchers also found that:

- Crashes in rural areas tended to be much more severe than crashes in urban areas, a characteristic attributed to higher crash speed.
- The percentage of belted drivers killed or seriously injured in two-car and single-vehicle crashes was “less than half that for unbelted drivers” in each weight category.
- While injury and death rates were higher in single-vehicle crashes, a finding also attributed to higher crash speeds, the researchers saw “no trend” in single-vehicle crashes that could be linked to vehicle weight.

The data for the study were based on accident reports filed by the police in North Carolina from 1973 through 1975, containing a total of 655,534 crash reports. Copies of “A Categorical Analysis of the Relationship Between Vehicle Weight and Driver Injury in Automobile Accidents,” by J. Richard Stewart and Jane C. Stutts, are available for \$3.50 from the Highway Safety Research Center, University of North Carolina, Chapel Hill, North Carolina 17514.

Serious and fatal injuries in crashes between two cars of equal weight



NHTSA Amends Passive Belt Requirements

The National Highway Traffic Safety Administration (NHTSA) has amended two safety standards in order to encourage the manufacture of passive seat belts that won't be disconnected permanently and that are comfortable and convenient.

In response to a petition from General Motors, the agency amended Federal Motor Vehicle Safety Standard (FMVSS) 208 to give manufacturers the option of using passive, or automatic, belts with emergency release mechanisms other than pushbutton buckles. GM is interested in using passive shoulder belts with a "spool release." The design is intended to "minimize the disconnection of the passive belt system by motorists," the agency said.

FMVSS 208 previously required that all seat belts be releasable by a latch mechanism. Under the earlier requirements, NHTSA said passive belts "could be easily disconnected by a buckle release identical to buckles on current active belt systems" – belts that motorists put into place manually. "As long as the belt remains disconnected, the 'passivity' of the system would be destroyed for future use," it noted.

The GM shoulder belt would not detach at either end, and its spool release would permit the belt to "play out" or unwind in an emergency, allowing "sufficient slack for the door to be opened and the occupant to exit from the vehicle," NHTSA explained.

AUTOMATIC OR MANUAL RESTORATION?

In issuing the new rule, the agency noted recommendations that spool mechanisms should have a self-restoring feature which would automatically retract a passive belt after its manual release has been activated to allow it to unwind. NHTSA said that although automatic restoration "does not require the vehicle user to have any knowledge of the system to reactivate the passive belt," manual restoration designs "would be less complex and would probably be more reliable." The amendment allows manufacturers to experiment with various emergency release mechanisms and permits both types of restoration systems.

When the driver's passive belt system is inoperable because a release mechanism has been activated, the FMVSS 208 revision requires that an audible warning signal sound for four to eight seconds, and that a warning light remain illuminated until the mechanism is deactivated. If the passive belt has a latching mechanism, the light must stay on until the belt is connected. The warning light provision supplements an existing requirement that a four- to eight-second signal sound when a driver's belt with a latching mechanism is disconnected.

In order to encourage efforts to design comfortable and convenient passive belts, NHTSA has amended FMVSS 210 to eliminate anchorage location requirements for the systems. However, NHTSA said anchorage location will be indirectly controlled by the necessity that passive belts comply with frontal crash protection requirements specified in FMVSS 208.

The amendment is intended to "give manufacturers wider latitude in passive belt design in order to facilitate the early introduction of passive restraints in existing passenger car designs," NHTSA said.

CONCERNS OVER HARDWARE HAZARDS

The agency noted concern expressed by the Center for Auto Safety (CAS) that the amendment may decrease occupant protection by allowing passive belt hardware to be placed in areas likely to be struck by the occupant's head in a side impact. NHTSA said that although present requirements do not prohibit the

placement of hardware in these areas, the agency is planning to upgrade side-impact requirements. In anticipation of these requirements, manufacturers should design passive belts so that they "will not compromise side-impact protection," NHTSA said.

The agency also noted CAS concern that the amendment may result in designs that do not adequately restrain the occupant from sliding forward under or from moving laterally under the belt in a crash. NHTSA commented that the Center's concern is not supported by data. But it said it plans to closely examine the performance of passive belt systems and stressed that the amendment is "only an interim measure." The agency said that separate anchorage location requirements for passive belts will be issued following research to determine "the optimum locations for passive belt effectiveness, comfort, and convenience."

Missouri Judge Blocks State Contract For Breath Testers

A Missouri judge's action in blocking state purchase of one type of breath-testing equipment has raised questions about federal standards for the devices, used in policing drunken driving violations.

The Missouri judge recently issued a permanent injunction to keep state officials from buying a breath-tester model that he ruled might not distinguish between drunken drivers and dieters or diabetics, even though this instrument met the federal standards for evidential breath-test instruments and was on the Department of Transportation's approved products list. The judgment blocked the purchase of 226 Intoxilyzers from CMI, Inc., of Colorado, low bidder for the state contract. The injunction was issued on the complaint of a competing company, Intoximeters, Inc., of St. Louis.

The problem cited by the court decision is that the Intoxilyzer, which uses the absorption of infrared light by the specimen from the suspect driver to analyze its alcohol content, cannot distinguish between acetone and ethanol (alcohol) in the breath. Thus, the judge found, "a person with breath acetone can register a positive reading on the Intoxilyzer's digital display, even if that person is an alcohol-free subject."

Evidence in the court hearing indicated that amounts of acetone can appear in the breath of persons on low-carbohydrate diets as well as in the breath of diabetics. Because such persons could be placed in jeopardy by use of the non-specific devices, the judge ruled, "The citizen's constitutional and legal rights must be protected even if he is only part of a small minority."

STATE, FEDERAL RULES MAY BE AFFECTED

The Missouri litigation has been watched by officials from other states where specifications for purchase of breath-testing equipment are being written. Officials of the National Highway Traffic Safety Administration (NHTSA) also have been studying the situation for its effects on equipment standards under which NHTSA is distributing federal funds for breath-tester purchases.

Anticipating the possibility of acetone interference with alcohol breath-testing equipment, NHTSA has under way several research programs to identify the scope of the problem. These programs are studying:

- Sensitivity of commercially available alcohol breath-testing equipment to acetone. The study is expected to be completed in January 1979.

(Cont'd on page 6)

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- Collection of state data from those states that have used gas chromatography equipment, such as the Intoximeter instrument, which is capable of individually measuring the alcohol and acetone concentrations of breath samples. This project also is to be completed in January 1979.

- The acetone levels in humans, testing groups of subjects, such as dieters and diabetics, likely to have acetone in their systems. NHTSA, which at present has no plans to investigate substances other than acetone whose presence in the breath might also conceivably interfere, expects this work to be completed in July 1979.

- The nature and extent of the interaction of various amounts of alcohol and acetone on measurements of Breath Alcohol Concentration. The expected completion date is August or September 1979.

'Ice Cream Truck' Ordinance Seen Cutting Pedestrian Injuries

A Detroit ordinance requiring motorists to stop before passing an ice cream truck displaying a stop sign and flashing lights has cut child pedestrian "accidents" by 77 percent, according to a study performed for the National Highway Traffic Safety Administration (NHTSA).

According to the report, about 1.5 percent of all urban pedestrian injuries involve children, between the ages of 2 to 10, struck while approaching or leaving ice cream vendors. Before the model traffic law went into effect in June 1976, field tests showed that the average speed of cars approaching vending trucks was 28 mph. Following the new law, speeds were reduced to 16 mph, in 1976 and 1977.

Vendor-related injuries among child pedestrians had averaged about 49 a year between 1973 and 1975, the researchers said, "but were reduced to 11 in 1977, a 77 percent reduction."

Despite a nationwide trend of reduced pedestrian injuries, the ordinance was credited with the sharp decline.

Under the "ice cream truck" law, ice cream vendors are required to install roof-mounted flashing lights and a swing stop arm, to be activated anytime a truck is stopped to sell ice cream. Motorists are required to stop before passing the activated lights and stop sign, and yield to pedestrians crossing the street. The law also restricts ice cream vendors to low-speed, low-volume streets.

The report, "Experimental Field Test of the Model Ice Cream Truck Ordinance in Detroit," by Allen Hale, Richard D. Blomberg, and David Preusser may be obtained by asking for DOT HS 803 410, National Technical Information Service, Springfield, Virginia 22161.

UPDATE . . .

MULTIPIECE WHEEL PETITION: The Insurance Institute for Highway Safety has notified NHTSA of two errors in its petition of Oct. 2, 1978, for the initiation of rulemaking that would, in effect, ban manufacture of multipiece wheels for trucks, buses, and campers. (See *Status Report*, Vol. 13, No. 14, Oct. 11, 1978). The two items for which the Institute submitted corrections concerned:

- Tires used in demonstration testing, which were incorrectly identified as Firestone Traction Hi-Miler tires. These should have been identified as Uniroyal Fleetmaster tires.

- A report of multipiece wheel and rim separation that incorrectly described the rim as a Redco three-piece rim. The incident actually involved a Redco rim base of two-piece design mismatched with a Firestone continuous side ring and lock ring.

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CONSTRUCTION ZONE SAFETY: Final rules on steps state highway departments must take to improve the safety in construction and maintenance areas for both motorists and workers have been published by the FHWA. The FHWA had agreed to develop such national standards as part of a court-approved settlement in 1976 of a suit brought by members of the Center for Auto Safety, the AFL-CIO, and motorists in Virginia. (See *Status Report*, Vol. 11, No. 15, Sept. 23, 1976).

The new rules require that a specific plan for safe traffic handling be developed for each project; that responsibility for correctly implementing the plan on the job be assigned to a named individual; that all persons responsible for development, design, implementation, and inspection of work zone traffic control must be "adequately trained"; that all work zone traffic devices and traffic control services to be provided by the contractor should be separate pay items, rather than purchased as a "lump sum"; and that states should monitor selected projects to determine the effectiveness of their safety procedures and adjust them where necessary.

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CERTIFICATION ACCEPTANCE: The Federal Highway Administration (FHWA) has issued final regulations for the Certification Acceptance program, an arrangement that permits states to carry out federally funded highway projects under their own laws and standards if FHWA believes the state standards "will accomplish the policies and objectives" of federal highway law.

The Certification Acceptance program is the subject of a lawsuit filed by the Center for Auto Safety in 1974 (see *Status Report*, Vol. 12, No. 17, Nov. 30, 1977). In that case, the U.S. District Court for the District of Columbia has ruled that FHWA used the American Association of State Highway and Transportation Officials as an advisory group in developing the regulations without following proper administrative procedures and also has ordered FHWA to reconsider its decision to permit Georgia to operate under the program. The latest action by FHWA, issuance of regulations in final form, paves the way for judicial review of the substance of the regulations themselves.

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