

ALASKA LEGISLATURE COMMITTEE FILES 1903-1900 00/2

3728

HSTA

HB 684

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SAFETY LEGISLATION  
CONCERNING SCHOOL BUSES

1. GENERAL:

A school bus is made by first constructing a very strong cube-shaped box of steel columns and beams, which is then covered with an outer "skin" and an inner skin or "lining", all of steel. This cube contains the children and the driver, as well as seats and heaters for them; and openings are provided in the cube for windows and for normal entrance and exit and for emergency exit.

On the outside of the cube, numerous safety lights and reflectors and mirrors are required, and the entire cube is painted "school bus yellow"; a color found to be the most visible in all types of weather and light conditions. This entire cube or "body" is mounted on the frame rail of a medium duty truck, which itself must meet hundreds of requirements for safe design.

The manufacturer of the school bus body, as well as the truck manufacturer, must run their own tests to "certify" that their design meets all Federal requirements. As an audit of these manufacturers, the Federal Department of Transportation tests each make and model, by purchasing one of each periodically and destructively testing them at a

special laboratory in California. If a product fails any of the tests, its manufacturer may be required to "recall" and fix every bus built since the last test, in order to bring it into compliance.

2. STRENGTH OF THE BASIC STRUCTURAL CUBE:

The cube must be made of heavy structural steel, welded or riveted together in such a way it will not collapse in case of side or roof impacts.

The roof of this cube must be able to take a load equal to one and one half the weight of the entire bus (the average bus usually weighs around 20,000 pounds) without deflecting more than 5 inches. This is to insure the roof will not collapse in case of a roll-over. (In addition to standard roof tests, Ward has actually rolled a bus down a mountain to check this feature.)

A bus' ability to withstand crushing of the "cube" depends on many features, but the main one is the design of the vertical members, which are like "roll bars". These are steel structural members which extend from the floor on each side up and over across the top. There is a bar every 27 inches. They are the parts you see separating each window.

3. STRENGTH IN CASE OF SIDE IMPACT:

A school bus is very strong in side impact. The floor must be of heavy gauge steel with reinforced cross-members every 27 inches. This floor is much heavier than your car floor. It is also much higher above the ground than any car or van or pick-up truck. This is very

important. If a car or small truck hits a bus, most of the impact is absorbed at or below the floor, below the level of the students.

The basic cube-shaped body of the bus is required to be attached to the truck frame in such a way that the body will not become separated from the truck, in case of an accident. (Ward buses have been hit at 45-50 miles per hour by logging trucks and car-carrier trucks and none have ever separated.)

As further protection, school bus bodies must have extra reinforcing steel beams running the length of the body. The ones which are attached on the outside are usually painted black and are quite visible as horizontal stripes. In addition, Ward buses have another member hidden inside the skin which runs just below the window line, at the childrens' shoulder levels. This protects in case of impact by a vehicle other than a car, which could reach that high.

#### 4. STRENGTH IN CASE OF FRONT OR REAR IMPACT:

The front of a conventional school bus is the same as the front of a medium-duty truck. Therefore, the bus has all the advantages of weight, size, height above the ground, and strength of bumper and axles, etc., that are available in a truck. These factors add huge safety margins compared to cars, vans or pick-ups.

In the rear, the bus has all the strength of the truck frame plus a huge (10 inches high) wrap-around bumper installed by the body builder. And all the steel body members in the rear, of course, must pass all the tests mentioned heretofore.

5. STRENGTH OF THE JOINTS:

Since the bus body must be made of steel, for strength, and since steel has sharp edges, it is required that every joint in the body must have a specified strength, which is 60% of the strength of the raw steel itself. This protects against pieces of the skin becoming separated upon collision and cutting children.

To achieve this, most manufacturers use hundreds of rivets in the body, although gluing with industrial adhesives and welding are permitted, if done properly.

Another technique is to eliminate as many joints as possible, since the basic steel is strongest (100%) where there is no joint (60%) (Ward uses full-length side sheets, and all its horizontal members above the floor are full-length, for this reason.)

6. STRENGTH OF SEATS:

Seats are required to be strong enough to withstand front and rear impacts, roll-overs and children being thrown against them without becoming un-bolted from the floor or side rails. This means the seat frame must be strong, the floor and side rail must not distort during collision, and the bolts used to hold the two together must be of specified strength.

Tests must be run regularly, by the manufacturers, wherein high forces are applied to the seat to try to tear it loose from the body.

In addition, seat cushions must be attached to the frame so they will not come loose in an accident and fly around.

7. ENERGY ABSORPTION SEATS:

Since the main concept for occupant protection in large school buses is "compartmentalization" instead of seat belts, all seats must meet numerous severe requirements for padding and "springiness".

First, the back of every seat must be covered with special thick foam which covers all steel areas above the cushion (older buses expose steel tubing at the head level). This foam must pass tests which prove it can absorb high forces from head and knee impacts without injury.

Secondly, the steel frame work inside the foam must be designed to spring forward a certain amount, in case a child is thrown against it. This further absorbs energy and reduces injury. The steel frame, of course, must still be strong enough to bend without breaking, but it must not bend too much, otherwise it could injure the student in the next seat forward.

8. ENERGY ABSORBING BARRIERS:

For most seats in a bus, padding is provided both behind and in front of the student by the backs of his/her own seat and the back of the next seat forward. However, the first seats in the bus do not automatically have anything in front of them. Therefore, a special padded "barrier" must be provided at this point.

These barriers, two per bus, must pass all the same tests as seat backs.

9. SPACING OF SEATS:

Since the compartmentalization concept calls for children to be

compartmentalized between energy absorbing surfaces, it is required these surfaces not be too far apart. Therefore, there is a requirement that seat backs can be no further apart than approximately 30 inches (center-to-center).

10. WARNING LIGHTS AND REFLECTORS:

A school bus naturally has all the safety lights and reflectors required of any other commercial truck. However, it has even more. It has large 7 inch yellow warning lights and red stop lights at the top corners. While exact configurations vary from state to state, the most common is a yellow and a red at each corner. The yellow lights are activated by the driver just prior to stopping and both red and yellow alternately flash when bus is completely stopped.

11. STOP ARMS:

Most states require a "stop arm" which is a large stop sign mounted on the side by the driver. When the bus stops to load or unload, the driver operates the arm to signal approaching traffic---as an extra precaution in addition to the flashing lights. (Louisiana, in fact, requires two stop arms, one left front and one left rear.)

12. EXTERIOR PAINT:

In order to make school buses as visible as possible to the drivers of other vehicles, "school bus yellow" paint is required. It has proven better than red, for example, which is very visible in daytime but appears black at night.

13. WINDSHIELDS AND WINDOWS:

All windshields and windows must be shatter proof and must pass tests to insure they will not "pop-out" in case of accident. Retention tests are run to try to force windows out.

To meet the shatter proof requirements, windows can be "tempered" glass which breaks into hundreds of small pieces without sharp slivers or "laminated" glass which provides a clear plastic sheet between two panes of glass which hold all glass particles to the plastic in case of breakage. (Ward offers both and manufactures its own laminated glass.)

The front windshield is required to be laminated for all cars and trucks, as well as school buses.

14. EMERGENCY EXITS:

All school buses have more than one method of exiting in case of emergency. Some states require more than others. The minimum is an emergency door in the rear, plus windows large enough for a child's body to go through. Additional exits are provided in some states. For example, both California and Washington State require an additional exit door in the left side toward the rear, New York not only requires this extra door, but also requires roof escape hatches.

15. GAS TANK PROTECTION:

In order to insure gas tanks are not ruptured in case of an accident, school buses have an extra "cage" of heavy steel tubing

surrounding the tank (which is usually 30 or 60 gallon size). This provides much more protection than any other vehicle.

16. FIRE-RESISTANCE OF SEATS:

All seat foam and upholstery in school buses must be fire resistant. Tests must be run to try to burn this material. It cannot burn rapidly or give off poisonous fumes.

17. BRAKES:

The brakes of a school bus are those of the basic truck manufacturer. As such, they must meet dozens of Federal safety requirements.

18. OTHER FEDERAL REQUIREMENTS:

The basic truck chassis must comply with dozens of other Federal and State requirements, covering components such as tires and wheels, windshield washers and defoggers, headlamps and tail lights and mirrors.

THE RESULTS: HOW SAFE IS A SCHOOL BUS?

As a result of all these safety requirements, plus rigorous programs of driver training, school transportation is the safest form of transportation in existence. Each year in the U. S. over 21,000,000 children are transported 3,000,000,000 miles in 380,000 buses.

In 1982, the last year for which data is available, the rate of fatalities in school bus accidents per hundred million vehicle miles

was 0.29 (8 deaths). This compares to 29.69 for motorcycles, 2.06 for passenger cars, 1.21 for combination trucks and 8.75 for commercial airlines.

WHAT IS THE REMAINING MOST COMMON CAUSE OF SCHOOL BUS FATALITIES TODAY?

Surprisingly, for the past several years, most school bus fatalities have occurred at the loading and unloading point, rather than in moving accidents. On the average, for the past three years, 53 deaths were of this type.

Some of these accidents were due to passing motorists not stopping properly. Approximately half of them, however, were caused by the driver not seeing small children who stopped for various reasons around the wheels of the bus and were run over.

It was for this reason that AmTran designed the Patriot bus, which greatly improves the driver's visibility, compared to any other conventional bus, at affordable prices. New mirror arrangements and "crossing gates" will be helpful. However, it is felt the Patriot design should become the school bus design of the future if we are to properly overcome this No. 1 remaining problem. In fact, William Griggers, a transportation expert on the National Safety Council, has recommended "the conventional bus of the future should have a re-designed front-end that would slope downward so that a small child could be seen from the driver's seat".

### HOW DO SMALL BUSES DIFFER FROM BIG BUSES?

There are two types of small buses; both are built on van type chassis. Both are classified as "under 10,000 GVW" (10,000 pounds gross vehicle weight), which means they are not really trucks but fall more into passenger van classifications. For this reason, some of the safety rules applied to passenger vans were carried over into these small buses. At the same time, since they were intended to transport school children, most large school bus safety regulations were applied to them also.

Most of the joint strength, seating, window, safety lights and color regulations apply.

Seat belts are the most noticeable carry-over from passenger vans.

### WHY DO SMALL BUSES REQUIRE SEAT BELTS AND LARGE BUSES DO NOT?

As mentioned above, since small buses were derived from passenger vans, they carried over the seat belt requirement. The main reason for this was the fact these buses do not have the extra protection of mass and height of the conventional bus (which is built on a medium-duty truck chassis).

However, because school bus seating does not lend itself to chest restraints, only the lap restraint portion was required. At the same time, the "compartmentalization" concept of school buses was added. This means the seats are closer together than would be ideal for lap-restrained passengers.

Also, three belts per seat are required, which is an imperfect compromise when two large students, rather than three small ones, occupy the seat.

WHAT ARE THE PROS AND CONS OF SEAT BELTS IN LARGE BUSES?

- |  |  |
|--|--|
| 1. Children are taught to use belts in cars. Consistency counts.               | 1. It will be hard; if not impossible to enforce use.  |
| 2. We enforce use in cars and air-planes, we should be able to do so in buses. | 2. In cars, we have parents to enforce usage. In planes we have stewardesses. In school buses, we have one driver for 60-70 children |
| 3. We <u>can</u> and should afford the extra expense.                          | 3. We can...but will we? Today we cannot replace old unsafe buses which would be more of a quantum leap forward than adding belts.   |

Proper installation of belts would require greater seat spacing, reducing capacity and further increasing the cost.

Proper installation would require retractors and chest

restraints for the younger children, additional costs to be covered.

4. Belts should not be a problem in emergency exits, any more than in cars.
5. "Compartmentalization" without belts does not do the complete job in case of roll-over.
1. In a car, there are fewer potentially unconscious or panicked passengers who might need help getting unbuckled in case of roll-over, fire or underwater submersion.
5. The main direction a child might be thrown in case of roll-over in which he/she would not be captured by padded surfaces would be toward the roof in case of roll-over. The school bus provisions for preventing roof crushing and for preventing separation of sheet metal panels and resultant cutting edges are answers.

Also, in roll-over accidents, being free to exit in a hurry is an advantage.

#### HOW DO STATE SAFETY REQUIREMENTS DIFFER FROM FEDERAL REQUIREMENTS?

Federal requirements are mandated on all school buses. State requirements add more or greater requirements, but not less.

The National Safety Council publishes "Minimum National Standards", which are recommended for states to adopt, but are not required.

The main restriction on special state requirements is that they cannot undo any of the safety items added by Federal requirements. For example, the requirement for increased seat spacing to better adapt to seat belts would violate existing Federal regulations and would require a change in the Federal regulations before being implementable.

#### WHAT IS THE POSITION OF SCHOOL BUS MANUFACTURERS IN REGARD TO ADDITIONAL SAFETY REGULATIONS, INCLUDING SEAT BELTS?

The body manufacturers and the truck chassis builders want to serve their customers and provide the safest transportation practical. They can and will build a bus to almost any practical performance specification, within existing Federal requirements. They do desire to have a chance to be heard in regard to what is practical, what is good engineering design and what is cost-effective. They do desire performance-based specifications which provide some latitude in design; and they do appreciate specifications which permit all manufacturers a fair chance to compete.

Manufacturers, in general, would receive higher prices for more rigorous, more complex specifications; and from that standpoint, they have little reason to resist change. The biggest obstacle is that

changes which are unique to only one state or a few school districts require inordinate amounts of engineering and tooling, which raises the price sharply and might cause some bidders to choose not to compete in that particular market, resulting in higher prices for buses due to reduced competition.

# # #

# National Association of State Directors of Pupil Transportation Services

March 18, 1986

## Executive Committee

### President

Romayne Kareen  
Alaska Department of  
Education  
Pouch F  
Juneau, AK 99811  
(907) 465-2890

Ms. Laura Schwartz, President  
National Coalition for Seat Belts  
on School Buses

P. O. Box 781  
Skokie, Illinois 60076

### Vice-President

Ron Kinney  
California Department of  
Education  
721 Capitol Mall  
Sacramento, CA 95814  
(916) 322-4879

Re: Request for Information

### Secretary

Woodrow Fitzmaurice  
Missouri Department of  
Elementary and  
Secondary Education  
P. O. Box 480  
Jefferson City, MO 65102  
(314) 751-2626

Dear Ms. Schwartz:

My organization has received the enclosed brochure published by the National Coalition for Seat Belts on School Buses which states that the need for seat belts on school buses has been endorsed by the:

### Treasurer

Kelvin Clayton  
Utah Department of Education  
250 E. 5th Street, South  
Salt Lake City, UT 84111  
(801) 359-5790

American Medical Association  
American Academy of Pediatrics  
American Academy of Orthopedic Surgeons  
American College of Preventive Medicine  
Physicians for Automotive Safety  
Center for Auto Safety  
National School Safety Center  
National PTA

Statewide medical and pediatric societies in states across the country, such as Oregon, Illinois, Texas and Delaware

### Past President

Paul Stewart  
West Virginia Department  
of Education  
1500 Washington St.  
Bldg. No. 6, Room B-258  
Charleston, WV 25305  
(304) 348-3711

Additionally, the brochure states that unbelted children have no rollover protection. The brochure also references studies dated 1967 and 1971 which advocate seat belts on school buses. Both studies were conducted prior to implementation of Federal Motor Vehicle Safety Standards on bus window retention and release, school bus rollover protection, school bus body joint strength, and school bus passenger seating and crash protection. These Standards became effective April 1, 1977 and apply to each school bus manufactured on or after that date.

## Regional Directors

### Western

Donald Camahan  
Washington Supt. of Public  
Instruction  
Old Capitol Bldg. FG-11  
Olympia, WA 98504  
(206) 753-0235

The enclosed memorandum dated September, 1985, from Bridget Ernst, Alaska Regional Co-Coordinator for the Coalition, states that currently 64 school districts nationwide have elected to install seat belts on their school buses. The memorandum also states that those districts with experience report from 80% to 100% usage by the children, with or without monitors.

### Southern

Ernest Farmer  
Tennessee Department of  
Education  
126 Cordell Hull Bldg.  
Nashville, TN 37219  
(615) 741-3489

The primary interest of the National Association of State Directors of Pupil Transportation Services is the safety of school children.

### Central

David Campbell  
Ohio Department of Education  
65 S. Front Street  
Columbus, OH 43215  
(614) 466-4230

### Eastern

Mike Collin  
New Hampshire Department  
of Safety  
Hazen Drive  
Concord, NH 03305  
(603) 271-2485

As such, we would like to review the written endorsements of the aforementioned organizations, information on school districts using seat belts on large school buses, studies which advocate seat belts on large post-1977 buses, and studies and/or crash test data which conclude that unbelted children in large post-1977 school buses have no rollover protection.

To assist us with our review, we would appreciate your sending the following:

1. A copy of the written endorsement from each of the above referenced organizations wherein its membership expresses the need for seat belts on large post-1977 school buses.

This would be for school buses with a gross vehicle weight rating of more than 10,000 pounds. Current Federal Motor Vehicle Safety Standards require seat belts on school buses weighing less than 10,000 pounds. The Standards do not require seat belts on school buses weighing more than 10,000 pounds.

2. A listing of each of the 64 school districts that have elected to install seat belts on their large school buses (over 10,000 pounds); the number of large school buses equipped with lap belts that each of the 64 districts is using; and whether or not each of the lap-belted large buses is used at any time for transporting special education students.

3. A listing of those districts with experience that reported on usage of belts by children, and the percentage of use reported by each district.

4. Copies of studies which advocate seat belts on large school buses weighing over 10,000 pounds, and which were manufactured on or after April 1, 1977.

5. Copies of studies and/or crash test data which conclude that unbelted children in large post-1977 school buses have no rollover protection.

Please send this information to:

Romayne M. Kareen, State Director  
Pupil Transportation Services  
Alaska Department of Education  
Pouch F  
Juneau, Alaska 99811

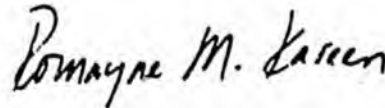
Ms. Laura Schwartz

-3-

March 18, 1986

Thank you in advance for your assistance. I will look forward to your reply.

Sincerely,



Romaine M. Kareen  
President, NASDPTS

Enclosures

cc: State Directors of Pupil Transportation Services  
Lee Ednie, President, NAPT  
Larry Durham, President, NSTA  
Karen Finkel, Executive Director, NSTA  
Barbara Caracci, National Safety Council

## YOUR MEMBERSHIP WILL ENSURE THAT THE COALITION CAN:

- Continue to gather and disseminate information concerning school bus seatbelts
- Participate on committees dealing with current national and state-by-state school bus seatbelt issues
- Establish close contacts with national experts
- Continue to encourage the promulgation of seatbelt standards
- Seek out and develop seatbelt educational materials
- Continue to develop installation guidelines

## HOW CAN I MAKE A DIFFERENCE?

The strength of NCSSB lies in its membership.

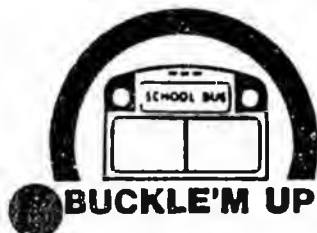
By joining, you help demonstrate to policy makers and school administrators that people all over the country are concerned about the issue of school bus seatbelts. Armed with the Coalition's wealth of accurate information and data, you can effectively help diffuse the many myths, misconceptions and misinformation surrounding the issue.

## OVER 50 SCHOOL DISTRICTS ARE OPERATING SCHOOL BUSES WITH SEATBELTS AS OF SEPTEMBER 1, 1985

These range in size from the City of Chicago to Hartland, Vermont. In Suffolk County, NY, all buses acquired after January 1, 1986 will be required to have seatbelts.

For more information contact:

Laura Schwartz  
Membership Vice President  
NCSSB  
PO Box 781  
Skokie, IL 60076  
(312) 679-2694



## WHY?

**WHY** are children, accustomed to riding buckled up in the family car, being denied the right to this extra margin of protection on the school bus?

**WHY** have only a few school districts in the US required the installation of seatbelts on their large school buses?

**WHY** is there a contradiction between the child restraint and seatbelt laws and requirements for passenger protection on the school bus?

**WHY** are there no federal standards for seatbelt installations in large school buses?

**WHY** do only a few school districts offer seatbelt education programs?

## HELP US FIND ANSWERS TO THESE QUESTIONS

## WHAT IS THE NATIONAL COALITION FOR SEATBELTS ON SCHOOL BUSES?

The NCSSB is an organization formed in 1984 to:

- coordinate the efforts of people throughout the country working for seatbelts on school buses
- to disseminate school bus seatbelt research and educational programs

The NCSSB has 40 Regional Coordinators, from Alaska to Texas and from Sydney, Nova Scotia to Florida. Even concerned people in Japan have contacted the Coalition.

## THE NEED FOR SEATBELTS ON SCHOOL BUSES HAS BEEN ENDORSED BY:

- American Medical Association
- American Academy of Pediatrics
- American Academy of Orthopedic Surgeons
- American College of Preventive Medicine
- Physicians for Automotive Safety
- Center for Auto Safety
- National School Safety Center
- National PTA
- Statewide medical and pediatric societies in states across the country, such as Oregon, Illinois, Texas and Delaware.

# NATIONAL COALITION for SEATBELTS

## on SCHOOL BUSES



**Children Deserve Seatbelts  
on School Buses**

# JOIN NCSSB

September 1985

The attached information is designed to give the reader an overview of the reasons seatbelts should be on school buses. Currently, on the Kenai Peninsula, a large group of parents would like the school district to equip all newly purchased buses equipped with seatbelts. This group has not asked that seatbelt use be mandatory, only that the seatbelts be provided.

They are concerned that current regulations provide little protection for children in the event of a lateral collision or rollover. They are also concerned that the lack of seatbelts is a form of negative education for their children who are being taught at home to use seatbelts to be safe.

A 1985 estimate from an Anchorage bus dealer for seatbelts on a new school bus is \$965.00. That is an approximate increase of 2 1/2% over the original purchase price of \$40,000. Seatbelts can be ordered for only \$12.50. Parents feel their child is worth the investment.

Currently, 64 school districts nationwide have elected to install seatbelts on their school buses. Those districts with experience report from 80 to 100% usage by the children, with or without monitors. They report no cases of seatbelt weaponry or increases in insurance rates.

The following information is included in this packet:

1. MEDICAL OPINTION REGARDING SEATBELTS ON SCHOOL BUSES
2. PTA SCHOOL BUS SAFETY REPORT CONCERNING SEATBELTS ON SCHOOL BUSES
3. TESTIMONY DELIVERED BEFORE THE NEW YORK STATE LEGISLATIVE COMMISSION ON CRITICAL TRANSPORTATION CHOICES - 1983.
4. THE CANADIAN STUDY
5. NATIONAL TRANSPORTATION SAFETY BOARD STUDIES AND REPORTS.

If additional information is needed, please feel free to contact the National Coalition for Seatbelts on School Buses Regional Office at P.O. Box 3331, Homer, Alaska 99603.

Bridget Ernst  
Regional CoCoordinator  
National Coalition for Seatbelts on School Buses

September 1985

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Regional CoCoordinator  
National Coalition for Seatbelts on School Buses

American Academy of Pediatrics  
Committee on Accident and Poison Prevention  
Committee on School Health

School Bus Safety

In 1970, the American Academy of Pediatrics, in a supplement to Pediatrics, reviewed the laws, regulations, and practices in school busing in the United States.<sup>1</sup> This survey was carried out by Physicians for Automotive Safety. The information available at that time (from 46 states) indicated that 14,709,000 students were being transported in a total of 203,994 vehicles.<sup>1</sup> Recent data now indicate that approximately 22 million pupils are transported daily to and from schools in the United States in nearly 400,000 school buses.<sup>2</sup>

Based in part on the recommendations resulting from the 1970 survey, the National Highway Traffic Safety Administration in February 1973 issued the Federal Motor Vehicle Safety Standard (FMVSS-222) which became effective in April 1977. That standard prescribed passive protection for school bus passengers and looked specifically at: (1) the seat and seat anchorage strength, (2) the seat and restraining barrier height and surface area, and (3) padding on surfaces within occupants' head space.

The National Highway Traffic Safety Administration subsequently has denied a petition from Physicians for Automotive Safety that the FMVSS-222 include requirements for anchorages for seat belts. Seat belts presently are required in vehicles weighing 10,000 pounds or less with a maximum passenger capacity of 16. Seat belts are not required for larger school buses.

September 1985

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HOMER, ALASKA 99603  
TELEPHONE (907) 235-8586

July 17, 1985

Ms. Jane Hammond, President  
Board of Education  
Kenai Peninsula Borough School District  
Box 7088  
Nikishka, AK 99635

Dear Ms. Hammond:

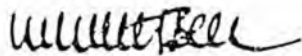
As local physicians actively interested in the health and well being of the children of our community, we would strongly urge the school board to require seat belts on the Peninsula school buses. Nothing could be more tragic than to have a disaster involving our children that would have been preventable by the simple purchase of seat belts for the children. There is no doubt in anyone's minds that seat belts are a major contributor to survival and decreased morbidity in auto accidents.

The state in its wisdom has refused to allow children to ride unbelted in their own parents' cars, so we do not see any moral justification for the Borough saying that they can sacrifice our children even though they are exempted by the letter of the law. It would be difficult for the school board to defend itself should they end up being sued by any parents of children who were injured in a school bus accident if the board continues to deny children even the possibility to voluntarily buckle up in our local school buses.

We cannot strongly enough state our support for the proposal of including seat belts on new buses and retrofitting the old buses for seat belts.

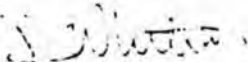
Yours for the health of our children,

Sincerely yours,



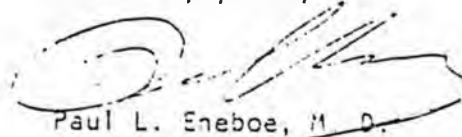
William H. Bell, M. D.

Sincerely yours,



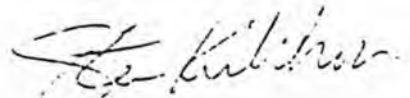
Dan White, M. D.

Sincerely yours,



Paul L. Eneboe, M. D.

Sincerely yours,



Steve Kirkhorn, M. D.

nc

cc: ✓ Bridgette Ernst  
Brentley Koene

American Academy of Pediatrics  
Committee on Accident and Poison Prevention  
Committee on School Health

School Bus Safety

In 1970, the American Academy of Pediatrics, in a supplement to Pediatrics, reviewed the laws, regulations, and practices in school busing in the United States.<sup>1</sup> This survey was carried out by Physicians for Automotive Safety. The information available at that time (from 46 states) indicated that 14,709,000 students were being transported in a total of 203,994 vehicles.<sup>1</sup> Recent data now indicate that approximately 22 million pupils are transported daily to and from schools in the United States in nearly 400,000 school buses.<sup>2</sup>

Based in part on the recommendations resulting from the 1970 survey, the National Highway Traffic Safety Administration in February 1973 issued the Federal Motor Vehicle Safety Standard (FMVSS-222) which became effective in April 1977. That standard prescribed passive protection for school bus passengers and looked specifically at: (1) the seat and seat anchorage strength, (2) the seat and restraining barrier height and surface area, and (3) padding on surfaces within occupants' head space.

The National Highway Traffic Safety Administration subsequently has denied a petition from Physicians for Automotive Safety that the FMVSS-222 include requirements for anchorages for seat belts. Seat belts presently are required in vehicles weighing 10,000 pounds or less with a maximum passenger capacity of 16. Seat belts are not required for larger school buses.

The primary reason given for not requiring seat belts in buses weighing more than 10,000 pounds is that the number of "inside bus fatalities" nationally does not justify the expense and maintenance of seat belts. However, in 1982 there were 140 deaths resulting from school bus accidents. Included in this total were 60 pupils, 5 bus drivers, and 75 "others." In addition, there were 7,000 reported injuries: 4,200 of those injured were students.<sup>3</sup> Therefore, should the number of deaths alone not justify changes, the potential for a reduction in the number of injuries, and/or in the seriousness of those injuries, would seem to make further changes in FMVSS-222 highly desirable.

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 with the 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.)

Based on a review of the available and extensive data, the American Academy of Pediatrics supports the following changes in School Bus Safety Standards:

1. Seat backs should be elevated to 28 inches. This is four inches above the height now mandated by federal regulations and will support and cushion a child's head and neck.
2. All seat backs and tops should be padded with firm material that adequately absorbs impact. The padding should completely cover the entire rear of the seat in addition to the top rail. The padding should also be placed on all stanchions and "modesty 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 driver training should be mandatory in all school districts and should include provision for health screening on a periodic basis, including vision and hearing evaluations.

This statement has been approved by the Council on Child and Adolescent Health.

8/13/84, 1/31/85

School Bus Safety

Committee on School Health

Joseph R. Zanga, MD, Chairman  
Michael A. Donian, MD  
Jerry Newton, MD  
Maxine M. Sehring, MD  
Martin W. Sklaire, MD  
John Trieschmann, MD

Liaison Representatives:

Janice Hutchinson, MD, AMA  
Betty McGinnis, MA, CPNP, NPANAP  
Marjorie Hughes, MD, ASHA  
Thomas Coleman, MD, Section on Child Development  
Jerry Jacobs, MD, Section on Rheumatology  
Charles Zimont, MD, American Academy of Family Physicians

Committee on Accident and Poison Prevention

Joseph Greensher, MD, Chairman  
Regine Aronow, MD  
Leonard S. Krassner, MD  
Ronald B. Mack, MD  
H. Biemann Othersen, Jr., MD  
Mark D. Widome, MD

Liaison Representatives:

Andre l'Archeveque, MD  
Gerard Breitzer, D.O., FAAP  
Jerry Foster, MD, Section on Emergency Medicine  
Joyce A. Schild, MD, Section on Otolaryngology  
Chuck Williams, Product Safety Association

7/30/84

sw

June 1984

AMA Convention (Resolutions)

No. 1 TERMINATION OF LIFE-SUPPORT TREATMENT OF TERMINALLY ILL PATIENTS

Introduced by Delaware Delegation

(Reference Committee on Amendments to Constitution and Bylaws, page 356)

HOUSE ACTION: REFERRED TO BOARD OF TRUSTEES

RESOLVED, That the American Medical Association support the establishment in each hospital of a special committee to examine cases that are brought before it by joint appeal from the patient's next-of-kin and attending physician, and to issue, where it deems proper, its agreement with the termination of life-support mechanical devices; and be it further

RESOLVED, That the AMA develop model state legislation recognizing these hospital committees and granting any legal protection necessary for this action, and urge all state medical associations to support enactment of this model state legislation.

No. 2 AUTOMATIC (i. e., PASSIVE) RESTRAINTS TO PREVENT INJURIES AND DEATHS FROM MOTOR VEHICLE ACCIDENTS

Introduced by Edward Press, M. D., Delegate

American Association of Public Health Physicians

(Reference Committee B, page 397)

HOUSE ACTION: FOLLOWING SUBSTITUTE RESOLUTION 2 ADOPTED IN LIEU OF RESOLUTIONS 2, 17, 62, 92, 99 AND 102:

RESOLVED, That the American Medical Association:

1. Reaffirm its policy which supports mandatory seat belt utilization laws;
2. Reaffirm support for mandated child passenger restraint laws;
3. Support immediate implementation of a program requiring passive restraints (preferably air cushions) in all new automobiles (domestic and foreign);
4. Support legislative action to promote availability of effective seat belts in all school buses in the United States; and
5. Support legislative action to promote availability of effective seat belts in all motor vehicles in public use, including public and private buses (including school buses), taxicabs, and any other vehicles carrying passengers.

No. 3 AMA CONSULTATION WITH SPECIALTY SOCIETIES

Introduced by American Academy of Neurology

(Reference Committee H, page 449)

HOUSE ACTION: ADOPTED AS FOLLOWS:

RESOLVED, That the American Medical Association Board of Trustees, councils, committees and staff continue to seek the help and advice of appropriate specialty societies as soon as it is recognized that a topic within the probable area of expertise of a specialty society will be the subject of significant deliberation, action or reports by the AMA.

References

1. Charles S, Shelness A: How safe is pupil transportation? Study of Laws, Regulations, and Practices in School Busing in the United States carried out by Physicians for Automotive Safety. Supplement to Pediatrics January 1970, Part II; 45:1.
2. Protection for School Bus Occupants, Issue paper, U.S. Department of Transportation, September 1981; 83:39-46.
3. National Safety Council: School Bus Accidents, 1982. Accident Facts 1983 ed., Chicago, IL; page 92.

SW  
1-31-85

PTA SCHOOL BUS SAFETY REPORT CONCERNING SEATBELTS ON SCHOOL BUSES

JOHN PAULDING P.T.A.

SCHOOL BUS SAFETY

COMMITTEE REPORT

January 15, 1985

Tarrytown, New York

EXCERPT

VII. SEATBELTS

A. OBJECTIVES. The committee strongly advocates the use of seatbelts on Tarrytown school buses for three reasons:

1. TEACHING CHILDREN TO BUCKLE UP. The number-one killer of children and young adults today is the automobile accident. Parents who have been using infant restraints and teaching young children to use seatbelts are dismayed to find that this education is disrupted on the first day of kindergarten when the children step onto the school bus. The school system should not give children a "recess" from safety.

The school years are the ideal time to educate children and to help them develop the safety HABIT--through consistent reinforcement. Now is the time for the schools to help a whole generation of children to think of buckling up in the same way they think of brushing their teeth.

2. KEEPING CHILDREN IN THEIR SEATS. Anyone who has passed a Tarrytown school bus cannot help but notice children standing, crawling over the backs of the seats, and leaning against the windows. The seatbelts will put the children exactly where they should be--in their seats and facing forward. The bus driver will then be able to give his full attention to where it is needed most--to driving his bus safely through the streets of Tarrytown.

3. PROTECTING CHILDREN IN AN ACCIDENT. Passive compartmentalization between well-padded high-backed (28") seats does not provide adequate protection in rear-end, lateral, or roll-over accidents. In either broadside or roll-over collisions, children can be thrown about within the vehicle and possibly even thrown out of windows or emergency doors, causing serious injuries or fatalities. The law

of physics cannot be questioned. A body will fly toward the point of impact and then back in the opposite direction. The life-saving and injury-reducing potential of seatbelts in any moving vehicle cannot be denied.

In 1971, safety engineers from the Trauma Research Group, University of California, San Diego, referred to the effect that the school-bus transportation professions have had on keeping seatbelts out of school buses. The following is a quote from their 1971 study, "Bus Collision Causation and Injury Patterns":

"For many years, certain public and pupil transportation officials have been presenting arguments against installation of restraint systems in buses, particularly school buses. It can be stated quite categorically that the absence of load-distributing, energy-absorbing seats, coupled with the absence of bus-passenger restraint systems has and will continue to be directly responsible for the majority of bus injuries and fatalities."

In 1981, the National Transportation Safety Board (the same board that investigates all fatal airplane crashes in this country) stated in a fatal school-bus Accident Report:

"Since 1967, the safety board has issued 13 safety recommendations requiring the installation and use of seatbelts in inter-city and/or school buses."

The following quote was given by Lomita, California Mayor Ed Mehler in testimony before the Sub-Committee on Commerce & Finance, on Bill HR-4187 (The School-Bus Safety Act). In his testimony, Mayor Mehler quotes Dr. J. Alex Haller, Chief of Pediatric Surgery, John Hopkins Hospital:

"By far, head injuries are the greatest cause of death and serious injury in vehicle accidents. It is very unlikely that there would be internal injuries due to the use of seatbelts. Especially not in children or slender adults. If the impact of an accident is severe enough for a seatbelt to cause injury, then that passenger would be dead without one."

- B. COST OF INSTALLING SEATBELTS. Installing a seatbelt would cost the district approximately \$1,000 per bus. On Tarrytown's 16 large buses, the total cost would be \$16,000. Figuring on a seven-year life span, the annual cost would be \$2,286--less than \$150 per year per bus.
- C. INSTALLATION. This school district owns and maintains Wayne Buses, which are already equipped with pre-drilled anchor holes in the body seat frame. These buses allow seatbelts to be installed with just belts, anchor bolts, and proper tools. To ensure correct fit, K-12, measuring from where the seat cushion joins the seat back, the short end of the belt must be approximately 16" and the long end 29". A uniform method of installing is important. The short end of the seatbelt would be placed on the aisle side. A color code would be helpful to assist students in determining which ends go together.

Because of tripping hazards, this committee does not recommend that seatbelts be anchored to the floor. In our supplementary information, we have included a letter from Dr. John States of the University of Rochester, who did preliminary testing of seatbelt usage in automobiles. In his letter, he openly endorses the anchoring of occupant restraints to the seat frames.

D. ENFORCEMENT OF USAGE.

1. Safety education in the school is the most important step in enforcing seatbelt usage. The bus drivers in Greenburgh--recognizing the value of seatbelts--prepared safety booklets. The bus drivers also went into the classrooms to talk to the children about the importance of buckling up.

The Ardsley district, taking advantage of the \$4,000 New York State grant available for seatbelt education, will construct dummy school-bus seats. Children will practice buckling and unbuckling their seatbelts, perhaps as part of the gym curriculum. The Room to Live movie is shown to high-school students, followed by discussion. Seatbelts are used by the high-school physics department as part of the teaching of the law of momentum. Safety education and the importance of seatbelts are integrated into the general school curriculum.

2. In the Ardsley district, a student reported for an infraction such as fighting, not buckling up, smoking, etc., receives one warning. If the student is reported a second time, he or she is suspended from using the bus for a specified time.
3. Both Tarrytown and North Tarrytown Police Departments expressed interest in making "spot checks" on buses once seatbelts are in place. The police would issue warning "tickets" to elementary-school children not buckled up. (These "tickets" could be created and supplied by the PTA.) High-school students could be issued a summons, requiring that they and their parents appear in Youth Court. The Board of Education should explore this possibility with both police departments.

- E. INSURANCE AND LIABILITY. Neither the Greenburgh nor the Ardsley school district has experienced any change in their insurance since installing occupant restraints. Since 1977, there has been a federal requirement for seatbelts on small buses. It makes no sense to believe that the same safety device on a large bus would increase liability.

It is the committee's assumption that as more and more Westchester communities put seatbelts on their school buses, the exposure to liability of those districts who do not provide seat restraints will increase.

- F. SUMMARY. Tarrytown school buses should be equipped with seatbelts for three compelling reasons: 1) They continue our children's education in the importance of always buckling up when in a moving vehicle. 2) They keep children in their seats. 3) They provide protection in case of an accident. We believe that seatbelts on the school buses are crucial in providing safety for our children.

## CONCLUSION

The committee has outlined the policies it recommends for inclusion into Tarrytown's school-bus program: 1) the elimination of standees; 2) increased attention afforded to bus schedules and routes; 3) the presence of bus monitors, especially on those buses transporting younger students; 4) the purchase of new buses equipped with occupant restraints and the retrofitting of older buses within the fleet; 5) increased contact with our police departments to improve student safety; and 6) the implementation of an on-going student safety program on all grade levels. Each of these proposals is feasible and well within the district's means to achieve. Together, these proposals will produce a well-balanced program of bus safety.

One area of safety not covered in this report is that of bus maintenance. Although stringent maintenance procedures are imperative for the safe transporting of Tarrytown's young, no member of the committee felt qualified to make recommendations.

The school administration must have a strong commitment to bus safety and must take an active role in implementing programs to enhance safety. It is appropriate to create within the administration the position of Transportation Director, as has been done, and we strongly encourage the administration to fill the position with a qualified person as quickly as possible. One of the primary duties of the Transportation Director should be coordinating and overseeing the school-bus-safety educational programs throughout the community.

Before the School Board votes on the above recommendations, we urge all members to join the John Paulding PTA (which has endorsed the Bus-Safety Committee's work) and to view several movies, among which will be Room to Live and Broken Bus (a bus-crash study from UCLA). These movies will be screened at John Paulding's March 13th PTA meeting. Because the other PTAs and concerned citizens will be invited, this meeting will be held at Sleepy Hollow High School at 8 p.m.

As the School Board prepares its budget for 1985-86, the committee expects its recommendations to receive priority consideration.

In closing, the committee takes this opportunity to thank the following people, without whose time and assistance this report would not have been possible: Detective Gordon Ferguson, North Tarrytown Police Department; Detective Sergeant Richard Pelliccio, Tarrytown Police Department; Dennis Fitzgerald, Judge, North Tarrytown Youth Court; Carol Fast, School-Bus Safety Committee, New York State PTA; Thomas Gillison, Transportation Director of Hastings, Dobbs Ferry, Ardsley, and Irvington; Fred Spry, Transportation Director, Greenburgh School District; Susan R. Mond, Director, Safety-Belt Child-Restraint Project, National PTA; and Charles Finley, New York State Department of Education.

C-101-10

SEAT BELTS ON LARGE SCHOOL BUSES

Pages 4 through 14  
excerpted from

Testimony Delivered Before the  
New York State Legislative Commission  
on Critical Transportation Choices  
December 8, 1983

by

CAROL FAST, School Bus Resource  
New York State PTA Safety Committee

11 Orlando Avenue  
Ardsley, New York 10502

(914) 693-5763

I now want to address myself to the issue of seat belts on school buses. The NY State PTA passed Resolution #7 in November of 1982, supporting seat belts on school buses. The 1,000 members attending the PTA convention, representing 360,000 NY State voters, recognized the necessity of equipping buses with belts. The number one killer of children and young adults today is the automobile accident. Only 11-14% of the American riding public wear their seat belts. Obviously, there are very few role models for our children. Obviously, it has been very difficult to convince children to wear their belts. The school years, or formative years, represent the best time to be educating them, but they have not had a chance to "practice" wearing belts. The school bus affords us the best place to do this, the best place to develop a habit. What a great opportunity we have before us to help a whole new generation of children to think of buckling up in the same way they think of brushing their teeth.

Two school districts - Greenburgh Central 7 and Ardsley - are believers in this theory and have put it into practice. Representatives from each district will be submitting testimony regarding HOW their respective districts implemented seat belt education and belts on buses, the costs involved, etc., but I would like to share some feelings with you on our experience, since I live in Ardsley, and am a close neighbor of Greenburgh. We found in both districts that the first thing to be done is to convince the drivers that seat belts save lives in automobiles. This was very easy to do because of the excellent films available today, namely "Room To Live" and "Sudden Stop At The End." After a training session with the drivers, they were able to see how important their role in the program was. They saw that they could help teach the students a HABIT that could save their lives in cars. Greenburgh started in 1979 and Ardsley started in 1983. The drivers in Greenburgh have since written a pamphlet on school bus safety for the children, including the use of belts on the buses. They became actively involved. There are no monitors on the Greenburgh buses, yet the children wear their belts. As was expected, the young ones who have grown up in infant restraints and who now know about the new law that will require belt usage in their cars until they are 10, were much more receptive and are much more "loyal" to the bus seat belt program than the high schoolers. In Ardsley we have monitors on the K-8 runs and of course this is an advantage. The monitors were trained the same way the drivers were. Both drivers and monitors have had training on all the special points one has to remember when teaching the young children how to buckle up. They have to remember to pull the strip down towards the seat, for instance, when trying to tighten the belt correctly. I have enclosed the sheet of information that we used at this particular training session.

The actual usage of the belts on the buses in Ardsley did not start until mid-November due to some problems with the length of the belts that were initially installed. We have now learned that when retrofitting a bus, belts must be ordered with very specific measurements. To insure correct fit, K-12, measuring from where the seat cushion joins the seat back, the short end of the belt must be approximately 16" and the long end 29". Any measurement very different will present

problems. I must share a wonderful story with you. Before the belts were re-installed, the monitors and drivers were told to tell the students NOT to wear them yet, because they would not fit correctly. A monitor contacted me to see if she could ALLOW the younger children to use them because they were insisting that they wanted their seat belts on! It was very hard for me to say no. This showed us how easy it is to work with the younger children. Since we've started the actual usage program, the reports from monitors and principals seem to be all positive. We know that there are no problems K-8 but suspect there may be high school students who do not wear them all the time. We are just in the process now of setting up meetings with the drivers to determine if there are "problem" buses. The high school principal is a very strong advocate of this whole program and has scheduled ongoing seat belt education for the students throughout the year in many different departments, and he wants to take any kind of action necessary to enforce belt use on the buses. He will interview the kids to get their opinion as to whether or not their driver has been strict enough in his "reminders" to them and to see if the driver has walked down the aisle of the bus before leaving the school to see that everyone is buckled up. There are many different tactics we will be experimenting with for high school usage and for evaluation of the entire usage program.

Is it carrying over into the high school students' car usage? That we can say a resounding YES to, for the community has reported, through the PTA, that whatever we are doing seems to be right, for their "nonuser" children are now using belts. We know of two accidents locally within the last few weeks where avid nonusers USED their belts and were involved in accidents that totaled their cars. The drivers and passengers -- our high school students -- walked away alive and unhurt. WE TAKE THIS TO REPRESENT INSTANT SUCCESS IN THE PROGRAM. LIVES HAVE BEEN SAVED.

At this point I feel it is time for me to ask a few questions and, at the same time, to rebutt some of the arguments against seat belts. WHY WERE SEAT BELTS AND EVEN SEAT BELT ANCHORAGES ELIMINATED FROM THE ORIGINAL FEDERAL SEAT STANDARD 222?

The national school bus contractors' lobby may explain in their National School Transportation Association Newsletter, and I quote: "NSTA is enjoying a major victory due to the elimination of mandatory seat belt anchorages from Docket #73-3, #5.....

"Docket #73-3 originally contained 28" high backed seats and seat belts. Notice #4 eliminated high-backed seats . . . This was due to the intense pressure applied by the NSTA Board of Directors, working in concert with public school officials. NSTA wishes to say, 'Thanks to all of you for your help, letters, telegrams, trips to Washington,' again and again and again. This effort will save every purchaser of school buses over \$300 per bus.....

"NSTA and its Board Members spent well over \$100,000 over the two and a half year period ... to reach this happy conclusion. If you feel as pleased as we do, NSTA could use some financial assistance to pay the numerous obligations incurred for Docket #73-3, #5."

According to this newsletter it was the school bus contractors' lobbying that influenced NHTSA to lower Standard 222.

At present, there is another national campaign going on against seat belts in buses, being led by the school transportation officials associations. They are passing out anti-seat belt material, usually listing about nine studies or statements, that they claim prove the hazards of having belts on buses. This was discussed at length at their annual convention in November in New Orleans, according to a report in "School Transportation." A version of this information had been distributed by our own NY State Education Dept. in August of 1983 at a driver trainers refresher course. It was written by James Reitmeier, President, Western NY School Transportation Supervisor's Association. I would like to quote from this material: "The American Association for Automotive Medicine advises against securing young children solely by lap belts in either passenger autos or buses. This is because the abdominal section of young children is not sufficiently developed to withstand the stress caused by lap belts in event of collision."

I contacted the American Association of Automotive Medicine and they have since written to Mr. Reitmeier. The following is a quote from their letter: "I do not know the source of your information concerning this Association, but the statement you made is absolutely incorrect. We have never taken a position as you stated in the newspaper article. I would appreciate knowing who or what your source of information is so that we may correct this erroneous information."

Further proof of the safety involved in use of lap belts in small children can be seen in the fact that many states around the country have passed infant restraint usage laws that allow even babies of 18 months(NJ) to ride in a lap belt alone. Also, many of the presentations given at the Society of Automotive Engineers Conference on Child Injury and Restraint, in San Diego this Fall, dealt with how to best protect 5-10 year olds in cars. There was no new information, from anywhere in the world, presented. NHTSA specifically stated that the safest way to transport young children is to place them in the middle of the back seat in a LAP belt.

David Soule, head of Pupil Transportation Division of NHTSA, has recently been quoted in "American School and University," 9/83, "Buckle UP? The Debate Goes On,": ". . . physicians explain that a child's body is different from an adult's. If a child is accelerated against a lap belt the force is transmitted directly to the abdomen and can cause serious internal injuries, even death."

I feel it is vital to include in my written testimony part of a testimony delivered by the Honorable Ed Mehler, mayor, city of Lomita, California, before the sub-committee on Commerce & Finance, on Bill HR-4187 (The School Bus Safety Act of 1973), as is. It gives excellent examples of misrepresentations on the part of the people who are not in favor of seat belts, and also includes excellent rebuttals to the misrepresentations.

\*Testimony text in part in pages 7 through 9.

The following is part of testimony delivered by the Honorable Ed Mehler, mayor, City of Lomita, California, before sub-committee on Commerce & Finance on Bill HR-418. (The School Bus Safety Act of 1973).

MEDICAL OPINIONS REGARDING SEAT BELT USE  
(Including seat belt as possible cause of injury)

"Dr. H. Rolf Noer of the Anderson Orthopedic Hospital in Arlington, Virginia, has been one of the most quoted as opposing the use of seat belts in school buses for medical reasons.

"David Soule, head of the Pupil Transportation Division of the Department of Transportation, has quoted Dr. Noer as saying: '--if you put any kind of lap belt on a young child...things will be torn loose from their moorings, 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.'

"Dr. Orville Parish, Director of Transportation for the New Jersey Department of Education, has also quoted Dr. Noer in opposing seat belts for school buses.

"When I talked to Dr. Noer regarding his comments, he said he had been widely misquoted. In talking to me he did not say he was opposed to seat belts in school buses, although he felt other safety requirements should be met first, such as adequate strength of bus bodies, better anchorage of seats and a better seat design, such as the one recommended by UCLA, and escape hatches. He also felt the seats should be turned around. He stated that if these things were done, he then would recommend seat belts be provided in all school buses.

"Mr. Soule, in that same talk in New Jersey, also quoted Dr. Verne Roberts, Head of Biosciences Division at the University of Michigan's Highway Research Institute, as saying that 'children are not miniature adults, they are built differently ...the adult's lap belt is not acceptable for the child.' This quote was used to support Mr. Soule's argument that seat belts should not be used in school buses.

"I called Dr. Roberts and he was appalled that this statement was used out of context. He said he was referring in his statement to toddlers, not to school children; and that he really meant that the belts would not be as effective because of improper fit. He said he was a strong advocate of seat belts for all vehicles, especially school buses. In his opinion, seat belts would be of tremendous value in saving lives and preventing injury in the event of a school bus accident. He said anyone wishing to discuss this in detail may call him.

"Dr. Donald Harrington, Resident Orthopedic Surgeon at Los Angeles Orthopedic Hospital, said that any injury to the hip or back caused by wearing a seat belt occurs only in high trauma - or severe impact accidents - and that any injury occurring in this manner would be minor compared to the extensive injuries that would have occurred if a belt had not been used. He said there is 'no question about seat belts providing greater safety for the school children in buses.' He further stated that this was the general opinion of the doctors with whom he was associated.

"Dr. Frank Sim, Resident Orthopedic Surgeon at Mayo Bros. Clinic said that in his experience there has been no problem with seat belts producing severe injuries, other than bruises or possibly hip dislocations in high impact crashes. In his words; 'any injury sustained by passengers due to seat belts would, in nearly all cases, be far less severe than the resulting injuries caused by no seat belts being used.'

"Dr. J. Alex Haller, Chairman of the Department of Medicine at Johns Hopkins Hospital is of the same opinion. So is Dr. Frank Redo, Head of Pediatric Surgery at New York Hospital. 'Have not observed any problems at all due to the use of seat belts.'

"Another question raised by David Soule of the Department of Transportation last year is not even worthy of comment. He asked, and I quote, 'How does the bus driver keep the curious child from putting his little finger in the belt buckle and getting it caught.'

"I believe the clincher is when Mr. Soule expresses deep concern that if seat belts were used in school buses - taking into consideration the number of buses involved in roll-over type accidents and the average number of pupils in each bus - we could have a 'frightening' situation. We might have as many as 25,000 kids each year hanging upside down inside their buses. Just think, 25,000 children strapped in, hanging upside down - secured to their seats instead of being ejected from the bus and crushed to death, or smashed from window to post within the bus - with resulting fractured skulls and broken necks.

"William F. Rawley, Jr., MD, Pediatric Ambulatory Services - New England Medical Center Hospital

"Eugene Lariviere, MD, Dept. of Pediatrics - New England Medical Center Hospitals

"Charles W. Dietrich - Traffic Sciences - Bolt, Boranek and Newman, Journal of Pediatrics - June 1971

'A physician who can and should recommend that parents of young children purchase restraining devices, can be assured that the devices will provide effective restraint.' These always include the use of a vehicle seat belt.'

'We encourage physicians with young children to use these proper restraining devices and to consider this area of prevention as important as routine immunizations.'

"E. Michelinakis, MD - July 1971

'Safety Belt Syndrome' - article in The Practitioner

'This article is not a condemnation of safety belts; these patients owe their lives to the use of safety belts.'

'It is essential to remember that these patients would have sustained far more serious, if not fatal, injuries if safety belts had not been worn.'

"Dr. Harold A. Fenner, Jr. - Hobbs, New Mexico - Chairman of the Committee on Medical Aspects of Automotive Safety of the AMA

'Dr. Fenner believes that seat belts would keep students in place and that high back seats would entail noisy interaction.'

"American Medical Association - Commission on Medical Aspects of Automotive Safety-  
Study and Report 1972

Study of 441 pregnant women involved in auto crashes, etc.

'Most injuries caused by seat belts were 'superficial'.'

'Seat belts practically guaranteed against ejection and both mother and fetus  
had less risk of injury or death when the mother wore a lap belt.'

"Dr. Sheldon Feinberg - American Academy of Pediatrics

"Dr. Seymour Charles - Physicians for Automotive Safety

"Dr. Arthur Yeager - Bergen County Dental Society - assisted Assemblyman C. L.  
Bassano from New Jersey in writing school bus safety legislation for that state.

"Warren M. Crosby, M.D., and J. Paul Costiloe, M.S.  
Report - Safety of Lap-Belt Restraint for Pregnant Victims of Automobile  
Collisions

'Discussing the advisability of lap belt restraint for pregnant passengers.  
'Study provides no evidence that lap-type restraints increase the mortality  
of either mother or fetus when pregnant women are the victims of severe colli-  
sions. Seat belts...should be recommended for pregnant travelers.'

"Dr. J. Alex Hailer - Chief of Pediatric Surgery - Johns Hopkins Hospital

'By far, head injuries are the greatest cause of death and serious injury in  
vehicle accidents.' 'It is very unlikely that there would be internal injuries  
due to the use of seat belts. Especially not in children or slender adults.  
If the impact of an accident is severe enough for a seat belt to cause injury,  
then that passenger would be dead without one.'

"Dr. Frank Redo - Head of Pediatric Surgery - New York Hospital

'Have not personally observed, or heard of, any problems at all through the  
use of seat belts.'

CONCLUSION OF THE HONORABLE ED MEHLER'S TESTIMONY

Next I will list and rebut the remaining issues that Mr. Reitmeier contends will prove that seat belts actually reduce safety and result in greater passenger injuries from impact collisions.

REITMEIER: "The University of California at Los Angeles conducted crash sled tests using seat belted dummies. The greatest injuries occurred to passengers that were seat belted in the bus. The least injuries occurred to passengers who sat unsecured in the bus. These passengers deflected their impact between seat benches."

REBUTTAL: UCLA first conducted crash studies in 1967. I believe you have seen the movie of these studies, "Broken Bus", at the hearing in Albany. A direct quote from that study is: "These bus experiments, the many types of collision experiments conducted during the past 16 years by the authors and investigations by others, CLEARLY ESTABLISH THE VALUE IN PASSENGER PROTECTION OF LAP BELTS WHEN USED WITH HIGH BACK SEATS...THESE RESTRAINTS CAN BE ADDED TO THE SAFETY SEAT AT VERY LITTLE ADDED COST AND THEIR PRESENCE PROVIDES THE CONTINUITY NEEDED FOR PROPER TRAINING OF YOUTH CONCERNING HABITUAL USE OF RESTRAINTS WHEN RIDING IN ANY VEHICLE."

In August of 1972, another study was released that had tested the effectiveness of the newly designed "UCLA Prototype Safety Seat." This seat was to take the place of the seat that the 1967 study had recommended, one with fully padded 28" seat backs and lap belts. The school bus "industry" had so strongly objected to the use of seat belts in school buses that UCLA had then designed a prototype seat with a very large side arm rest that was more like a panel. The seats were to be close together, but were so large that it would have greatly decreased the number of rows of seats able to fit into a bus. The back of the seat was a metal "mesh" that "pocketed" the passenger if he was thrown into it. This stopped the excessive vertical acceleration that normally takes place when a person is thrown into a seat back. Of course, these seats would have had to have been replaced after even slight impact by the knees because of this "mesh" type of flexible seat back. THE COMPARISONS DRAWN IN THE STUDY ARE MISREPRESENTED BY MR. REITMEIER, and by other anti-seat belt persons such as Ms. Billie Reynolds, executive director of the National School Transportation Association, NSTA. The study compares lap belted dummies who are seated behind low back, 22", unpadded "conventional seats to dummies contained in the nearly perfect example of a PASSIVE RESTRAINT SEAT. To quote the study: "This does not mean that lap belts would not be of substantial assistance where collisions include bus upset..." So even with the UCLA Prototype Seat the authors recognize the need for seat belts in a rollover. We (safety advocates) would have agreed to this UCLA seat, even without seat belts, but again the "industry" said NO. They did not want to cut down on the capacity of their bus or have to discard a seat every time a child hit into it, so we now have a WATERED DOWN VERSION OF THE UCLA SEAT FOR OUR FEDERAL STANDARDS: Lower back, no arm rest, no "pocket", very little deflection from LATERAL COLLISION OR ROLLOVER. If we put seat belts on our New York seats, we would have none of the jackknife effect they observed in the study over the 22" seat, and we would have padding to absorb the energy of the head, not unpadded metal seats. Give our children the UCLA Prototype Seat or give them seat belts.

REITMEIER: "The NHTSA conducted extensive research through crash sled tests. Those crash tests concluded that passengers secured to bench seats in a bus by lap belts suffered the most severe injuries in the event of upset or collision. This was because the height and construction of the bench seats produced injury hazards to the head and upper portions of the passengers seated behind."

REBUTTAL: 1. Yes, the researchers found higher "G" forces on the head of the belted dummy, but not significantly higher and certainly not in the realm of danger.

2. The unbelted dummy, in comparison, was thrown into a yielding seat and therefore showed "G" forces on the knees, chest, and head instead of most on the head...BUT, THEY ALSO NOTICED THAT AFTER THE TORSO ROTATED UP, ALLOWING THE KNEES TO HIT FIRST, THE NECK THEN SLAMMED DOWN OVER THE TOP OF THE SEAT IN FRONT, letting the head flail downward. The neck had no transducer in it, so the forces it took COULD NOT be measured and recorded. THE AUTHORS POINTED OUT THIS DISCREPANCY IN THE STUDY AND CALLED FOR FURTHER RESEARCH ON THIS PHENOMENON. If the transportation supervisors really cared about children's safety, they would have been pointing out that unbelted children may be in a very dangerous position in our "passive" seats, even during a frontal collision. The throat and neck are very vulnerable parts of the body.

3. When doing a study to test the effectiveness of lap belts versus compartmentalization, you of course have to conduct SIDE ANGLE COLLISIONS OR ROLLOVERS. No one will argue with the fact that compartmentalization works beautifully during front end collision. Believe it or not, this is all NHTSA asked for in the study. But does Mr. Reitmeier even mention this? This is very reminiscent of the study that NHTSA did to determine the needed height of a school bus seat. AMF was only asked to do frontal collisions, but went further by stating: "THE MAJOR CONSIDERATION IN DETERMINING CORRECT SEAT HEIGHT MAY BE ONE THAT WAS NOT ADDRESSED IN THIS STUDY: THE WHIPPING OF THE HEAD OVER THE TOP OF THE SEAT BACK IN REAR IMPACTS...A MINIMUM SEAT BACK HEIGHT OF 24" ABOVE THE SEATING REFERENCE POINT (SRP) [ OR 28" using the older standard way of measurement ] IS NECESSARY TO PROTECT A 50TH PERCENTILE ADULT MALE AGAINST WHIPLASH IN A REARWARD IMPACT." The SAME PEOPLE who quoted this NHTSA "study" against our 28" seat back are the same people quoting the NHTSA front impact "study" against seat belts. Are they lying or are they ignorant? In either case, they have no business quoting this study as evidence for their case.

REITMEIER: "The National Motor Vehicle Research Foundation conducted 200 crash tests with seat belts and concluded that at least 40 inches of unobstructed area must exist in front of the belted passenger in order to protect the passenger from frontal impact. The greatest danger to a seat belted passenger is impact injury to the head. Seats in buses are typically spaced 22 to 28 inches apart."

REBUTTAL: Not ever having seen this study, I can only speculate. In Billie Reynolds' publication, "The Importance of Seat Belts in the Total School Bus Safety Picture," (executive director of the National Contractors' Association) she refers to this study also. "Over 200 tests by the MVR showed seat belts to be ineffective in protecting the head. The belt acted as a fulcrum allowing the head to strike the WINDSHIELD AND DASHBOARD TOP." I can only speculate that these tests were done in cars. What does this have to do with someone's head hitting a fully padded, high-backed seat in front of him? Does this figure mean that Mr. Reitmeier and Ms. Reynolds want all seat belts removed from van buses? After all, vans have belts but have no more than 27" between them, a far cry from 40"!

REITMEIER: "The Virginia Polytechnic Institute and State University conducted attitudinal studies of seat belts in school buses. Their findings questioned the compliance of children using seat belts and the ability of drivers to enforce seat belt usage. In addition, the legal and educational barriers to seat belt installation were considered factors that would make seat belts impractical for school buses."

REBUTTAL: The word "attitudinal" is the key to this study. This is not a study of something factual. Come and study Greenburgh and Ardsley if you want the answers to the questions raised here. We don't get much more than 11% usage rates in America, but we keep requiring seat belts in cars in this country. Why should we deprive our children of the option of safety in the event of a side impact or in the event of a swerve or in the event of a rollover just because ALL of the children can't be expected to comply? The drivers won't have it easy, there is no doubt, but the drivers who are able to maintain good discipline will also be able to convince most of the children that he or she means what he says about seat belt usage. What legal barriers could arise? We have district-owned buses and contracted buses in operation with belts and there were no legal ramifications at all. I'm not sure what Mr. Reitmeier could possibly mean by educational barriers. If he is referring to the curriculum in the classroom, I have enclosed a complete list of all materials used by each grade level in Ardsley and how to get these for your district. Ardsley spent a total of about \$300 as an initial investment. Most things are available free through organizations such as NHTSA and the National PTA. Also, Southern Westchester BOCES gladly purchased the films we wanted.

REITMEIER: "The California Highway Patrol commissioned Southwest Research Institute to study seat belts in school buses and concluded:

- a) The interior of an auto is not similar to that of a bus in that appurtenances such as steering wheels, dashboards, door handles, etc. are not present in bus passenger compartments.
- b) Should a major accident occur in an auto, it is relatively easy to release seat belts and remove passengers from outside the vehicle. Belted passengers in a much larger bus could not be easily removed.
- c) Bus drivers or aides would be tasked with insuring that belts are fastened, as unsecured belts would result in a tripping hazard for other students. Given a bus load of 65 children, the amount of time required to check belts at each stop would be prohibitive.
- d) Factors such as vandalism to belts and the possible use of belts as weapons were also cited by the Highway Patrol as reasons why the device should not be employed."

REBUTTAL: You must realize that this study, printed up under the name of NHTSA upon completion, was simply an opinion survey. To quote the NHTSA Abstract, "The study included visits, inspections and in-depth discussions with bus owners, operators, maintenance personnel, seat manufacturers, belt manufacturers, and bus manufacturers..." Need I say more? Aren't these the very same people who misrepresent and misquote whenever they get the chance in order to defeat seat belts the way they successfully did with the Federal standard? Only because this study brings up some of the oldest and hardest to die arguments against

belts on buses will I address some of them. Belted children in two separate accidents in 1979 who escaped injury were cited by the National Transportation Safety Board in an August 1982 News Release. Both involved vans that overturned and left very young, belted passengers "hanging upside down." But contrary to old beliefs, they instantaneously unbuckled their belts and all very quickly and calmly escaped, unhurt. If not belted in, they would have been injured or stunned and quick escape would have been greatly slowed down. Because they were not injured, they did not have to be "removed" at all! The NTSB release stated: "Seat belt usage by children in school buses may be not only possible but relatively easy to achieve." "Drivers of both buses had taught their students that unless all belts were fastened, the buses would not be moved." "...Neither driver had been given special training in how to carry out their school's policy of requiring belt usage." "The Safety Board observed that both accidents suggest that the unquestioned benefit of being protected by a seat belt when an accident occurs could be available to our children in their school buses just as it is to us in our private automobiles."

The next point that I will clear up is in regard to unfastened belts being a tripping hazard. If the short ends are always installed on the aisle and the long ends are the proper length and not too long, there is no way that they can reach the aisle floor. While we're discussing the tripping hazard, let me mention that the old fear of the belts being attached to the floor and therefore the anchorages being a tripping hazard no longer exists. We do not recommend installing the belts through the floor. It would be impractical. As for the amount of time required to check belts at each stop being prohibitive, of course we would never ask the driver to do this. He has to do all in his power to see that they are worn within the boundaries of reality. Drivers can stop the bus and spot check. If he/she suspects that there are children who did not have their belts on then he/she can report the entire busload to the principal for action or more education. Greenburgh and Ardsley will be working on creative ways to encourage belt use on buses over this next year. The problem is far greater in the automobile where there is never anyone to "spot check" if the parents are not seat belt users. As for vandalism, it is very difficult to cut through the nylon webbing used in seat belts. The anchorages are inside the seat, so cannot be unbolted. Modern buckles cannot be unthreaded, and NO.... WE'VE NEVER, AND GREENBURGH HAS NEVER, HAD A BELT USED AS A WEAPON. They are too small and lightweight to inflict much pain and other objects, such as lunch boxes and clarinets, make much more effective weapons!!

REITMEIER: "The National Association of Independent Insurers questions the legal liabilities created by buses equipped with seat belts. Insurers are concerned about enforcement in seat belt usage, and anchorages for seat belts as obstructions to children walking in the bus during boarding and disembarking."

REBUTTAL: Suffice it to say that neither district has ever had a problem with their insurers. Suffice it to say that we have had a Federal requirement for seat belts in small buses since 1977. Did the NAII raise these same questions about those buses, or is this another tactic on the part of the school bus industry to keep belts out of big buses?

REITMEIER: "The National School Transportation Association (contractors) computed the cost of safety belt systems in school buses. Their conclusions

were that the economics of seat belts due to hazard, enforcement, vandalism, and attitudinal factors were not cost effective. The net result would be loss of bus services with additional children placed on the streets to find their own way to school."

REBUTTAL: To sum up my feeling on this Association, I must quote from a study done in 1971 at the Trauma Research Group, University of California at San Diego in conjunction with the Automobile Club of Southern California. The name of the study is "Bus Collision Causation and Injury Patterns":

"For many years, certain public and pupil transportation officials have been presenting arguments against installation of restraint systems in buses, particularly school buses...IT CAN BE STATED QUITE CATEGORICALLY THAT THE ABSENCE OF LOAD-DISTRIBUTING, ENERGY-ABSORBING SEATS, COUPLED WITH THE ABSENCE OF BUS PASSENGER RESTRAINT SYSTEMS, HAS AND WILL CONTINUE TO BE DIRECTLY RESPONSIBLE FOR THE MAJORITY OF BUS INJURIES AND FATALITIES."

There is another issue that always crops up in New York when seat belts are discussed. This is the issue of having seat belts on buses in a state that still allows standees. I have been working to eliminate standees, as has the New York State PTA, for years and years, but that does not mean that we are not going to try to protect seated children to the greatest extent possible. Shall we remove all forms of compartmentalization, or "passive restraint", from our buses until we eliminate standees? Or further...should we tear out all the seats until we eliminate standees? Of course, the answer is NO to both of these silly questions and it is just as silly to ask if we should stop trying to provide the greatest protection we can for our children through "active restraint" until we get rid of standees. We need to accomplish both of these goals.

In conclusion, I appreciate your great patience in listening to me rebut some very destructive ideas. I hope I have been able to help you see more clearly in order to pass a bill mandating the installation of seat belts on all new school buses manufactured after the 1984 model year. Also, I would hope that you would consider a usage law that would cover small vans. We must start as soon as possible to help change the attitude of our children and young adults regarding seat belt usage in their cars, and I am convinced, as is the New York State PTA, Greenburgh and Ardsley School Districts, that practicing the use of seat belts on the school buses daily is the only hope for achieving that goal.

TESTIMONY DELIVERED BEFORE THE NEW YORK STATE  
LEGISLATIVE COMMISSION ON CRITICAL TRANSPORTATION CHOICES - 1983.

TESTIMONY TO BE ENTERED INTO THE MINUTES OF THE LEGISLATIVE COMMISSION ON CRITICAL TRANSPORTATION CHOICES, PUBLIC HEARING, December 8, 1983, by William Lamb, School Bus Driver and Custodian for the Ardsley Union Free School District

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I have been a school bus driver in Ardsley for nearly 25 years now and have always approved of the latest safety features that this district has put on the bus. In 1974 I testified at a public hearing on school bus safety to say that our district ordered one of the first buses made with 28" high back seats. I wanted the legislators to know that discipline had improved since we got the bus and that all the kids in the district were jealous of the one high backed seat bus. The reason they liked it so much was that the kids behind them weren't able to bother them now. They liked being left alone and having privacy.

Today I would like to tell you about another safety feature that Ardsley is insisting on—the seat belt. This year I happen to be driving a van type bus, but the seat belts in it had not been used in the past. In the middle of November I was told that the Board of Education's seat belt usage policy would now go into effect. I drive 15 children from Ardsley who go to a parochial school, in grades Kindergarten through eighth. I explained to the children that seat belts are for their own good. They had not had any lessons on seat belts in their school because they were out-of-district children, and we also have no monitor on this bus to tell them about belts. I had no problems at all getting them to use them. The older kids were terrific and the kindergarteners only had trouble tightening them until I showed them how. Within a couple of days everyone used them without question. I tell them how important it will be to use them in their own cars and to get their parents and family to use them too. I think they understand and that the bus use will carry over to the car.

Because of seat belts in the bus I no longer have any discipline problems. Nobody ever moves out of their seats and if they did, it would be easy to spot, even if it were a large bus, because they would be the only one standing up.

I think there should be a law for seat belts in New York just like the 28" seat back became a law.

Thanks for this chance to tell you about our seat belt program.

*Bill Lamb*

THE CANADIAN STUDY

# National Coalition for Seatbelts on School Buses

## THE CANADIAN TESTS

The January 1985 Transport Canada report of school bus crash tests has been widely publicized as proving that seat belts should not be used on the large (Type I) school bus and that the so called "compartmentalized" school bus seat without a seat belt offers better protection for children. Nothing could be further from the truth.

In the Canadian tests a large, a mid-size and a van type bus were subjected to severe 30 mph front end barrier crashes. On each bus there were six 5th percentile adult female anthropometric dummies, three belted and three unrestrained. From previous studies at UCLA and at East Liberty, Ohio it was learned that in such high force front end crashes belted dummies tend to pivot over their seat belts and strike their foreheads on the padded seat backs in front of them. Unbelted dummies on the other hand are thrown forward violently by the crash forces into the seat backs which they face. When measuring devices are placed by the researchers in the head and chest of these dummies, the belted dummies produce higher head readings and the unbelted higher chest readings. Experimentally, Head Injury Criteria (HIC) levels of greater than 1000 and Chest Accelerations of greater than 60 g. are generally accepted as sufficient to produce severe injury or death.

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DUMMY NUMBER	LOCATION IN BUS	SEAT SPACING mm	BELTED	UNBELTED	HIC	CHEST ACCELERATION (g)	
1	Front LH	533		X	*	60.4	LARGE BUS BLUEBIRD 66 PASSENGER
2	Front RH	533	X		649	40.8	
3	Centre LH	690	X		629	28.1	Vehicle Wt           8147 kg Vehicle Velocity   48.8 km/h Vehicle Decel.     15 g Dynamic Crush     1371 mm Body Slide         775 mm
4	Centre RH	690		X	220	34.2	
5	Rear LH	610		X	205	48.2	
6	Rear RH	610	X		731	25.0	
							*Data not valid due to technical problems

The results of the Canadian test of the large bus are above. In this test crash of a 66 passenger bus the only dummy experiencing life threatening forces was dummy number 1 seated unbelted in the front left hand seat with a chest reading of 60.4 g. All belted dummies were well within acceptable limits. The bus met all current federal standards including Standard 222 for school buses.

Since it is well known that the Federal 222 seat offers no protection at all for passengers in side impact and no "whiplash" protection for taller riders in rear end crashes, and that the seat was developed primarily to protect against injury in front end crashes, the failure to protect dummy number one without a seat belt is of particular concern.

In this type of front end test crash, as explained above, belted dummies will produce somewhat higher HIC levels than the unbelted dummies. In addition, the selection of the 5th percentile female which is just the right height to target the dummies head to the area of the seat back where the padding narrowly covers the metal bars of the seat and the use of the type 572 dummy which has been widely criticized for excessive HIC readings in crash tests severely prejudices these tests against seat belt use. In spite of all these test induced disadvantages, the dummies with the seat belts on the Bluebird Bus did remarkably well. On the other hand, in spite of the large area of the seat back to spread the forces, the unbelted dummy in the front seat would have experienced serious or fatal injury.

When film of the crash is viewed, dummy number 4, unbelted in the center seat, is seen to fly forward until its throat strikes the top of the seat back. In a high force frontal crash such as this the resulting throat injury would have been severe or fatal. It is conceivable that the HIC and chest readings were lower on this passenger because the throat and neck absorbed so much of the crash energy. Just how much force was so absorbed was not determined because, unfortunately, the researchers decided not to instrument the necks of the dummies

higher. As the size of the vehicle crashed gets smaller, the crash pulse becomes greater. The forces on the dummies increase. As a result of these higher forces coupled with the stiff, targeted 572 dummy, HIC levels were increased. Further, it has been documented in the 1978 testing of school bus 222 seats in East Liberty that seats manufactured by the Thomas Bus Company consistently registered HIC levels 2.4 times greater than seats produced by the Ward Bus Company in comparative tests. Thomas seats were used in the mid size and van tests in Canada. The Coalition is convinced that the higher HIC readings in the smaller vehicles was the result of the high crash pulse, the height of the dummy, the stiffness of the type 572, and the use of a Thomas seat.

Investigation of real world accidents in van type vehicles with passengers wearing seat belts in 222 seats and forces approximating those used in Canada have not produced injuries of the head anticipated by the test data. The researchers themselves admit that they were confused by the head and chest readings in two of the three belted dummies on the van, calling their own results "inexplicable."

When Canada implemented their Standard 222, seat belts were not ordered on smaller vehicles as was done in the United States because of pressure from those who operate school buses. The Coalition believes that the protocol of these tests was influenced by a desire to support the decision not to place seat belts on small buses. No assessment by crash testing of the safety provided by the 222 seat can be considered a valid measure of passenger protecting ability (compartmentalization) unless the tests include side and rear impacts to simulate the real world of school bus accidents. Any test which measures frontal collisions only must be considered self serving.

The 222 seat was designed to protect in front end crashes, a job which it does reasonably well. The Canadian tests were designed to demonstrate this 222 seat in the best possible way, and, because of the high crash forces, the dummy height and stiffness, the Thomas seat, to show the use of seat belts on

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school buses in the worst possible way. In spite of these efforts, the results clearly indicate that the use of seat belts on large (Type I) school buses as advocated by the Coalition, provides superior protection to school children in front end crashes as tested in Canada as well as in all other accidents experienced by children in school buses.

Arthur L. Yeager DDS


Chairman

May 1985

The University of Alabama at Birmingham  
Department of Rehabilitation Medicine  
Spain Rehabilitation Center  
205/934-3334  
June 25, 1985

M E M O R A N D U M

TO: Ms. Gloria Molina  
Assemblywoman, Fifty-sixth District

FROM: Dr. Russ Fine  
Professor and Co-Director 

RE: Canadian School Bus Safety Study

> Based upon all that is known about deceleration injuries and the inherent protection possible from proper restraint systems and appropriate packaging of motor vehicle occupants, it is absurd to dignify the contention that unbelted occupants (specifically children) are at lesser risk of physical injury than belted occupants. Of course, the three-point (viz. lap-shoulder type) passenger belt is safer than the two-point because the fulcrum and arc of upper torso travel (with fixed anchors or inertia reels) is markedly reduced. However, we must reject, summarily, the conclusions of this or any other study that concludes it is safer to be unrestrained than restrained in a vehicular collision... irrespective of "differences" between motor cars and buses.

> The ostensible comparisons are, in our opinion, of the apples and oranges genre'. The question as to whether to restrain or not restrain is ludicrous and those responsible for its promulgation simply know better ... and, if they don't, they need to get out of the safety engineering business.

That which constitutes the most appropriate restraint system and seat design (configuration, etc.) is the only appropriate question. The former question does an extreme disservice to automotive safety engineering as a discipline. It is an embarrassment irrespective of the veil of pseudo-scientific credibility in which it is clad.

The issues seized on but only casually alluded to by the anti-restraint advocates are clearly economic and pertain to such things as (1) "existing designs" [and the industry's interest in maintaining them as they are at present for economic reasons], (2) the larger question of responsibility for ensuring that students wear the seatbelts - especially small children [to escape the culpability/negligence issue], etc.

> The authors have, in our opinion, developed a logical sounding argument that is, in reality, predicated upon absurdities.

Moreover, the inquiry restricted the type of crash/collision to one described as a "severe frontal collision." Clearly, data from a singular type crash (which according to their own admission constituted barely more than half the

Ms. Gloria Molina  
June 25, 1985  
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crashes by type) should not and cannot be legitimately generalized to the spectrum of collision types in which any vehicle can be involved.

Their argument against belts flies in the face of the accepted practice of restraining airline passengers who are also very scrupulously "compartmentalized" (in keeping with the author's definition of compartmentalization) and who also are at risk of experiencing a deceleration type injury that is almost without exception, of the "severe frontal collision" variety (i.e. nose of fuselage into the ground or water).

Enormous attention within the flight-safety engineering community has been devoted to perfecting and mandating the use of lap type restraint systems for aircraft passengers (including children) who are subject to even more severe g loads and greater decelerative forces than those achieved by school buses traveling not at or near terminal velocity, but rather at or below a ground speed limit twelve to fifteen orders of magnitude below aircraft speed.

> It is our educated guess that a rather strong manufacturer's lobby has engaged the services of a consultant engineer ... and since many of us have served as consultants, from time-to-time, we are painfully aware of the realities that consultants "prove, verify, demonstrate, document or determine" precisely that which they are paid to prove, verify, demonstrate, etc. It is the nature of the consulting game.

> If one reads the article carefully it becomes apparent the conclusions are equivocal and, based on the data, could have been opposite those espoused. It is merely a matter of interpreting data, accepting or rejecting design premises, previously documented research findings, dismissing as unimportant or inconsequential failed instrumentation, ignoring shortcomings associated with the ATDs, with the HIC, ignoring associated injuries, etc.

Unfortunately, it appears that a generation of excellent, scientific achievement - an entire body of information - has been conveniently ignored ... and in a word, "that ain't kosher." In my humble opinion, giants in the field such as John Swearingen, former Chief of the Civil Aeromedical Research Institutes Protection and Survival Section and Colonel John Stapp would not be amused that their pioneering efforts in this field have been dismissed without due consideration.

> We agree that current passenger packaging can and should be improved, because the basic design configuration of the school bus has changed very little, if any, since the first ones appeared many years ago. There is little doubt that recent design modifications have improved the inherent safety (i.e. have reduced risk of injury) of school buses. However, this should not be misconstrued to negate the need for the long-overdue re-design of passenger compartments, seats, seating arrangements, interior configuration(s), restraint systems (passive and active), etc.

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> We enclose a copy of an article from this morning's Birmingham Post-Herald and one from the afternoon's Birmingham News. I spoke personally with the Chief of Police who stated unequivocally that most, if not all, of the injuries that occurred in this strangely coincidental crash would have been prevented (or their seriousness reduced) had the passengers been properly restrained with seat belts.

> There are other areas of the report that warrant criticism, but after a while it's more like beating a dead horse.

We are hopeful you and your fellow seatbelt/viz. lifebelt advocates will be aided by the information contained herein.

Good Luck ... you'll need it.

Good morning Party policy

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Dotsch isn't  
picky about  
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does more  
than build  
C1



# Birmingham Post-Herald

Final Edition

TUESDAY, JUNE 25, 1985

25 Cents

## 13 injured as MAX bus loses control, hits bridge abutments

By Kathleen M. Johnston  
Post-Herald Reporter

A Metro Area Express bus went out of control yesterday afternoon in Mountain Brook, striking two bridge abutments and injuring 12 passengers and the driver.

Six ambulances transported the injured to three area hospitals — Cooper Green, Baptist Medical Center-Montclair and University Hospitals.

Mountain Brook Police Chief John Haley said the most serious injuries among the passengers involved broken bones. All the injured were treated and released, according to hospital spokesmen.

Haley said the accident occurred on Old Leeds Road about 3:44 p.m.

The bus was carrying 23 people when the driver hit some wet pavement while rounding a curve.

"The driver lost control and hit a bridge abutment and careened across the road and hit the bridge abutment on the left-hand side before running off the road," Haley said.

The bus came to rest in a wooded area on the bank of Shades Creek.

No other vehicles were involved in the accident. Haley said no charges were being considered yesterday. Haley said the force of the out-of-control bus knocked

both of the abutments partially off the bridge.

Al Richards, general manager for MAX, said the transit system had safety personnel investigating the accident.

Richards identified the driver as Timothy Jones. He said Jones is a new driver who had completed his training two weeks ago.

Richards said indications were that the bad weather and slick road led to the accident.

"He's a new driver and Mountain Brook is a hard area to know and he was a little off schedule. — Last time he reported to be was behind schedule."

Mountain Brook police Officer Gary Bailey identified the injured as:

- Daniel Walker, 54, of Harrison Avenue Southwest
- Anne G. Fleming, 54, of 14th Street Southwest
- Arleen Cage, 51, of Netherland Drive Southwest
- Linda Ferrrell, 31, of 32nd Place North
- Fannie M. Shine, 51, of 30th Avenue North
- Rosie Dickson, 64, of 12th Avenue West
- Mildred Milton, 51, of 37th Avenue North
- Sarah Harville, 54, of 27th Court North
- Irene Gray, 49, of Ninth Avenue North
- the driver, Jones, 38, of 939 Ninth Court West
- Ruby Temple, 43, of Cotton Avenue Southwest
- Bertha Perry, 67, of Avenue J
- Ruth Glover, 62, of 18th Street North

### BIOGRAHPICAL SKETCH OF DR. PHILIP R. FINE

Philip R. Fine, Ph.D., M.S.P.H. is a Professor in the Department of Rehabilitation Medicine at the University of Alabama School of Medicine, Birmingham, Alabama. Since 1975 he has been Director of Research for the Medical Rehabilitation Research and Training Center and Co-Director of the University's Spinal Cord Injury Care System. He holds secondary faculty appointments in the Graduate, Public Health and Nursings Schools. He holds a doctorate in epidemiology and biostatistics, having been trained as a trauma-epidemiologist. In addition, he holds a Master of Science in Public Health degree. Dr. Fine was affiliated with the Federal Aviation Administration's Civil Aeromedical Research Institute in the late 60's before becoming Director of Research, Planning and Development for the Chicago Board of Health. Subsequently, he was appointed to the position of Health Services Coordinator for the Illinois Department of Public Health under former Governor Richard B. Ogilvie - for whom he later served as an aide. Before joining the University of Alabama at Birmingham, Dr. Fine was executive vice president of Master Care Health Plan. He is the author or co-author of over 100 published contributions to the scientific medical literature. In 1982, Dr. Fine was one of two finalists considered for the appointment to the position of Director of the National Institute of Handicapped Research. Dr. Fine is the immediate past Chairperson of the Research Committee of the National Association of Rehabilitation Research and Training Centers and a member of the Joint Ad Hoc Research Committee of the American Academy of Physical Medicine and Rehabilitation and the American Congress of Rehabilitation Medicine.

He is a co-founder of the Jefferson County Chapter of Mothers Against Drunk Driving (MADD), Alabama's first and largest MADD Chapter, and has served on the Board of Directors of the organization since it was chartered in 1982 and is presently the President. Dr. Fine served as the Chairperson of the Governor's Task Force on Drunk Driving for the State of Alabama.

NATIONAL TRANSPORTATION SAFETY BOARD STUDIES AND REPORTS.



6/25/82  
8/25/82

AUG 27 1982

## Safety Information

FOR IMMEDIATE RELEASE: Monday,

CHILDREN IN VAN SCHOOL BUSES,  
TAUGHT TO USE SEAT BELTS,  
ESCAPE INJURIES IN ACCIDENTS

**We would like  
you to have this  
information**

*Bob Evans*

NATIONAL TRANSPORTATION SAFETY BOARD  
Washington, D.C.: 20594

Seat belt usage by children in school buses may be not only possible but relatively easy to achieve, the National Transportation Safety Board said today.

Special investigation of a New York City accident last July 27 involving a van-type school bus mirrored the findings of a 1979 investigation -- grade-school children who had been taught to wear their seat belts all had them on and escaped injury when their buses overturned.

Drivers of both buses had taught their students that unless all belts were fastened, the buses would not be moved. Each driver reported that only a few days to a week had been required to teach students how to fasten and unfasten their metal-to-metal seat belts, and for them to become accustomed to "buckling up." Older children were happy to help others and served as an example to the younger ones.

The July 27 accident involved a day camp van occupied by the driver and three campers -- a 14-year-old and two seven-year-olds. The van was struck broadside by a car as the van pulled into the intersection of Rosedale and Storey Avenues in the Bronx with the changing of the traffic light.

The collision impact was not severe, but the van overturned on its right side. One of the seven-year-olds was left hanging from a seat on the high side of the bus, but none of the three children was injured. The driver, who also was wearing a seat belt, suffered only a scratched ankle.

- more -

In the similar 1979 accident, another van-type school bus skidded out of control on State Route 120 in North Castle, N.Y., when it ran over a motor vehicle muffler lying on the highway. The bus overturned on the shoulder of the road, but the driver and all six passengers -- all children 5 to 7 years old -- were wearing seat belts and escaped injury. Most, if not all, of the children were able to release their own belts and walk out of the van unassisted even though three were in "high side" seats.

The driver told Board investigators it had taken her "just a few days" to teach the children to use their seat belts. She reported no serious delays in waiting for children to buckle their belts, and said the use of belts solved the problem of the smallest children sliding off their seats because their feet would not reach the floor, as well as that of dozing children.

The Safety Board said neither driver had been given special training in how to carry out their schools' policy of requiring belt usage.

The Safety Board observed that "both accidents suggest that the unquestioned benefit of being protected by a seat belt when an accident occurs could be available to our children in their school buses just as it is to us in our private automobiles."

"Past suggestions that seat belts would prevent deaths and injuries in school buses have been met with skepticism that children would or could be made to wear them," the Safety Board said. "These cases, involving multi-purpose vans in which seat belts are required, indicate that the added safety of belts may be quite attainable." Seat belts are not required on most school buses.

--oOo--

Press Contact: Brad Dunbar  
(202) 382-6605

# "Seatbelts on School Buses"

## Information on Resolution #7

N Y State PTA Convention  
November 7, 8, 9, 1982

Compiled by Carol Fast  
School Bus Safety Resource,  
Juvenile Protection Committee

### Accident Investigations & Studies Advocating Seatbelts on School Buses 1967-1981

1967 School Bus Passenger Protection, Severy, Brink & Baird, Institute of Transportation & Traffic Engineering, UCLA (film entitled "Broken Bus"):

Seatbelts Recommended for Safety Seat: "These bus experiments, the many actual school bus accidents investigated by the authors, the many types of collision experiments conducted during the past 16 years by the authors and investigations by others, CLEARLY ESTABLISH THE VALUE IN PASSENGER PROTECTION OF LAP BELTS WHEN USED WITH HIGH BACK SEATS ..... These restraints can be added to the safety seat at very little added cost and their presence provides the continuity needed for proper training of youth concerning habitual use of restraints when riding in any vehicle."

1971 Bus Collision Causation & Injury Patterns, Siegel & Nahum, Trauma Research Group, UC San Diego; Runge, Automobile Club of Southern California:

Restraint Systems & Seats: "In all cases where an individual is ejected from his seat to strike either the forward seat or other areas within the bus, the passenger injury level is increased. IT IS, THEREFORE, RECOMMENDED THAT THE SEATS BE PADDED AND THAT ALL BUSES BE EQUIPPED WITH RESTRAINT SYSTEMS CAPABLE OF BEING ACTIVATED BY EACH INDIVIDUAL. RESTRAINT WITHIN THE SEAT AREA IS ESSENTIAL FOR INJURY MINIMIZATION ....."

"For many years ~~certain public and rural transportation~~ officials have been presenting arguments against installation of restraint systems in buses, particularly school buses. .... IT CAN BE STATED QUITE CATEGORICALLY THAT THE ABSENCE OF LOAD-DISTRIBUTING, ENERGY-ABSORBING SEATS, COUPLED WITH THE ABSENCE OF BUS PASSENGER RESTRAINT SYSTEMS, HAS AND WILL CONTINUE TO BE DIRECTLY RESPONSIBLE FOR THE MAJORITY OF BUS INJURIES AND FATALITIES."

1971 National Transportation Safety Board, Bureau of Surface Transportation Safety, Washington, D. C., Highway Accident Report #71-8:

Abstract: "The NTSB determines that THE FATALITIES AND INJURIES WERE CAUSED... IN SOME CASES BY THE ABSENCE OF OCCUPANT RESTRAINTS."

Kinematics of Occupants:

b. "When the bus vaulted (or rolled over), most occupants were shaken from their seats and were tumbled about the bus interior, striking the ceiling and interior components, some may have been ejected."

c. "When the bus struck on its left roof area all occupants were dislodged from their seats. Many were probably thrown from the right-side seats into (or through) the left windows. Some may have been ejected through the rear window area, while others were tossed about within the bus."

d. "When the bus roof impacted the masonry outbuilding and the small tree, additional occupants may have dropped out the left windows."

e. "When the bus settled back onto its left side, it came down upon a number of the occupants who had been thrown or shaken out earlier."

1972 National Transportation Safety Board, Ibid., Highway Accident Report #72-2:

Abstract: "The school bus ran off the roadway & partially overturned, injuring all occupants...The injuries to the bus occupants were caused by impact against interior bus components."

Conclusion: "THE INSTALLATION OF OCCUPANT RESTRAINTS AND THEIR USE BY THE DRIVER AND PASSENGERS ON THE BUS WOULD HAVE REDUCED THE NUMBER AND SEVERITY OF INJURIES."

1973 National Transportation Safety Board, Ibid., Railroad/Highway Accident Report #73-1:

Abstract: ".....five students died and the bus driver and all 44 remaining students were injured.....the rear section of the bus was torn loose, fell beside the track, and overturned with a number of students underneath. Two of the several who were ejected from the remaining portion of the bus passed through separated floor sections and fell between the rails into the path of the train."

"THE GREATEST NUMBER OF INJURIES OCCURRED TO THE HEAD. These injuries can be ATTRIBUTED TO THE TUMBLING MOVEMENTS OF THE PASSENGERS AS THEY STRUCK EACH OTHER AND INTERIOR COMPONENTS OF THE BUS.....disfiguring head and facial scars can have long-lasting effects on the development of their [children] personalities as young adults."

Seatbelts: "THE AVAILABILITY OF SEATBELTS IN COMBINATION WITH PADDED HIGHBACK SEATS OF IMPROVED DESIGN WOULD HAVE REDUCED THE INJURY SEVERITY in the following ways:

- Restraints would have prevented the ejections in this accident.
- Restraints would have prevented the postimpact kinematics to the passengers.

This is especially true of the rear section that came to rest on its top."

Conclusions: "AT LEAST 2 OF THE 5 FATALITIES WERE EJECTED AS A RESULT OF A FLOOR SEPARATION AND THE LACK OF AVAILABILITY AND USE OF AN OCCUPANT RESTRAINT SYSTEM..."\*\*\*

\*\*\*A national safety group, Physicians For Automotive Safety, after investigating this accident, stated that 4 of the 5 fatalities would have been prevented if seatbelts had been used.

1976 National Highway Traffic Safety Administration (NHTSA), Federal Motor Vehicle Safety Standards, School Bus Passenger Seating & Crash Protection, Docket #73-3 Notice 5, Federal Register, Vol. 41-#19 - Wed., Jan. 28, 1976:

"NHTSA calculations demonstrate that the strength characteristics of the seat specified by the standard to provide the correct amount of compartmentalization also provide the strength necessary to absorb seat belt loads. This means that AN OPERATOR OR DISTRICT MAY SAFELY ATTACH SEATBELTS TO THE SEAT FRAME .....

1977 Grand Jury Report Into School Bus Accident On Clearview Expressway, Queens:

Introduction: ".....The injuries suffered ... were directly attributable to the unsafe construction of the school bus involved."

Recommendation: "THE GRAND JURY RECOMMENDS ... A 3-POINT BELT, A LAP BELT OR OTHER FORM OF EFFECTIVE RESTRAINT."

"In the Clearview accident case, one child was ejected from the bus onto the roadway. Had this child been wearing a seatbelt, the chances of this happening would have been greatly diminished."

"The child who was thrown against the inside back portion of the bus and suffered serious head injury did not have any lateral constraint ... many children injured in the crash were sitting three to a seat and consequently ... at the time of impact with the truck, many of these children were thrown about the inside of the school bus."

1981 National Transportation Safety Board, Ibid., Highway Accident Report #81-7:

Abstract: 25 of the 32 occupants were ejected as the bus rolled 2-1/4 times down a hillside. 26 occupants were injured, 5 were killed, and the bus sustained moderate damage ..... CONTRIBUTING TO THE SEVERITY OF THE OCCUPANTS' INJURIES AND TO THE FATALITIES WAS THE LACK OF OCCUPANT RESTRAINTS WHICH PERMITTED THE EJECTION OF MOST OF THE OCCUPANTS."

".....the rollover was relatively gentle ... This accident was survivable. However, the accident highlights the important need to prevent occupant ejection

during vehicle rollover, and further supports the Safety Board's belief that the lap belt occupant restraints are a practical deterrent to occupant ejection..... Crush injuries to several victims indicated they probably were completely or partially under a bus at some point during their ejection and the bus roll action."

"The student driver, who was wearing a seatbelt when the accident occurred, was not injured."

"SINCE 1967, THE SAFETY BOARD HAS ISSUED 13 SAFETY RECOMMENDATIONS REQUIRING THE INSTALLATION AND USE OF SEATBELTS IN INTERCITY AND/OR SCHOOL BUSES."

## Newsletter Excerpts:

1980 Spring-Fall PAS News, a newsletter published by Physicians For Automotive Safety:

Belts in Vans and Small Buses: "If school officials' objections to belts are to be believed, how can the requirement for belts in "busettes" and vans be justified? In vehicles weighing 10,000 lbs. or less (with a maximum passenger capacity of 16), belts have been required as standard equipment since April, 1977. (These vehicles make up about 10% of the total school bus population.) The need for belt use is greater in these smaller, lighter vehicles, but the principle remains the same: the objective is to keep passengers contained in their seats."

UNFORTUNATELY, FEW SCHOOLS NOW ENFORCE BELT USE EXCEPT IN THE CASE OF HANDICAPPED CHILDREN. SCHOOL AUTHORITIES AND THEIR BUS CONTRACTORS MUST BE MADE TO RECOGNIZE THAT THEY HAVE A RESPONSIBILITY TO SAFEGUARD THE LIVES OF STUDENTS EN ROUTE TO AND FROM SCHOOL BY INSISTING THAT THEY BUCKLE UP IN VEHICLES IN WHICH BELTS ARE PROVIDED."

The "Hidden" Benefits of Belt Use in Buses: "WITH ALL THE EFFORTS MADE AND MONEYS SPENT OVER THE YEARS IN PERSUADING MOTORISTS TO BUCKLE UP IT IS SURPRISING THAT AN OPPORTUNITY FOR TEACHING CHILDREN 'BY DOING' IS NOT BEING TAKEN ADVANTAGE OF: INSTEAD, EVERY TIME A CHILD RIDES THE BUS, HE OR SHE RECEIVES NEGATIVE REINFORCEMENT."

"PROVIDING BELTS IN BUSES COULD BE FOUND TO REAP SUBSTANTIAL BENEFITS. COMBINED WITH EDUCATION AND STRICT ENFORCEMENT, BELT USE IN BUSES COULD WELL CARRY OVER TO CARS."

Conclusions: "NHTSA should be urged to amend standard #22 to require high-backed seats and seatbelts or, at the very least, seatbelt ANCHORAGES to make it possible to install belts in the course of the 14-year lifespan of a bus ... Ultimately, it is public concern that is the key to action. Buses may be relatively safe, but they are not safe enough."

1980 May ACTIONS, a newsletter published by Action For Child Transportation Safety:

Learning From Experience: "Fifteen members of a Lake Forest, Illinois volleyball team, all wearing seatbelts, escaped with only minor injuries when the homeward-bound small bus in which they were riding attempted a left turn, was struck on its right rear passenger side, and flipped over onto its side ..... Although the State of Illinois requires that belts be provided in small buses, in all the time the school had used the bus the girls had never worn them. The school officials "just couldn't get them to wear them." ..... five minutes before the accident the girls were misbehaving and the coach/driver stopped the bus. AS PUNISHMENT, all the girls had to wear their seatbelts for the remainder of the trip!"

## A Case Study:

1982 Greenburgh Central School District #7, February, letter from Salvatore J. Corda, Assistant Superintendent, to NY State Senator Gary Ackerman (regarding Ackerman's bill to require installation of seatbelts in all new school buses, and mandating their use):

"In 1979 the Greenburgh Central School District made a commitment to have every bus owned by the District equipped with seatbelts by 1982 [15 large buses]. We have met that timetable. THE COST ... HAS BEEN \$660, OR \$10 PER INSTALLED BELT. Given a total purchase price of \$28,000-\$30,000 for a school bus, this additional expenditure of approximately 2% is well worth the investment in a child's safety."

"We estimate about 80% OF OUR YOUNGSTERS USE THEIR BELTS."

"IT IS OUR BELIEF THAT BY DEVELOPING IN YOUNGER CHILDREN THE HABIT OF WEARING A SEATBELT EVERY TIME THE CHILD IS IN A MOTOR VEHICLE, THE PRACTICE WILL CARRY OVER INTO USE IN THE CHILD'S FAMILY AUTOMOBILE ... "

".....I would submit that GIVEN WHAT WE KNOW ABOUT THE VALUE OF SEATBELTS, PRUDENCE WOULD DICTATE THAT WE TAKE EVERY PRECAUTION TO PROTECT OUR CHILDREN."

## Questions and Answers:

1982 NY State PTA Juvenile Protection Committee Meeting with Mr. Corda in Greenburgh

Mr. Corda also reported, during a meeting with the NY State PTA Juvenile Protection Committee, that opposition to seatbelts on school buses based on fear of the buckles being used as "weapons" by the children is unfounded. TODAY'S BUCKLES ARE SMALL AND LIGHTWEIGHT AND NOT AT ALL SUITABLE AS "WEAPONS." THERE HAVE BEEN NO SUCH INCIDENTS.

Another fear the committee asked Mr. Corda about was that the belts would present a tripping hazard by hanging down into the aisle. He replied that the belts are no different than the belts that have been used in the small buses since the inception of the federal standards, April, 1977. THE BELTS ARE INSTALLED WITH THE "SHORT" END ON THE AISLE EDGE OF THE SEAT AND CANNOT HANG DOWN TO CREATE A TRIPPING HAZARD.

The fear that children will be "left dangling" if a bus flips over on its side, or that they would be "trapped" in the event of an accident, were unjustified in Mr. Corda's mind. The National Transportation Safety Board and many other investigative teams have found that PEOPLE WHO ARE UNBELTED DURING VEHICULAR ACCIDENTS ARE OFTEN TOO STUNNED OR INJURED TO ESCAPE BEFORE A FIRE BREAKS OUT. To quote a State Trooper in the movie entitled "Room to Live," "IN TWENTY YEARS I'VE NEVER HAD TO UNBUCKLE A DEAD MAN."

## News Release:

1982 August, National Transportation Safety Board Safety Information News Release:  
Children in Van School Buses, Taught to Use Seatbelts, Escape Injuries in Accidents:

"Seatbelt usage by children in school buses may be not only possible but relatively easy to achieve."

"SPECIAL INVESTIGATION OF A NYC ACCIDENT...MIRRORED THE FINDINGS OF 1979 INVESTIGATION - GRADE SCHOOL CHILDREN WHO HAD BEEN TAUGHT TO WEAR THEIR SEATBELTS ALL HAD THEM ON AND ESCAPED INJURY WHEN THEIR BUSES OVERTURNED."

"Drivers of both buses had taught their students that unless all belts were fastened, the buses would not be moved."

".....NEITHER DRIVER HAD BEEN GIVEN SPECIAL TRAINING IN HOW TO CARRY OUT THEIR SCHOOLS' POLICY OF REQUIRING BELT USAGE."

"EACH DRIVER REPORTED THAT ONLY A FEW DAYS TO A WEEK HAD BEEN REQUIRED TO TEACH STUDENTS HOW TO FASTEN AND UNFASTEN THEIR ... SEATBELTS AND FOR THEM TO BECOME ACCUSTOMED TO 'BUCKLING UP.'" Older children were happy to help others and served as an example ... "

"...these cases, involving multi-purpose vans in which seatbelts are required, indicate that the added safety of belts may be quite attainable. Seatbelts are not required in most school buses."

"THE SAFETY BOARD OBSERVED THAT BOTH ACCIDENTS SUGGEST THAT THE UNQUESTIONED BENEFIT OF BEING PROTECTED BY A SEATBELT WHEN AN ACCIDENT OCCURS COULD BE AVAILABLE TO OUR CHILDREN IN THEIR SCHOOL BUSES JUST AS IT IS TO US IN OUR PRIVATE AUTOMOBILES."

## Who is Against Seatbelts in School Buses ??

In light of all the accumulated evidence, why do we not have seatbelts on buses? THE SCHOOL TRANSPORTATION INDUSTRY HAS LOBBIED AGAINST SEATBELTS BECAUSE IT AFFECTS THEIR PROFITS. It is the old story: MONEY vs. SAFETY.

Quoted below: THE NATIONAL SCHOOL BUS CONTRACTORS' ASSOCIATION (NATIONAL SCHOOL TRANSPORTATION ASSOCIATION, or NSTA), THANKS ITS MEMBERS FOR HELPING TO DEFEAT THE FEDERAL STANDARD THAT WOULD HAVE MANDATED 28" HIGH BACKED SEATS, SEATBELTS AND SEATBELT ANCHORAGES in all new school buses:

National School Transportation Association Newsletter, Feb. 1976:

"NSTA is enjoying a major victory due to the elimination of mandatory seatbelt anchorages from Docket #73-3 Notice 5....."

"Docket #73-3 originally contained...seatbelts. Fortunately, Notice 3 eliminated ...seatbelts. THIS WAS DUE TO THE INTENSE PRESSURE APPLIED BY THE NSTA BOARD OF DIRECTORS, WORKING IN CONCERT WITH PUBLIC SCHOOL OFFICIALS. NSTA WISHES TO SAY THANKS TO ALL OF YOU for your help, letters, telegrams, trips to Washington again and again and again. THIS EFFORT WILL SAVE EVERY PURCHASER OF SCHOOL BUSES OVER \$300 PER BUS..."

"NSTA AND ITS BOARD MEMBERS SPENT WELL OVER \$100,000 OVER THE TWO AND ONE-HALF YEAR PERIOD IN TRAVEL, OFFICE AND PERSONNEL EXPENSES TO REACH THIS HAPPY CONCLUSION. If you feel as pleased as we do, NSTA could use some financial assistance to pay the numerous obligations incurred for Docket #73-3 Notice 5."

## Why Should You Be In Favor Of Seatbelts on School Buses ?

According to the U. S. Dept. of Transportation, MOTOR VEHICLE ACCIDENTS ARE THE NUMBER ONE KILLER OF CHILDREN AGE 14 AND UNDER in this country today. 4100 children are killed and several hundred thousand are injured. 50% of those killed are occupants and half of these deaths could be prevented by use of restraints.

SEATBELT USE IN ALL SCHOOL BUSES, not just in the vans, IS THE LOGICAL ANSWER TO THE QUESTION OF HOW TO GET CHILDREN TO "BUCKLE UP" IN THEIR CARS. By encouraging the installation of seatbelts and their usage in school buses, there will be a positive carryover to automobiles. IT IS EVEN POSSIBLE THAT THE PARENTS WILL LEARN FROM THEIR CHILDREN !

# The Medical Case For Seat Belts On School Buses

The Physicians for Automotive Safety believe school buses should have seat belts; high back, padded seats, and compartmentalization do not provide adequate protection.

By Dr. Arthur Yeager, D.D.S.

The leading cause of death of children in the United States is the motor vehicle accident. The National Safety Council reports that for those between the ages of one and 14 traffic accidents claim far more lives than cancer, congenital disease, pneumonia, drowning or fire. They go on to point out that over half these highway deaths could be prevented if the children were properly "buckled up."

Riding restrained prevents occupants from being thrown violently by the crash forces. Seat belts reduce the severity of the injuries and save lives. With this in mind, to date 42 states and the District of Columbia have enacted child restraint legislation requiring the use of child safety seats for infants and seat belts or child restraints for older children. As a result, observational studies indicate a substantial increase in the use of child restraints, and motor vehicle statistics show a significant drop in fatalities. Encouraged by these very positive results, one state has now extended its laws to include children up to the age of 10, and others are considering similar proposals.

Because of this those engaged in

school bus operation are beginning to encounter a new generation of parents who, prior to the enactment of restraint laws, did not seat belt their children in motor vehicles. The over 90 percent who did not buckle their kids preferred to accept the old excuse for not using seat belts to rationalize their inaction. When restraining children in cars became the law, many re-examined their



Dr. Arthur Yeager, D.D.S.

thinking and found out that it is *not only* safer to be thrown clear, that seat belts will *not* harm a child if he is old enough to sit up, that in very rare instances of post-crash fire it is those who are less injured because they were wearing a seat belt who were able to escape and, most importantly, that the trips they

were taking, which they feel are perfectly safe are, in fact, far more dangerous to their children than they ever believed.

Imagine the shock of these parents, now committed to the use of seat belts for their children, when youngsters start school and they find no seat belts on the school bus. When they question "Why not?", think of their chagrin when they hear the same old lame excuses from those in authority. Increasingly parents are not being dissuaded because they know better.

## Studies and statistics

During the mid-1960's after becoming convinced that seat belts save lives in automobiles, the United States Department of Transportation ordered that all cars be equipped with seat belts. They then asked the Institute of Transportation and Traffic Engineering at UCLA to undertake a study to find out if crash characteristics of school buses were similar to automobiles and to find out what features of school bus construction cause injury and death during school bus accidents.

The engineers conducted a series of extremely sophisticated tests and concluded that the major cause of injury in school buses was inade-

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*"Currently a great deal of misinformation is being circulated to oppose the installation of seat belts in school buses."*

---

*"When a crash occurs, the passengers are thrown violently by the crash forces until these forces are spent."*

---

quacy of the bus seat. At that time the seat backs were not padded and had exposed metal bars. They were poorly anchored. The 20-inch seat back height was not sufficient to prevent "whiplash" injury, and they had no seat belts. The research demonstrated that school bus seats should be better anchored and padded, with a seat back height of 28-inches. Although the old seats were not able to support seat belts, the research proved that seat belts attached to the better anchored, higher back, well-padded seat would provide substantial additional protection to the child passengers.

Much school bus safety research has followed this classic study, and these conclusions have never been questioned. In a recent letter, Severy, the chief researcher, has reaffirmed his conclusion that seat belts add significant additional protection when used with properly constructed seats.

The Department of Transportation, impressed with the findings but unaware that seat belt use was extremely low, then asked UCLA to conduct a second series of tests to develop a seat which would provide greater protection without the use of a seat belt — a passive seat. The resulting design, a seat with a mesh yielding back to absorb the impact of crash forces and a heavy side arm to compartmentalize during lateral crashes, was produced. Unfortunately, the seat was impractical because it was massive in size, could accommodate only two passengers, and would have greatly cut down the number of rows of seats on the bus.

At about the same time work done by Siegel et al at the Trauma Research Group in San Diego, California focused on accident inves-

tigations of school bus collisions, identified their injury and fatality profiles, and concluded that seat belts on seats with better anchorages, padding, and of significant height would save lives. The automotive engineers went on to point out that only the obstinacy of pupil transportation officials stood in the way of upgrading school buses with a proper seat belt system.

In the meantime, the National Transportation Safety Board was also active in investigating serious school bus accidents. Their specialists, after extremely detailed post-crash study, concluded that the availability of seat belts on school buses would have saved lives.

#### Safety awareness

As a result of increasing consumer awareness based on these studies and personal experience, legislation was enacted by Congress in 1976 to require the National Highway Traffic Safety Administration (NHTSA) to set standards to upgrade school bus construction. One of the areas the NHTSA was specifically ordered to improve was the inadequate seat. It is most unfortunate that the final standard, although an improvement, fell far short. The resulting seat is well anchored and padded; however, raising the seat back height only four inches fails to protect the average high school student from "whiplash" because he sits head and shoulder above the 24-inch seat. Significantly, NHTSA chose not to test the proposed seat for lateral or rear-end collision effectiveness and sled tested only for low speed front end crashes. Since the seat was designed for frontal impacts, the seat performed adequately.

The UCLA seat conceived for the

1972 series relied on true compartmentalization of children between 28-inch energy absorbing seats with massive side panels. NHTSA raising a seat back four inches and padding it is hardly the same. Obviously there is no containment in lateral crashes, when the bus rolls on its side or roof, or for taller youngsters when the bus is rear-ended.

In 1978 NHTSA did subject manufacturers production seats to testing to compare their seats with and without seat belts. Again they tested at low speed and not for lateral or rear-end accidents. It must be understood that when a crash occurs the passengers are thrown violently by the crash forces until these forces are spent. This may happen if the occupants slam into hostile areas or may be controlled by the seat back envisioned by NHTSA or by a restraint system such as a seat belt. In all cases these forces are absorbed with some trauma; however, the better the control the less the injury.

#### Test results and misinformation

The experiment indicated that when seat belted the dummies had a slightly higher head force reading as they rotated over their seat belts and hit their heads on the padded seat backs and tops; however, the difference was insignificant. Ironically, in the same tests the researchers found that the dummies of small children flew forward, hitting their foreheads on the seat-backs, flexed their heads sharply backward, arching their backs with severity. Taller dummies hit their knees and rotated forward, striking their throats on the seat tops. Since there was no measuring devices in either the backs or throats, no com-

*continued on pg. 48*

parable readings were available, but the failure of the seat belts was evident. It has been more than seven years since the new seat has been produced. By now a significant reduction in injuries should have been noticed. The latest National Safety Council statistics show injuries down slightly, but so is the number of students being transported.

Currently a great deal of misinformation is being circulated to oppose the installation of seat belts in school buses. Either by misunderstanding or by design, the above studies are being misquoted or quoted out of context. Costs have been widely exaggerated and dangers implied. For example, in the recent SCHOOL BUS FLEET "Open Letter to Ralph Nader," [Editor's Note: see the February/March issue, page 64] on the theme "A little learning is a dangerous thing," the editorial claimed that the UCLA study showed that the skeletal structure of five- to seven-year olds can't stand the forces as their bodies slam forward against the belts. Not only did the UCLA study never mention the subject, but the major medical organizations such as the American Academy of Pediatrics, the Physicians for Automotive Safety and the American Association for Automotive Medicine (a group often misquoted to their great distress) strongly disagree. They all favor the use of seat belts for school age children.

Since 1977 Type II vehicles have been equipped with seat belts without problem. When utilized they have worked well, and accident reports have shown they have saved lives. There has been no increase in liability for any operator of these Type II buses or for any district installing belts on the large buses.

#### Taking another look

To the school bus industry, State Directors, Pupil Transportation Supervisors, Contract Operators, and manufacturers, I would suggest a review of the validity of their information and a rethinking of their position.

At the present time we are active-

ly supporting legislation to require seat belts on only newly manufactured school buses. The installation of seat belts should be supplemented with educational programs by the schools of both parents and children, and with the full backing of school officials.

We do not favor the retrofitting of seat belts on school buses. The seats and floors of units built before the 1977 standard are not strong enough to anchor the belts, and the seat backs are neither padded nor high enough to protect belted students. Although NHTSA has calculated that the better anchored, high back, padded seat on the post-1977 bus can be fitted with seat belts on an aftermarket basis by districts who so desire, experience has shown that proper retrofitting is extremely difficult for some models and impossible for most.

To eliminate the fear of increased liability we will back, as we did successfully with child restraint legislation, language in the law which states that failure to use the provided seat belts shall not be considered negligence, nor shall the failure to use seat belts be admissible as evidence in the trial of any civil action.

Today almost every child rides a motor vehicle almost every day. The lessons learned and the habits formed from child restraint use are not being reinforced on the school bus. For those who wish protection, seat belts are not even available.

Support for seat belts on school buses is growing throughout the nation. In the near future seat belts on school buses will be a reality. Unfortunately, many proposals are unreasonable and would require extensive rebuilding of older buses. Given the pressure of a tragic accident, such a measure could become law.

The industry has a choice to make. Either continue to stonewall, blocking the installation of seat belts for the short term and risking the passage of punitive legislation or to join in and support efforts to provide seat belts on all new school buses in a proper and orderly fashion.

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