

Status Report

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.

Crash Tests Show Costly Vehicle Design Defects

The designs of too many new cars are resulting in unnecessary, high-cost crash damage in their low-speed impacts, the Insurance Institute for Highway Safety has told the Senate Consumer Subcommittee.

The costs of damage to 1978-model cars in Institute crash tests varied widely – from \$15 to a Volkswagen Dasher to \$421 to a Datsun B210 in one 5 m.p.h. frontal collision test, in which a concrete barrier was struck at an angle. This indicates that the more severely damaged cars "are designed in ways that needlessly produce excessive losses for their owners and insurers in low-speed collisions," Ben Kelley, the Institute's senior vice president, testified at the Senate oversight hearings on federal motor vehicle safety and property damage standards.

IMPROVED BUMPER IS DEMONSTRATED

Technology "has been available for years to preclude any damage" in low-speed crashes, Kelley testified. The testimony included a filmed demonstration of a bumper developed for the Institute which, Kelley noted, prevented any damage to itself, or to the 1977 Gremlin to which it was attached, in a direct, 7 m.p.h. frontal collision into a concrete barrier – a higher speed impact than those specified by federal bumper standards that take effect beginning with the 1979 model year. (See *Status Report*, Vol. 12, No. 16, Nov. 8, 1977.) No damage was sustained when the Gremlin was tested in a 5 m.p.h. angled frontal collision, the film showed, but a 1977 Gremlin mounted with its conventional bumper sustained \$236 worth of damage in the same test.

The subcommittee also saw filmed highlights of the Institute's tests of 21 of the 1978 models. Damage was measured at 5 and/or 10 m.p.h. in three types of crashes: rear-end collisions into a pole, angled frontal collisions into a concrete barrier, and front-into-rear collisions involving two identical vehicles (see table).

In the subcompact category, the Plymouth Horizon had the lowest estimated repair costs for all the tests combined (\$815), while the Datsun B210 had the highest (\$1,847). The compact with the lowest estimated repair cost was the Plymouth Volare (\$1,453), while the Ford Fairmont had the highest

**INSURANCE INSTITUTE FOR HIGHWAY SAFETY
1978 MODEL LOW SPEED CRASH TEST RESULTS ^{1,2}**

MODEL	5 MPH FRONT INTO ANGLE BARRIER	5 MPH REAR INTO POLE	10 MPH FRONT INTO ANGLE BARRIER	10 MPH FRONT INTO REAR			TOTAL DAMAGE ALL TESTS
				FRONT DAMAGE	REAR DAMAGE	DAMAGE TO BOTH	
INTERMEDIATE:							
Chevrolet Impala	\$319	\$200	\$849	\$199	\$160	\$359	\$1,727
Chrysler Cordoba	273	138	875	300	369	669	1,955
Ford LTD II	273	151	820	316	195	511	1,755
AVERAGES:	288	163	848	272	241	513	1,812
COMPACT:							
AMC Concord	372	248	914	62	136	198	1,732
Buick Skylark	237	201	735	185	258	443	1,616
Chevrolet Chevelle	226	173	937	90	143	233	1,569
Chevrolet Monte Carlo	238	107	1,068	39	105	144	1,557
Ford Fairmont	282	278	858	304	248	552	1,970
Plymouth Volare	200	203	789	130	131	261	1,453
Volvo 244DL	171	13	1,306	49	4	53	1,543
AVERAGES:	247	175	944	123	146	269	1,634
SUBCOMPACT:							
Chevrolet Chevette	206	121	586	7	181	188	1,101
Chevrolet Monza	122	229	741	155	212	367	1,459
Datsun B210	421	329	940	73	84	157	1,847
Ford Fiesta	146	126	677	9	165	174	1,123
Ford Pinto	290	195	639	230	210	440	1,564
Honda Accord	206	231	735	20	60	80	1,252
Plymouth Horizon	110	90	532	66	17	83	815
Toyota Celica	186	206	620	28	137	165	1,177
Toyota Corolla	384	258	861	140	188	328	1,831
VW Dasher	15	406	921	6	88	94	1,436
VW Rabbit	231	111	1,152	14	151	165	1,659
AVERAGES:	211	209	764	68	136	204	1,389
OVERALL AVERAGES:	\$234	\$191	\$836	\$115	\$154	\$270	\$1,531

¹ Each damage appraisal is prepared by three (3) members of an independent damage appraisal service using a labor rate of \$11 per hour.

² Rounded to nearest dollar.

IIHS, March 23, 1978

(\$1,970). Of the three intermediate-size cars tested, the Chevrolet Impala had the lowest estimated cost (\$1,727), and the Chrysler Cordoba had the highest (\$1,955).

DOORS JAM IN CRASH TESTS

In his statement to the subcommittee, Kelley said the tests also revealed that:

- An “alarming” number of the doors of the vehicles tested jammed shut in the low-speed impacts, which, in addition to increasing repair costs when the doors were finally forced open, would deny passengers a quick emergency exit (see table).
- Bumpers on some cars are continuing to pass over and under each other in collisions, despite NHTSA’s stated intention of eliminating bumper “mismatch.”
- Of the intermediate-size cars tested, the Chevrolet Impala had the lightest bumper as well as the least costly damage, which “puts the lie to the claim that somehow bumpers that meet the very modest federal standards have to be heavier.”

(Cont'd on page 4)

(Cont'd from page 3)

● Manufacturer decisions to use filler panels or gravel shields – sheets of steel or plastic that are placed between the bumper and the car which “serve nothing but cosmetic purposes” – are adding “unnecessarily and inordinately” to the amount of damage in low-speed crashes. Kelley noted that NHTSA recently barred low-speed crash damage to the shields or panels on new cars beginning in model year 1980. (See *Status Report*, Vol. 13, No. 4, March 23, 1978.)

PROPERTY DAMAGE STILL NOT LIMITED

Consumers “can and should expect much more from NHTSA” in the future in setting property damage standards in low-speed crashes, Kelley said. Bumpers are now required to prevent damage in low-speed crashes to certain safety-related vehicle parts including hoods, headlights, taillights, and exhaust systems, but no limit exists on property damage. In model year 1979, however, NHTSA is scheduled to require bumpers to protect new cars from damage in a direct 5 m.p.h. collision into a concrete barrier, and in tests in which a weighted pendulum is swung at 5 m.p.h. squarely into the cars’ bumpers, and at 3 m.p.h. into the corners of the bumpers. But under the new standard, damage to the bumper and its fasteners is unrestricted until model year 1980, when only minimal damage will be allowed.

(Cont'd on page 5)

INSURANCE INSTITUTE FOR HIGHWAY SAFETY 1978 MODEL LOW SPEED CRASH TESTED VEHICLES WITH JAMMED DOORS

MODEL	JAMMED DOORS	FRONT INTO ANGLE BARRIER TEST ⁽¹⁾
INTERMEDIATE: Chevrolet Impala Ford LTD II	Right Front Right Front Right Front	10 mph 5 mph 10 mph
COMPACT: Chevrolet Chevelle Ford Fairmont Volvo 244DL	Right Front Right Front Right Front Right Front	10 mph 5 mph 10 mph 10 mph
SUBCOMPACT: Chevrolet Chevette ⁽²⁾ Ford Fiesta ⁽³⁾ Honda Accord VW Rabbit ⁽⁴⁾	Right Front Right Front Left Front Right Front	10 mph 10 mph 10 mph 10 mph

(1) Right front of vehicle impacted barrier.

(2) Opened approximately 5 inches before jamming.

(3) Opened approximately 2 inches before jamming.

(4) Opened approximately 14 inches before jamming.

Asked by subcommittee chairman Sen. Wendell Ford (D.-Ky.) what changes he recommended in the property damage requirements, Kelley called the tests under the new standard “very limited” and said NHTSA should consider looking at a “wider variation of crashes that occur in the real world and attempt to replicate” them in its test work. He also urged NHTSA to consider requiring protection from property damage in crashes at higher speeds, and that the damage standard be extended to apply to vehicles other than automobiles.

Kelley noted that 10 m.p.h. – the highest collision speed used in the Institute tests – is well within the range of speeds for which NHTSA has said it can impose limits on property damage. NHTSA has interpreted the Motor Vehicle Information and Cost Savings Act to allow requirements protecting vehicles from property damage in collisions at speeds as high as 20 m.p.h.

Holding Children On Laps During Auto Travel Risky

Parents who think they are protecting their children by holding them in their laps while traveling in automobiles are actually increasing the risk of serious – including fatal – injuries in crashes, according to a researcher for the Insurance Institute for Highway Safety. In his report, “Warning: In Cars, Parents May Be Hazardous to Their Children’s Health,” Dr. Allan Williams has warned that “drivers on the average, take better care of themselves . . . than of children” when they transport them in vehicles.

It has been well-documented by an earlier Institute study that children usually travel unrestrained. One common travel mode, especially among infants, is on the lap of an adult. In a 1974 Institute survey, 44 percent of infants less than one year of age were observed being carried on someone’s lap rather than in approved infant carriers, while 26 percent of the children between the age of one and two were on laps. (See *Status Report*, Vol. 10, No. 10, May 12, 1975.)

CHILDREN PLACED IN ADDED JEOPARDY

According to the report, infants held on laps cannot be adequately protected against crash forces by adult arms, and they are placed in further jeopardy because of the likelihood of their being crushed by the persons holding them. In frontal crashes, both child and adult continue to move forward as the vehicle comes to an abrupt halt, causing the child to be crushed between the person holding him and unyielding interior surfaces such as window frames, instrument panels, doors, and even floors.

According to Williams’ study of 53 cases in which children traveling on laps were injured, “injuries due to probable or definite occupant-to-occupant contact were reported in 42 percent of the cases.” The injuries ranged from lacerations to fatal injuries resulting from crushing.

In one case a 14-month-old boy was being held on the lap of a passenger in the rear seat of a car. After the vehicle crashed, the child was found face-down, with the adult on top of him. He died of a brain injury and had sustained multiple fractures and cuts from contact with the back of the front seat and the adult. In the same crash, a nine-year-old passenger, sitting beside the adult and wearing a lap belt, received no injuries.

While the need for parental education concerning the hazards of on-lap travel was stressed, the report indicated that, even with increased information and persuasion, parents won’t necessarily respond to the need to use effective child restraints.

(Cont’d on page 6)

(Cont'd from page 5)

EDUCATIONAL EFFORTS CITED

The report noted an earlier study of three educational programs designed to teach mothers to protect their babies. (See *Status Report*, Vol. 12, No. 15, Oct. 13, 1977.) The educational effort did not succeed in getting mothers to use child restraints properly, according to the evaluation. "The most common mode of travel in each group was on laps, even though the dangers of this practice were specifically addressed in the literature provided and in personal discussions," said Williams.

While parental education is important, the study stated, introduction of passive protective systems holds the most hope for reducing injuries and deaths among children. These "passive" strategies include increasing the crash padding of vehicle interiors and introducing air bags that work automatically when needed in crashes.

The report warned that parents should be made aware of the dangers they are inflicting upon their children when they travel with them on their laps. "They are exposing the children to the risk of unnecessary crash injuries and creating situations in which they themselves are likely to inflict injuries on their children through bodily contact — no different in end result than if they batter their children deliberately," the researcher explained.

Burn Injuries Significant Public Health Problem

A recent epidemiologic survey of burn injuries resulting in hospitalization in upstate New York shows that motor vehicles accounted for 8.5 percent of total burn injury hospitalizations during 1974 and 1975.

The researchers, from the New York State Department of Health and the federal Center for Disease Control, reported that overall, burn "injuries severe enough to result in hospitalization occur at the rate of 27 per 100,000 population per year in upstate New York."

In a supplement to the extensive study, the authors showed that 41 percent of all burn injury hospitalizations associated with motor vehicles in the 57-county area were associated with flames. "Of the 140 flame burns associated with cars, 38 were known to be incurred in traffic accidents," they said. Flame injuries resulting from crashes, however, were less common than those associated with repair work, especially work on vehicle carburetors either at home or on the job.

RADIATORS CAUSE MANY PROBLEMS

Scalds accounted for 31 percent of the motor vehicle burns. Radiators were associated with the bulk of these, buttressing findings in a 1973 University of Pittsburgh study which showed that 4.5 percent of all burns reported there were associated with automotive radiators. (See *Status Report*, Vol. 8, No. 3, Jan. 31, 1973.)

Among motorcyclists, the researchers found that a common cause of hospitalization for burn injuries was contact with hot exhaust pipes. Women accounted for a surprising 23 percent of motorcycle burn hospitalizations. In 1967, the National Highway Safety Bureau considered issuing a standard that would have mandated exhaust system protection to reduce the likelihood of injury to motorcycle operators and their passengers, but the move was dropped.

The report suggested a number of strategies aimed at reducing burn injuries. In discussing the scope of the entire problem, beyond that associated with motor vehicles, the authors commented, "The magnitude and importance of the burn injury problem is not well recognized. Competing public health entities such as cancer, heart disease, even vehicle crashes, are more precisely perceived by those decision-makers who allocate resources."

Copies of "An Epidemiologic Study of Burn Injuries and Strategies for Prevention" by Gerald Feck, Mark Baptiste, and C. Lee Tate, may be obtained from the Environmental Health Services Division, Bureau of State Services, Center for Disease Control, Atlanta, Ga. 30333.

Institute Urges NHTSA To Change Proposed VIN Rule

The Insurance Institute for Highway Safety has urged the National Highway Traffic Safety Administration (NHTSA) to revise its proposed method for standardizing the vehicle identification numbers (VINs) of all new motor vehicles. The Institute's research vice-president, Brian O'Neill, appearing before the National Highway Safety Advisory Committee, recommended instead that NHTSA adopt as a federal VIN standard the regulation issued by the Vehicle Equipment Safety Commission (VESC).

Highway safety groups have said the use of VINs would aid in identifying stolen or recalled motor vehicles, facilitate accident research, and increase the effectiveness of titling and registration controls. Conflicting proposals have been made regarding the standardizing of the numbers, however. (See *Status Report*, Vol. 13, No. 2, Feb. 7, 1978.)

In an Institute statement before the advisory committee and later filed with the NHTSA docket on proposed VIN rulemaking, O'Neill said each vehicle manufacturer now uses its own numbering system, leading to a variety of VIN lengths, formats, and coding systems. As a result, "computer programs which are capable of decoding the VINs of different manufacturers must be large and complex, and therefore unnecessarily expensive." But, O'Neill said, the most serious consequence of this "hodgepodge" of numbering methods is that it leads to unacceptable error rates in recording VINs, sometimes as high as 40 percent.

VINs should have a fixed length and as fixed a format as possible if the "unacceptably high" number of recording errors is to be reduced to an acceptable level, O'Neill said. He explained that "if all VINs had the same format," people frequently recording them "would soon become familiar with it and as a result coding errors would be reduced."

FORMAT COULD VARY ON NINE CHARACTERS

The researcher noted that although NHTSA's proposed method fixes the length of VINs at 16 characters, it allows manufacturers to vary the format of nine of the characters. The VESC method also fixes the length of VINs at 16 characters, he said, but allows the format of only three of the characters to vary. O'Neill called the NHTSA decision to use a flexible format "ironic" in light of the agency's own research which concluded that a fixed format would improve the accuracy of transcriptions. He also noted that the VIN proposal of the International Standards Organization (ISO), while fixing number length, would allow virtually all of the characters to vary in format. "It is clear that the ISO 'standard' does not adequately address the present VIN deficiencies," he said.

O'Neill said the NHTSA proposal to include a "check" digit with the VINs (making a total of 17 digits), as an alternative to a fixed format, would not solve the problem of numerous transcription errors

that accompanies the use of a flexible format. The check digit would be computed using the VIN characters. In order to detect transcription errors, the digit later would be recomputed using the recorded VIN characters and compared with the check digit. "Clearly check digits do not prevent recording errors; they merely facilitate the detection of such errors, long after much can be done about them," O'Neill commented. Noting that the check number is an audit procedure, he again pointed to the findings of the NHTSA study, which said that "the efficiency of the overall system suffers when audit procedures have to compensate for poor code design."

NHTSA Proposal Would Double Headlight Brightness

The National Highway Traffic Safety Administration (NHTSA) has announced it will move to double the candlepower permitted for headlights from the current level of 75,000 candlepower to 150,000 candlepower.

The current Federal Motor Vehicle Safety Standard (FMVSS) 108 permits the 150,000 cp. ceiling for some headlights using rectangular lenses but the new amendment would cover traditional headlamp systems using circular lenses as well. The amendment would be applicable to all four-wheeled motor vehicles. In the past, the agency has permitted motorcycles to be equipped with the brighter headlights for safety reasons.

NEW RULE WOULD RETAIN SAFETY FEATURES

NHTSA's proposed rule would retain safety requirements calling for sealed beams and construction that permits the lamps to be aimed mechanically. The American units will cost about a third less than the European-manufactured lamps, Joan Claybrook, NHTSA administrator, explained, and NHTSA expects "most manufacturers will use halogen type bulbs to meet the higher allowable output."

The NHTSA proposal would also require the establishment of a marking code on the lens of each headlamp to help identify the lens types and permit consumers to replace lamps with compatible photometric output.

ILLEGAL LAMPS SCORED

Claybrook said that the department would continue to investigate the "illegal" sale and use of the European lamps, which have been popular among sports car and recreation vehicle drivers. For years, Europeans and Canadians have used unsealed beam headlights with up to 300,000 cp. NHTSA objects to the more expensive European lamps because it says the unsealed bulbs allow reflectors to get dirty and the lamps cannot be mechanically aimed. They also cause glare in the face of oncoming vehicles, says NHTSA, creating a hazard for other drivers who may be blinded by the beams.

NHTSA officials became concerned last year when Oregon and Washington passed laws to permit the sale of the high intensity, unsealed lamps. The agency alerted the governors of those states saying that in its view, FMVSS 108 preempts the state laws.

According to NHTSA researchers, increasing photometric output beyond the 150,000 cp. limit "results in only a marginal increase in visibility with an increase in glare." Says Claybrook, "Our research indicates that the 150,000 candlepower level will provide increased seeing distance without creating excessive glare for oncoming vehicles."

Canada's Alcohol-Linked Traffic Deaths Studied

According to a report by the Traffic Injury Research Foundation of Canada (TIRF), out of 1,119 fatal auto crashes in 1976, at least 47 percent of the fatally injured drivers had been drinking prior to the incident and at least 38 percent were legally impaired. Despite various countermeasures taken by Canadian authorities to cut the number of alcohol-related traffic fatalities there, the report showed the number of impaired drivers killed in auto crashes has hovered at 38 or 39 percent of total driver fatalities since 1973.

One particularly startling finding was a 350 percent increase in the number of alcohol-impaired drivers of tractor-trailers. In 1974-75 surveys, TIRF found that only 7 percent of these drivers who were fatally injured in crashes were alcohol impaired. The 1976 record shows that at least 25 percent of the 32 drivers killed were found with blood alcohol concentrations of at least 80 mg. per 100 ml. (or 0.08 percent), the official "impaired" limit in Canada.

The second largest group of fatalities after passenger car drivers were drivers of trucks and vans. The report showed that 49 percent of such drivers had been drinking, with measurable blood alcohol concentrations of 10 mg. per 100 ml. (or 0.01 percent) or more, and 42 percent were legally impaired.

TIRF publishes an annual report on Canadian driver fatalities with special emphasis on the number of drivers who have consumed significant quantities of alcohol prior to crashes. Information is provided not only for drivers of cars, but for operators of trucks and vans, motorcycles, and snowmobiles, thus giving officials an impression of the magnitude of the "drinking and driving" problem there. (See table.)

Copies of "Analysis of Fatal Traffic Crashes in Canada, 1976 – Focus: The Impaired Driver," may be obtained by writing TIRF, 1765 St. Laurent Blvd., Ottawa, Ontario, Canada K1G 3V4.

ALCOHOL IMPAIRMENT AMONG FATALLY INJURED DRIVERS BY VEHICLE TYPE DURING 1976 SEVEN CANADIAN PROVINCES			
Drivers of:	Number of Fatafs	Had Been Drinking	Impaired
Automobiles	1,119	47%	38%
Trucks/Vans	291	49	42
Motorcycles	153	40	29
Tractor-Trailers	32	25	25
Snowmobiles	52	60	52

Virginia Reports Success With Highway 'Crash Cushions'

An analysis of the performance of several types of highway "crash cushions" installed at 48 locations around Virginia shows they are working well to minimize losses in crashes at those locations, the Virginia Department of Highways and Transportation has reported.

"Accidents which in previous years would have resulted in severe injuries or death are terminating in hit and run maneuvers," the report said. "Each of the fifty reported accidents involving attenuation devices in Virginia would have involved direct hits with bridge piers, concrete abutments, or radial guardrails. Because of the devices, however, severe personal injury and property damage were minimized."

THREE TYPES EVALUATED

Crash cushions are devices which protect motorists from severe injury in impacts with hazardous roadside fixed objects, by absorbing and dissipating the energy of impact. Three types were evaluated in the Virginia study: sand containers (an array of crushable plastic barrels containing strategically placed air spaces and sand in varying amounts), hydraulic cushions (an assemblage of water-filled plastic tubes with fender panels along the sides), and crushable cartridge cushions (an assemblage of crushable lightweight concrete cannisters with fender panels). A fourth common type is the steel drum cushion, an arrangement of empty 55-gallon drums with fender panels.

According to the report there have been 50 crashes into the crash-cushion installations in Virginia; only 10 of the crashes have been investigated by police, however, since the other 40 were hit-and-run. In 40 crashes into sand barrels, there were no fatalities and only five reported injuries; three of these probably were caused by a preceding impact between two vehicles, one of which then rebounded into the barrels. Virginia's 27 hydraulic cushion installations have experienced 10 crashes, with no fatalities or injuries. (The report noted that in one of these crashes, a standard size car skidded 190 feet at high speed into the device. There were no resulting personal injuries and "relatively little" vehicular damage.) The four crushable cartridge installations in Virginia had not been hit at the time of the report.

The total installation costs for 48 sites were about \$500,000, with the crushable cartridge cushions the most expensive type to install (about \$20,000 apiece) and the sand barrels the least expensive initially (about \$5,000 per arrangement). However, the sand barrels had the highest average repair cost, about \$750 per repair.

MAINTENANCE PROBLEMS MINIMAL

Virginia reported minimal maintenance problems on the installations. The only significant problems with the systems, according to the report, were the substantial amounts of debris scattered in impacts with the sand barrels and the "ramping" of vehicles which the report said sometimes occurs in crashes with the sand barrels as the sand and pieces of smashed barrel are bulldozed in front of the vehicle.

The report also described possible ways to use some of the devices in temporary locations, such as towed behind maintenance or construction equipment to protect motorists and workers from rear-end crashes in work zones.

Copies of the report, "Evaluation of Impact Attenuation Devices: A Preliminary Report," may be obtained by writing to Virginia Department of Highways and Transportation, Traffic and Safety Division, 1221 East Broad St., Richmond, Va. 23219.

UPDATE . . .

ANTILOCK BRAKES: Notices of proposed rulemaking have been published by two Department of Transportation agencies to carry out Transportation Secretary Brock Adams' recently announced policy on antilock braking equipment for tractors and trailers. (See *Status Report*, Vol. 13, No. 3, March 2, 1978.) The National Highway Traffic Safety Administration (NHTSA) has proposed a moratorium on the FMVSS 121 antilock requirement as it applies to trailers and has set a hearing on the matter for April 24 and 25. The Bureau of Motor Carrier Safety (BMCS) has proposed revision of Federal Motor Carrier Safety Regulations to require owner maintenance of antilock systems installed on the drive axles of truck tractors. Comments for both rulemaking procedures must be received by the respective agencies by June 7, 1978. NHTSA comments should be addressed to Docket No. 75-16; Notice 17, at Room 5108, Nassif Building, 400 Seventh St., S.W., Washington, D.C. 20590. BMCS comments should be addressed to Docket No. MC-83; Notice No. 78-7, at Room 3402, Bureau of Motor Carrier Safety, 400 Seventh St., S.W., Washington, D.C. 20590.

NHTSA also has amended FMVSS 121 to suspend the antilock braking requirement for school buses, scheduled to take effect April 1, 1978. Petitions for reconsideration of the action and comments on the amendment should be submitted by April 24, 1978, to Docket No. 75-16; Notice 18, Docket Section, Room 5108, Nassif Building, 400 Seventh St., S.W., Washington, D.C. 20590.

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