

ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 86/2

3725

HSTA

HB 684

10/



NEW YORK ASSOCIATION  
for PUPIL TRANSPORTATION

c/o Chautauqua Transportation  
P.O. Box 1097  
Chautauqua, NY 14722  
January 25, 1986

Frank Curran, Manager  
School Transportation  
Concord Public Schools  
Concord, Mass. 01742

Dear Frank,


Enclosed is the information we discussed on the phone a month or more ago. Sorry to take so long. I think the outline of the Rochester presentation and other copy is self explanatory, but call if you have questions.

There is absolutely no question in my mind, that the compartmentalization of the school bus effective since 1977 has been a tremendous improvement in the safe transportation of school students. It's difficult to document whether the NYS 28" high back seat has provided better protection than the Federal 24 inch high back. Both are fully padded and substantially better than the old 20 inch seats used prior to 1977. It is my opinion that the Federal seat is the best overall. I think it would be difficult for anyone to accurately predict that injuries with the NYS High Back would be less in number and/or severity had they happened in the Federal High Backs; or that injuries that have occurred in Federal High Backs would have been prevented or less serious by the use of the NYS 28" High Back. And the Federal seat still allows the driver to see most of the passengers and have some eye contact. It is a generally accepted fact among NYS Operators, that our discipline problems have increased with the 28 inch seat. The driver simply can not see what's going on back there until the problem is bigger than it otherwise would be.

The Federal DOT seat seems to be the best solution in my opinion, since it provides protection for the rare occasion of a school bus accident, and also permits more effective discipline - which is a routine daily concern. As you know, 49 of the 50 states use the Federal DOT seat standard so far. New York is the only state that requires the 28 inch high back, which contributes to the higher cost of buses built for use in New York State.

My seat belt file is quite thick, so if you need something more, or if I can be of further assistance, let me know. And I will attempt to be more timely.

Best Regards  
from Western NY,



K.H. Pete James  
NYAPT's  
National Liaison

PJ:pj

cc: Noel Kaiser, NYAPT Pres.



# New Jersey School Boards Association

Headquarters: 413 West State Street, P.O. Box 909, Trenton, New Jersey 08605  
Telephone (609) 695-7600

## POSITION STATEMENT

S-568/A-1545 -  
(Bassano/Naples)

### SEAT BELTS IN SCHOOL BUSES

The New Jersey School Boards Association opposes these proposals which require the installation of seat belts in newly purchased school buses. While these are different bills, they are similar in intent; the main difference being that the Assembly version requires the belts be used and requires the bus driver take an active role in this process. NJSBA considers the cost for installing the belts at \$1.7 million per year modest and money well spent if it could be demonstrated the belts prevented more injuries than they caused.

Nationally, 21 million students travel many times that number of miles daily, yet there were only ten student fatalities and 5,500 student injuries in 1984, the last year for which information is available (source: National Safety Council). New Jersey is justly proud of the fact that there never has been a child killed riding inside a New Jersey school bus.

The state boasts a long history of concern about and study of the issue of school bus safety in general and of seat belts in particular. In 1972, a Governor's (Cahill) committee, chaired by Senator Raymond Bateman, was formed to study the construction of school buses. That committee's deliberations resulted in a series of recommendations modeled after those from a 1968 UCLA study on bus safety. These recommendations dealt with a wide range of improvements but stopped short of recommending the required installation of seat belts. In 1975, another study panel convened by Governor Byrne specifically and deliberately refused to recommend the installation of seat belts. Instead, the panel approved an approach to occupant bus safety, later called "compartmentalization," which consists of increased structural strength of seats, thicker padding, higher seat backs and covering the formerly exposed seat back bars. All school buses manufactured after April 1, 1977, comply with these federal compartmentalization requirements. This has resulted in an environment similar to that of a rail car; there are no belts in railway passenger cars either.

One of the main arguments for belts in bus — that children should learn a consistent message to "buckle up" — is overwhelmed by the arguments emanating from the National Highway Traffic Safety Agency (NHTSA), the National Safety Council (NSC) and the National Transportation Safety Board (NTSB). Summarized, these arguments are as follows:

1. If seat backs are of a sufficient height and adequately padded, the child is safest unbelted. At the time of impact, an unbelted child slides off the seat and many parts of the body strike the seat in front at the same time, thereby distributing the load. When belted, the force is concentrated in two areas, the head as it pivots forward and strikes the seat back and the abdomen.
2. With seat belts, there is always the possibility that a child could be trapped in the event of a fiery crash or a plunge off a bridge. When seconds are precious, it is questionable whether or not a child, especially a younger child, would have the presence of mind to release himself or herself immediately. Even the best instructed pupils can become disoriented at the time of such a crash and certainly a school bus driver could not be expected to unbuckle 30 or 40 youngsters in time to avoid a catastrophe.
3. There is always the potential for the misuse of seat belts. At the very minimum, the buckle could serve as an additional weapon to children who tend to be disruptive on buses.

These arguments are reinforced by more recent testimony from the major federal agencies. In June of 1985, the NHTSA, in elaborating on the matter of monitoring the use of belts in buses, stated its belief that "the currently mandated occupant protections in school buses provide an adequate level of safety protection and that seat belts would not raise the level of protection for the occupants."

Perhaps the most damaging evidence against fitting the belts comes from a 1984 Transport Canada (that country's equivalent of NHTSA) study which contended that for all types of buses, including small vans, "In a frontal collision, belted school bus occupants are liable to suffer more serious injury than unbelted ones." These tests have been the subject of vitriolic procedural attacks by the proponents of belts who feel wounded by results which indicate that the belts do not belong in large buses and perhaps should be removed from the Type II smaller vans where they are now required. It is significant and tunnel-visioned that these attacks never call for new testing — just a mandate for belts. Yet, in its own analysis of the Canadian study, NHSTA concurred with its findings.

The results are in general agreement with laboratory testing conducted within the United States. It should be recognized that the compartmentalization counter measure was specifically designed to protect the occupant in frontal barrier tests similar to those conducted by the Canadians. The low head injury readings for the unbelted dummies are indicative that compartmentalization performs as

well in production buses as it did in the research tests which perfected the concept. The lap-belted dummies also performed in a predictable manner in the Canadian tests. In NHTSA-sponsored research on lap-belted dummies in the automobile environment, lap-belted dummies typically have higher head injury measurements than unbelted dummies.

Concerning the second most common type of school bus accident, the side impact crash, Thomas Built Buses, the largest school bus manufacturer in the nation (and one which has built buses with seat belts for those districts that request them since 1977), recently financed a replication of the Canadian study for side impact crashes according to specifications established by NHSTA. The results demonstrated that seat belts offered no greater level of protection for the occupants and none of the dummies were hurled like missiles about the bus from a 30 mph side impact of a 4,000 pound weight; all readings were well below the threshold of injury.

To be beneficial, a seat belt must not only be worn, but worn properly. A loosened belt at time of impact could do considerable harm, causing severe pelvic damage. Even if the bus driver were to be responsible for monitoring and securing each seat belt, there is no guarantee that the belt would remain in place during the bus ride or be secured with sufficient tension. However, even if the belts were properly fastened, there is reason for serious concern.

It is important to note in this regard what type of belt is being discussed here. Due to the structural configuration of school buses, the shoulder/lap combination cannot be installed in buses; only lap belts are feasible. There exists considerable research literature documenting the damaging effects of lap seat belts in cars. For example, an Australian study found that,

Among 71 of the belt wearing fatalities whose condition was inspected for possible belt injury, 11 suffered severe or fatal torso injury not attributable to impact with invading objects or as a result of the ejection. Of these, four were associated with obvious signs of seat belt burn across the abdomen from the lap strap and showed a wide range of intra-abdominal destruction.

Even more telling is the fact that rear seat lap belts in cars are coming under increased criticism for causing more injuries than they prevent in cars which crash. While not exactly analogous with compartmentalization in buses, the two environments are roughly comparable and, together with the results of the Canadian tests, suggest increased danger for occupants in buses should belts be installed.

Thus, despite the educational value of belts in buses, none of the major national research organizations whose full-time job it is to study transportation safety -- and who at other times have had no problem mandating safety features -- have endorsed the installation of lap belts in school buses. We believe you should heed that advice and vote NO on S-568 and A-1545.

Copy 2/7  
- S.E. Conf. Directors  
- Amtron Dealers  
- Carlisle Beasley  
- Bob Donley  
- mxy staff  
for your info  
J. Williams

Minneapolis Star and Tribune  
Wednesday, January 9, 1985

# Panel won't recommend seat belts on school buses

By Cheryl Johnson  
Staff Writer

The State Task Force on School Bus Safety said Tuesday that putting seat belts in school buses would be costly and probably would not improve safety significantly.

Instead, it recommended improvements in equipment and training that would cost between \$800,000 and \$1 million each year.

Deciding whether school bus riders should buckle up was a major issue concerning the panel, according to Ronald Lallberte, the State Department of Education's director of school transportation.

"The task force recommended against mandating seat belts for two reasons," said Lallberte, who worked

with the 13-member task force.

"First, 80 percent of fatalities occur outside of the bus, not inside. In 1983, 22 of 28 fatalities nationwide occurred outside the bus. Second, the cost of equipping buses is about \$120 per seat."

Instead of recommending costly seat belts, said Lallberte, "The task force decided it was better to spend money taking action to improve the situation outside and around buses where the fatalities occur."

Electronic monitoring devices recommended would improve safety outside a bus, the panel concluded.

Also recommended were sensing devices that tell a bus driver when a child is near the sides or wheels of a bus and an electronically operated

guard rail that would force a student to walk far enough in front of the bus to be seen by the driver.

The task force also said it would be useful to install public address systems on buses to enable drivers to stop children from crossing if a vehicle is approaching.

The panel also recommended additional training for veteran and new bus drivers and tougher criteria when renewing or gaining licenses for them.

In general the task force recommended being more restrictive when issuing bus driver licenses to those convicted of charges involving alcohol and drugs. "The task force also recommended a harder look at felony convictions," said Lallberte, who added, "You can be an excellent

driver, but we think felons ought not be with small children."

Other task force recommendations included:

- Having parent volunteers monitor bus-route pickup and drop-off points.
- Educating motorists about laws that require traffic from both directions to stop for a school bus with flashing lights.
- Seeking stricter enforcement of school bus laws by police.
- Increasing rider awareness of what is expected while children ride.
- Shortening school bus routes and thereby improving children's classroom performance.

The task force was created by the 1984 Legislature, which was responding to concerns raised about school bus safety after school bus-related fatalities.

According to Lallberte there were six school bus-related fatalities in Minnesota in 1984, seven in 1983, two in 1982, two in 1981 and one in 1980.

The task force report will be presented to the education committee of the Minnesota House and Senate during this legislative session. The lawmakers will decide what portions of the recommendations should be put into effect and whether the state or local school districts will foot the bill.



State of West Virginia  
Department of Education  
Charleston  
25305

ROY TRUBY  
STATE SUPERINTENDENT  
OF SCHOOLS

February 4, 1985

Ms. Gloria Molina  
Assembly Woman, Fifty-Sixth District  
California Legislature  
5261 East Beverly Boulevard  
Los Angeles, California 90022

Dear Ms. Molina:

Your interest in obtaining facts related to seat belts for school bus passengers is appreciated. This is becoming an emotionally charged issue with some. My plea is, let's examine the facts and prioritize school bus safety needs. We can then concentrate our action upon the most urgent safety problems, without being emotionally diverted from the most significant problem. I will attempt to put some of the current school bus safety problems in perspective.

1. Seat belts - are not a panacea for school bus safety. To address belts as an urgent need, and get the public emotionally involved, is to divert attention and funds away from more pressing safety needs. There are approximately 10 fatalities occurring inside the bus annually. No evidence exists that seat belts would have prevented any of these.

Most school bus accidents resulting in fatalities, inside the bus, involve another large vehicle such as a tractor-trailor combination or a railroad train. Usually a section of the bus is torn away or there is a serious intrusion into, or compression of, the passenger compartment. In these types of accidents it is sometimes evident that if pupils had been belted in some seat locations they would have suffered more severe injuries and/or a greater number of fatalities.

Tests have shown that in some crash situations belted passengers suffer more severe injuries than those not belted. A case in point is the most recent crash tests by the Canadian Government. (A copy of the Canadian Government release is enclosed, with other reference material.)

(It was necessary to drive my three (3) year old grandson to nursery school. In telling me how to "get to his school," he said, "You go down past the grocery store, then go through two red lights - but you have to wait till they are green." He learned this by observation. Think what he could learn with instruction!)

E. That the modern school bus provides no lateral protection for its passengers.

I can provide accident reports from several operational jurisdictions where school buses have rolled over with their precious load of pupils aboard. In those immediately in the scope of my knowledge the most severe injury to a passenger has been a broken wrist. Certainly a rollover accident would afford a critical test of protection afforded to the passengers by interior design of the vehicle.

Seat belts for school buses would cost from \$2,000.00 to \$3,000.00 per bus, with no evidence or assurance that any lives would be saved.

2. Now to some serious school bus safety problems. Funds can be spent to correct these that will show a definite return in lives saved.

Outside the school bus, at the bus stop, 45-60 pupils are losing their lives annually. More than half of these are killed when hit by the bus they regularly ride. The others, by passing motorists who disobey the law requiring motorists to stop for school buses loading and unloading passengers. Needed to save these lives are:

- A. Electronic sensors - can be purchased for the bus that warn the bus driver of the presence of someone near the wheels, who would be jeopardized by movement of the bus. These are available in the range of \$225.00 to \$1,000.00 per bus, depending upon the degree of sophistication and application of the device(s).
- B. Driver training - the bus driver is the single most important factor in the safe operation of a school bus. Most accidents are the result of human error. Drivers with better training and supervision make fewer errors. School transportation systems need to be provided with adequate funds and training programs to train effectively.

Anyone concerned about the safety of children on school buses should:

- (1) Determine the quality of the training program.
- (2) Determine that all bus drivers regularly receive the training, by a competent instructor.

Ms. Gloria Molina  
February 4, 1985  
Page 5

My urgent plea is, let's deal with facts, not emotions, and coordinate our efforts for safety to deal with the most pressing safety needs first, then with others as funds are made available.

Additional documents and information are enclosed for your information and consideration. I apologize for the length of this letter. I just felt that I should explain in some detail my reasons for holding that other issues and problems were more urgent for pupil passenger protection in relation to school buses, than seat belts.

Sincerely,



Paul T. Stewart, State Director  
School Transportation

PTS:jj

Enclosures



# SPI

DR. FRANK B. BROUILLET

Superintendent of Public Instruction

January 6, 1986

TO: All State Director's of Pupil Transportation  
FROM: Don M. Carnahan, State Director, Pupil Transportation *DMC*  
RE: Testimony on Seat Belt Standards

Enclosed for your information is a copy of testimony that I submitted in opposition to Wayne's request for seat belt standards on large school buses. My position (as you can see from my comments) is that these rules do not go far enough to protect belted students in compartmentalized school buses.

If you feel the same, don't hesitate to let NHTSA know. If you have any other questions, please write or give me a call.

DMC:nab

Enclosure



DR FRANK B BROUILLET

Superintendent of Public Instruction

November 29, 1985

Docket Section, Room 5109  
National Highway Traffic  
Safety Administration  
400 Seventh Street SW  
Washington, DC 20590

Reference: Docket No. 85-14, Notice 01

The State of Washington's Office of the Superintendent of Public Instruction and the Governor's Traffic Safety Commission are opposed to the proposed amendment to Federal Motor Vehicle Safety Standard No. 222. This proposed change will not improve the public safety on school buses because it represents the current practice in the industry (in the absence of such regulations). Presently it is a simple task to add to bid specification language which references the requirements of FMVSS Nos. 208, 209 and 210 when a purchaser wants lap belts installed in their school buses. Our position is stated in the attached "position paper". On page 2, recommendation number two states "School districts should have the choice of compartmentalized or a safety belt equipped large school bus, each of which should meet strict and separate occupant protection standards."

We believe that adopting such an amendment will mislead the general public into believing that this change will provide improved performance levels of belts in large school buses. NHTSA's own statement "Amending Standard No. 222 as proposed in this notice would provide performance requirements for safety belts in large school buses which would ensure that the safety belt assemblies and anchorages used in those buses are capable of providing an acceptable level of safety." This statement infers that current lap belt performance in large buses will be improved by this change and that current industry practice is to provide lap belts not meeting FMVSS Nos. 208, 209 and 210. Both inferences are incorrect. In summary, the proposed amendment to FMVSS No. 222 accomplishes nothing.

We feel that it is irresponsible to establish standards that have the potential of increasing life threatening injuries in frontal school bus collisions. Especially when such potential has been repeatedly documented in crash studies. The change is ineffective and counterproductive because it does not go far enough.

Docket Section, NHTSA  
November 29, 1985  
Page 2

The problem of adding lap belts to a compartmentalized large school bus has been well documented in numerous studies. The most recent, the 1985 study conducted by Transport Canada. The jackknife effect in frontal collisions while wearing only a lap belt, as opposed to a 3 point restraint as required in front seats of multi-purpose passenger vehicles, tremendously increases the passenger's risk of life threatening head injuries. Attached is the Insurance Institute for Highway Safety Status Report, Vol. 20, No. 5, May 11, 1985. The table on page 7, which summarizes Transport Canada's Crash Study, graphically displays the tremendous increases in the values for head injury criterion for passengers that are lap belted in a "compartmentalized" school bus.

On page 5 of the same publication, a NHTSA official, Dr. Kennerly Diggs, references 1978 NHTSA sled tests which yielded similar findings related to head impacts with seat backs.

Seat spacing on large school buses is controlled by FMVSS No. 222 and this standard limits the space that may be provided between the seats and between the seats and barriers. This system of occupant protection works fine until the lap belt is added. With the lap belt added and the resultant jackknife effect during frontal collisions, the head violently strikes the seat back causing more life threatening injuries than if lap belts were not used. The seats are much too close together to use lap belts. We do not believe that NHTSA should degrade the existing level of safety for school bus passengers by simply passing the proposed amendment.

We contend that the proposed change does not go far enough! And unless adequate standards are established with the change, no change should be made. Adequate passenger protection is not provided against potential head injuries with this proposed amendment. In fact, existing passenger protection is compromised with regard to life threatening head injuries.

We believe that school districts that want buses equipped with lap belts should have that opportunity. However, we believe that the interior design of such an equipped bus should meet a separate set of standards. Don't mix FMVSS No. 222 "compartmentalization" with lap belts.

When lap belts are added to the seats in a school bus, there should be minimums established for how close the seats may be spaced and not a maximum distance on how far apart the seats may be spaced as is currently required in FMVSS No. 222. Perhaps at least a 40 inch center-to-center seat spacing should be required if lap belts are added. No FMVSS No. 222 standard change should be made which might provide an illusion of safe performance for lap belts in school buses until it has been established that the adopted change is actually "SAFE". If adequate data cannot be found to establish this minimum distance between seats, if lap belts are used, a study should be completed prior to making any change.

Docket Section, NHTSA  
November 29, 1985  
Page 3

If you are going to make a change, please do it to protect the passengers and not because of any manufacturer's desire for liability protection. The problem is not the strength of the lap belt. The problem is mixing the use of a lap belt in a compartmentalized school bus.

Sincerely,

Don M. Carnahan  
State Director  
for Pupil Transportation

and

Technical Advisory Committee Member  
for Washington Traffic Safety Commission

DMC:nab

Attachments  
WTSC Position Paper  
IIHS Status Report

cc: Chuck Hayes, WTSC

## WASHINGTON TRAFFIC SAFETY COMMISSION

### POSITION PAPER

Purpose: To express the Washington Traffic Safety Commission's position on the need for safety belts in school buses.

Background: Every school day throughout the U.S., 390,000 school buses log some three million miles transporting 21,500,000 youngsters to and from classes, athletic events, and field trips. Almost always the trip is routine, and the children arrive without mishap. But is school bus travel safe enough? A growing number of parents, aware of the safety advantages of wearing seat belts in passenger cars and trucks, are questioning why most school buses are not equipped with seat lap belts for their children's protection. Now a grassroots movement wants to require school districts across the country to add lap belts to their shopping lists when purchasing new buses. Others contend such an action is unwarranted and may create more injuries in bus crashes. (IIHS Status Report.) Persons on both sides of the argument are in general agreement that retrofitting existing school buses with lap belts should be approached with a great deal of caution.

School buses manufactured after April 1, 1977 must comply with Federal Motor Vehicle Safety Standard (FMVSS) 222, "School Bus Passenger Seating and Crash Protection." The standard requires high and strong seats and seat backs, seat back padding, and seat spacing that reduces the chance of the occupant being thrown over the seat in front. This approach taken to bus occupant protection is commonly referred to as compartmentalization. Compartmentalization, as outlined in the standard, requires strength in the entire seating system which includes the floor, the seat frame, and the fastening of the frames to the floor while at the same time providing seat system padding and flexibility to absorb energy in a crash.

Small, van-type school buses (under 10,000 lbs. gross vehicle weight) are required, the same as passenger cars, to have safety belts. These small school buses respond in a crash in a similar manner as cars because of their weight and design.

There is no body of data available to definitively demonstrate whether safety belts in large school buses would increase occupant protection. The number of school bus occupant deaths and serious injuries is so low (one in ten years) that assessing the extent to which adding safety belts could prevent death or injury (or cause of it) is not feasible.

Position: Based on extensive research, crash testing, and 20 years of performance history, the effectiveness of the current safety standards, and the excellent safety record of school buses generally, we do not believe that a requirement for safety belts in large school buses is warranted. The National Transportation Safety Board reviewed this matter in 1983 and found that current NHTSA standards appear to be effective in eliminating or substantially reducing the majority of school bus injuries.

Recommendation: Since studies have indicated the mixing "safety belts" and compartmentalization causes more severe and life threatening injuries; and, since there are no standards for manufacturers to meet when installing safety belts on large school buses of 10,000 lbs. gross vehicle weight and over, it is recommended that:

1. NHTSA establish standards for occupant restraint systems in large school buses which do not increase the potential for life threatening injuries for any size passenger.
2. School districts should have the choice of compartmentalized or a safety belt equipped large school bus, each of which should meet strict and separate occupant protection standards.
3. School districts should not purchase safety belt equipped compartmentalized school buses until NHTSA establishes appropriate and separate school bus passenger seating and crash protection standards for safety belt equipped large school buses.
4. The WTSC recommends that all passengers occupying seats in any school bus equipped with safety belts be mandatorily required to have the safety belts fastened and properly adjusted any time the bus is in motion.



State of New Jersey  
DEPARTMENT OF EDUCATION  
225 WEST STATE STREET  
P. O. BOX 2019  
TRENTON, NEW JERSEY 08625

March 1, 1983

Mr. F.C. Orecchio  
Superintendent  
Readington Township Schools  
P.O. Box 2  
Readington, New Jersey 08870

Dear Mr. Orecchio:

The Bureau of Pupil Transportation has been concerned with seat belts/lap restraints for the past 15 years. In 1972, then Governor William Cahill called for an investigation, and we sponsored a two day workshop, inviting experts from many disciplines. Participants included representatives from:

- |                                     |                                 |
|-------------------------------------|---------------------------------|
| 1. Physicians for Automotive Safety | 8. PTA                          |
| 2. Ralph Nader's organization       | 9. Parents                      |
| 3. Orthopedic surgeons              | 10. Students                    |
| 4. Anthropologists                  | 11. Industry representatives    |
| 5. State Senators and Assemblymen   | 12. NJ Dental Society           |
| 6. State Directors of Pupil Trans.  | 13. NJ State Board of Education |
| 7. Members of the UCLA crash team   | 14. Superintendents and others. |

The final decision of this group leaned toward the development of a safer bus environment. However, after in-depth evaluations, it did not recommend seat belts.

We then applied for Federal funding to conduct an experimental seat belt program. It was rejected, basically on the grounds that N.H.T.S.A. (National Highway Traffic Safety Administration) was conducting experimental programs at their test site in E. Liberty, Ohio. After all these years, there is still no Federal mandate for seat belts for students.

In 1975, former Governor Brendan Byrne called for another statewide conference on safety on the school bus, including seat belts. Again, this new committee did not recommend a state mandate, since the Federal government was still not mandating nationally. A very serious question of legal liability arose for any state installation of safety equipment which was not backed by mandated Federal standards.

March 1, 1983

The decisions of these two independent groups, after exhaustive studies, was based on fact and on pure research.

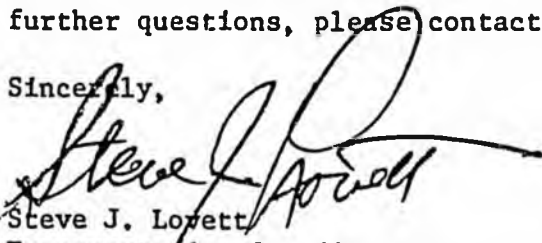
In any decision-making process involving the safety and well being of transported students, the bus internal and external safety environment must be carefully analyzed.

Such questions as, "Is what we are proposing more safe, less safe or as safe as what we already have?"

It is apparent that there still are too many safety trade offs that, under highly critical questioning, prohibit mandated seat belts at this time. There is no easy answer.

You can be assured that the safety of the transported youngster is of primary importance to each of us. I have enclosed some research statements for you. If you have any further questions, please contact me.

Sincerely,



Steve J. Lovett  
Transportation Coordinator  
Bureau of Pupil Transportation

SJL:jh

Enclosures

cc: Dr. Gerald V. Savage  
Hunterdon County Superintendent  
of Schools

REPORT OF THE  
DEPARTMENT OF EDUCATION

# On School Bus Safety

TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA



## House Document No. 10

COMMONWEALTH OF VIRGINIA  
RICHMOND  
1986

Report of the  
Department of Education  
On School Bus Safety  
To  
The Governor and the General Assembly of Virginia  
Richmond, Virginia  
December, 1985

TO: The Honorable Charles S. Robb, Governor of Virginia  
and  
The General Assembly of Virginia

ORIGIN OF THE STUDY

House Joint Resolution No. 228, agreed to during the 1985 Session of the General Assembly, requested the Department of Education to conduct a study of school bus safety. The resolution may be found in Appendix A of this report.

House Joint Resolution No. 228 requested that the Department of Education:

1. Examine the need for equipping new and old school buses with seat belts.
2. Examine the efficacy of using seat belts for small students, particularly those in Grades K-3.
3. Examine whether the use of seat belts on school buses will result in behavior modification in the use of seat belts in cars.
4. Examine the feasibility of requiring instruction on seat belt safety in the health curricula.
5. Examine the need for emergency communication devices on school buses.
6. Examine the need for inspection of older buses and revision of their capacities.
7. Examine the appropriateness of current driver qualifications.
8. Examine the appropriateness of the sites for loading and unloading of students.

A 15 member advisory committee was appointed by S. John Davis, superintendent of public instruction, to assist the Department of Education in conducting the study of school bus safety. A list of the members and the organization represented by each member follows:

Mr. William E. Beamer, Member, Newport News City School Board	Virginia School Boards Association
Miss Jeane L. Bentley, Associate Director Health, Physical Education and Driver Education Services	Department of Education
Mr. M. Gary Blumenstein, Classroom Teacher, Virginia Beach Public Schools	Virginia Education Association
Captain R. L. Bumgardner, Safety Officer	Department of State Police
Mr. R. A. Bynum, Study Coordinator, Pupil Transportation Service	Department of Education

REPORT OF THE  
DEPARTMENT OF EDUCATION

# On School Bus Safety

TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA



## House Document No. 10

COMMONWEALTH OF VIRGINIA  
RICHMOND  
1986

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Report of the  
Department of Education  
On School Bus Safety  
To  
The Governor and the General Assembly of Virginia  
Richmond, Virginia  
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TO: The Honorable Charles S. Robb, Governor of Virginia  
and  
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6. Examine the need for inspection of older buses and revision of their capacities.
7. Examine the appropriateness of current driver qualifications.
8. Examine the appropriateness of the sites for loading and unloading of students.

A 15 member advisory committee was appointed by S. John Davis, superintendent of public instruction, to assist the Department of Education in conducting the study of school bus safety. A list of the members and the organization represented by each member follows:

Mr. William E. Beamer, Member, Newport News City School Board	Virginia School Boards Association
Miss Jeane L. Bentley, Associate Director Health, Physical Education and Driver Education Services	Department of Education
Mr. M. Gary Blumenstein, Classroom Teacher, Virginia Beach Public Schools	Virginia Education Association
Captain R. L. Bumgardner, Safety Officer	Department of State Police
Mr. R. A. Bynum, Study Coordinator, Pupil Transportation Service	Department of Education

Dr. William H. Cook, Physician	The Medical Society of Virginia
Mr. David Cozzolino, Transportation Supervisor	Russell County Public Schools
Mr. John R. Easter, Attorney-at-Law	Virginia Congress of Parents and Teachers
Mr. Thomas R. Fulghum, Assistant Superintendent, Operations and Planning, Chesterfield County Public Schools	Virginia Association of School Administrators
Mr. John T. Hanna, Deputy Commissioner	Department of Motor Vehicles
Mr. Joseph P. Higgins, Transportation Director	Fairfax County Public Schools
Mr. Forest G. Jones, Director, Maintenance and Operations	Salem City Public Schools
Mr. Don L. Long, Transportation Director	Norfolk City Public Schools
Mr. James W. Severt, Chairman	Virginia Transportation Safety Board
Mr. Nathan H. Young, Jr., Transportation Director	Henrico County Public Schools

#### RATIONALE FOR THE STUDY

The safety of school children traveling on school buses is of paramount importance to parents and school personnel. School buses in Virginia provide transportation services for more than 720,000 public school pupils twice each school day. Over the past three years there has been an average of one accident for each 114,419 miles traveled, and one pupil injury inside the bus for each 529,954 miles traveled. During the same period three pupil fatalities and 20 pupil injuries have occurred outside the bus, when children as pedestrians were struck by another vehicle or the bus itself. There were no pupil fatalities and 448 pupil injuries inside the bus during this three-year period. Most of these injuries were minor and many of the injuries were not verified.

In recent years, public discussion of the need for protection of occupants of automobiles (i.e. safety belts and automatic protection devices) has increased greatly. Likewise, the issue of safety belts on large school buses has become a topic of much discussion. The appropriate method for safeguarding the safety of children in school buses has been questioned by organizations such as Physicians for Automotive Safety, the American Medical Association, and the Virginia Congress of Parents and Teachers. These organizations favor the use of safety belts in all buses and have actively supported mandating their installation. Conversely, the Virginia Department of Education and the National Highway Transportation Safety Administration have for some years taken the position that "compartmentalization," i.e. requiring high, padded seat backs, is the more appropriate method for assuring the safety of all children in school buses. These divergent positions are based on conflicting interpretations of data and studies relating to school bus operation.

Prior to 1985, the use of seat belts and other important issues relating to school bus safety had not been studied by the Virginia legislature for at least 10 years. Therefore, the General Assembly determined that a study of school bus safety was both necessary and timely.

### HISTORICAL OVERVIEW OF PUPIL TRANSPORTATION IN VIRGINIA

Current data indicates that pupil transportation services were provided by a few public schools as early as 1902. The legal authority for the Board of Education's control and supervision of public school buses was contained in laws enacted in 1919; however, Board minutes dated September 26, 1926, include the first known statement of policy regarding transportation of pupils. While General Regulations and Requirements for Drivers and School Buses were promulgated in 1928, it was not until 1939 that the Board adopted more detailed standards for school buses. Two school bus driver instructors were employed in 1942 at the request of the U. S. Office of Defense Transportation. In July 1946 the Pupil Transportation Service was created in the Department of Education.

Pupil transportation services have evolved through the years, as have other programs of Virginia's public schools. Significant developments occurred during the periods of rapid school consolidation between 1940 and 1960 and during the late 1960s and early 1970s. It was during the latter period that cities began transporting most of their public school pupils.

In 1983-84, the last year for which complete data are available, 130 of the 139 public school divisions in Virginia operated approved school buses regularly on home-to-school schedules. In that year, approximately 721,000 pupils, about 79 percent of the total number of pupils in average daily attendance in Virginia's public schools, were transported daily on 9,042 buses that traveled about 80,000,000 miles. The total operational cost, including capital expenditures, exceeded \$113,000,000. Transportation also was provided for federal programs, summer school, special trips (extracurricular), etc. in addition to the home-to-school operation. Twelve city school divisions arranged for approximately 12,000 pupils to ride public transit buses. Additionally, special transportation (use of cars, airlines, taxis, transportation by parents, private school vehicles, etc.) was provided for 1,734 handicapped pupils. State categorical aid to the localities supported about 30 percent of the total cost of operation, not including cost of equipment.

Public school bus transportation services in Virginia, as in all but two other states, are provided by the local school divisions under laws and regulations promulgated by the state. Detailed minimum standards and specifications for school buses are provided to the localities. Special features in bus design and equipment require prior approval from the Department of Education. The development of policies for day-to-day operations, such as selecting/training school bus drivers, establishing bus routes and disciplining pupil riders, is the responsibility of local school boards.

Virginia's school bus standards, in most instances, equal or exceed the Recommended National Standards for School Buses. Some Federal Motor Vehicle Safety Standards became effective on April 1, 1977. Specifically, they deal with school bus seating and crash protection, emergency exit requirements, strength of panel joints, and fuel system integrity. Generally, states are pre-empted in these subject areas. School buses built prior to April 1977 are referred to as pre-DOT (Department of Transportation) buses and subsequent models are referred to as post-DOT buses. Some

other federal motor vehicle safety standards, such as brake standards, apply to school buses as well as to trucks. Federal school vehicle regulations also apply to private/parochial schools, but Virginia Board of Education regulations apply only to public school vehicles.

### ANALYSIS OF STATISTICS FOR ACCIDENTS, INJURIES, AND FATALITIES

Reports of accidents involving school buses, pupils, and personnel who ride school buses, including injury and death while crossing highways or waiting at bus stops, are required by the Board of Education. For purposes of analysis on a mileage basis, only accidents, injuries, and fatalities that occurred while buses were transporting pupils are included in "Data On School Bus Accident Reports, 1980-1985" (See Appendix B).

#### Fatalities

During the past 34 years, 16 pupils have been killed in school buses. A list of these fatalities may be found in Appendix C. Operational statistics, including accidents, injuries, and fatalities occurring both inside and outside of school buses for the past 20 years, are shown in Appendix D. Five of the 16 pupil fatalities inside buses occurred in March 1951 when a train struck a school bus. Ten of the 16 pupil fatalities resulted when the buses were struck by large trucks. One of the 16 pupil fatalities occurred when a bus went over a ten-foot embankment.

Forty-nine pupils have been killed outside school buses during the past 20 years. Twenty-seven of these pupils were struck by buses and 22 were struck by other vehicles near the bus stop.

#### Injuries Inside the Bus

The number of pupil injuries occurring inside and outside buses has fluctuated during the past 20 years, as indicated in Appendix D. A follow-up review of injuries reported inside buses was completed for the 1983-84 and 1984-85 school years. Of the 195 pupil injuries reported inside school buses during 1983-84, time permitted the review of the circumstances surrounding 191 of the injuries. The review showed that (1) three pupils sustained broken bones, (2) 29 pupils in grades K-3 were injured, and 126 pupils in grades 4-12, were injured; (3) because of injuries 89 pupils missed one day from school, 24 missed two days, 17 missed three days, eight missed four days and 19 missed five or more days, and (4) 34 alleged injuries could not be verified because of lack of documentation.

Of the 151 pupil injuries that occurred inside school buses during 1984-85, time and circumstances permitted a review of 147 of the injuries. The review showed that (1) one pupil sustained a broken hand; (2) 20 pupils in grades K-3 and 62 in grades 4-12 were injured; (3) 48 pupils missed one day from school, 19 missed two days, 17 missed three days, two missed four days and six missed five or more days; and (4) 65 reported injuries were not verified.

#### Injuries and Fatalities Outside the Bus

A follow-up review on the pupil injuries occurring outside the buses during 1982-83 through 1984-85 was completed. During 1982-83, six pupils were struck by their school bus, three of which sustained multiple fractures. Two of the six pupils missed one day from school, one missed two days, two missed three days and one missed five or more days. Five of the six pupils were in Grades K-3.

Five pupil injuries occurred outside the bus during 1983-84; one pupil was struck by the bus and four were struck by other vehicles. One pupil missed one day from school and four missed five or more days. Four of the five pupils were in the grades K-3.

For 1984-85, 12 pupils were struck outside the bus. Five of the 12 pupils were struck by buses and seven pupils were struck by other vehicles. Three of the 12 pupils sustained multiple fractures and three pupils each sustained a fractured leg. Two of the 12 pupils injured missed one day from school, one pupil missed two days, three pupils missed three days, and six pupils missed five or more days.

In an effort to reduce further the incidence of pupils being struck by school buses, the 1982 session of the General Assembly provided funds to purchase hemispherical mirrors to be installed on the right front fender of all school buses in Virginia. The mirrors were installed on all publicly-owned school buses during the summer and fall of 1982. During the previous year, four pupils were killed when struck by their bus. In 1982-83, two pupils were killed: one was struck by the front wheel of the bus and one was struck by the rear wheel of the bus. In 1983-84, a pupil was killed when struck by a passing vehicle. No fatalities occurred outside the school bus during 1984-85.

#### Activity Trips

Accident data pertaining to activity trips were analyzed for a three-year period from 1982-83 through 1984-85. During this period, 153 accidents were reported. Thirty-three of the accidents occurred at night. Six pupils were injured inside school buses during the period.

#### Mechanical Failures

During 1984-85, 14 accidents were reported to have been caused by mechanical failure in school buses. Nine of the accidents were reported to have been caused by defective handbrakes which allowed the buses to roll forward or backward into other vehicles. Four accidents were reported to have been caused by service brake failure, and one accident was caused by failure of the steering mechanism of the bus.

### THE WORK OF THE ADVISORY COMMITTEE

The Advisory Committee met on August 6-7, 1985, to receive information developed by the Department's staff, to hear presentations by a representative of the school bus body industry, the Virginia Crash Investigation Team, and to identify further information needed to complete the study. The committee met again on October 1 to hear a presentation by a representative of the American Academy of Pediatrics which supports the use of seat belts in school buses, to discuss the information that had been collected, and to plan for drafting and approving the committee's report. The committee met again on November 19 to review and approve the final report.

#### Safety Questionnaire

To obtain information from local school divisions, the Department of Education developed a questionnaire which contained 36 questions pertaining to specific issues addressed in House Joint Resolution No. 228 and other issues directly related to the safe operation of school buses. Responses were received from the 131 school divisions that operate school buses. The tabulated results were made available to the Advisory Committee. (See Appendix E)

### Federal and State School Bus Regulations

The committee reviewed the Regulations Governing Pupil Transportation Including Minimum Standards for School Buses in Virginia, September 25, 1981. It was noted that the Virginia school bus standards and annual chassis specifications cover all major component parts of school buses, and that compliance with the requirements is monitored during the Department's annual inspection of buses. In addition to the Virginia standards, 30 of the 50 Federal Motor Vehicle Safety Standards (FMVSS) apply to buses, including school buses. Eight of these are of special interest:

- |     |               |   |
|-----|---------------|---|
| (1) | FMVSS No. 217 | Bus Window Retention and Release        |
| (2) | FMVSS No. 220 | School Bus Rollover Protection          |
| (3) | FMVSS No. 221 | School Bus Body Joint Strength          |
| (4) | FMVSS No. 222 | School Bus Seating and Crash Protection |
| (5) | FMVSS No. 301 | Fuel System Integrity                   |
| (6) | FMVSS No. 302 | Flammability of Interior Materials      |
| (7) | FMVSS No. 105 | Hydraulic Brakes                        |
| (8) | FMVSS No. 121 | Air Brakes                              |

These federal regulations supersede state standards in these areas.

### Canadian and Body Company Crash Test

A. The committee viewed a film and read the report on the School Bus Collision Tests conducted at Transport Canada's Motor Vehicle Test Centre in Blainville, Quebec. The Canadian government contracted with Arvin Calspan of Buffalo, N.Y. for technical assistance on these tests. The following summary appears in the report:

"Tests of three school buses were conducted to determine the adequacy of the current occupant protection standards in preventing death and injury, and also to determine the effect of seat belts on the level of occupant protection. The school buses were run into a fixed collision barrier at 48 km/h., approximately 30 mph., with belted and unbelted instrumented dummies used to estimate injury. The results indicate that, in a frontal collision, belted school bus occupants are likely to suffer more serious injury than unbelted ones."

B. The committee also viewed a film and received written information on tests conducted for Thomas Built Buses, Inc., High Point, N.C., at the Arvin Calspan Full Scale Test Facility in Buffalo, N.Y. These tests involved one frontal crash and two side crashes of a 16-passenger cutaway chassis model with a school bus body applied to the chassis behind the driver's seat. A spokesman for Thomas Built Buses reported:

"The purpose of these three tests was to give factual test data as to the effectiveness of compartmentalization versus belts on larger school buses. No side impact tests have been done on school buses since the introduction of the 1977 Federal Motor Vehicle Safety Standards on Occupant Protection. The bus chosen for the test was a Thomas Minotour 16-passenger bus. This size bus was chosen over the larger buses with the feeling that this would be the most extreme situation and would give us the most violent results, and if things went satisfactorily in this size bus, we could feel assured that it would be even better in the larger buses. The factual results in the reports indicate clearly that compartmentalization works as it was designed to work in frontal impacts or side impacts. These tests also indicate that in the case of the side impact, there seems to be very little significant difference between the belted and unbelted

dummies in these test conditions relating to head and chest injuries."

#### Summary, Virginia Crash Investigation Team Reports

Mr. David O. McAllister, Manager, Virginia Crash Investigation Team, Department of Motor Vehicles presented a synopsis to the committee of the following school bus crashes that involved severe collision forces:

1. February 1985, a 1975 model (pre-DOT) bus was rear-ended by a tractor trailer. The force of impact caused the bus to roll over and strike a tree. There were 16 injuries, one serious. Driver alertness was credited with saving lives: the driver saw the crash coming and directed pupils in the rear of the bus to move forward as he accelerated. The rear of the bus was damaged substantially. No one was ejected and the padding on this pre-DOT bus reduced the severity of injuries sustained by the pupils.
2. March 1977, a 1972 model (pre-DOT) bus was rear-ended by a tractor trailer while stopped to take on pupils. There were three fatalities and 30 injuries. Two of the pupils who were killed were sitting in the rear seats of the bus. The third was seated on the front seat of the bus behind the service door and was thrown out the door at impact and killed when the bus rolled over.
3. Fall 1981, a 1980 model (post-DOT) bus was sideswiped by a tractor trailer and knocked down an embankment. There were 16 injuries, all minor. The bus held up well and exits were usable. Due to the bus being equipped with well padded high back seats, the number of pupils injured and the severity of their injuries were reduced.
4. Winter 1983, a 1978 model (post-DOT) bus was hit head-on by a Volkswagen which ended up under the bus. The three occupants of the Volkswagen were killed but there were only minor injuries to 13 pupils in the bus.
5. April 1984, a 1980 model (post-DOT) bus was struck by a train moving at 49 mph., causing the bus body to separate from its chassis. There were 26 injuries, two of them serious. The bus driver died five days later. Considering the severity of the collision, the post-DOT design of the bus was credited with saving lives and reducing the number of serious impact injuries to pupils.

The Virginia Crash Investigation Team has investigated approximately 15 school bus crashes in the past 13 years. The buses, particularly the post-DOT models, performed extremely well in collisions. The team's recommendations to the committee were:

1. Continue upgrading education and training for bus drivers;
2. Continue to focus on improved bus maintenance programs;
3. Continue to study selected bus stop locations and turnarounds;
4. Emphasize lowering noise levels inside buses to aid driver concentration;
5. Accelerate the removal of all pre-1977 buses and ensure that school divisions have newer buses measuring up to the latest crash-worthiness standards;
6. Emphasize efforts to prevent fatalities and injuries outside of buses;
7. Re-enact objective or measurable physical standards for school bus drivers during physical examinations.

In short, the crash team, like the National Transportation Safety Board, National Highway Traffic Safety Administration, Insurance Institute for Highway Safety and the National Safety Council feels that more benefits can be gained from these and other improvements in pupil transportation than by installing safety belts on school buses.

#### Reports Reviewed by the Committee

##### A. National Transportation Safety Board Report

The committee reviewed National Transportation Safety Board Report Number NTSB/HAR-85/02 on the Carrsville school bus/train collision because it was a major accident. A synopsis of the report and recommendations follows:

"About 3:25 p.m. on April 12, 1984, a westbound Chesapeake and Ohio Railway Company freight train traveling about 49 mph struck the front right side of a northbound 1980 Isle of Wight County schoolbus stopped at a railroad grade crossing on State Route 615 near Carrsville, Virginia. The weather was clear, the sun was to the schoolbus driver's left, and the train's whistle and bell were sounding before the collision. There were crossbucks on both sides of the single track crossing. The driver's sight distance in the direction of the approaching train was about 1/3 of a mile. The 64-passenger schoolbus body separated from the chassis at impact, rotated counterclockwise 180 degrees, rolled over 270 degrees to the right, and came to rest on its left side about 80 feet southwest of the crossing. Of the 26 school-aged bus passengers, two were injured seriously, one had moderate injuries, and the other 23 sustained minor injuries. The bus driver was seriously injured and died five days after the accident. The train crew was not injured. The National Transportation Safety Board determines that the probable cause of this accident was the school bus driver's failure to stop before driving onto the railroad crossing to determine that it was safe to proceed."

The Carrsville crash was a very severe accident involving a 1980 model (post-DOT) school bus. In summary, the NTSB Report indicates that:

- (1) The roof of the bus body performed in a crash-worthy manner which provided survivable occupant space,
- (2) There was no interior body panel separation due to improved crash-worthiness resulting from the federal joint strength standards,
- (3) There was no seat leg separation and all passenger seats retained their original spacings due to compliance with the seating and crash protection standards, and
- (4) Numerous minor injuries occurred when occupants struck interior surfaces other than seats and barriers.

As a result of its investigation of this accident, the National Transportation Safety Board made the following recommendations:

"--To the State Directors of Pupil Transportation of the 50 States and the District of Columbia:

Encourage local school jurisdictions to establish and enforce procedures to systematically monitor school bus driver compliance with railroad crossing stop requirements and routing requirements which include on-scene observations of driver performance. (Class II, Priority Action) (H-85-4)

Encourage local school jurisdictions to issue an announcement to parents and students at or near the start of each school year which (1) states the jurisdiction's rules regarding school buses stopping at railroad crossings, (2) requests that school bus drivers who fail to comply be reported to a designated school official, and (3) provides the name and telephone number of the official. (Class II, Priority Action) (H-85-5)

Encourage local school jurisdictions to: discuss with driver applicants during the selection process the physical and mental demands placed upon school bus drivers, encourage in-service drivers to discuss their problems and their satisfaction with the present job assignment with their supervisors during routine contacts and during performance evaluations, and encourage supervisors to have frequent contact with their school bus drivers to discuss and resolve behavior problems concerning school bus passengers. (Class II, Priority Action) (H-85-6)"

"—To the Virginia Department of Education:

Consult without delay with the Virginia Medical Society to promulgate objective minimum physical standards for school bus drivers as specified by Section 22.1-178 of the Code of Virginia, as amended in 1979. Incorporate the standards in the prescribed physical examination forms and specify the health history that medical examiners shall obtain when examining school bus driver applicants. (Class II, Priority Action) (H-85-7)"

The report indicates further that in 1983, "The Board stated that it did not believe there is sufficient justification at this time to recommend extending the mandatory passenger restraint system requirements to large school buses." Conclusion No. 15 in the Carrsville report stated that "The majority of the minor injuries and the one moderate injury to the occupants seated next to the right side wall probably were sustained when these children struck the right side wall. The installation and use of seat belts would not have prevented or mitigated these injuries."

#### B. National Highway Traffic Safety Administration Report

A report entitled Safety Belts In School Buses, June 1985 issued by the National Highway Traffic Safety Administration, U. S. Department of Transportation, contains a review of facts and opinions about the efficiency of providing safety belts in large school buses. The "Executive Summary" in the report follows:

"School buses are the safest form of surface transportation. In 1983, 42,589 people were killed in traffic accidents. Only 17 were school bus occupants. On average for 1981-1983, 11 passengers and 1 driver were killed in school bus accidents and 30 were seriously injured. The subject of occupant protection in large school buses is complex. Based on extensive research and public rulemaking, the National Highway Traffic Safety Administration (NHTSA) concluded by 1977 that the concept of "compartmentalization" - i.e., strong, well-padded seats with high seat backs and better seat spacing to safely retain and cushion students during a crash - would be an 'automatic' system to protect children effectively in large school buses without requiring safety belts. All available test data and real world accident data indicate that this concept has worked extremely well.

NHTSA believes that the occupant protection required in school buses manufactured after April 1, 1977, plus the inherent safety of a highly recognizable vehicle that travels on a regular route, provide a high level of safety. There is insufficient data available to demonstrate whether safety belts would increase occupant protection. The number of school bus occupant deaths and serious injuries is so low that assessing the extent to which safety belts could either prevent deaths or injury, or cause them is not feasible.

In view of the effectiveness of the current safety standards, and the excellent safety record of school buses generally, we do not believe that a Federal requirement for safety belts in large school buses is warranted. The National Transportation Safety Board reviewed this matter in 1983 and found that current NHTSA standards appear to be effective in eliminating or substantially reducing the majority of school bus passenger injuries.

Small, van type buses (under 10,000 pounds gross weight) are required to have safety belts for all occupants as standard equipment. The agency believes that safety belts are necessary and effective in providing occupant protection in those vehicles, because of their similarity to cars, and we encourage all passengers to wear their belts whenever the vehicles are in motion.

It is important to emphasize that the Federal standards specify the minimum safety requirements applicable to school buses. Nothing prohibits a state or local jurisdiction from purchasing buses equipped with safety belts."

The report cites several problems which prevent successful retrofitting of school buses with safety belts, especially, those buses built before the the 1977 safety standards were instituted. The report suggests that consideration be given to alternate investments in school bus safety, such as replacement of pre-DOT model buses and improved driver training and vehicle maintenance. The report also notes that the question of whether the use of safety belts in school buses would encourage increased use of safety belts in private vehicles has not been answered.

#### Age and Maintenance of Buses

A review of information on the age of public school buses, as of January, 1985, indicated that 5,537 buses (51% of total number) were 1978 or newer models built to the latest federal school vehicle standards (post-DOT). Of the 5,398 buses in service which were built prior to the institution of the federal standards (pre-DOT), 4,743 (44%) were between seven and 12 years old, and 555 (5%) were 13 or more years old.

The Committee noted the statements of the National Transportation Safety Board, the National Highway Traffic Safety Administration, and the Virginia Crash Investigation Team concerning the improvement of crash-worthiness, and the resulting safety provided for children in post-DOT buses. This was reinforced by an apparent reduction in the number of pupil injuries and deaths inside Virginia school buses in recent years. To understand the differences between the pre-DOT and post-DOT buses, the committee viewed a bus of each type.

The inspection program for public buses was described as involving three different inspection procedures for each bus:

- (1) An annual inspection by Department of Education personnel of all buses for safety

- an compliance with standards and specifications.
- (2) A detailed annual inspection by licensed inspectors under the auspices of the Department of State Police.
  - (3) Monthly inspections by local personnel following guidelines and forms provided by the Department of Education.

A comprehensive preventive maintenance manual entitled Preventive Maintenance Manual for Virginia School Bus Maintenance Personnel and School Administrators was published by the Department of Education in November 1983. The program outlined in the manual was upgraded from guidelines to requirements effective June 1, 1985. The committee considered the inspection/maintenance programs to be adequate on paper; however, information was received to the effect that the bus maintenance programs in about 10 percent of the school divisions may be below an acceptable level. This preliminary view was based primarily on results of inspections conducted by the Pupil Transportation Service, Department of Education. In addition, the Committee felt that the local and Department of Education inspections for buses over 12 years of age should be more stringent and more frequent.

Information was received to the effect that some school buses are operated in Virginia by city governments under city transit charter provisions. It was noted that these buses are not always in compliance with Virginia school bus construction standards and inspection/maintenance requirements.

#### Safety Education

Ms. Arlene Cundiff presented an outline of the scope and sequence of the safety education materials covered in the grade K-10 curriculum, including a chart showing how safety is taught in grades K-8. The staff of the Department's Health, Physical Education and Driver Education Service expressed concern that no mandate has been given on the amount of time required for teaching health education in the elementary grades. The current requirement is for a comprehensive health education program. Several publications developed by the Department were presented to the Committee: "School Bus Safety Patrol Bulletin," "Street and Bus Safety Guide," and "Your Child Starts to School." In addition, Ms. Cundiff explained the use of a Beltman Kit for grades K-5. The kit contains a series of tapes and filmstrips, and a seat belt which can be attached to a child's chair to teach how to fasten and unfasten the belt. Committee members asked why the curriculum contained nothing dealing specifically with seat belt instruction. It was explained that seat belt use is taught in the section of the guide dealing with motor vehicle safety. A committee member suggested that in the next printing of the "Health Education Curriculum Guide, K-7", safety belt use and instruction should be addressed at the point when the child is first exposed to safety concepts.

Ms. Jeane Bentley later updated the Committee on plans for revision of the Health Education Curriculum Guide. The revised guide would include safety belt instruction at the primary grade level. It was suggested that a specific amount of time, i.e., 90 minutes per week, be scheduled for health education instruction in the primary and elementary grades. Further, Ms. Bentley said safety belt instruction would be reinforced as part of the substance abuse program in the fifth grade.

#### Pupil Stantees

It was noted that many telephone calls and some written communications are received each year by the Department and local school divisions concerning pupils

standing while riding school buses. Pupil Transportation Regulations allow some pupils to stand under certain circumstances. Information obtained from the questionnaire (Appendix F) indicated that 46 school divisions permitted standees on buses. Of the 46, 21 indicated that additional buses would be needed to eliminate this situation. Approximately 1,500 pupil standees daily, with one pupil injury in 1983-84 and no injuries in 1984-85, were reported. The Committee considered several facets of this question, including the unpredictable impacts upon school populations around military bases and in rapidly developing areas. The Committee undertook to seek ways to reduce the number of pupils who must stand on school buses.

#### Presentation in Support of Seat Belts in School Buses and Improved School Bus Safety

Dr. Joseph Zanga, representing the Virginia Pediatrics Society and the American Academy of Pediatrics(AAP), presented his organizations' position on improved school bus safety. Dr. Zanga is the director of the emergency room and outpatient pediatric services at the Children's Medical Center of the Medical College of Virginia. In support of this position, Dr. Zanga utilized studies, statistics, data on actual use of safety belts, and other safety improvements on school buses and presented reasons for the need for changes in the present policy for school bus safety.

Dr. Zanga discussed excerpts from National Highway Transportation Safety Administration's (NHTSA) report on Safety Belts In School Buses, June 1985 which he felt were ignored by bus manufacturers and their organization. Specifically, he said, that the report correctly concludes that "there are no studies to prove....that seat belts would absolutely save lives in school buses." However, he noted such tests are impossible to conduct realistically because we can not put children in the bus and crash the bus. Although some tests of safety belts can be conducted with dummies, the validity of such tests is questionable. Further, he said children cannot be protected from ejection by compartmentalization.

The results of the Canadian study need to be viewed with caution, in Dr. Zanga's opinion. He quoted from the NHTSA Report: "In examining the Canadian tests, several factors must be considered. A 30 mph barrier crash force for a large bus is an unlikely occurrence. For example, a head-on crash between a large school bus and a full-size car, both traveling at 55 mph, would be less severe to bus occupants than the 30 mph barrier test. Also, only one size dummy was used which typically represents a junior high school student. The geometry for young children would be significantly different with likely different results. Taken together, the results of the Canadian tests should be viewed with caution."

A study conducted in 1967 by UCLA was cited by Dr. Zanga as the best study performed to date. This study used child-size dummies and concluded that school bus seats used at that time were not designed to accommodate the added stress of multiple lap belts. The UCLA group designed the ultimate safety seat which included seat belts. The UCLA seat has never been used, however, according to Dr. Zanga, because it is too costly.

Dr. Zanga noted statistics demonstrating that the most common accidents involving pupil fatalities are rollover accidents and side-impact crashes. The AAP maintains that the child receives the most protection from seat belts in side-impact and rollover crashes. There is evidence suggesting that the child is protected by safety belts in other kinds of crashes as well.

He reviewed the following excerpts from the AAP's Policy Statement on School Bus Safety:

"Unsupported arguments have been presented in an effort to prevent seat belt installation on school buses. Among these are:

1. Children can't handle the buckle adequately. (The American Academy of Pediatrics notes that all children, given their familiarity with seat belts and buckles, should be able to satisfactorily buckle and unbuckle seat belts.)
2. The buckles would entrap children and could leave them dangling from the ceiling in accidents in which the bus is overturned. (This is true, but it is still preferable for children to be strapped in rather than thrown out of the seat or the vehicle at the time of an accident.)
3. Wearing seat belts would produce internal injuries. (With the restraints presently available, any school aged child can safely wear a seat belt.)
4. Children could use the belts as weapons. (Children have much better weapons available including lunch boxes and books. In addition the newer, lightweight, smaller, retractable seat belts now available are unlikely to be effective as weapons.)"

Dr. Zanga said that there was not a lot of actual experience in the use of seat belts. At least, 26 school districts require seat belts in their school buses in this country; however, there may be as many as 40 or 50 districts that use seat belts. He also stated that there were a number of states, notably New York, that are moving towards mandating seat belts. The City of Etobicoke, Ontario, Canada has successfully used seat belts on school buses since 1975. No accidents have occurred to prove their value.

Dr. Zanga said that the committee and staff of the AAP have studied all available literature and have concluded that the following actions should be taken:

- "1. Seat backs should be elevated to 28 inches. This is four inches above the height now manufactured by federal regulations and will support and cushion a child's head and neck.
2. All seat backs and tops should be padded with trim materials that adequately absorb impact. The padding should completely cover the entire rear of the seat in addition to the top rail. The padding also should be placed on all stanchions and "modest" panels. Seat construction should be designed to eliminate sharp or unyielding objects that could cause or worsen injury.
3. Seat belts should be required on all newly-manufactured school buses--regardless of their size and the number of pupils transported.
4. Adequate and appropriate bus drivers training should be mandatory in all school districts and should include provision for health screening on a periodic basis, including vision and hearing evaluations."

In discussing the use of seat belts on school buses as an educational issue, Dr.

Zanga noted that many medical and parent groups believe that young children must be taught to use safety belts at all times.

## COMMITTEE DISCUSSION OF OTHER ISSUES

### Danger Zones Outside The Bus

The statistics on injuries and deaths outside school buses, contained in this report under Analysis of Statistics for Accidents, Injuries and Fatalities, Page 6, were discussed at considerable length. Based on the number of deaths and the severity of injuries, the hazard to students outside the bus is considered to be a very serious problem. In Virginia 49 pupils were killed outside their public school buses in the last 20 years, five times the rate of deaths inside school buses. Records show that injuries to pupils outside the buses are usually much more severe.

The Committee noted that numerous safety campaigns have been directed toward solving this problem but that success appears to be limited. The Committee considered the fact that pupils are exposed to the possibility of such accidents approximately 1.5 million times each school day under widely varying circumstances. They agreed that safety precautions outside the buses must continue to be emphasized. These continuing efforts should include: (1) pupil rider safety education offered periodically both in the classroom and in demonstrations/practice; (2) daily consultation with the pupils by the drivers as needed; (3) continued search for new technical developments such as functional warning sensors; (4) more use of crossing control arms to prevent pupils from crossing immediately in front of the bus; (5) encouraging parents to accompany their children to and from the bus stops as often as possible, and (6) enlisting the aid of parents in reinforcing the bus safety concepts taught by the schools. The consensus of the Committee was that no single measure would provide a solution to this problem.

### Sites for Loading and Unloading Pupils

Board regulations require school bus routes to be reviewed at least once each year for safety hazards. Section 46.1-250, Code of Virginia, stipulates that stops are to be made only at points where the bus can be seen clearly for a safe distance in both directions. The Committee agreed that the location and the safety condition of stops can only be determined effectively on the local level. The Committee also discussed the 8-lamp traffic warning system which uses four amber lamps for warning motorists of bus stops and four red lamps to indicate that buses are stopped to pick up or discharge pupils. It was noted that approximately 38 states are using the 8-lamp system on buses. The committee felt that this system would enhance enforcement of the "school bus stop law". The Committee expressed an interest in assuring that the school bus warning sign (stop arm) is now required, pursuant to Section 46.1-287, Code of Virginia. The volume and directional conflicts of automobile, pedestrian, and school bus traffic on school sites also were discussed.

### Driver Qualifications/Supervision and Evaluation

A summary of the present state requirements for school bus drivers, concerns expressed by the National Transportation Safety Board, and the concerns of several local school divisions were presented and discussed. A copy of the current requirements may be found in Appendix F.

The proposed revision of the "physical requirements for school bus drivers" was reviewed by the Committee. The revision was prepared by the Department of Education staff after consultation with the Medical Society of Virginia and is scheduled

for consideration by the Board of Education. The proposed "Physical Qualifications For School Bus Drivers" are based on the requirements of the Federal Bureau of Motor Carrier Safety. If adopted, the regulations would apply to private/parochial schools, as provided in Section 22.1-180, Code of Virginia.

At the state level, the Department of Education trains school bus driver instructors. These instructors train school bus drivers at the local level. A manual entitled "Virginia School Bus Driver Training Curriculum Guide" provides each instructor with material which all drivers should receive during the training period. Inasmuch as the average number of hours spent in the pre-service classroom instruction and other phases of the training varies from locality to locality, the Committee felt that a minimum number of hours of pre-service classroom instruction should be required of all drivers.

### COMMENTS AND RECOMMENDATIONS

The Advisory Committee addressed each major topic mentioned in HJR 228, and other topics believed to have a significant impact on school bus safety. The Committee discussions were lengthy and detailed. Establishing priorities for the topics in terms of greatest need proved to be difficult because all safety items involving children are important. However, the first three topics, as listed below, were deemed to be of high priority.

1. Danger zones outside the bus - Experience in Virginia and nationally indicate that in an average year about five times more school pupils are killed or severely injured in accidents occurring outside school buses than inside the buses. While there have been repeated safety campaigns to reduce this problem in Virginia and only one fatality occurred outside a bus in the last two years (1982-83 and 1983-84), the Committee was concerned that the number of injuries that occurred outside school buses in 1984-85 indicates that the problem still exists.

Recommendation: That the Department of Education and local school boards continue to emphasize the need to protect pupils in the danger zones around school buses. This should include appropriate pupil rider safety education; constant attention by bus drivers and staff to encourage pupils to follow safe procedures at bus stops; encouraging parents to accompany their young children to and from bus stops, to reinforce the bus and safety instruction given by the schools; and consideration of the use of safety patrols and safety devices such as crossing control arms on buses transporting pupils.

2. Replacement of buses - Forty-nine percent of Virginia's public school buses were manufactured prior to April 1, 1977 (pre-DOT) the date when more stringent safety construction standards became effective. Five percent of these buses are reported to be more than 12 years of age. These pre-DOT model buses do not include such safety features as the fully padded seat backs and stronger seat frames, flame retardant interior materials, increased panel joint strength, greater fuel system integrity, improved bus window retention and release, and stronger structural roll-over protection. The crashworthiness of these buses, particularly those which have been in service for more than 12 years, is questionable.

Recommendation: That all pre-DOT school buses be replaced as soon as possible; that school buses be replaced after 10 years of age and that 12 years of age be established as the maximum age for approved school buses; that a feasibility study be conducted for funding the cost of replacing all pre-DOT model buses; and that all school buses

operated by city transit systems conform to state and federal school bus construction standards.

3. Pupils standing on school buses - Approximately 30 percent of Virginia's school divisions allow pupils to stand on school buses. While few injuries have been reported among standees, they are not afforded the same degree of protection as pupils who are seated while riding buses.

Recommendation: That standees not be permitted after the first 30 days of school, except under unforeseen emergency conditions as identified by the local school board.

4. Driver qualifications/supervision and evaluation - The Department of Education has estimated that approximately 55 percent of school bus accidents result from school bus driver error. The number of classroom hours for pre-service training of new drivers and the procedures for supervision and evaluation of drivers varies considerably among the school divisions. There are at present no objective physical qualifications for school bus drivers.

Recommendation: That a minimum of 12 classroom hours and 12 hours of behind-the-wheel training be required for new driver applicants; that supervision and evaluation (including a written evaluation) of drivers be carried out periodically; that the list of objective physical requirements that has been developed by the Department of Education with advice of the Medical Society of Virginia be promulgated; and that drivers be at least 18 years of age.

5. Instruction on seat belt safety in the health curricula - Instruction on the use of safety belts is included in the high school curriculum guides and in optional supplemental materials for use in the elementary grades. The amount of time to be devoted to health instruction, including the use of safety belts, is not specified for the elementary level.

Recommendation: That instruction on the use of safety belts be initiated at the kindergarten level and reinforced in grades 1-7.

6. Inspection and maintenance of buses - The three-phase inspection program and the preventive maintenance program (see page 19) for public school buses were judged to be appropriate. However, the Committee expressed concern for the safety of pupils in those school divisions in which the level of vehicle maintenance is considered to be marginal. The safety of older buses, particularly those over 10 years of age, was discussed in depth by the committee. The committee strongly recommends the replacement of buses over 10 years of age. However, if replacement is not immediately feasible, more stringent maintenance and inspection standards will be necessary. Therefore, the consensus was that necessary steps should be taken to ensure compliance with maintenance and inspection requirements.

Recommendation: That proper use of the inspection and maintenance programs for school buses (including school activity buses) be ensured; that buses over 10 years of age be subject to more stringent and more frequent inspections; and that school buses operated by city transit systems be subject to the school bus inspection/maintenance requirements.

7. Sites for loading and unloading pupils - The provisions of law and regulations relating to the location of school bus stops, and the review of routes at least once each year for safety hazards appear to be adequate. The choice of locations for bus stops and roads to be used can best be determined at the local level. Members of the Committee expressed concern about a continuing pattern of motorists passing school

buses while the buses are loading or unloading pupils.

Recommendation: That school divisions review traffic patterns on school sites and on future site plans to ensure the safest possible traffic arrangements for automobiles, buses, and pedestrians; that the eight-lamp warning light system (four amber and four red) be implemented on new buses as soon as possible; that the Department of Education promote the retrofitting of eight lamp systems on older buses; that the school bus warning sign (stop arm) be included as part of the "warning device" required on all school buses; and that an official study be conducted of the problem of motorists passing school buses while pupils are being loaded or unloaded.

8. The need for emergency communication devices - The response to the safety questionnaire by local school divisions supported the use of two-way communication equipment, but on assigned frequencies rather than on public citizen band channels. Board of Education regulations now permit either type to be installed on school buses, subject to local control.

Recommendation: That the use of communication equipment on school buses continue to be a local option, and that the use of assigned frequencies be encouraged.

9. The need for equipping new and old school buses with seat belts - This issue dominated the discussions of the Committee. The Committee members were agreed that school bus transportation has an excellent safety record in Virginia. However, all felt that every possible means should be employed to protect Virginia's children. During the course of the study, several crucial safety problems became apparent to the Committee, including the dangers outside the bus, the need to eliminate standees on buses, and the urgent need to replace older, substandard buses. The Committee members concluded that solutions for these critical issues were imperative.

The Committee unanimously supported the use of safety belts in cars. However, the differences between buses and cars make data relating to the use of safety belts in cars inapplicable to school buses. Although no studies establish conclusively that safety belts would enhance the safety of school bus riders, safety belts have been alleged to provide additional safety in side-impact and rollover accidents. Some organizations believe that habitual use of safety belts on school buses might increase the use of safety belts in automobiles. However, in view of the inconclusive data on the value of seat belts in school buses, the Committee agreed that a requirement for the mandatory use of seat belts in school buses is not indicated. The retrofitting of buses with safety belts was not considered efficacious by the Committee because of the many variables in bus design and construction.

Much time was devoted to the discussion of local option for the use of seat belts on school buses. The majority of the Committee opposed allowing local option. Four of the Committee members (representing the Department of Motor Vehicles, Medical Society of Virginia, Virginia Congress of Parents and Teachers, and the Virginia Transportation Safety Board) felt strongly that local school divisions should not be precluded from having the option of using safety belts in new Type I school buses. Further, the Committee took note of the U. S. Department of Transportation's proposed rule providing standards for installation of safety belts on Type I buses as printed in the FEDERAL REGISTER, October 10, 1985.

Recommendation: That the installation of seat belts on Type I (large) school buses should not be mandated.

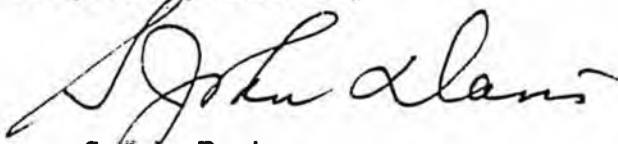
## CONCLUSION

Much data, many positions, and a variety of materials were presented to the Committee within its limited work time. Although the members of the Committee were drawn from a variety of disciplines, they developed an understanding of many of the factors and details influencing the day-to-day operation of school transportation programs. The Committee's discussions were conducted in an open and frank atmosphere without generating adversarial relationships. All came to believe that a flexible, commonsense approach is necessary for the management of these complex and costly activities.

The Committee members felt strongly that the general public and the many interested organizations should be better informed of the excellent safety record of school bus transportation. It was also felt that education of the public should be enhanced concerning the crucial hazards identified by the Committee, particularly the dangers to pupils outside the bus.

The Advisory Committee wishes to express its appreciation for the contributions of all persons, including representatives of organizations, who presented important information during the course of this study. Further, the Committee commends R. A. Bynum, Study Coordinator, Clarence R. Giliespie and Fred S. Valentine of the Department's Pupil Transportation Service for their assistance and cooperation, and most especially, Norma Szakal, Staff Attorney, Legislative Services, for her assistance in completing the Committee's report.

Respectfully submitted,



S. John Davis,  
Superintendent of Public Instruction

## Appendices

- A. House Joint Resolution No. 228, 1985
- B. Data On School Bus Accident Reports, 1980-85
- C. List, Pupils Killed Inside Virginia Public School Buses, 1950-51/1984-85
- D. Pupil Transportation Statistics, 1964-65/1984-85
- E. Questionnaire, School Bus Safety Study
- F. Requirements For School Bus Drivers

GENERAL ASSEMBLY OF VIRGINIA -- 1985 SESSION

HOUSE JOINT RESOLUTION NO. 228

*Requesting the Department of Education to study school bus safety.*

Agreed to by the House of Delegates, February 4, 1985

Agreed to by the Senate, February 20, 1985

WHEREAS, thousands of school children are transported to and from school daily on school buses in the Commonwealth of Virginia; and

WHEREAS, the safety of these children is of paramount importance to parents and school personnel; and

WHEREAS, the Board of Education promulgates regulations to ensure the safety of school children being transported by school buses; and

WHEREAS, in recent years, controversy has developed concerning the appropriate method for safeguarding the safety of children in school buses; and

WHEREAS, the Virginia Department of Education and the National Highway Transportation Safety Administration have taken the position for some years that "compartmentalizing," i.e., requiring high, padded seat backs, is the most appropriate approach to school bus safety; and

WHEREAS, other organizations, such as Physicians for Automotive Safety and the American Medical Association, favor the use of seat belts in all school buses; and

WHEREAS, other issues related to school bus safety have also arisen recently including driver qualifications, the appropriateness of certain thoroughfares for loading and unloading of students and the use of emergency communications devices; and

WHEREAS, issues related to school bus safety have not been the subject of a legislative study in at least the past ten years; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Department of Education is requested to conduct a study on school bus safety.

In the course of its study, the Department of Education shall examine the need for equipping new and old school buses with seat belts, the efficacy of using seat belts for small students, particularly those in grades K-3, whether the use of seat belts on school buses will result in behavior modification in the use of seat belts in cars, the feasibility of requiring instruction on seat belt safety in the health curricula, the need for emergency communication devices, the need for inspection of older buses and revision of their capacities, the appropriateness of driver qualifications and the appropriateness of the sites for loading and unloading of students.

The Department should complete its work in time to submit its findings and any recommendations to the 1986 Session of the General Assembly.

**DATA ON SCHOOL BUS ACCIDENT REPORTS  
FOR 1980-81 through 1984-85  
WHILE TRANSPORTING PUPILS**

**TYPES OF ACCIDENTS:**

	<u>1980-81</u>	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>
Collisions Involving Two or More Vehicles	632	646	598	636	620
Head-on Collisions:					
Straight Road.....	37	57	63	67	58
Curves.....	69	55	49	39	53
Total.....	<u>106</u>	<u>112</u>	<u>112</u>	<u>106</u>	<u>111</u>
Rear End Collisions:					
By Other Vehicles.....	87	103	103	119	113
By Bus.....	48	53	40	53	29
Total.....	<u>135</u>	<u>156</u>	<u>143</u>	<u>172</u>	<u>142</u>
At Intersections:					
Other vehicles entering.....	63	51	49	62	55
Bus entering.....	36	33	44	57	48
Other vehicle turning.....	22	18	21	15	15
Bus turning.....	59	98	83	66	66
Total.....	<u>180</u>	<u>201</u>	<u>197</u>	<u>200</u>	<u>184</u>
Backing:					
Other vehicle.....	17	16	18	19	22
Bus.....	97	77	62	60	71
Total.....	<u>114</u>	<u>93</u>	<u>80</u>	<u>79</u>	<u>93</u>
Passing:					
Other vehicles.....	37	37	23	39	52
Bus.....	25	18	14	11	11
Bus passing parked vehicle.....	35	29	29	29	22
Total.....	<u>97</u>	<u>84</u>	<u>66</u>	<u>79</u>	<u>85</u>

Appendix B

21

(Types of Accidents - continued on next page)

\* Data for 1984-85 is subject to verification

**DATA ON SCHOOL BUS ACCIDENT REPORTS FOR 1980-81 through 1984-85 WHILE TRANSPORTING PUPILS**

(Continued from previous page)

	<u>1980-81</u>	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>
No. of Pupils Injured Outside School Bus.....	11	5	6	4	12
Struck crossing road.....	2	5	6	4	10
Hit on School Grounds.....	0	0	0	0	2
Other.....	9	0	0	0	0
No. of Pupils Killed Outside School Bus.....	0	4	2	1	0
Struck crossing road.....	0	4	2	1	0
Hit on School Grounds.....	0	0	0	0	0
Other.....	0	0	0	0	0
No. Injured Inside School Bus.....	149	158	123	220	174
Pupils injured in vehicle caused accident...	127	145	102	195	151
Drivers.....	22	13	17	25	20
Other.....	0	0	4	5	3
No. Killed Inside School Bus.....	0	0	0	1	0
Pupils.....	0	0	0	0	0
Drivers.....	0	0	0	1	0
Other.....	0	0	0	0	0
Others Injured Outside School Bus.....	48	51	70	57	93
Others Killed Outside School Bus.....	2	0	3	0	3

Twenty-two counties, two towns, and twelve cities reported no accidents occurring while transporting pupils during the school term 1980-81.

Fourteen counties, two towns, and twelve cities reported no accidents occurring while transporting pupils during the school term 1981-82.

Eighteen counties, two towns, and fourteen cities reported no accidents occurring while transporting pupils during the school term 1982-83.

Twenty-eight counties, two towns, and twelve cities reported no accidents occurring while transporting pupils during the school term 1983-84.

The total miles travelled by buses in 1981-82 divided by the number of accidents reported is equal to 112,207 miles, for 1982-83 is 116,567 miles, and 1983-84 is 113,734 miles, which is equivalent to an average of 13 years operation for a school bus.

\* Data for 1984-85 is subject to verification

**DATA ON SCHOOL BUS ACCIDENT REPORTS  
FOR 1980-81 through 1984-85  
WHILE TRANSPORTING PUPILS**

(Types of Accidents - continued from previous page)

	<u>1980-81</u>	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>
Non-collisions.....	24	32	55	53	45
Pedestrians.....	4	2	5	2	12
Bicycles.....	1	4	0	1	1
Motorcycles.....	5	3	1	0	4
Railroad Crossings.....	0	0	0	1	0
On Board Accidents.....	10	2	14	5	9
Bus striking pupils waiting for, leaving, or approaching bus.....	4	6	6	1	6
<b>Total Number of Accidents Reported</b>	<b>680</b>	<b>695</b>	<b>680</b>	<b>699</b>	<b>686</b>

	<u>1980-81</u>	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>
23 Adult Drivers · M $\frac{181}{181} + F \frac{482}{482} = \frac{663}{663}$	$\frac{663}{663}$	$\frac{684}{684}$	$\frac{677}{677}$	$\frac{697}{697}$
Student Drivers M $\frac{17}{17} + F \frac{0}{0} = \frac{17}{17}$	$\frac{17}{17}$	$\frac{11}{11}$	$\frac{3}{3}$	$\frac{2}{2}$
ALL DRIVERS M $\frac{198}{198} + F \frac{482}{482} = \frac{680}{680}$	$\frac{680}{680}$	$\frac{695}{695}$	$\frac{680}{680}$	$\frac{699}{699}$

Percentage of Each Type of Accident

<u>1984-85</u>	<u>1983-84</u>		<u>1984-85</u>
27	29	percent were at intersections	$\frac{685}{685}$
21	25	percent were rear end collisions	$\frac{1}{1} + F \frac{0}{0} = \frac{1}{1}$
13	11	percent were backing	$\frac{1}{176} + F \frac{510}{510} = \frac{686}{686}$
12	11	percent were passing	
16	15	percent were head-on collisions	
7	8.0	percent were non-collisions	
4	1.0	percent - other	

\*Data for 1984-85 is subject to verification

## Appendix C

### PUPILS KILLED INSIDE OF VIRGINIA PUBLIC SCHOOL BUSES

1950-51	Prince Edward County - March 1951 - Five pupils killed inside of bus - Bus struck by train. Three girls 18,18,& 17. Two boys 14 & 15.
1951-52	None
1952-53	None
1953-54	None
1954-55	None
1955-56	None
1956-57	None
1957-58	None
1958-59	None
1959-60	Frederick County - May 1960 - Two pupils killed inside of bus - Bus hit in rear side by lime truck - Both girls 9 & 10.
1960-61	None
1961-62	None
1962-63	None
1963-64	None
1964-65	None
1965-66	None
1966-67	None
1967-68	None
1968-69	King George County - August 1968 - Two pupils killed inside of bus. Bus hit in rear by furniture van. One girl 14. One boy 13.
	Page County - May 1969 - One male, age 10 killed inside of bus. Bus went down 10 ft. embankment.
1969-70	None
1970-71	Montgomery County - Two pupils killed inside of bus. February 1971 Bus hit in left side by dump truck. Two girls 7 & 10.
1971-72	None
1972-73	None
1973-74	None
1974-75	None
1975-76	None
1976-77	Campbell County - March 1977 - Three pupils killed. Two inside - one ejected through entrance door onto ground. Bus struck in rear by five axle tractor semitrailer combination - Three females 7,11, & 14.
1977-78	None
1978-79	None
1979-80	Appomattox County - May 1980 - One (1) pupil killed inside of school bus. Bus struck in rear by tractor trailer truck - Girl, Age 14.
1980-81	None
1981-82	None
1982-83	None
1983-84	None
1984-85	None

## Appendix D

## Pupil Transportation Statistics, 1964-65 to 1984-85

1	2	3	4	5	6		7	
School Year	No. of Pupils Transported	No. of Buses	No. of Miles Traveled	No. of Accidents	Inside Bus No. of Pupils <u>Injuries</u> <u>Fatalities</u>		Outside Bus No. of Pupils <u>Injuries</u> <u>Fatalities</u>	
1964-65	524,857	5,769	346,744	503	132	0	8	5
1965-66	538,579	5,945	49,526,879	503	207	0	10	2
1966-67	555,829	6,157	50,824,192	515	266	0	17	3
1967-68	573,207	6,368	52,060,826	546	249	0	13	1
1968-69	598,773	6,599	54,624,803	502	259	3	12	1
1969-70	618,960	6,808	54,954,507	641	274	0	21	2
1970-71	636,172	7,047	56,600,653	612	259	2	30	5
1971-72	660,207	7,312	59,524,844	883	414	0	15	5
1972-73	669,313	7,521	61,387,385	862	356	0	11	1
1973-74	688,868	7,723	64,050,516	782	320	0	18	3
1974-75	718,851	8,017	66,365,758	797	294	0	12	2
1975-76	736,219	8,199	69,433,445	677	225	0	16	2
1976-77	762,016	8,681	72,553,030	849	280	3	18	2
1977-78	760,849	8,877	76,004,967	849	197	0	18	2
1978-79	759,652	9,060	78,276,159	826	187	0	15	3
1979-80	752,948	9,079	79,279,169	714	200	1	19	3
1980-81	743,706	9,097	79,348,106	680	127	0	11	0
1981-82	724,867	9,003	77,984,165	695	145	0	5	4
1982-83	722,157	9,026	78,419,863	680	102	0	6	2
1983-84	720,984	9,042	79,499,740	699	195	0	4	1
*1984-85	-	-	-	686	151	0	12	0

\* Figures for 1984-85 Subject to Verification

Appendix E  
COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF EDUCATION  
P. O. BOX 6Q  
RICHMOND, VIRGINIA 23216

SUPTS. MEMO. NO. 57  
May 15, 1985

ADMINISTRATIVE

TO: Division Superintendents

FROM: S. John Davis, Superintendent of Public Instruction  
M. E. Cale, Associate Superintendent for Financial and  
Administrative Services

SUBJECT: Questionnaire - School Bus Safety Study, House Joint Resolution  
Number 228, 1985

The General Assembly, 1985 Session, enacted HJR Number 228 requesting the Department of Education to conduct a study on school bus safety. The resolution has been printed on the reverse side of this memorandum.

The enclosed questionnaire contains questions which, when answered and returned, will provide statewide information on most of the issues listed in the resolution. Some additional safety or operational issues not listed in the Resolution have been included in the questionnaire. If your school division would like to suggest other issues or concerns which should be considered during this study, please list them on an additional page(s) and attach it to the questionnaire.

Information received in response to this communication will be tabulated and provided to a fifteen member Study Committee. This Committee has been appointed to assist the Department in completing the study, making recommendations, and presenting its findings to the 1986 Session of the General Assembly.

If you desire additional information or have questions concerning the study, please contact R. A. Bynum, Associate Director, Pupil Transportation Service at (804) 225-2037.

SJD/MEC/ns

Enclosure

NOTE: This report is not listed in the 1984-85 Calendar of Reports because it is in response to recent legislation.



10. Total number of approved buses in fleet 10,675.  
(Include all spare buses)
11. Indicate number of buses in fleet by year model of chassis.
- |              |           |              |                |
|--------------|-----------|--------------|----------------|
| <u>5,442</u> | 1978-1985 | <u>3,760</u> | 1972-1976      |
| <u>938</u>   | 1977      | <u>507</u>   | 1971 and Older |
12. How many buses in your current fleet are equipped with seat belts  
for all passengers?
- 322 Type I Conventional School Buses (Usually, 34-64  
Passenger capacity)
- 465 All Other Buses  
(Usually, Type II Small School Buses up to 20 passenger  
capacity)
- \*13. Indicate the number of K-3 grade pupils riding school buses in  
your system during 1984-85 223,440, 1983-84 217,360.  
Estimated Estimated
14. Would a requirement for use of a seat belt by all pupils riding in  
school buses enhance the use of seat belts by teenagers while  
riding in automobiles?
- 38 - Yes 79 - No
15. Should school buses be equipped with two-way emergency  
communication equipment?
- 111- Yes 20 - No
16. If answer to No. 15 was yes, which buses should be equipped?
- 38 - Special education buses only
- 19 - Rural route buses only
- 78 - All buses
17. What type of communication equipment should be used?
- 101 -Two-way commercial/government type radios with  
an assigned frequency
- 9 - Citizen band radios
- 5 - Mobile telephone

\* Figures based on 80% of fall membership

18. Are the current Virginia school bus inspection requirements adequate?

124 - Yes

7 - No

19. Should the inspection of buses be required more frequently for buses 10 years or older?

45 - Yes

86 - No

20. Should there be a mandatory replacement schedule for school buses?

72 - Yes

57 - No

21. If your answer to No. 20 was yes, indicate the maximum number of years buses should be used.

10 Yrs. 37 12 Yrs. 29 14 Yrs. 10 Other 2  
(specify)

22. Should the number of classroom hours for school bus driver training be specified?

77 - Yes

54 - No

23. If your answer to No. 22 was yes, indicate the number of hours.

13 Hrs. 13 15 Hrs. 32 17 Hrs. 6 Other 28  
(specify)

24. Should the minimum number of days for behind-the-wheel training time with pupils onboard be increased?

44 - Yes

85 - No

25. If your answer to No. 24 was yes, indicate the total number of days recommended.

50% recommended 5 days  
Recommendations ranged from 2 days to 25 days

26. Does your division use 17 year old school bus drivers?

11 - Yes

120 - No

27. If your answer to number 26 was yes, indicate the number in each capacity. (Count each driver only once)

Regular	<u>4</u>
Substitute	<u>45</u>
Activity Trips	<u>6</u>
Voc. Tech.	<u>1</u>
Other	<u>0</u>

28. Does your system employ aides for buses transporting children?  
77 - Yes 54 - No
29. If your answer to No. 28 was yes, how many aides do you employ for buses transporting handicapped pupils? 633
30. If your answer to No. 28 was yes, how many aides do you employ for buses transporting non-handicapped pupils? 24
31. Should the provisions contained in law and regulation governing school bus loading and unloading sites be changed?  
13 - Yes 116 - No
32. If your answer to No. 31 was yes, describe recommended changes.  
(1) Minimum distance between stops (2) Use of eight light warning system (3) Separate area from general public on all school sites
33. Does your division have school buses which travel across state boundary lines (Interstate)?  
51 - Yes 78 - No
34. If your answer to No. 33 was yes, indicate the number of buses crossing state lines.  
36 a.m. Home to school trips each day  
36 p.m. School to home trips each day  
3,735 Activity/Field trips per year
35. Would your division support an increase in the current 35 miles per hour (mph) maximum speed allowable for a school bus transporting pupils on regular route?  
45 - Yes 82 - No
36. If your answer to No. 35 was yes, indicate which change your division would support.  
2 - 40 MPH on all type roads  
3 - 45 MPH on all type roads  
44 - 35 MPH on "secondary" roads and 45 MPH on "primary," U. S. and Interstate roads

\_\_\_\_\_  
School Division

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Supt/Designee

Please complete and return  
by JUNE 3, 1985 to:

R. A. Bynum, Associate Director  
Pupil Transportation Service  
Department of Education  
P. O. Box 6Q  
Richmond, VA 23216

#### IV. Requirements for School Bus Drivers

1. No school board shall hire, employ, or enter into any agreement with any person for the purposes of operating a school bus transporting pupils unless the person shall:
  - A. Have a physical examination of a scope prescribed by the Board of Education with the advice of the Medical Society of Virginia and furnish a form prescribed by the Board of Education showing the results of such examination.
  - B. Furnish a statement or copy of records from the Division of Motor Vehicles showing that the person, within the preceding five years, has not been convicted of a charge of driving under the influence of intoxicating liquors or drugs, convicted of a felony, or assigned to any alcohol safety action program or driver alcohol rehabilitation program pursuant to Section 18.2-271.1 of the Code of Virginia or, within the preceding 12 months, has been convicted of two or more moving traffic violations or has been required to attend a driver improvement clinic by the Commissioner of the Division of Motor Vehicles pursuant to Section 46.1-514.11.
  - C. Furnish a statement signed by two reputable residents of the school division that the person is of good moral character.
  - D. Exhibit a license showing the person has successfully undertaken the examination prescribed by Section 46.1-370.
  - E. Has reached the age of 17 and has not reached the age of 70 on the first day of the school year. (Section 46.1-169, 22.1-178 and Exemption of Hazardous Occupations Order No. 2, U. S. Department of Labor)
2. Any school board may require successful completion of the American Red Cross first-aid course as a condition to employment to operate a school bus transporting pupils.
3. The documents required pursuant to paragraphs 1.A. and 1.B. shall be furnished annually within 30 days prior to the anniversary date of the employment to operate a school bus. A school board may require the statement set forth in paragraph 1.C. to be furnished periodically.
4. The documents required pursuant to this section shall be filed with, and made a part of, the records of the school board employing such person as a school bus operator.
5. The State Department of Education shall furnish to the division superintendents the necessary forms for applicants to use to provide the information required by this section. Insofar as practicable, such forms shall be designed to limit paperwork avoid the possibility of mistakes, and furnish all parties involved with a complete and accurate record of the information required. (Section 22.1-178)
6. As a condition to employment, every school bus driver shall submit a certificate signed by a licensed physician stating that the employee appears free of communicable tuberculosis. The school board may require the submission of such certificates annually, or at such intervals as it deems appropriate, as a condition to continued employment. (Section 22.1-300)
7. No person shall drive a school bus upon a highway in this state unless such person has had a reasonable amount of experience in driving motor vehicles, and shall have passed a special examination indicating the ability to operate a school bus without endangering the safety of pupil passengers and persons using the highway. To prepare for the examination required by this section, any person holding a valid

operator's license issued under the provisions of 46.1-369, may operate, under the direct supervision of a person holding a valid school bus license endorsement, a school bus which contains no pupil passengers. The Division of Motor Vehicles shall adopt such rules and regulations to provide for the examination of persons desiring to qualify to drive such buses in this state and for the granting of permits to qualified applicants. (Section 46.1-370)

8. Every driver of a school bus shall receive instruction before being allowed to operate a bus transporting children. This instruction shall include classroom, demonstration, and behind-the-wheel instruction. The length of the instructional program shall be determined by the experience of the applicant.

A. Classroom instruction shall include, but not be limited to, the following:

- (1) responsibilities of the driver, pupil, parent, principal, and superintendent
- (2) applicable laws and regulations
- (3) local reports and policies governing pupil transportation
- (4) proper driving practices
- (5) planning for emergencies

B. Demonstration instruction

- (1) pre-trip instruction
- (2) care of school bus
- (3) emergency evacuation drills
- (4) proper driving practices
- (5) defensive driving techniques

C. Behind-the-wheel instruction--under supervision of trainer

- (1) operate empty bus until proficient
- (2) operate loaded bus--(minimum-complete route for two days)

The superintendent or his designee shall maintain a record showing that the applicant has completed the training and has been approved to operate a school bus.

9. In-service training shall be devoted to improving the skills, attitudes, and knowledge of all school bus drivers. At least two hours of in-service training shall be provided during the first half of the school year and at least two hours during the second half.

10. The driver of a school bus shall be under the general direction and control of the superintendent and school board and/or the supervisor of transportation, and shall also be accountable to the principal of the school to which transportation is provided.

11. The driver of a school bus shall perform a daily pre-trip safety inspection of the vehicle.

12. The driver of a school bus shall report to the principal misconduct of pupils on the school bus or at waiting stations or stops on the way to or from school and shall be guided by the principal's advice and direction, subject to the regulations of the school board. When it becomes necessary for the driver to correct pupils, the driver shall stop at the nearest and safest place and restore order before proceeding. In no case shall a driver put a pupil off the bus between home and school as a disciplinary measure.



12/13/85

# ACCIDENT FACTS 1985 EDITION



*National  
Safety  
Council*

ACCIDENT FACTS-1985 EDITION

# School bus accidents, 1984



School bus transportation accidents killed about 100 persons in 1984, including 45 pupils, 5 bus drivers and 50 other persons.

Of the pupils killed, about 10 were passengers on school buses and 35 were pedestrians either approaching or leaving a loading zone. More than half of the pupil pedestrian victims were struck by the school bus which they were entering or leaving.

Injuries in school bus related accidents totalled about 8,400 of which 5,500 were students.

The table on page 91 shows certain details of the injury and property damage accidents which occurred in 1984. Types of school bus accidents not itemized include an estimated 400 pedestrian, 100 bicycle, and 10 railroad accidents. About eight out of ten accidents involved property damage with no injuries.

## Characteristics of school bus transportation

Interpretation of school bus accident data is complicated by the many variations between state operations, by lack of standard definitions of terms, and by lack of comparable reporting by states.

The state totals in the table on page 91 are shown as reported by the states. The U.S. totals are National Safety Council estimates developed by inflating the total from reporting states to compensate for the portion from missing states. State figures are weighted based on the number of pupils transported in that state. Procedures for estimating all U.S. totals on this page and in the table on page 91 were revised for the 1985 edition of *Accident Facts* and are not comparable to estimates from previous editions.

## Terms and reporting classifications

**Vehicles.** Included are regular school buses and other nonfamily-owned vehicles used in transporting pupils.

**Annual bus mileage.** Total mileage includes deadheading (traveling with no pupil passengers) and extracurricular activity trips. Data from seven states indicate that deadheading may average about 14 per cent of total mileage, ranging from practically none in some states, up to one fourth of the total bus mileage in others, depending on arrangements for driver and bus storage. Extracurricular mileage, based on 18 states, is indicated to be about 9 per cent of total mileage, also with a wide range among states. Such mileage includes athletic and field trips, shuttle service, and so on.

**Pupils transported daily.** A pupil is counted only once for each day transported, although usually two one-way trips or more are made daily.

**Pupil passenger miles and average bus occupancy.** Total pupil passenger miles cannot be computed directly from total bus mileage and pupils transported. Reports indicate average bus occupancy as upwards of 35 pupils, but it may rise or fall several times on a single route trip, as a bus in some instances may serve several schools along the route. Average occupancy for all bus mileage, including deadheading, may be only about 40 per cent of capacity. The National Safety Council estimate of total pupil passenger miles for 1984 is 78.3 billion.

**Route trip.** A route trip may represent (1) a one-way trip from the point where the first pupil boards the bus to the point where the last pupil leaves it, (2) a round trip, or (3) several separate trips ending at the same school(s). Miles per route trip reported for 18 states ranged from 18 to 76, averaging 33 miles. Pupils carried per route trip ranged from 13 to 79, averaging 54 pupils. Route trips per bus ranged from 1 to 4, averaging 2 trips daily.

# School Bus Accidents by State

State	Vehicles	Annual Bus Mileage (000)	Pupils Transp. Daily	Type of School Bus Accident				Prop. Damage Only Acc.	Persons Injured	
				Total*	Other Veh.	Non-coll.	Fixed Obj.		Total	Pupils
U.S. <sup>b</sup>	340,000	3,400,000	22,100,000	29,000	25,000	400	2,000	23,000	8,400	5,500
Alabama	...	51,105	386,239	258	242	2	14	245	104	97
Alaska	600	7,200	39,000	124	107	0	14	113	...	...
Arizona	3,316	35,245	199,986	199	184	2	6	135	143	72
Arkansas	4,180	39,428	263,916	230	80	2	0	203	68	57
California	17,248	245,555	867,549	1,282	897	65	69	976	536	286
Colorado	...	...	...	207	186	1	...	...	...	...
Connecticut	4,686	...	243,000	788	684	0	39	683	136	37
Delaware	1,252	15,632	81,043	91	77	0	8	71	16	7
Dist. of Col.	144	2,073	2,600	58	...	...	...	...	7	6
Florida	7,787	...	738,007	579	386	0	110	531	48	24
Georgia	9,473	...	803,390	969	...	...	104	...	275	230
Hawaii	735	7,374	38,048	36	23	0	3	26	19	10
Idaho	2,004	18,989	120,000	99	77	1	8	81	18	12
Illinois	15,791	180,000	894,748	2,485	2,358	25	48	2,052	761	275
Indiana	8,629	59,529	663,834	...	...	...	...	673	...	128
Iowa	6,847	62,829	253,031	511	359	15	118	451	111	41
Kansas	...	...	...	...	...	...	...	...	...	...
Kentucky	7,297	71,548	462,204	941	763	2	78	804	216	148
Louisiana	7,511	65,837	583,959	711	672	5	7	676	86	77
Maine	2,280	26,680	167,004	148	132	1	11	134	13	3
Maryland	4,880	71,940	444,222	1,032	915	4	97	...	45	21
Massachusetts	7,279	66,613	512,259	1,020	847	1	74	893	175	143
Michigan	...	...	...	...	...	...	...	...	...	...
Minnesota	9,923	90,170	700,000	575	364	9	17	496	340	185
Mississippi	5,300	42,807	358,388	271	...	...	...	...	89	72
Missouri	9,242	96,279	453,662	599	527	0	32	501	259	193
Montana	1,320	17,827	63,108	55	48	3	3	51	4	4
Nebraska	3,622	31,139	61,427	153	145	0	6	132	29	14
Nevada	874	11,278	55,174	62	54	0	3	41	21	15
New Hampshire	1,827	10,793	94,482	190	165	2	16	160	83	59
New Jersey	12,600	120,000	628,412	573	446	22	59	273	298	206
New Mexico	2,021	23,330	130,691	161	137	1	12	136	35	14
New York	...	...	1,977,000	621	545	9	25	462	257	181
North Carolina	12,825	110,511	725,732	1,246	1,018	5	9	887	697	613
North Dakota	1,891	25,484	48,281	39	35	1	0	...	12	7
Ohio	14,374	153,207	1,319,505	1,665	...	...	...	1,437	225	225
Oklahoma	6,395	58,609	295,694	377	300	6	38	165	261	212
Oregon	3,822	39,611	226,650	330	240	9	73	304	44	13
Pennsylvania	19,521	230,112	1,545,995	2,011	1,700	58	214	...	406	142
Rhode Island	1,652	15,179	103,192	107	105	0	2	93	15	13
South Carolina	5,942	59,857	438,117	834	779	12	22	807	422	387
South Dakota	...	...	...	...	...	...	...	...	...	...
Tennessee	6,364	68,703	569,900	657	582	7	61	561	129	113
Texas	22,481	...	947,110	1,210	1,071	0	15	889	...	316
Utah	...	...	...	...	...	...	...	...	...	...
Vermont	...	...	...	...	...	...	...	...	...	...
Virginia	9,042	79,500	720,984	699	636	8	41	591	286	119
Washington	6,005	61,043	376,727	248	225	2	13	173	142	50
West Virginia	2,941	37,338	292,061	690	524	0	165	674	56	29
Wisconsin	6,859	73,807	462,347	642	532	3	0	490	252	...
Wyoming	1,289	13,074	41,322	52	45	2	3	47	8	3

Source: National Safety Council survey of state departments of education and state traffic authorities. Most reports cover 1983-1984 school year or 1984 calendar year. U.S. totals are Council estimates for the calendar year 1984. \*Totals include additional accident types not shown separately. <sup>b</sup>Procedures for estimating U.S. totals have been revised for this edition and are not comparable to estimates in previous editions. (See page 90.)



**National  
Safety  
Council**

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August, 1984

TO: Members of the School Transportation Section,  
Motor Transportation Division

FROM: C. Deane Fortune, Vice President for Motor Transportation

We are enclosing for your information a copy of the National Safety Council's recently adopted policy on protecting pupil passengers in school buses.



**National  
Safety  
Council**

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NATIONAL SAFETY COUNCIL POLICY

on

PROTECTING PUPIL PASSENGERS IN SCHOOL BUSES

"The National Safety Council supports methods and procedures that effectively provide safe transportation of pupils aboard school buses. The Council recommends that until further research and testing demonstrate that pupils will be safer by the installation of seat belts in school buses, the Council believes that passive protection provided by compartmentalization as required by the current (1977) federal standard on school bus seating and crash protection protects seated pupil passengers in school buses with gross vehicle weight ratings (GVWR) greater than 10,000 pounds. (Compartmentalization involves protecting each passenger by his seat, his seat back and the back of the seat or restraining barrier immediately in front of him.)

Approved, Motor Transportation Division, May 2, 1984  
Approved, Executive Committee, Board of Directors, June 28, 1984

## SEAT BELTS ON SCHOOL BUSES:

### A CLOSER LOOK

There are two essential questions to be addressed here: 1) Would the installation of seat belts in school buses be effective in reducing injury and death from school bus accidents? and 2) Would finite funding available for safety efforts be best utilized in this manner, or more appropriately on other school bus safety concerns?

### THE STATISTICS

According to the National Highway Traffic Safety Administration (NHTSA), approximately ten passengers and one driver die inside a school bus each year. Of these fatalities, 50 percent occur in rollovers, 55.9 percent in frontal collisions, 14.7 percent from side impacts, and 25 percent due to ejection. It is estimated that 50 percent of all school bus accidents are the result of driver error. The total number of passengers injured or killed in school bus accidents has declined steadily in recent years, though the evidence is clear that a far more significant problem continues to exist regarding loading zone fatalities (31 in 1983, and an estimated average of 50 each year according to the National Safety Council) — five times the number of fatalities than occur inside the bus.

Based on deaths per 100 million passenger miles, the National Safety Council has concluded that school buses are twice as safe as transit buses, four times as safe as trains, five times safer than scheduled airlines and fifty-three times safer than passenger cars. The school bus industry's safety record is unmatched.

### THE SEAT BELTS IN SCHOOL BUSES DEBATE

The National School Transportation Association (NSTA) firmly believes that compartmentalization — containing children within a structurally reinforced passenger compartment of fully padded, high-back seats and crash barriers — is preferable to any form of containment that relies upon the use of safety belts or other similar restraining devices. NSTA does not come to this conclusion lightly, but only after years of extensive study and consideration. In a June 1985 report, NHTSA similarly asserted that requiring seat belts in school buses is neither cost-effective nor necessarily likely to create a safer ride, and that "compartmentalization provides satisfactory protection, and that a requirement for belts without the assurance of proper supervision of their use would not be an effective means of providing occupant protection."

#### 1. Safety Considerations for School Buses vs. Automobiles

It is important to understand first that there are major differences between school buses and automobiles, and that these differences call for different safety solutions.

- a. School buses are larger and heavier, and efforts have been made to remove protruding objects that could result in passenger injury during a crash.
- b. An unbelted auto passenger would be thrust forward toward the point of impact during a crash, whereas compartmentalization in school buses is designed to cushion students upon sudden impact or swerve.
- c. Autos offer precious little in the way of exterior reinforcement, while school buses are encased in a metal rib-cage like frame. Further, school bus bumpers are well above the height of auto bumpers so that the impact of a collision would not be felt at the same level.
- d. The special features of school buses (shiny yellow color, flashing lights, and special markings) and the knowledge that they are transporting our children give these vehicles a great advantage over autos during transit.

#### 2. Compartmentalization vs. Seat Belts

While seat belts undeniably result in fewer fatalities and injuries in autos, there is no evidence that the same can be concluded as to use in school buses. In fact, the lap-type belt that would be used in the latter may well lead to injuries that otherwise would not occur. Numerous medical experts and studies have shown that younger children could suffer severe abdominal injuries, as well as injuries to the head and shoulder areas caused by a sudden thrust forward. A recent Canadian study concluded that the varying sizes of children make design of adequate seat belts virtually impossible, and many younger children would experience great difficulty in releasing belts in the event of rollover, fire or other such incident requiring quick evacuation of the bus.

### 3. Other Considerations

- a. Would the seat belts be used? Most would agree that bus drivers would be hard-pressed to assume the added responsibility of ensuring that all passengers were properly belted continually during transit. It would, therefore, be necessary to augment the driver with an aide (or elaborate sensing systems), especially in the case of elementary and junior high age students, who would assume this responsibility. With older students, experience dictates that such supervision would be necessary to ensure that the seat belts were not used as potential weapons or subjected to acts of vandalism. A California study now eight years old estimated the annual costs for such monitors in that state at \$45,670,000.
- b. There is also a significant question regarding legal liability. Effective legal arguments could be lodged relative to the potential liabilities of bus drivers, school boards, bus companies, and insurers should an accident occur in which a student injured or killed had not been belted.
- c. Some suggest that use of seat belts on school buses will lead to greater use by children in autos, and instill good habits for later years. There exists no evidence that such patterns can be established and, in fact, seat belt use in autos has never approached what safety advocates have envisioned. Without proper supervision on school buses, the belts are not likely to be used. However, a conscientious parent in an auto or flight attendant on an airplane, for example, is likely to ensure use in that more appropriate setting.

### CONCLUSIONS

NSTA is not alone in its opposition to installation of seat belts in school buses. The following organizations have expressed similar views:

- The National Safety Council
- National Transportation Safety Board
- Delegates to the Tenth National Conference on School Transportation
- School Bus Manufacturers Institute
- The Hartford Insurance Company
- National Association for Pupil Transportation
- State Directors of Pupil Transportation

In addition, many state transportation agencies and legislatures have expressed doubt as to the utility of installing seat belts in school buses. These include the states of Alaska, Arkansas, Montana, Maryland and Minnesota, as well as the government of Canada. In each instance, this position was adopted only after thorough study of the issue. In several cases, the study came after well-publicized bus tragedies where lives were lost or many serious injuries resulted.

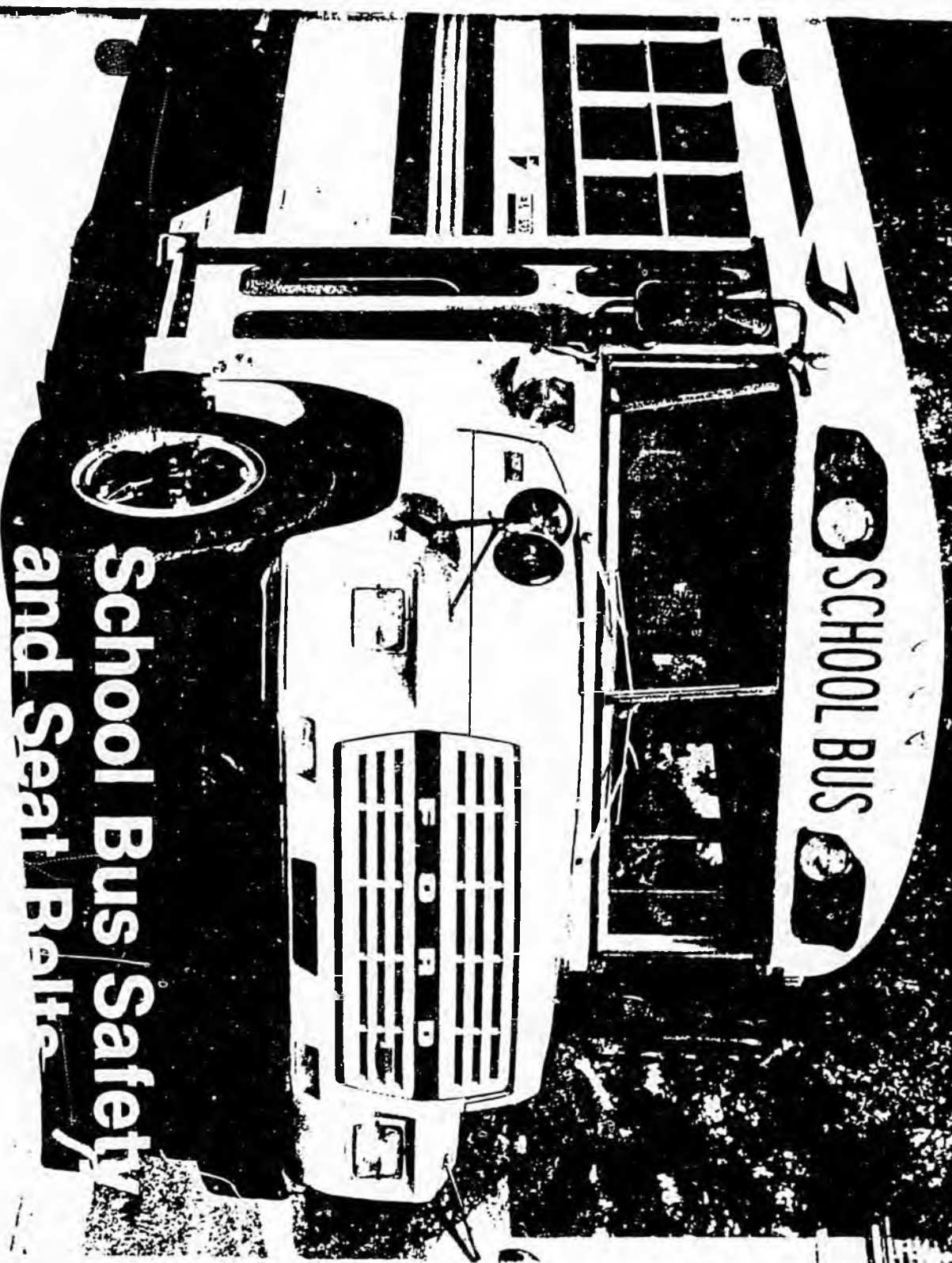
The above discussion is in no way intended to suggest that safety improvements could not be made which would further diminish the likelihood of death or injury for school bus passengers. In fact, NSTA has been an active advocate of a number of enhancements in design and driver training that it believes would more effectively address existing safety concerns. Further, it must be emphasized that NSTA does not oppose installation of seat belts on school buses based on cost considerations. Most manufacturers estimate the per bus cost of simple lap-type seat belts to be in the range of \$1,200 to \$1,800. This cost would not be assumed by school bus contractors, but rather incorporated into future bids for service ultimately to be borne by individual taxpayers in the school districts.

Each day nearly 23 million American children ride about 350,000 school buses to their schools and back again. With improvements that have come in recent years due to compartmentalization, improved warning signals, and the like, school buses have become the safest vehicles on the road. The degree to which improvements can be made upon this impressive record should come in the area of more extensive driver training, expanded motoring public education, standardization of state laws applying to a motorist approaching a bus loading or unloading students, and efforts to standardize warning lights and lettering. Were federal funds to be dedicated to enhanced school bus safety activity, it is our view that it would be most prudently utilized in these areas, thus attempting to reduce the number of deaths and serious injuries which occur in loading areas — by far the most serious concern.

NSTA supports timely completion of a thorough study by the U.S. Department of Transportation of this issue, complete with necessary crash testing. While it expects that any study will reach the same conclusions, should installation of seat belts be recommended, NSTA only seeks to have promulgated uniform federal standards as to the design changes required and the preferred method of installation.

# National School Bus Report

Magazine of the National School Transportation Association



## School Bus Safety and Seat Belts



Published by the National School Transportation Association

SPECIAL EDITION

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# The NSTA Position

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The National School Transportation Association's prime concern is the safety of the children its members transport daily. In fact, the Association was founded — and continues — because they are able to get students to and from school in the safest possible manner. Traveling in today's well-equipped, shiny yellow bus is seven times safer than taking the same trip in the family automobile.

This is why NSTA supports the National Highway Traffic Safety Administration's position on occupant protection in school buses.

Our association is not so much opposed to the use of safety belts in school buses as it is supportive of the concept of *compartmentalization*. We came to this position after years of tests, experiments and studies resulted in the NHTSA concluding that compartmentalization provides an adequate level of safety protection. In contrast, there are no standards established for seat belts on large school buses.

NSTA believes that compartmentalization — containing children within a structurally reinforced passenger compartment of fully padded, high-back seats and crash barriers — is preferable to any form of containment that relies upon the use of safety belts or other similar restraining devices.

Furthermore, we believe that the studies and excellent safety record of school buses support compartmentalization. The *real* safety problems in school transportation — and those that need to be thoroughly addressed by the industry, schools, parents and the public — are the fatalities and injuries that occur where children get on and off the buses — the loading zones.

Those of us who work with the children and school buses every day feel that every new item that is added or changed on school buses should be well tested and engineered prior to being mandated as a regulation. This is why NSTA will continue to support the compartmentalization concept until documented research establishes that seat belts on school buses will raise the level of protection for the occupants.

NSTA is concerned that many interested and well-meaning individuals are not informed of the safety record of school buses, the safety features incorporated into school bus construction, and why seat belts are not mandated or needed on school buses. This is why the board of directors has approved a special edition of the *National School Bus Report* to address these topics.

NSTA Board of Directors

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*The National School Transportation Association was founded in 1964 by private school bus contractors to "promote and foster the highest degree of safety in the transportation of school children." The Association represents approximately 40 percent of the nation's yellow school bus fleet. The bulk of these private contractors, many of them from second- and third-generation firms, are members of the NSTA as well as state contractor associations.*

# Seat Belts: The Difference Between Automobiles and Buses

For years safety officials have been telling the American public that "seat belts save lives." They do, too — in automobiles.

Even so, after two decades only a small portion of the driving public regularly uses these safety devices. No slogans, campaigns or even visible evidence have caused the majority of Americans to buckle up when they get in their cars.

There is a segment of our population — well intentioned, concerned people — who are calling for seat belts to be placed on all school buses in the country. At first glance, this may seem like a good idea, but upon closer examination, it turns out to be simply not the case at all.

The fact to keep in mind is there are major differences between automobiles and school buses, and these differences call for different safety solutions.

## Different Construction

Even though they both have tires, steering wheels and motors, there are basic differences between automobiles and school buses besides that of size. In a school bus, great effort has been made to eliminate protruding objects that could injure a passenger during a crash. Automobiles, in contrast, are loaded with hostile objects such as dashboards, windshields, knobs, and worse.

Unbelted, an automobile's passenger will fly toward the point of impact in the event of a crash, colliding with any of these hostile objects that are in the path. The safest place to be in such an event is belted into the seat, which is designed to stay attached to the automobile frame.

A school bus is different. Passengers are protected by the lack of protruding objects and by compartmentalization — the careful padding or seats, seat backs, sides and aisles. This compartmentalization is designed to cushion the students in the event of a sudden impact or swerve and the padding itself absorbs most of the impact.

## Other Differences

There are other differences as well. The outer construction is an excellent example. A school bus is encased in a metal frame, much like a metal rib cage, unlike today's small automobiles which have very little reinforcement. In addition, the passenger compartment in buses is well above the bumper height of automobile bumpers, so the impact of a collision isn't felt on the same level.

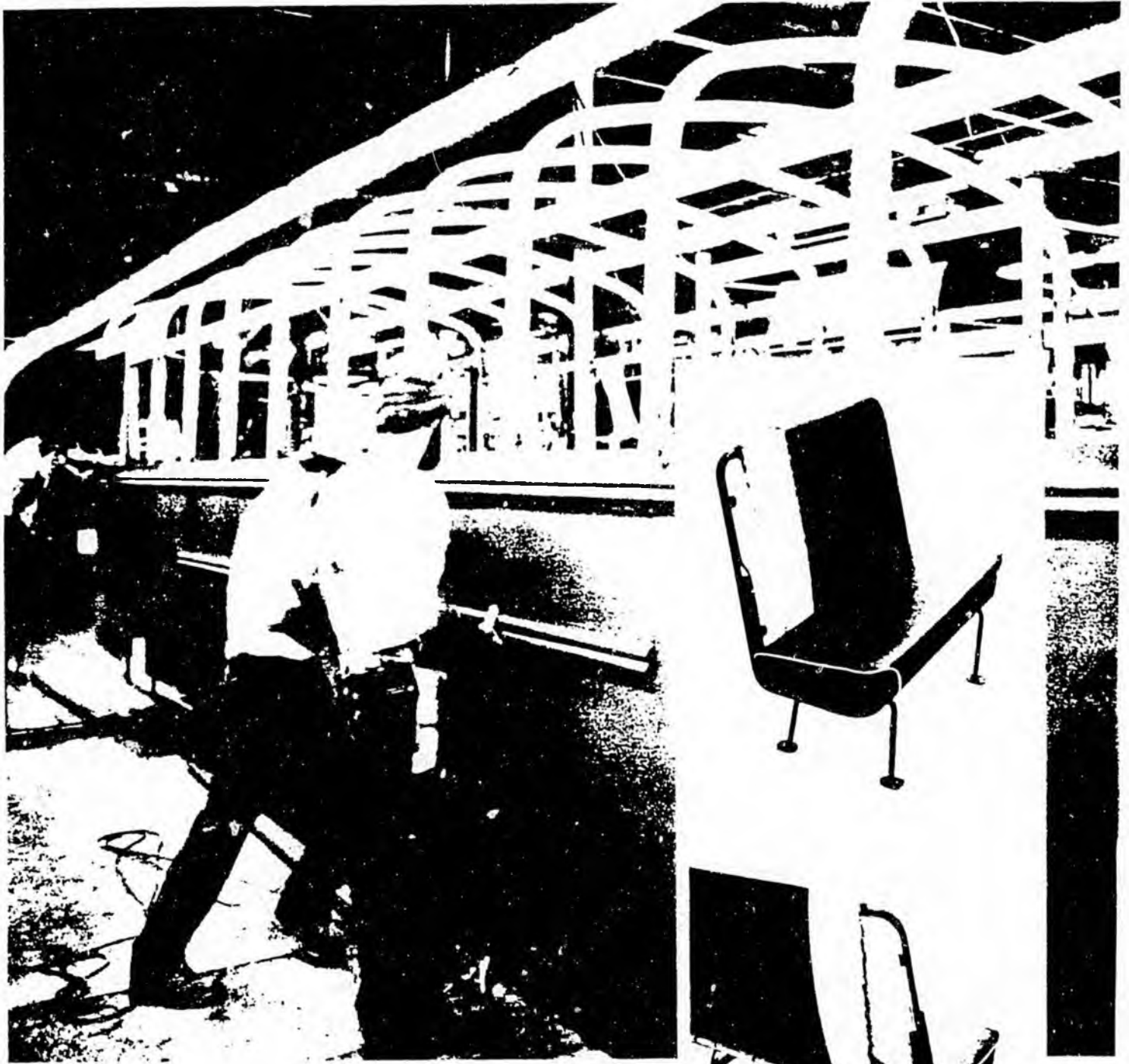
This is the reason why interstate carriers, school buses and public transit buses are exempt from safety belt requirements. They have inherent safety advantages related to their size, weight and interior design that other vehicles don't normally have.

## School Buses Are Special

School buses are special for other reasons as well. First of all, the public is aware of them because of their shiny yellow color, flashing lights and special markings. This automatically makes the public more cautious around this type of vehicle. Besides, these buses are normally operated at a low speed.

They are particularly special because they carry a precious cargo: our children. This knowledge on the part of the bus drivers and the motoring public gives this type of vehicle a large advantage when it comes to safety.

When all these factors are taken into account, it becomes clear that different safety devices must be considered for these two completely different types of vehicles.



# The Safety Record and The REAL Problem Areas

Although statistically there are few pupil fatalities on school buses — .4 of one percent per 100,000 vehicular miles in 1982-83 — the school bus industry can't afford to brag. As long as one child is killed, the quest for safety must be a never-ending process.

The fact remains, however, that the majority of fatalities in school bus related accidents don't occur on the bus. They happen before, during, or after the loading or unloading procedure. Considering the potential for accidents and the number of children who regularly ride school buses (over 22 million in 1981-1982), it is amazing that the number of deaths or injuries is not greater.

## The Real Problem Areas

Seat belt proponents continually stress the need for safety aboard the bus and contend that existing standards created by the compartmentalization concept are not adequate protection against side collisions and rollovers. Setting aside the question of whether or not the school bus itself is a safe vehicle, it is important to look at where children are being killed and to examine some of the reasons behind the accidents.

One accident that received a great deal of publicity was the 1983 Jonesboro, Arkansas tragedy. The findings of the investigation board clearly indicated driver error as a primary factor. The bus was traveling at an excessive rate of speed and the driver, who was unfamiliar with the terrain, simply lost control. Had he been familiar with the area and traveling at a lower speed, the accident would never have occurred. The same can be said of many of the major tragedies involving school buses, and of a significant number of fatal automobile accidents as well.

## Too Late and Too Little

It appears that seat belt proponents, instead of correcting the problem at its source, are looking for devices designed to protect students in case of an accident — rather than seeking ways to avoid these mishaps altogether. The situation is similar to closing the barn door after the horse has been stolen.

Instead of placing the major emphasis on student protection in the *event* of an accident, time and effort could best be spent on driver training and public awareness.

According to the most recent statistics available, during the 1982-83 year 28 school children were killed in school bus related accidents while outside the bus. Of those, 17 were killed by their own bus — 12 at the front and five at the rear. The remaining 11 fatalities occurred when vehicles passed — illegally in most instances — a stopped school bus in the process of loading or unloading. Why do fatalities such as these occur.?

The cause of the 11 killed by vehicles passing a stopped school bus is ignorance of the safety hazards and a lack of awareness on the part of the motoring public. The transportation industry hasn't done a very good job of educating the public. In addition, the number and variety of traffic laws around the country specifying procedures to be followed when approaching a bus loading or unloading is in itself a cause for motorist confusion. Not only do laws vary from state to state and locality to locality, there are also major differences in warning equipment. For example, the eight-light warning system is not universally required; neither is the stop arm nor standard lettering such as "Stop on Signal."

## Driver Training

Emphasis on reducing the federal deficit makes it unlikely that additional funds will be made available for school bus driver training. The end result of this lack of funding means a reduction in school bus driver training. This is particularly lamentable in light of recent studies that show the positive effects of such programs. One in particular — a California study — concluded that school bus driver-caused accidents declined an amazing 20 percent after a driver training program was initiated in 1974. Similar studies conducted by other states show comparable findings.

## Where Should Learning Take Place?

The suggestion by seat belt proponents that if children are taught to buckle up on a bus, they will continue the habit into adulthood is commendable, but unrealistic. No school bus driver — operating under less than ideal conditions at the best of times — could accomplish that which only 10 to 14 percent of the parents whose children ride in seat belt equipped automobiles have accomplished in the 25 years since these devices were introduced.

Doesn't it make more sense to concentrate energies in teaching in an environment where educational experiences have shown that learning is best accomplished? Even if seat belts were made mandatory — in automobiles as well as in school buses — the process of teaching children the value and desirability of their use could be accomplished much more effectively in a controlled educational environment than on a crowded school bus.

## A Desirable and Workable Goal

There is a solution to eliminating a great number of school bus related fatalities. It's driver education, and it's an attainable goal. All a driver need do is be certain that he or she knows where the child is who is getting on or off the bus. It's that simple. By counting and not moving until they are sure, the child will not be run over.



This message should constantly be in front of every school bus driver. Additional distractions, such as assuring that seat belts are properly adjusted and buckled, would only divert driver attention from this primary responsibility. If seat belt proponents direct their efforts toward accomplishing this single goal, instead of campaigning for, and promoting, additional safety equipment, it could be accomplished and the safety of the children would be greatly enhanced.

Roscoe Bernard

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*A former educator, Mr. Bernard is currently a professional in the school transportation industry.*

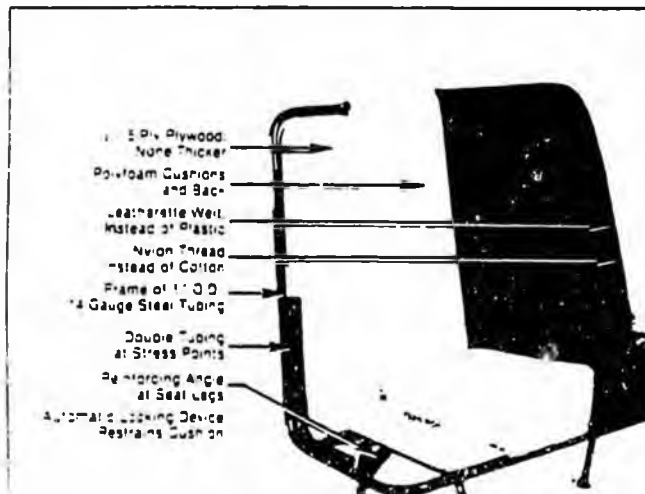
# What is Compartmentalization?

A lot of thought, care and research went into the National Highway Traffic Safety Administration's standards for school bus passenger seating and crash protection.

The underlying philosophy behind these standards was the premise that it is more practical and effective to put the passengers in surroundings that could absorb a great deal of the shock and energy generated by a collision or sudden swerve than to confine the children in seats with seat belts.

"The standard relies on compartmentalization between well-padded and well-constructed seats to provide occupant protection on school buses," is how NHTSA's language actually reads. These standards are applicable only to large school buses. On the smaller, van-type vehicles, seat belts are required.

NHTSA also noted that, "Compartmentalization provides satisfactory protection and that a requirement for belts without the assurance of proper supervision of their use would not be an effective means of providing occupant protection."



Compartmentalization involves several things. It calls for higher seat backs, impact-absorbing seats and padded reinforcement of these seats, which also must not separate from the vehicle at any attachment point. Special padding of the rear of the seats is designed to protect children's heads in the event of a sudden impact, and special leg protection zones are specified in the construction requirements. All of this padding is required to be of thick foam rubber in order to absorb the maximum energy from the impact.

In 1983, the Federal Motor Vehicle Safety Standards for school buses was modified to increase the spacing between the seats from 21 to 24 inches. This was done, however, only after tests had demonstrated that such an increase would not impair the concept of compartmentalization. Any increase beyond 24 inches might impair the ability of the seats to absorb energy in the manner required by the standard.

The benefit of compartmentalization is that it is a passive protection system. The student passengers don't have to do anything to afford themselves this protection. It is built into the vehicle itself.

Seat belts on school buses might work under certain conditions — and there is even some argument about this — but one thing is clear; they won't do any good at all if they aren't fastened, and fastened properly. With compartmentalization, the protection is automatic . . . and effective.

# Seat Belts: Some Medical Opinions

Seat belts are designed to prevent injuries and save lives. In automobiles, using the shoulder-type harnesses installed today, they often achieve this purpose. However, in some cases, seat belts themselves can cause injuries, particularly the lap-type seat belts that would be used on school buses.

As one physician put it, "If we devise a restraint to hook over a particular prominence, when we come to the child, we may find that that prominence is in fact not there. A case in point is the familiar seat belt. If the seat belt is permitted to ride up above the iliac crest, there is nothing from a skeletal standpoint between it and the backbone. We are already seeing brand-new visceral lesions produced by seat belts, including crushed kidneys, ruptured bladders, and damage to the pregnant uterus.

"If the seat belt is worn properly as a lap belt, it hooks between the thigh bones and the anterior-superior iliac spines of the pelvis. These are broad, strong bony projections, hooking slightly downward, that completely prohibit such injuries which can occur only when the seat belt is worn too loose and the patient slides out from under it, or else it worn too high. But in a child, those bony prominences are too rounded. The thigh is relatively larger and the pelvis itself is smaller. Therefore, it is almost impossible to apply a seat belt to a youngster in such a way that — with a decelerative force — the child's weight will not be thrown directly upon the viscera."

## Spines of Children are Different

As you sit, you can feel two very sharp anterior superior iliac spines about an inch above your thighs. This means that an adult can put a lap belt across between the thighs and the pelvis and the load will fall directly on the pelvis. This is not the case with children. These spines just do not exist in a child under the age of nine or 10. The child doesn't begin to form secondary ossification centers there until about the age of 12 in girls, and about 13 or 14 in boys, so what you do have is largely cartilage and flexible. "Now, therefore, if you put any kind of lap belt on a young child, and you accelerate the child against the lap belt, the force will be

transmitted directly to the abdomen — and since the abdomen acts largely as a fluid-filled sac, any force applied to it will be transmitted in all directions."

"Things will be torn loose from their moorings," the physician continues, "and their moorings include blood vessels. One may bleed to death in the belly without any difficulty at all."

"I don't really know how you are going to get anything approaching any lap belt that I have ever seen that would be safe to put on a young child, much less effective. I don't know how old a child must be to safely wear a lap belt, but I would guess the age of 10 or 11."

## Abdominal Injuries

Other physicians have written extensively about abdominal injuries caused by lap-type seat belts, not only to children, but also to adults. In addition, because such restraints don't protect the upper torso, the head and shoulders frequently plunge forward causing injuries in these areas as well.

## A Canadian Study

The Council on Road Trauma of Hamilton, Ontario, conducted a study on the use of seat belts in larger school buses. It concluded that the varying sizes of children make it almost impossible to design restraints in large buses. If the belt is put on incorrectly, a pupil could not release himself and escape the bus in a rollover situation, and injuries could arise. If the belt was not designed for the child using it, injuries could mount.

The council report also concludes that research data available does not support providing seat belts in buses to reduce injuries. Members of the council included a pediatric surgeon and a design engineer.

Until there is further proof to the contrary, it would appear that the use of seat belts in large school buses — of necessity the lap-type devices — would possibly cause as many injuries as they would prevent.

# Legal Liability

There are many unresolved issues related to the proposal to put seat belts on school buses. Some — which are significant but are often overlooked — may be loosely categorized as legal considerations.

The first of these is the consideration of whether a particular proposal is legally valid. This would depend to a great extent on whether it was generated at the federal, state, or local level.

Federal constitutional problems may be asserted, particularly if it is a federal proposal. On the state level, there may be problems with the state constitution. The state action may be considered to burden federal prerogatives. On the local level, the rule-making agency may not have the power to issue such a proposal.

## The Question of Additional Liability

One area of concern to parties interested in a seat belt proposal consists of questions of the potential liabilities of bus drivers, school boards, bus companies, and insurers should these devices be installed on large school buses.

In school bus incidents in which the injured child sues the bus company, the driver, and/or the school authorities, the child's theory of recovery is usually based on negligence. Typically, the child will assert that the bus driver owed a duty of care to the child which the driver has neglected to fulfill and that such neglect was the cause of the child's injuries.

What is the nature of the duty owed by a school bus driver? In some states, the school bus service has been held to be a common carrier service, and, consequently, the bus company and driver have been required to fulfill an extraordinary duty of care, or the highest duty of care. In other states, the bus company and driver have been held to an ordinary duty of care (but in many of these states it is, in fact, a heightened standard which is applied).

In one case the bus driver was held to have violated the ordinary duty of care in part by failing to warn a disembarking child that a car was approaching. In another case, it was held

that the court could not rule as a matter of law that the school's duty did not require stricter supervision where a child was injured by another child while rough-housing on a bus.

These cases, among others, suggest that a school bus company and the bus driver may well be subject to liability if the driver fails to ensure that all students use the seat belts; for example, where a student who does not use a seat belt is injured under circumstances in which it is arguable that he wouldn't have been injured if he had worn the seat belt. Liability is possibly more likely in the above example if the local school has a regulation posted in each bus stating that seat belts must be worn.

The negligence theory may also be based on poor maintenance or upkeep of the safety equipment. Assume that in the example above a seat belt malfunctioned: the child may base his theory of liability on an assertion that the bus company's or the driver's duty of care was neglected because the seat belts were not checked.

The significance of this potential for expanded liability is twofold. In the first instance, it will cost local school authorities and bus companies either through increased insurance premiums or expensive court costs and settlements. Secondly, it will force the schools to adopt costly measures in order to minimize exposure to liability.

As a final note, it may be possible that the existence of seat belts may have another effect on litigation strategy. A school authority or bus company that is sued for injuries caused by negligence, may assert the non-use of seat belts in its behalf. It may argue that the student was contributorily negligent by failing to use his seat belt.

In addition, the school board may argue on the issue of damages that they should be decreased by the amount of injury that would have been avoided if the student had worn his seat belt.

Eric Rubin, Esq.

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*Mr. Rubin is a partner in the Washington, D.C. law firm of Rubin, Winston & Diercks.*

# Seat Belts: Would They Be Used?

Student safety is — and should be — a prime concern of all school personnel. Safety includes having proper facilities and equipment in the school buildings and on the school grounds; teaching and practicing good safety habits; and making sure students are transported to and from school and to various school activities in a safe manner.

Whether a school district contracts for student transportation or does their own, the question usually arises sometime during the school year as to the value of seat belts on school buses. There possibly was a time when the use of seat belts could have served a useful purpose. This was before school buses were designed and built in a compartmentalized manner with exceptionally high and well-padded seat backs. Based upon reports I have seen, it's my opinion that a student is in much less danger of being injured by a sudden drop or jolt if forced against a padded seat back than being thrust against a tightly restrictive seat belt.

It is likely that the use of seat belts on buses transporting elementary or junior high age students would dictate additional costs to a school district because an aide would be needed to ensure that all belts were properly fastened and kept fastened. The use of the seat belt would undoubtedly lead to much greater time loading and unloading buses, which in turn might cause traffic problems or accidents as buses waited on busy streets for students to buckle up or unbuckle before leaving a bus.

At the high school level the problems would undoubtedly be much greater if seat belts were required. There would have to be some physical discomfort for the high school student, since the school bus would probably be designed with three belts to a seat, even though only two high school students would fit in a seat. This would also mean that one seat belt would be loose in the seat and could become a hazard by hanging in the aisle.

There is certainly no practical way to make high school students use seat belts; and where elementary or junior high students ride with high school students, it would be difficult to explain or defend to the younger students why they had to use the seat belts when the high school students did not use them.

The feeling among the administrators in the three large suburban high schools with which I have been associated is that seat belts could and would serve as a potential weapon to be used against fellow students or bus drivers. This is a real concern among school administrators in urban and suburban school systems. All in all, the disadvantages of seat belts in a school bus appear to far outweigh any real advantages.

William Augustus

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*Mr. Augustus is a former school teacher and administrator in the Chicago, Illinois area.*

# Student Management

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Student management has become a very important concern to school bus drivers over the last decade. Changing social values have meant that all authority has been challenged and a driver can no longer expect his directives to be simply obeyed. Although this change has not made the driver's life an easy one, the problem has not gone unanswered. Efforts at both state and federal levels have resulted in training programs designed to give the driver the tools needed to do the job. Progress has been made, but if a new element is introduced — seat belts — much of the ground gained may be lost.

First let's look at what seems to work. "One-to-one" is a term often mentioned. If the driver can isolate the disruptive student and remove the peer pressure in the bus, his chances of success are much better. The driver must be seen by the students as a professional who is concerned about them, not as a friend. When the student and driver meet, it must be with mutual respect, and without pressure from either side.

## Who's in Control?

Rules that are enforceable are important. Neither being too strict nor too lenient seems to work. Drivers differ in how they handle their small societies, but there must be clear-cut limits. Boundaries are important. The rules must be constant, and if a student steps over the line, action must be taken. Without this, control is lost and the situation becomes intolerable.

I don't believe we should try to change students' values even if we don't agree with them. To do so takes a great deal of time and expertise — in any event — and such attempts are often not successful. I find, however, that most students respect safety. If offending behavior is pointed out as something that affects the safety of the bus and its occupants — rather than being categorized as good or bad — the driver has a much greater chance of maintaining discipline. It then becomes a cooperative effort toward a common goal.

It's important to make sure the driver is in a situation that he can handle on his own. If outside help is needed, it must be seen as an adjunct to — not taking the place of — the driver's position and authority. If the driver brings in outside help to settle a dispute, he is no longer the leader and that all-important sense of respect is lost. Any type of confrontation that cannot be resolved by the driver destroys the students' feeling that the driver is in command of the situation.

## The Question of Seat Belts

Now let's turn to seat belts. The question that we need to address is this: If there are seat belts in the bus, will the child use this belt properly, or will he even use the belt at all?

Experience has shown me that children who are belted in are able to get out of a bus, and that they don't use the belts as weapons. However, they don't, in fact, use the belts at all, in most instances. Where monitors are provided, the belts are used and they seem to make some sense. However, there is a cost factor involved here. The Southwest Research Institute's *Study Relating to Seat Belts for Use in Buses* put this concept in its proper perspective when they estimated that the State of California would have to spend \$45,670,000 a year for such monitors — and the study was done in 1977. It would presumably cost much more today.

It is unlikely, therefore, that monitors will be assigned to large numbers of school buses in the country. This means that if seat belts are installed in the buses, the driver will be solely responsible for the management or use of these belts.

I don't agree with the concept that belts should be installed for those few that might wish to use them. Even without a legal mandate, the liability question is going to force the driver to make some attempt to see that all the students are buckled in.

### **The Driver's Dilemma**

Here's where it becomes a dilemma for the driver. He will be put in a position where he will not be able to control this segment of his bus environment. Without an additional person to help him — such as a monitor — there's no way for him to know if the belts are being used or not. We will have given the driver a situation that he cannot enforce, and we are negating the very things we are currently trying to do to make his job — and his authority — an important component of an overall safety program.

Another aspect of this issue that bothers me is that in the driver's management of the bus, he tends to enforce those rules he believes in. If our bus driver population is roughly equivalent to the population as a whole, the percentage of them who believe in — or use — seat belts in their private automobiles is quite small. This is a sad commentary, but unfortunately, it's a fact.

One of the strengths of this industry is that the driver is his own boss most of the time. He sees himself as an important person, and rightfully so. This enhances his self esteem and creates a self confidence that is essential to his success in his position as a leader and a manager. If the issue of seat belts causes friction between the driver and the students, or the driver and management it won't — in the long run — be worth the effort.

The problem of student management isn't going to be helped by the addition of seat belts. If they had been proven effective in school buses, and if there were important gains to be realized, then it would be worth the effort. Right now, this doesn't appear to be the case.

### **First Things First**

Student behavior is often cited as a major cause of school bus accidents. If this is so, we should try to solve this problem first. I believe we should focus on such items as driver selection and training, which is the subject of a NSTA study. Here, at least in a small way, the problem is being examined. If more of this type work were done, I believe the situation of student management would be improved.

Seth Corwin

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*Mr. Corwin is chairman of NSTA's Safety and Driver Training Committee and a long-time advocate of safety efforts in school buses. He is from Chappaqua, New York.*

# AS I SEE IT: Perspectives on the Issue From . . .

## . . . The Driver

My first responsibility as a school bus driver is to transport my children to and from school as safely as possible. This responsibility is far greater than many people realize. There are many distractions in my job, and any one of them could cause injury or even death to those entrusted to my care. It's unfortunate, but there just isn't enough time to be concerned with some of the things that are important to those who aren't actually involved in pupil transportation.

I wish I had more time and fewer distractions, but my primary responsibility has got to come first. As long as I keep that in view, I believe I'm doing what I should be doing as a school bus driver.

Some people believe that seat belts should be installed on school buses. I don't agree and I'd like to tell you why.

### Children and Seat Belts

Although I've driven only a short while, I've really learned to care for my kids; they're very important to me. The area in which I drive has the reputation of being a pretty tough neighborhood, and although I haven't had too many problems, I have had some. Most of my kids are pretty well behaved, but some aren't.

If the students cut seats and cushions, they sure wouldn't hesitate to cut seat belts or tie knots in them. Seat belts would be just one more thing for them to get their hands on. Kids have a continual need to manipulate, twist and pick at just about everything.

This is the reason manufacturers stopped making classroom furniture with exposed bolts, nuts and screws long ago. If belts were attached to the seats, I'm afraid there would be similar problems. For instance, it's difficult to get elementary school children to sit still for very long. They like to push and shove and I could see a child who is buckled in being pushed against a tightened belt.



### A Question of Time

Even though these would probably be the most on-going problems, my major concern is what would happen in an emergency evacuation, particularly with the little ones. It would be impossible to get them out in a hurry. I know from experience — having had to occasionally help with snaps and zippers — that some would need help unbuckling their belts. In the event of fire sweeping through the bus, the majority of my children could not get off in time. That's my major concern: I can't see a functional evacuation under such high-stress conditions.

Another of my concerns is how to enforce the use of seat belts. At the present time, I can manage my bus. Most of the children behave well enough so that I'm not constantly looking in the mirror. I don't worry too much about whether or not they're misbehaving while I'm driving. If I had seat belts to worry about, however, I don't believe I could manage the situation by myself; I'd have to have help.

If I had to get out of my seat after every stop to make sure the belts were buckled, I'd never get to school on time. Coupled with the problem of belt misuse, I would be facing an impossible situation. In order to ensure the use of seat belts, I'd have to have monitors. There's simply no other way.

### **Safety Question is Misdirected**

It seems to me that the question of safety on school buses is misdirected. According to my information, the majority of bus-related fatalities are caused either by the child being struck by the bus or by another vehicle. For this reason, a monitor could best be used in the loading and unloading process. This is the situation we really need to address.

This is the area that also needs to be stressed as far as public education is concerned. I've had people repeatedly run my stop arm. If they were aware that the law says, "When that stop arm is out, you do not go by," it would help. If the general public knew how kids behave on the buses and what it is really like to be responsible for them and for their safety, they would be more careful when approaching a stopped school bus. This would substantially reduce the fatality rate.

### **The Delay Factor**

Another thing that a lot of people don't think about is the delay factor. Even though we are supposed to pull over and let cars pass when there are three or more behind us, it isn't always possible. This is where the stop arm violations occur. There have been occasions in which I've had a line of cars behind me and I couldn't do anything about it. I must wait until every child is seated before I move. Even with my stop arm in, I can see that seat belts would cause an additional delay.

I really can't blame motorists for being impatient. Many people have deadlines or are running late for work and so forth, but some are just plain impatient and can't stand waiting regardless of the reason. The time factor is often critical. I've had some people stop and then go around because they think I'm taking too long. It's hard enough for many to have to wait while I load five students. If they had to wait until I went back to check seat belt buckles, I can imagine what would happen.

### **The Question of Cost**

I've read about some of the projected costs for seat-belt installations, and it seems to me that this could be a major factor in their use. We're talking about taxpayers' money for something that hasn't been proven to be either needed or effective as a life-saving device in school buses. We'd be better off using the money for more driver education.

My defensive driving course was very beneficial to me. It increased my awareness of the dangers involved in transporting students and of my own responsibility.

### **Compartmentalization is Proven**

What is the purpose of having unproven devices — and this is what seat belts in school buses are — when we already have adequate safety protection? A lot of tests and expense has gone into compartmentalization of school buses. We know that it works as a safety device. With our high back and padded seats, it is unlikely that any of the kids are going to suffer injuries from metal or projections, such as you have in a car. This used to be a problem, but bus seats are much different now. We can't compare automobiles with school buses. They are entirely different in strength, size, height, and protection. I don't think the general public really understands this difference.

As a divinity student, I personally believe I need to set a good example for my kids by my own conduct and by the way I treat them. The safety of the children entrusted to my care is very important. Injury or death to any one of them would be an ultimate tragedy and I must speak out against anything that might jeopardize their safety. If I can help them be better educated and grow up to be contributing citizens, then maybe I've done my small part.

Jonathan K. Merki

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*Mr. Merki is a driver in a suburban Kansas City school district. Born in South Africa, he is attending a theological seminary in Kansas City.*

## ... The Parent

Yesterday my neighbor and I took our junior high-aged daughters shopping, and as we got in the car, I reminded everyone to be sure to fasten their seat belts. My daughter, who normally wears a seat belt, protested because she felt she would seem childish in front of her friend. After a short confrontation, Jami put on her seat belt and we were able to leave for our afternoon outing. The use of seat belts, however, became the main topic of conversation that afternoon. Our discussion eventually got to the question, "if seat belts are needed in automobiles and vans, then why not in school buses?" At this point I'm afraid I shocked my neighbor when I said that seat belts were not necessary for school buses. I went on to explain that my position is based on several related factors.

First, my husband is a certified defensive driving instructor for the National Safety Council, and the philosophies of safety are a definite part of our driving habits.

Second, in the last few years while the construction of automobiles seems to have become less protective, the construction of school buses has been greatly improved. The spacing of seats has been changed to allow less room for occupants to fall, the height of seat backs has been raised, and the amount of padding has been increased in order to reduce the severity and occurrence of injuries resulting from a collision. The standards for impact resistance and overall body strength have been increased in order to lessen the danger of injuring passengers. These improvements, along with other safety devices such as convex mirrors, better warning light systems, and stop arms that swing out from the side of the bus, have increased children's safety.

Third, most states now have a standardized certification program for school bus drivers, and most districts have implemented safety and training programs not only for drivers, but also for students. These programs have resulted in drivers who are not only better trained in driving habits and safety awareness, but also in understanding the needs of children and what can realistically be expected of them. The programs for students include guidelines for behavior while riding the bus, classroom materials

designed to promote greater student safety awareness, and standardized procedures for emergencies. These programs have resulted in improved student behavior on the bus which means fewer distractions for the driver and, in turn, fewer accidents.

### Are Seat Belts Practical?

The practicality of seat belt use by students on the bus is another side of the issue. Who would be responsible to see that they are used? The most obvious answer is the driver. But if the driver has this added responsibility, might it not distract him from his driving?

Once the student is seated and secured, how would the driver know the student has kept the seat belt buckled? To answer this question, some sort of system would have to be established to ensure seat belt use. This could result in frequent driver checks, additional adult supervision on the bus, installation of a panel of lights or buzzers to alert the driver, and so forth.

There are other practical considerations involved with the use of seat belts on school buses as well:

- How many seat belts per seat? One for each student? One for each seat? Logically, one would have to say one seat belt per student.
- How much additional time would my child have to ride the bus to and from school in order to ensure seat belt use?
- Could — and would — an unused seat belt be deliberately or unintentionally used by one student to injure another?

Finally, a seemingly callous, but necessary, question arises: What is the cost of installing and maintaining seat belts on a school bus and who would pay this additional cost?

After taking all of these concerns into consideration, I feel that seat belts in school buses are not the answer. The answer to greater safety seems to me to be continued financial and moral support for programs on driver training and safety awareness, together with student programs on proper school bus behavior and safety rules. Another answer would be to have the Federal

Government establish standards restricting the number of years a school bus could be used.

Panny Schingel

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*Mrs. Schingel is the mother of four children, two of whom still ride a school bus daily. She is very active with the church youth group and is a resident of Bourbonnais, Illinois.*

### ... The Highway Patrol

In the 14 fiscal years preceding 1983/84, California has experienced seven pupil passenger fatalities in school buses. We can safely conclude that the use of seat belts would not have altered the outcome of five of these fatalities. The result of the remaining two fatalities is subject to pure conjecture.

In spite of these statistics, the results of scientific studies, and the opinions of traffic safety experts, we continue to receive requests to install seat belts in school buses. If a state is going to make this a requirement, the following needs to be considered. In order to accommodate seat belts, floors, seat frames and structural supports need to be strengthened, and the anchorage points for the seats and seat belts also need to be adequate to withstand the additional forces that will be applied during crashes. A cost of \$100 per pupil seating space is a conservative estimate to accomplish this in existing school buses.

The installation of seat belts in school buses presents a very costly issue that needs to be carefully evaluated against its potential for enhancing safety versus its unintended consequences, e.g., the Martinez charter bus accident. There may be other aspects of pupil transportation safety that can be improved that may not be as costly as seat belts and they could have a much greater potential for yielding positive results. These alternatives need to be considered before making a final decision.

E. Kynaston

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*E. Kynaston is Chief of the Enforcement Services Division of the Department of California Highway Patrol.*

### ... The Student

Students of various ages who daily ride school buses were asked to give their opinion of seat belts on school buses. They were not given the pros and cons of the arguments, simply asked to share their ideas with us. In 99 percent of the responses, the opinion was against the use of seat belts in these vehicles. Here's what they had to say:

"I am writing to express my feeling toward the idea of seat belts on buses. I think that if the bill is passed and forced to be law, that it would prove nothing."

"I think it is a rotten idea, because the kids will not wear them and it will raise our taxes."

"Seat belts do make buses, cars, trucks, or any vehicle safer, but I don't think there is a need for them on school buses. Children know how to behave and it would take longer to get anywhere because everyone would have to buckle and unbuckle them all the time."

"I feel that seat belts on buses will be more of a problem than good. If the bus were to catch on fire it would take too long to get them undone. If we had a crash the seats in front of us would protect us anyway. I think the bus driver will have a very hard time keeping the seat belts on us."

"I have mixed feelings about having seat belts. Personally, I don't like them. I'm not sure the students would appreciate having seat belts. I think the kids will fight this. I sure will!"

"We wouldn't like seat belts on Miss Charlotte's bus because we high school students can get out if there is an emergency, but pre-schoolers wouldn't know how to get out."

"I know that seat belts can save your life, but they are uncomfortable and 99% of us kids don't want them. Besides, they will cost a lot of money to install. Since I am on the honor roll, my opinion should be heard. I also think that we are old enough to not stand up. Besides, if you put them in, nobody is going to wear them any way."

# The Manufacturer's Viewpoint

There are no standards for seat belts in large school buses. Now, before those of you outside the school transportation industry get too upset by this, let me add that there are good solid reasons for this state of affairs.

In September, 1966, the National Traffic and Motor Vehicle Safety Act (U.S.C. 1403) was enacted into Public Law 89-563. This law directs the Secretary of Transportation to issue federal motor vehicle safety standards to which school bus and motor vehicle equipment manufacturers and suppliers must conform and certify to their compliance.

The first such standards became effective on all vehicles manufactured after January 1, 1968, and additional standards have been added since that date. Still other safety standards are in the process of being developed and issued.

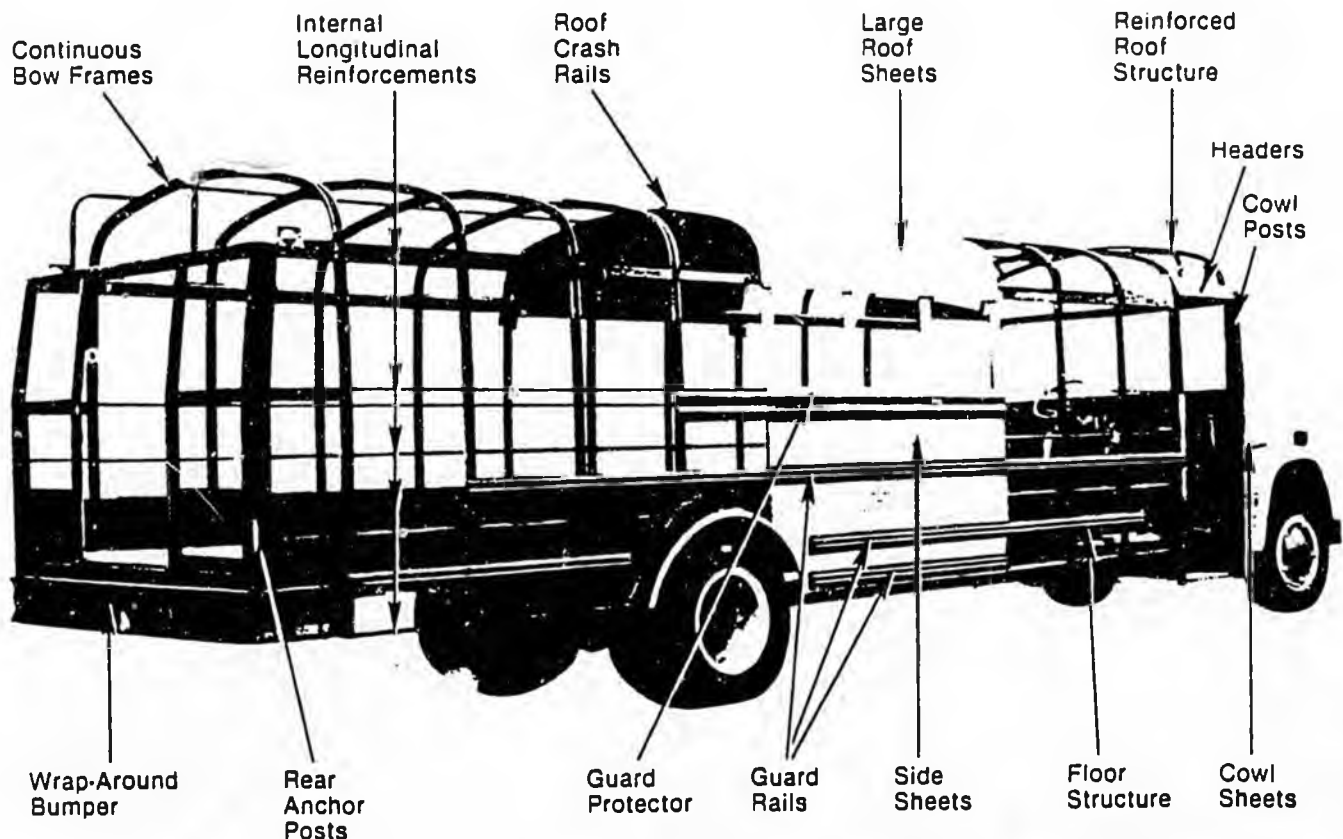
The Canadian Government is following this pattern as well, and has issued its own safety standards modeled after those in the United States. They became effective January 1, 1971.

There are some 20-plus vehicle standards which school bus manufacturers and suppliers must conform to, and severe penalties exist for noncompliance with the mandated federal motor vehicle safety standards.

## School Buses Safer Than Ever

Standards in effect today assure parents of the children that ride our school buses throughout North America that the vehicles in which they travel are the safest ever built. In addition to the federal motor vehicle safety standards, there are many state standards in effect that compliment the federal standards by assuring a higher level of safety for school bus occupants.

These standards — or specifications — cover a wide range of vehicle components. Some of these are related to: lighting; brake systems; glare resistant reflecting surfaces; tires and wheels; mirrors; hood latch systems; accelerator control systems; emergency warning devices; occupant protection in interior impact; restraint



systems for the drivers; window retention and release; emergency exits; structural integrity to provide safety for the children in a roll-over situation; body joint strength to assure that the joints will not separate upon impact from another object or vehicle; fuel system integrity which prevents dangerous levels of fuel escape; flammability of interior materials; and, last but not least, school bus passenger seating and crash protection through the compartmentalization approach.

The crash protection standard establishes occupant protection requirements for school bus passenger seating and restraining barriers. Its purpose is to reduce the number of deaths and the severity of injuries that result from the impact of school bus occupants against structures within the vehicle during crashes and sudden swerves.

### **Compartmentalization is Key**

Compartmentalization — as outlined in the standards requirements — requires strength in the seating system which includes the floor, the seat frame, and the fastenings of the frames to the floor, while at the same time providing flexibility for all this seating system to flex and absorb energy in order to prevent the energy having to be absorbed by the children on the bus.

In addition to the strength and energy absorption of the frame and floor, padding is also required to absorb a high level of impact energy.

It's true there are no standards for seat belts in large school buses. However, those of us who have labored for many years in the school transportation industry, together with state and federal government officials, have continued to seek and to require more and more safety features in the vehicles in which our children ride.

The philosophy underpinning these efforts is this: If the total vehicle itself is made safe, then this is more important than the seat belt which must be fastened to the vehicle.

Perhaps these standards — requiring such a high level of safety in the structure of the vehicle, and compartmentalization of the seating of the buses — are more important than the belts themselves.

Morris Adams

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*Mr. Adams is vice president, corporate affairs with Thomas Built Buses, High Point, North Carolina.*

# The Contractor's Viewpoint

Nearly all of my *practical* business knowledge was gained over the dinner table in talks with my father. Some things we discussed became such second nature to me that I assumed the things I had learned at the ages of eight, 10 and 12 were basic, and that everyone understood them.

My family has been in the school bus contracting business for 59 years; I have seen firsthand what makes a school bus operation function. My father's first contracted route had 12 passengers, eight of whom were his younger brother and sisters. Since that time in 1925, the school bus has evolved from a black, wooden body with two benches on either side to the well lit, bright yellow, stop arm-equipped vehicle of today.

One of the things that concerned my father most was that competition be fair. He must have said to me on a thousand occasions that it only mattered to him that everyone bid "apples to apples." Then, he could compete with anyone.

For that reason, my father and I — as well as the thousands of school bus contractors in the country — have seen laws and regulations change every year with little concern on our part. Every company had to comply. These changes have caused the evolution of that old, black, wooden, two-bench vehicle into today's modern school bus.

Our firm has not paid for one of those changes. Every cent put into every one of the thousands of buses purchased was incorporated into our bids for service, and was paid for by those using the service and ultimately, by the taxpayers of the individual school districts.

Some people's suggestion that the school bus contracting industry opposes seat belts because of our profit motive is unfortunate and untrue. It is contrary to my dad's simple dinner-table logic that our industry should shoulder these costs. We never have. Neither has any other business, when mandated to change some part of their operation. If we operated safely and — as a result — paid less insurance than our competition because of our good safety record, we were able to keep some of that money for ourselves. We call that "profit." The more we protect kids' lives, the more profit we make.

## Consumer Gets the Tab

Has General Motors been less profitable because they are required to put seat belts in cars? Have construction companies been less profitable because they're required to put up guard rails when they build roads? Have airlines been less profitable because they're required to supply oxygen masks? Certainly not! The consumer has always picked up the tab for such items.

It is difficult for me to find any segment of the industry that supports the seat belt issue. Those who are involved daily with school transportation have consistently looked for, and have found, alternatives to seat belts. The costs for compartmentalization, which added immeasurably to the safety of the children riding in school buses, were much greater than simply adding seat belts with no standards.

I'm proud to be a part of an industry whose profit motive is contingent upon safety. It has produced the safest form of transportation available. Our industry's leaders will continue to maintain our leadership position in passenger safety. I find it extremely regrettable that some people actually think our position on passenger restraints has anything whatsoever to do with the cost of a seat belt.

Terry Van Der Aa

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*Mr. Van Der Aa is president of the National School Transportation Association and vice president of Vancom, Inc., South Holland, Illinois.*



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February 11, 1986

Mr. Don M. Carnahan  
State Director, Pupil Transportation  
Old Capitol Building, FG-11  
Olympia, Washington 98504

Dear Don:

Today I received a copy of your letter to all State Directors of Pupil Transportation, dated January 6, 1986 with your comments to Docket Number 85-14; Notice 1, dated November 29, 1985. Thank you for sending me a copy.

Your comments to docket 85-14 were presented very well and discussed in detail the potential problems of using lap belts in today's compartmentalized school bus. As a major manufacturer of school buses, we have carefully studied the issue of lap belts in large school buses and are aware of the Transport Canada Crash Test results as well as the results of the 1978 NHTSA sled tests and know that there is evidence that the use of lap belts in a compartmentalized bus may result in more severe head and neck injuries for a belted occupant than for an unbelted one in a severe frontal collision. We also considered the fact that other types of accidents can and do occur and that the use of lap belts in these accidents may decrease the potential for injury or death. Federal law requires us to meet FMVSS 222 on all new school buses and we do not know of any type of seat belt other than lap belts that can be provided on school bus seats meeting FMVSS 222. We believe we must not and should not refuse to provide seat belts in large school buses when the user insists on them. Therefore, we have no choice but to provide lap belts as customer specified optional equipment in conjunction with the seat spacing required by compartmentalization.

Because of our concern over the seat belt issue we wrote a letter to NHTSA in March, 1984 urging them to conduct the necessary research to answer this question: "Are occupants of a school bus with a GVWR of more than 10,000 pounds safer with or without seat belts installed at each designated seating position?" To date, NHTSA has not conducted this research nor indicated they intend to. A copy of our letter and the NHTSA response are enclosed.

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