

ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 86/2
3806 HTA HB 684

HOMER PARENT ADVISORY COMMITTEE
P.O. BOX 1037
HOMER, AK 99603

October 16, 1984

Jane Hammond, President
Dr. Fred Pomeroy, Superintendent
and Board Members
Kenai Peninsula Borough School District
148 No. Binkley Street
Soldotna, AK 99669

Dear Madam President, Dr. Pomeroy, and Board Members:

The Homer Parent Advisory Committee supports the installation of seat belts on the new school busses.

It is felt that this is an important safety addition to our busses which must travel many treacherous and icy roads. This is especially true in Homer when the bus travels up the East Hill Road, West Hill Road, and McNeil Canyon/East End Road.

Respectfully submitted for the Homer Parent Advisory Committee,

Mari-Anne Gross

MG:gs
!

McNeil Canyon Community Council
McNeil Canyon Elementary School
January 15, 1985

Kenai Peninsula Borough School Board
Soldotna, Alaska 99669

Dear School Board:

The McNeil Canyon Community Council members and concerned parents voted to advocate the installation of seatbelts on all new buses purchased for the Kenai Borough School District after January 1, 1985. At our regular monthly meeting, January 14, 1985, we agreed that the following stipulations be recommended:

1. That by installing seatbelts on school buses, parents are given the CHOICE to require their own children to buckle up. Those parents who are against buckling need not do so.
2. That shoulder/lap harnesses versus just lapbelts be installed as soon as it can be engineered feasibly.
3. That, if nothing else, the driver at least has a shoulder harness installed on all new buses to increase his or her chance of being conscious after an accident.

We further encourage the School Board to more carefully consider all available data on the subject of seatbelts on school buses.

Sincerely,

Susan Cushing
Susan Cushing
Tammy Jones
Committee Chair-Persons
Seatbelts on School Buses Study



FAMILY MEDICAL CLINIC APC
Lavern Davidhizar, D.O. AAFP, John Stardeter, P.A.C.
Paula Dunn, P.A.C.
206 Rockwell Ave
Soldotna, AK 99669

Telephone (907) 262-7566

February 26, 1986

Kenai Peninsula Borough Assembly

Assembly Members Concerned about the
Safety of our School Children

We have heard all the arguments pro and con concerning seat belts in School Buses. We now have a law that requires our children to be buckled in when they are in a private vehicle, but if they are riding a School Bus they are exempted from this law. I encourage the Borough Assembly to have seat belts installed in all new School Buses purchased. The safety of our children should be important to all of us.

Sincerely,

L. Davidhizar, D.O.

LD:sar
cc.

March 3, 1986

Attn: Bridget Ernst

This letter is written in support of a test program for seat belts on school buses. There is considerable diversity of opinion on the subject and the time has come to see if seat belts would be an improvement. I suspect they would increase safety, but would also require additional work, especially by the drivers.

Further, the design of school buses should be examined. Specifically, the visibility in front, side and back appears to be deficient.

Further, there has been coverage in the media on a bill to increase penalties for passing a stopped school bus.

We also need to get the School District support for the crosswalks and getting street lights at every bus stop. The Homer Mayor's Advisory Committee on Safety discussed having the schools consider student walking patterns and safety questions such as lights and crosswalks when schools are initially designed.

Sincerely,


James C. Hornaday

February 28, 1986

Hi, my name is Mariah Maloney and I am a senior at Homer High School. I ride the school bus almost every morning. The bus I ride is filled with kids from ages five the eighteen.

When I ride in a car I always wear my seat belt. I do because I want to be safe and I don't want to break the law. I am sure that almost all of the children that ride the buses also wear their seat belts when they are in cars. My question is why is there an exception to the seat belt law when on a school bus? Is it because people think that the buses will be safe even though they are driven on Alaskan roads that sometimes aren't even passable for four wheel drive vehicles? Or would it just be to expensive to put the seat belts on the buses? Well think about the doctor bills for fifty children hurt in a bus accident, that is not a small number either. The buses that pick up children on West Hill, East End Road East Hill, Anchor Point, and on North Fork are taking very dangerous hills and canyons. Not to mention all of the hair pin curves that are scary to drive around, especially when you know that you are not strapped in and that if the bus rolled you could end up undernieth a thousand pounds of children and books and what ever else was on the bus. What ever the reason may be it sure is not well thought out. I know that my parents would want for me to be safe while I was on my way to school. So I do not understand or agree with the adults who are against seat belts on buses.

If these people really care about the children today on the Kenai Peninsula getting the best possible education that they can then they would start by reinforcing some of the basics that children are taught from year one. WEAR YOUR SEAT BELT!!!! Thank you for your time and I sincerely hope that these seat belts are put on the buses. For everyone's safety.

Sincerely,

Mariah Maloney
Mariah Maloney

August 20, 1985

To Whom it May Concern:

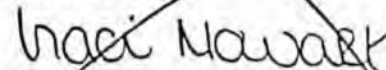
I am 18 years old and have attended Homer school for the last ten years. Last week, I was in a head on collision with a drunk driver. It was the only time I ever wore my seatbelt and it saved my life.

I never learned about wearing seatbelts in school. Something told me to wear it that night; I'm not sure what. Maybe it was all this discussion I've been hearing concerning seatbelts on school buses.

Shouldn't we be teaching our children how to save their lives and prevent injuries in the school, just as we now learn about alcohol and drug abuse, and fire safety, and sexual abuse, etc.

I was a non-user of seatbelts but my accident last week has made a user out of me. The school bus is a perfect place to make "users" out of other kids. I support seatbelts on school buses.

Sincerely,



Traci Nowark
Box 1303

Homer, Alaska 99603

March 3, 1986

Dear School Board Members,

I am encouraged that you are once again considering installation of seatbelts on the newly soon-to-be purchased school buses for our district. As a parent and seatbelt advocate, I feel I cannot urge you strongly enough to give our children the option of belting up on our school buses. Consider if you will, the length of time spent on school buses and the regularity of their usage. For me, anytime in transit is a time to be belted in. I feel that new, independent (non-biased) studies are convincing enough to warrant installation of belts as a preventative measure. I will never feel comfortable with sending off my most precious treasures (my children) to school on a bus without seatbelts. Please vote to have them installed. It is a decision our children will live with for many years. Imagine one accident in which a child's life could be saved by a seatbelt. Isn't the precaution worth the small cost?

Most Sincerely,

Adelle Hillis
PO Box 1109
Homer, Alaska 99603

February 28, 1986

Kenai Peninsula Borough School District
Board of Education
148 North Binkley
Soldotna, AK 99669

Ladies and Gentlemen:

As a former teacher (Adak, Alaska), I urge you to approve seatbelts for school buses. I feel this is an important safety and educational issue for our students. Seatbelts are proven lifesavers!

From an educational standpoint, there is a valuable safety lesson to be learned by teaching students to use seatbelts in all vehicles, including school buses. Learning this lesson well could result in the difference between life and death! It is a paradox that children are required by law to wear seatbelts in automobiles but not in school buses. Shouldn't the school set a good example by providing seatbelts in all school vehicles and teaching the students to use them? For a very small expenditure, you can safeguard the lives of our students.

After living in Alaska for ten years, I am well aware of the inclement weather and hazardous road conditions that affect school bus routes. The ice that forms on the roads in our area could easily result in a bus leaving the road and turning over. It has been proven time and again that the greatest risk of injury is when the occupants of a vehicle are not securely belted and are thrown about the vehicle.

I am certainly unconvinced by the School District's arguments against seatbelts in comparison to the overwhelming evidence proving their safety. I would think the District would be concerned about lawsuits charging negligence by not providing a basic, economical, simple safety device which could prevent many injuries or deaths.

Sincerely,



Donna S. Martin

dsm

2-28-86

DEAR SCHOOL BOARD MEMBERS,

I HAVE TWO SONS 1YR AND 4YRS OLD - I BELIEVE STRONGLY IN 100% SEATBELT USE. I STRAP MY KIDS IN WHEREVER WE GO.

I AM CONCERNED ABOUT THE LACK OF SEATBELTS ON SCHOOL BUSES. I WANT THEM SIMPLY MADE AVAILABLE. I DONT BUY ANY OF THE AGREEMENTS AGAINST THEIR USE ON SCHOOL BUSES. AND I HOPE WE DONT HAVE TO WRITE OUR SEATBELT LAWS IN BLOOD, THE WAY IT WAS DONE IN THE AIRLINE INDUSTRY

SINCERELY,

VICTOR HILES
BOX 1109
HOMER, AK 99603

PAUL L. ENEBOE, M.D., A.B.F.P.
WILLIAM H. BELL, M.D., A.B.F.P.
A PROFESSIONAL CORPORATION
4285 HOHE STREET, SUITE 1
HOMER, ALASKA 99603
TELEPHONE (907) 235-8586

*Report
8/1/85*

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 busses for seat belts.

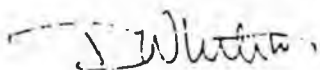
Yours for the health of our children,

Sincerely yours,



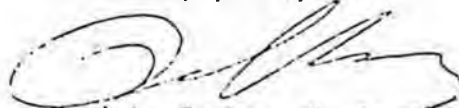
William H. Bell, M. D.

Sincerely yours,



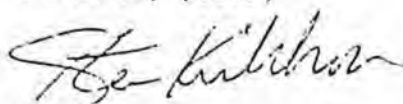
Dan White, M. D.

Sincerely yours,



Paul L. Eneboe, M. D.

Sincerely yours,



Steve Kirkhorn, M. D.

nc

cc: ✓ Bridgette Ernst
Brentley Keene

MEDICAL OPINION REGARDING SEATBELTS ON SCHOOL BUSES

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-

"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

Medical Case *continued from pg. 27*

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.

Dr. Arthur Yeager is a dentist who has long been active in school bus safety. He has served as chairman of the national school bus safety committee of the Physicians for Automotive Safety; is a former member of the New York State DOT school bus construction advisory committee (which was instrumental in the development of regulations mandating roof hatches and emergency side doors for school buses); and one of four key individuals in New Jersey who pushed state legislation to raise the drinking age to 21. Dr. Yeager was recently named to the N.J. State Board of Dentistry by Gov. Thomas Kean.



American Academy of Pediatrics



T E S T I M O N Y

BEFORE THE
SUBCOMMITTEE ON TRANSPORTATION
COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES
ON
MANDATORY SEAT BELTS IN SCHOOL BUSES

PRESENTED BY
Joseph R. Zanga, M.D., F.A.A.P.

MAY 1, 1985

Office of Government Liaison
1331 Pennsylvania Avenue, N.W.
Suite 721 North
Washington, D.C. 20004-1703
202-662-7460 / 800-336-5475

Mr. Chairman:

I am Joseph R. Zanga, M.D., Director of the Child and Adolescent Emergency Unit at the Children's Medical Center of the Medical College of Virginia. I am also President of the Virginia Automotive Safety Alliance and a Fellow of the American Academy of Pediatrics. My appearance here today is on behalf of the Academy, a national and international organization of more than 25,000 pediatricians. Those pediatricians and that organization have, as their overriding concern, the health, well-being, and safety of children and youth.

We are a cautious organization which studies issues in great detail before making public pronouncements. It was, therefore, with a great deal of confidence, based on more than 15 years of study, that in February, 1985, we issued a policy statement on school bus safety. During all of those years we looked at school buses, their design and construction, school bus drivers, their qualifications and training, and children who are the passengers on those vehicles. We studied accident reports and the investigations of individuals and organizations interested in school bus safety. We corresponded with school bus manufacturers, local, state and federal transportation safety agencies, consumer groups and the like. I come before you today to reinforce our February statement and tell you what we have learned.

That school buses have an enviable safety record is difficult to dispute unless, of course, you are the parents of one of the 10 or so children killed each year. In Virginia alone, there are 100-200 children injured each year as passengers on buses involved in accidents. Because my emergency room is a trauma center, I have occasion every year to examine 30-40 children injured in relatively minor bus accidents. Not

Bluebird, both indicated that the design on their seats did not lend itself to belt installation. For these companies, it would seem that retooling would be necessary should safety belts be required. Also please note that the Thomas Company is one of the industry leaders in opposition to safety belts.

One of the most interesting things we learned is that there are actually people out there who actively oppose the use of safety belts on school buses. We do not understand that opposition. We have examined the same studies they have and have found different words in those studies than they have quoted. We, therefore, have drawn different conclusions. Even the most recent Canadian study about which I'm sure you will hear, indicated that in an unusually high speed (for a school bus — 65 MPH) front end crash, "even belted children appeared to fare okay." The American Academy of Pediatrics maintains that had the test mimicked a more real-world event, at speeds more usually maintained by school buses with more life-like (non-stiff neck and spine) test dummies, and with instrumented child, rather than adult-size, dummies, there would have been a clear advantage shown for the safety of restrained subjects. Further, if our recommendation on increased seat back height had been followed, the safety advantage of the restrained dummies would have been unquestionably demonstrated. The school bus industry, however, is touting this study as "proving" the "danger" inherent in the use of safety belts on school buses.

Let's move away, though, from the issue of primary injury in school transportation to the broader issue of child safety. Among the things the members of the American Academy of Pediatrics know more about than school buses is school children. We, of course, spend our lives working with, studying and learning more about children. We have observed that children, particularly the young ones, are avid learners; but for those young ones, learning is concrete, not abstract. Children, unfortunately,

Mr. Chairman:

I am Joseph R. Zanga, M.D., Director of the Child and Adolescent Emergency Unit at the Children's Medical Center of the Medical College of Virginia. I am also President of the Virginia Automotive Safety Alliance and a Fellow of the American Academy of Pediatrics. My appearance here today is on behalf of the Academy, a national and international organization of more than 25,000 pediatricians. Those pediatricians and that organization have, as their overriding concern, the health, well-being, and safety of children and youth.

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That school buses have an enviable safety record is difficult to dispute unless, of course, you are the parents of one of the 10 or so children killed each year. In Virginia alone, there are 100-200 children injured each year as passengers on buses involved in accidents. Because my emergency room is a trauma center, I have occasion every year to examine 30-40 children injured in relatively minor bus accidents. Not

one of those injured children would have required my services had safety belts been in use on those vehicles. The experience of my colleagues in pediatrics around the country is very much the same.

Lest someone tell you that despite what I have said, the buses themselves are intrinsically safe, and that by "compartmentalization" protect children from the harm of crash events, please recognize that current design safety standards were intended primarily to protect children from the forces of a front end crash (and even there they do an inadequate job). Unfortunately the majority of accidents involving buses have little to do with the front end of the vehicle. Buses are, more commonly, struck from the side at intersections or experience rear end or rollover collisions. These are precisely the accidents in which safety belts would unquestionably be life savers.

We have learned some other things as well. We've learned, for example, that buses manufactured in accordance with Federal Motor Vehicle Safety Standard #222, are fully capable of safely supporting the use of seat belts. As noted in the "Federal Register," Volume 41, #19, January 28, 1976, page 4017, "The strength characteristics of the seats specified by the standard. . . provide the strength necessary to absorb seat belt loads." We learned from school bus manufacturers' testimony that several of them indicated, as early as 1980, a willingness to install safety belts in newly manufactured school buses if those belts were among the specifications in the order they received. The Wayne Company indicated that the seats used on their large buses are identical to those used in the small buses in which belts are required by law. Seat frames have pre-drilled holes to accommodate belt assemblies so that "after market" installation of belts by school districts is easily accomplished. It is interesting to note that in that same 1980 review, two companies, Thomas and

Bluebird, both indicated that the design on their seats did not lend itself to belt installation. For these companies, it would seem that retooling would be necessary should safety belts be required. Also please note that the Thomas Company is one of the industry leaders in opposition to safety belts.

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can not rationalize the way we adults often do. For them, most issues have no shades of gray.

It has taken 3 years, but fortunately in our country all 50 states in some way protect young motor vehicle passengers by mandating the use of safety seats or belts in private passenger automobiles. Many of our children are thus growing up with the habit of riding safely secured. That habit safely persists, enforced by law, until the first day of school where we literally and figuratively lose these children to an educational system that says it is proper to ride unsecured in a moving motor vehicle. Two trips a day, every weekday, for about 9 months of the year is a powerfully negative learning experience. Our older children, our teenagers and our young adults are killed in massive numbers each year because they have not learned the importance of using a safety belt for every motor vehicle excursion. The potential for powerfully reinforcing the education inherent in the child safety seat laws is also inherent in any federal or state legislative effort which would seek to encourage or mandate the use of safety belts on all of our school buses.

Ladies and gentlemen of this committee, the American Academy of Pediatrics, its members and the children whom we serve, urge you, for reasons of safety and safety education, to consider what we have said today, to review our February statement on school bus safety and the other attached information.

We urge the Committee to request the National Highway Traffic Safety Administration to initiate rulemaking or other programs to mandate seatbelts in school buses. As individual members we ask that you vote in favor of measures such as that introduced by Representative Kostmayer which would provide incentive grants to states to adopt and enforce laws requiring the use of safety belts in school buses.

June 1984

KFB
4/54

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 386)

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, 82, 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.

BOARD OF EDUCATION

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COLUMBUS GAZLEY

Executive Superintendent of Schools

ANTHONY G. COPPOLA

Director

733-7280

August 1, 1983

Ms. Ann Marie Shelness
Executive Director
Physicians for Automotive Safety
Port Chester, New York 10573

Dear Ms. Shelness:

Mrs. Phyllis Sheps, New Jersey State P.T.A. Chairlady has asked me to bring the following bus incident to your attention.


On June 16, 1983 one of our school buses was involved in a serious intersection accident in our city. A motorist ran a red light and struck our school bus squarely on its side. The bus teetered on two wheels for a moment but luckily did not turn over. Passengers on the bus were twelve pre-schoolers, age 3, the bus attendant and driver.

None of the children were injured because each was held securely in his or her seat by their individual seat belt. God only knows what injuries would have been sustained with three year olds flying all over the bus without the restraint of the seat belt.

This incident demonstrates clearly the life or injury saving value of the seat belt on school buses especially in urban centers.

The Newark Board of Education and I have been advocates of the seat belt on buses for many years.

Sincerely,


Anthony G. Coppola
Director of Attendance/Transportation

AGC/ir

cc: Mrs. Phyllis Sheps
5 Tenney Court
West Orange, N.J. 07052

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

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

WILLIAM HADDON, JR., M.D.
PRESIDENT

October 20, 1983

Francine J. Klenetsky
9341 Lavergne
Skokie, Illinois 60077

Dear Ms. Klenetsky:

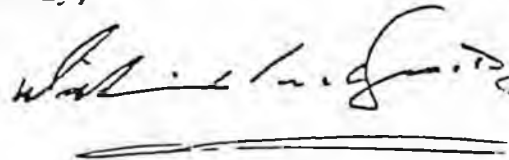
Thank you for your October 13 letter.

The advantage of using seat belts with children is entirely the same as with adults. The child is far more likely to survive the crash, and, in addition, is far less likely to be injured.

I enclose a copy of our publication, "Children in Crashes", which gives additional details, and, in addition, a few other items I hope you will find of interest.

If there is any other way in which we can be of assistance, kindly let me know.

Sincerely,



A handwritten signature in cursive script, appearing to read "William Haddon, Jr.", is written over a horizontal line.

Enclosures

AMERICAN COLLEGE of PREVENTIVE MEDICINE

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June 26, 1984

Carol Fast, Director
National Coalition for Seatbelts On School Buses
11 Orlando Ave.
Ardsley, NY 10502

Dear Ms. Fast:

The American College of Preventive Medicine is supportive of efforts to provide seatbelts on school buses. The College recently supported a resolution in the House of Delegates of the American Medical Association which called for seat belts in school buses.

Restraint systems have been proved successful in preventing death and disabling injuries to vehicle occupants involved in accidents. Similar success can be expected in the case of school buses. In addition, the reinforcement learning from "Buckling Up" in school buses will transfer to private vehicles.

The College supports the immediate installation of seatbelts in new school buses as immediate preventive action to protect the health of children.

Sincerely,

William M. Kane

William M. Kane
Executive Director



PHYSICIANS FOR AUTOMOTIVE SAFETY

50 UNION AVENUE, IRVINGTON, NEW JERSEY 07111

Arthur Yeager, D.D.S., Chairman
School Bus Safety Committee

Please respond to:
1 Park Place
Westwood, NJ 07675

March 1, 1985

The Hon. Edward Cavazos
Texas State Legislature
House of Representatives
P.O. Box 2910
Austin, Texas 78769

Dear Mr. Cavazos

On behalf of Physicians for Automotive Safety, let me express our support for HB 158 to provide seat belts on school buses.

Seat belts on school buses reduce injuries by absorbing the energy of crash forces and by keeping young passengers from being thrown about violently during bus accidents. As a result of your child restraint law, children in Texas have already learned to use seat belts. It does not make sense to have them unlearn this important safety lesson and put them at risk as they ride back and forth to and from school.

Because of their injury reducing potential and the valuable lesson they teach, seat belts should be provided on school buses.

Sincerely,

Arthur Yeager D.D.S.



AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS

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(Ex-Officio)
Thomas C. Nelson

September 27, 1984

The Honorable Peter H. Kostmayer
Representative, 8th District,
Pennsylvania
Congress of the United States
House of Representatives
Washington, D.C. 20515

Dear Mr. Kostmayer:

I am writing on behalf of the Academy to inform you of our support of your bill, H.R. 5511, which provides incentive grants for the states requiring installation of seat belts in school buses.

The Academy supports the use of seat belts and, in fact, we recently published "A POSITION STATEMENT" paper on this subject which I have enclosed for your information.

The Director of our Washington, D.C. office, Nick Cavarocchi, stands ready to assist you and your staff in advancing this legislation.

We look forward to working with you.

Sincerely,

Thomas C. Nelson
Executive Director

TCN/ak

Enclosures



**TENNESSEE CHAPTER OF
AMERICAN ACADEMY OF PEDIATRICS
TENNESSEE PEDIATRIC SOCIETY**

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Nashville, Tennessee 37203
Phone (615) 327-1451

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LINDA BASS
112 Louise Avenue
Nashville, Tennessee 37203
Telephone: (615) 327-1451

September 25, 1984

TO WHOM IT MAY CONCERN:

This is to commend and warmly support the "National Coalition for Seat Belts on School Buses" and their current drive to encourage state laws to require seat belts on new school buses.

Although the compartmental concept to create a padded seat environment for school children will provide added protection, the proper use of a seat belt will serve to protect the child even more efficiently, especially in side collisions or roll over conditions. The prevention of death and injury by seat belt use far outweighs the cost of installation, and it seems timely and appropriate that state governments should require its young citizens be so protected.

Sincerely,

Luther Beazley, MD, FAAP
Chairman, Tennessee Chapter

Robert S. Sanders, MD, FAAP
Chairman, Accident Prevention Committee

be



Texas Children's Hospital

PO Box 20269
Houston, Texas 77225-0269

June 27, 1985

Board of Trustees
Houston Independent School District
3830 Richmond Avenue
Houston, TX 77027

Members of the Board of Trustees:

Each year in the United States, 150,000 children less than the age of 15 years are injured or killed in motor vehicle accidents.

Recently, a number of studies in the Pediatric literature have focused on a less known but equally dangerous cause of injury of children in motor vehicles, that of the noncrash event.

The noncrash event is characterized by an accident involving a motor vehicle where there is no collision. Sudden stops or acceleration, turns and swerves of the motor vehicle can cause the unrestrained child to strike against areas of the vehicle or in some cases to be ejected. In addition, passenger behavior, such as changing seats, has also been reported as a cause of these events. Each of these sited etiologies can occur on a school bus.

In a recent California study, 23% of the vehicle injuries to children involved these noncrash events. At Texas Children's Hospital we have seen 2-3 children each year with serious noncrash injuries resulting in long term disability.

* As to the issue of lap belts versus shoulder harnesses, it should be noted that shoulder harnesses are inappropriate for any child less than 55 pounds or 4.5 feet in height according to the American Academy of Pediatrics. Lap belts for the child older than 4 years of age and over 40 pounds in weight are correct, and in this group are certainly preferable to no restraint at all.

Based on the survey of the literature outlined above, I strongly recommend the installment of restraints in school buses.

Sincerely,

Larry S. Jefferson, M.D.
Assistant Professor of Pediatrics
Baylor College of Medicine
Medical Director, Pediatric
Intensive and Intermediate Care Units
Texas Children's Hospital
Chairman, Legislative Liaison Committee
Houston Pediatric Society

STEVEN GOLDSTEIN, M.D., P.A.
BRIAN SCHULMAN, M.D.
HOWARD MARMELL, M.D.
7800 FANNIN, SUITE 402
HOUSTON, TEXAS 77054
TELEPHONE (713) 797-1525

NEUROLOGY

June 19, 1985

Board of Directors
Houston Independent School District

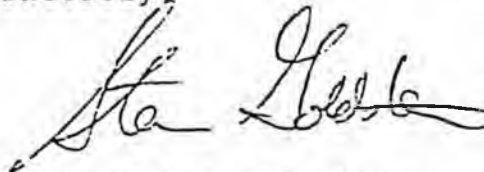
Dear Sirs:

As a neurologist in Houston, I frequently treat people who suffer head injury following motor vehicle accidents.

I have been impressed that the more severe head injuries occur in those individuals not wearing seat belts. I have not yet seen any spinal injury in an accident where the patient was wearing a seat belt in my eight years of practice in Houston.

As a parent and a neurologist I support and recommend the installation and use of seat belts on school buses.

Sincerely,

A handwritten signature in cursive script, appearing to read "Steven Goldstein".

Steven Goldstein, M.D.

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

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.

JOHN PAULDING P.T.A.

SCHOOL-BUS SAFETY

COMMITTEE REPORT

January 15, 1985

Tarrytown, New York

EXCERPT

VII. SEATBELTS

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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.

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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.

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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.

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

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

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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

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 sure 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

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"!

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.

"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 collisions. Seat belts...should be recommended for pregnant travelers.'

"Dr. J. Alex Haller - 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

"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.'

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-411 (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.

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.

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.

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

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

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

NATIONAL TRANSPORTATION SAFETY BOARD STUDIES AND REPORTS.

nation's schoolbuses had been manufactured after 1977, and because fatal and injury-producing schoolbus accidents are in any case relatively infrequent, the conclusions of the study were based on inferences drawn from analysis of accidents involving pre-1977 schoolbuses. The study concluded that:

[The post-1977 schoolbus seating and restraint standards] are probably very effective (about 60 percent injury reduction) in the vast majority of schoolbus accidents, which usually involve minor damage to the bus, with at most a few passengers injured at the [minor to moderate injury] level. In the few violent schoolbus accidents that produce fatalities, [the standards have] lower effectiveness—about 29 percent injury reduction. The [standards have] only limited effectiveness in the extremely small subset of very violent accidents involving rollover, crashes with trains, etc.

The Safety Board has reviewed this analysis and believes that the inferences drawn in it are sound. The Board estimates that within about 4 to 5 years, most large schoolbuses on the road will meet the Federal seating standards. Because preliminary analysis indicates that these standards appear to be effective in eliminating or substantially reducing the majority of schoolbus passenger injuries (those which are minor to moderate), the Safety Board does not believe there is sufficient justification at this time to recommend extending the mandatory passenger restraint system requirements to large schoolbuses.

Nevertheless, the Safety Board would strongly support decisions by parents and State and local school authorities to install occupant restraint systems in their large schoolbuses on an after-market basis. The passenger seats in all post-1977 large schoolbuses are required to be designed in such a way that they will support the installation and use of seatbelts. Many pre-1977 schoolbuses can be modified to support seatbelt installation also.

The Board stresses that a decision to install seatbelts in large schoolbuses must be accompanied by a strong and continuing commitment to educate students in the importance of using the seatbelts and using them properly. Such instruction needs to be complemented, in the case of younger children especially, by adequate adult supervision to ensure that seatbelts are properly positioned on each child's body and snugly secured.—

Small schoolbuses and vans, manufactured since April 1977 and sold for school transportation and related events, are required to provide essentially the same enlarged, strengthened, and padded seats required in large schoolbuses. In addition, they are required to provide an installed restraint system at each seating location, in recognition of the fact that the smaller and lighter construction of these vehicles offers less protection in a crash than the bodies of large conventional schoolbuses. As in all buses, the driver's seat must have a restraint system, and both passengers and driver must be required to wear the restraints whenever the vehicle is in motion.

Because of the lesser degree of crash protection provided by the body structure of small schoolbuses and vans, the Safety Board believes that it is important that student passengers in small buses and vans be provided the additional crash protection offered by occupant restraints. As a result of a crash involving a 16-passenger Head Start van in Mississippi in 1981, 4/ the Board recommended that all Head Start programs be explicitly

4/ Highway Accident Report--"Pattison Head Start Center School Van, Run-Off-Bridge and Fire, Near Hermanville, Mississippi, December 17, 1981" (NTSB-HAR-82-5).



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 -

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

HIGHWAY ACCIDENT REPORT

Adopted: September 29, 1981

ARA SERVICES, INC., TOUR BUS
DENALI NATIONAL PARK AND PRESERVE
(MT. MCKINLEY NATIONAL PARK), ALASKA
JUNE 15, 1981

SYNOPSIS

About 8:00 p.m. A.s.t., on June 15, 1981, a 40-passenger tour bus, eastbound on Denali Park Road, Denali National Park, Alaska, ran off the right edge of the roadway at a very slow speed and rolled to its right down a hillside. Twenty-five of the thirty-two occupants were ejected as the bus rolled 2 1/4 times down the hillside. Twenty-six occupants were injured, five were killed, and the bus sustained moderate damage.

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the student driver to give adequate attention to the driving task and his misjudgment of his lateral position on the road which resulted in the bus leaving the right edge of the roadway and rolling down the hillside. Contributing to the accident was the driver's lack of training and experience in this tour bus operation. 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.

INVESTIGATION

The Accident

At 3:00 p.m. A.s.t., 1/ on June 15, 1981, a 40-passenger 1979 Bluebird Tour bus departed the Denali Park Hotel, Denali National Park, Alaska, with a student driver, instructor driver, and 30 passengers on board. The student driver drove about 65 miles to the Eielson Visitors Center while the instructor driver offered driving suggestions to the driver and used the microphone of the public address system to "interpret" what the bus passengers were seeing along the route. The bus arrived at Eielson Visitors Center about 7:00 p.m. and departed about 7:50 p.m. for the return trip to the hotel. While returning, the student driver drove the bus and used the microphone headset to perform the narrative. The instructor driver sat on the floor in the stepwell near the door so he would not obstruct the view of the passengers.

Within a mile of the visitors center, the student driver stopped the bus to permit the passengers to watch and photograph several caribou that were at the right side of the roadway. After several minutes, according to the student driver, the bus started moving slowly forward so as not to startle the animals. The bus traveled approximately 1/2 mile before leaving the roadway. The student driver believed that the bus was in the center of the road, but realized he was over the road edge when he felt his right front wheel drop down the hillside. He estimated that the speed of the bus at this time was 10 to 15 mph. He tried to return the bus to the road by steering to the left but the wheel in the dirt would not move to the left but went farther right and then dropped lower as gravel

1/ All times herein are Alaska standard, time based on the 24-hour clock.

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

2. Minor two-way park roads should have a pavement width not to exceed 20 feet with shoulders not to exceed 3 feet.
3. Major, minor, and special-purpose one-way park roads should have a pavement width not to exceed 12 feet with shoulders not to exceed 2 feet.
4. Interpretive (motor nature) roads should have an overall width not in excess of 14 feet.
5. Administrative roads should be of the minimum width necessary to serve the purpose of the road. In no event may they exceed the guidelines for minor park roads.
6. Where guardrails or guideposts are required for reasons of safety, additional feet of shoulder will be permitted.

Medical and Pathological Information

Two passengers died at the scene. One, found under the bus near the right front wheel, suffered crushing injuries to the head and chest area; the autopsy report listed the cause of death as asphyxiation due to breathing passages blockage. The other fatality was found outside the front of the bus and the autopsy report indicated head and chest area crushing injuries. The cause of death was listed as asphyxiation due to hemorrhaging and blood in the air passages.

A third victim died in surgery at the Fairbanks hospital. She had been ejected along the roll route, as were all the fatalities, and had suffered a fractured skull and fractured ribs. Her heart was bruised and she suffered extensive internal bleeding. Two other victims succumbed to injuries while in the hospital.

Survival Aspects

Of the 32 occupants, 5 were killed and 26 were injured. None of the 27 survivors were able to describe their specific movements within the bus except that they were tumbling around as the bus rolled. The student driver was not injured and the instructor driver was injured by the damaged door. Twenty-five passengers were ejected, and the 20 who survived were not able to describe when or through which opening they were ejected, and no one remembered seeing anyone ejected. The student driver, who was wearing a seatbelt, was the only occupant that remained in place. Restraints were not provided for other seating positions. When the bus came to rest on its right side, the student driver, the instructor driver, and five passengers were still in the bus. They had no trouble exiting through the rear emergency escape opening and the windshield opening. Some occupants considered the possibility of fire and moved injured victims away from the bus; however, there was no fire.

Since the student driver stated he did not know what emergency actions to take after the accident, the instructor driver and surviving passengers with minor injuries assisted those who were more seriously injured using first-aid equipment on the bus. Within 5 minutes after the accident, another bus arrived at the scene, and some of its occupants also rendered aid.

Medically trained persons (nurses and emergency medical technicians) in other buses which stopped administered aid, and additional aid was summoned via the radio at Eielson

The student driver said he attempted to steer to the left to return to the road. The tire track in the loose dirt showed a widening pattern as it proceeded east, verifying the driver's statement. The soil embankment against the inside surface of the right wheel prevented the leftward redirection of the bus and the right front wheel scuffed partially sideways in the loose soil. The wheel maintained a route roughly parallel to the road edge for about the length of the bus and then angled farther down the hillside. At that time, the underside of the bus started scraping the surface of the road and the right rear wheel left the traveled portion of the roadway. Until the right rear wheel left the road, the student driver could have stopped and possibly backed the bus onto the roadway. However, when the soil at the edge of the roadway could no longer support the calculated 6,374-pound right rear wheel load, both the front and the rear right wheels slid sideways at a right angle to the roadway, down the hillside, providing the dropping feeling passengers described as the road collapsing.

The routine maintenance performed on the Denali Park Road provided sufficient compaction for the gravel roadway proper. The natural alluvial fill material that makes up the approximate 1:1 side slope offered resistance to sliding under its own weight but did not have the internal friction necessary to support a 6,374-pound wheel load. The gravel roadway did not collapse under the bus. The noncompacted side slope did give away under the wheel load and permitted the bus to slide until it reached its angle of vertical instability.

Calculations indicate that after the bus rotated past 40°, the center of gravity had shifted to the point where rollover was inevitable. The lateral velocity of the bus in the 2 1/4 turn rollover and its trajectory to its final resting point were a result of the contour of the terrain next to the edge of the road. Physical damage to the bus suggests that the rollover was relatively gentle and deformation to the soil on the hillside indicate that the bus did not become airborne.

Survivability

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.^{6/} As the bus rolled slowly to the right, the unrestrained occupants tumbled inside the bus. As a result of the impact with the ground and impact from the occupants during the roll action, the windows were either unlatched or broken and separated from the frames. It is possible that one occupant was ejected as the right side of the bus first struck the ground. As the bus continued to roll to the right, an indeterminate number of occupants were ejected. When the right side of the bus struck the ground the second time, some of the right windows were broken, debris was deposited, and possibly other occupants were ejected. When the left side struck the ground during the next roll, the broken and possibly unlatched windows permitted ejection of other occupants and debris along the hillside. As the bus started its last quarter roll, at least one occupant was ejected forward of the bus roll path. Crush injuries to several victims indicated they probably were completely or partially under the bus at some point during their ejection and the bus roll action. Twenty-five of the thirty-two occupants were ejected at some time during the rolling of the bus and many occupants contacted the interior roof area. Had all of the bus occupants been belted, they may have been retained in their seats and would not have been subject to tumbling within the bus. The heads and upper

^{6/} Highway Accident Report--"Bus Station Wagon Collision Followed By Bus Overturn U.S. Route 66 Near Marshfield, Missouri, October 10, 1971" (NTSB-HAR-73-1).

extremities of the occupants near the windows would have been vulnerable to injury due to their nearness to the ground during rollover sequence, but it is likely that considerably fewer injuries would have been experienced by all occupants. 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 buses and/or schoolbuses. Eight recommendations were addressed to the Bureau of Motor Carrier Safety (BMCS); two to the National Association of Motor Bus Owners (NAMBO) (currently, the American Bus Association); and five to the National Highway Traffic Safety Administration (NHTSA). ^{7/} Numerous conferences between the Safety Board and the agencies resulted in the following actions:

1. The BMCS modified Federal Motor Carrier Safety Regulation (FMCSR) 393.93 (49 CFR 393.93) to require the installation and use of seatbelts by truck and busdrivers in all vehicles used in interstate commerce.
2. The NHTSA developed and published Federal Motor Vehicle Safety Standard (FMVSS) 217, "Bus Window Retention and Release" and FMVSS 209, "Schoolbus Seating and Crash Protection." NHTSA repeatedly responded that seatbelts in intercity buses and schoolbuses were: (a) not cost effective; (b) a major enforcement problem; and (c) occupant containment could be achieved through seat design (FMVSS 209) and window design (FMVSS 217).
3. The BMCS funded the Research Group of Indiana University to study the feasibility of placing restraint systems in buses engaged in interstate commerce. The study concluded that: (a) voluntary use of seatbelts at all positions on a bus would be about 17 percent; (b) the first two rows of seats (8 seats) are the most hazardous as far as bus accident injuries and fatalities are concerned; and (c) for lap seatbelts in the first two rows of seats to be cost effective, it would require a 47 percent voluntary usage; and (d) an alternate method of passenger protection would be the installation of a crash panel between the driver and passenger compartments.

The tour and shuttle bus service in the Denali Park operation is different from that of intercity bus and schoolbus operations. The passengers are adults, or children under the direct control of their parents. The service is more under the direct control of the busdriver. The alternatives provided by window retention and improved crash protection, as proposed by NHTSA, are in conflict with the need for the large window areas to provide visibility for the occupants of the tour bus since the purpose of their taking the tour is to see as much of the environment as possible. The Safety Board believes that the tour bus passengers should be provided the added personal protection through the installation and use of seatbelts in the tour buses.

In rollover accidents, side windows open and windshield extractions occur as a direct result of cross-sectional bus body distortion. In the transverse direction, a motor bus body is strongest at the roof and floor. The vertical seat back and legs provide additional transverse integrity up to the bottom side window sills. When a bus overturns, dynamic loadings are imposed laterally at the roof edge and the normally rectangular bus cross section is deformed into a parallelogram. Major bending occurs at the side window posts (i.e., the weakest point) and the windows break and/or open. The only solution to the problem is to increase the transverse rigidity of the bus with either extremely stout roll bars, or transverse bulkheads. Smaller windows, or changes in the window locking design,

^{7/} In some instances, the same recommendation was issued to more than one agency.

will not prevent a window from opening in a rollover environment. Reducing window size small enough to prevent ejection conflicts with the need for a window opening large enough to be a good viewing area and also an emergency escape route. When the bus remains on its wheels after an accident, side window emergency exit capability is of utmost importance to insure postcrash occupant evacuation. The availability and use of individual occupant restraints provides an answer to the problem of occupant ejection and also prevents the occupant from being tumbled within the bus.



U.S. Department
of Transportation
National Highway
Traffic Safety
Administration

Safety Belts in School Buses

June 1985

EXECUTIVE SUMMARY

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

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

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

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

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

For Immediate Release
January 28, 1985

Contact:
David Weiss
202-225-4276

Seatbelts in School Buses

Congressman Peter H. Kostmayer (D-PA) today introduced legislation to encourage the installation of seatbelts in new school buses.

Kostmayer's bill would authorize a total of \$30 million over three years for state-initiated programs requiring seatbelt installation in new school buses.

"More than 4000 students each year suffer injuries related to school buses," said Kostmayer, "and I'm convinced that seatbelts can reduce the number and severity of these injuries."

"I am pleased that 29 Members of Congress have already followed my lead and have cosponsored this bill," Kostmayer noted.

Since the introduction of a similar bill by Kostmayer in April of 1984, more than a dozen communities across the country have begun seatbelt programs for their school buses. These communities report great success with seatbelts and student acceptance is high.

School bus standards were tightened in 1977, requiring higher seats and additional padding to produce the "compartmentalization" features which help protect children in case of an accident. However, seatbelts are needed to keep children within this padded compartment during an accident, reducing chances of serious injury and thus enabling the child to exit the bus quickly.

Kostmayer noted that "The National Coalition for Seatbelts in School Buses, Physicians for Automotive Safety, American Academy of Orthopaedic Surgeons, and others are supporting this legislation. Last year at its convention in Chicago, the American Medical Association endorsed the use of seatbelts in school buses."

Under Kostmayer's bill the seatbelt program would be administered by the National Highway Traffic Safety Administration as part of their overall school bus safety effort. Kostmayer is hopeful that hearings on seatbelts in school buses will be held in early spring.

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 Vehicle Wt 8147 kg Vehicle Velocity 48.8 km/h Vehicle Decel. 15 g Dynamic Crush 1371 mm Body Slide 775 mm
2	Front RH	533	X		649	40.8	
3	Centre LH	690	X		629	28.1	
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

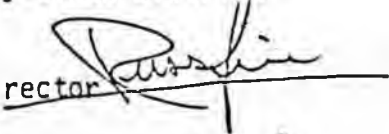
school buses in the worst possible way. In spite of these efforts, the results clearly indicate that the use of seat belts on large (Type I) school buses as advocated by the Coalition, provides superior protection to school children in front end crashes as tested in Canada as well as in all other accidents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

Arthur L. Yeager DDS
Chairman
May 1985

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

MEMORANDUM

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 car 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

Page 2

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.

Goodman's Parody

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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-Monclair 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, 75, of Harrison Avenue Southwest
- Annie G. Fleming, 54, of 18th Street Southwest
- Arleana Cage, 51, of Northland Drive Southwest
- Linda Harrell, 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, 58, of 27th Court North
- Irene Gray, 49, of Ninth Avenue North
- the driver, Jones, 38, of 939 Ninth Court West
- Iluby Temple, 43, of Cotton Avenue Southwest
- Bertha Perry, 67, of Avenue J
- Ruth Glover, 62, of 18th Street North.

Ms. Gloria Molina
June 25, 1985
Page 3

> 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.

BIOGRAPHICAL 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 Nursing 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.

A FRESH LOOK AT
THE ARVIN/CALSPAN
CRASH TEST RESULTS
(The Canadian Report)

A FRESH LOOK AT THE ARVIN/CALSPAN CRASH TEST RESULTS

(The Canadian Report)

This report is prepared at the request of Dr. Stanley Toll, Superintendent of the North Salem School District. It is also intended as an appendage to the "Comprehensive Study of Ways to Increase the Safety of School Children in School Buses".

It is important to point out that the Canadian Government Report included three sections: A literature review, a field investigation and the crash test. The portion of the report which reviewed the available literature draws no conclusions. The authors of the report considered existing studies to contain insufficient data and documentation. The study's investigators researched the experiences of school districts who had installed seat belts on their school buses. They concluded that this evidence supported the use of seat belts. The third and central section consists of an analysis of the crash tests which had been conducted.

We shall address the Arvin/Calspan Crash Test Results by focusing on the actual data itself rather than the Report's conclusions. We shall examine all the information not just isolated portions of the data. We shall provide a fresh look at the material.

The dummies were placed in three buses: Eight in a Type A and six each in a medium size and van conversion bus. Sensors were placed on the heads and chests of the dummies to record velocities and impacts. There was a suspicion that belting the dummies would increase the velocity of the heads of the dummies, so that in a crash they would receive head injuries that would be life threatening. Therefore, a formula was worked out that purported to indicate the

threshold of such injury; proposing that numbers which exceed a 1000 HIC (Head Injury Criterion) would indicate such a traumatic injury. However, as the report itself indicated, "Certainly, a HIC of 1000 is probably not the best value for a limit of human tolerance for children. Unfortunately, the fundamental research necessary to provide a reliable head injury criterion for children had not been completed." (page 14)

Among the oddities of this test's circumstances we note that none of the belted dummies were placed in original equipment. All seating was reinforced and fitted at the site. All belted dummies were seated on one side, with unbelted ones across the aisle, at front, center and rear locations. "The use of one ATD per seat in these tests somewhat limits the scope of the results since different ATD kinematics may have occurred if two or three had been placed in each seat." (Canadian Report, page 51) Six dummies were of a size comparable to a small adult female and two, included in the Type A bus only, were the size of a six year old child.

The data includes an apology for the possible or probable inadequacy of using the adult configuration for the tests, noting the probable difference in results of calculations due to the different "geometry" of children's bodies. Also noted was the inability to account, in the dummies, for the flexibility of human necks. The difference this makes in calculations, wherein the velocity of the movement of the head is very definitely concerned with flex and reaction, is not mentioned. It would seem that a thorough analysis of results would concern itself with such details. The engineers appear to be aware of this inadequacy, though they rather leave it

alone, preferring to couch their conclusions in words of possibility such as may, might and could. They do state on page 70, under Conclusions, #8, "Further collection and analysis of such data should be pursued. In particular, the direction of impact with the bus and the type of injuries encountered should be documented more fully."

The spacing of the seats is in three increments; 533 mm (approximately 22"), 610 mm (approximately 24") and 690 mm (approximately 27"). The actual belting process is not described. The belted dummies experienced an almost universal "slide" of 254 mm (appx. 10") during impact. One wonders whether the testing personnel thought it safe to assume that no occupant would position the seat belt in a good or normal fit. These were not retractable belts and the slide factor was built into the test, but not described or explained except as a description of the dummies behavior during impact. The close seating situations make this slide a considerable factor in the impact sensor reports. Again altering the calculations and therefore, logically, demanding some reservation in evaluating the oft quoted HIC values.

These often quoted conclusions of the tests largely ignore all other indications of injury presented by the test's data. Ignored are such factors as neck and chin contact with, "the area of the barrier or seat in front containing the structural steel tubing." Also ignored are instances of the unrestrained dummies' neck, forehead, chest and knees hitting the seats in front with force sufficient to break either the seatbacks or legs and to dislodge either the cushion in front or the seats themselves. Also ignored is the ultimate "disposition" of the unrestrained dummies. For example: "...ended up laying in aisle." (page 54) "The dummy then rotated to an upside

down position and ended up resting on the door operating mechanism." (page 59) "...dummy was rotated to the right and rebounded into the centre aisle." (page 61) "... the dummy ended up laying partially in the aisle." (page 63) Where are the sensors determining the extent of internal and other serious injuries to these unrestrained dummies? The report of the disposition of the dummies is eloquent and seeing the film, invaluable, in demonstrating what actually happens in an accident!

A. Blue Bird Bus -- Type A

Two out of the five (40%) unrestrained dummies suffered probable serious injury from the compartment itself or from failure of the compartment to contain them.

B. Thomas Mid-Size Bus

100% of the unrestrained dummies suffered probable serious injury from the compartment itself or from failure of the compartment to contain them.

C. Campwagon Bus

100% of the unrestrained dummies suffered probable serious injury from the compartment itself or from failure of the compartment to contain them.

In summary, 8 out of the 11 unrestrained dummies (appx. 73%) suffered probable serious injury. We submit that the "Canadian" tests are, when taken in full, clear proof that by itself the compartmentalization concept is inadequate to provide protection from serious or life threatening injury.

Researçhers note the inadequacies of HIC values and other elements of the tests. No such apologia accompanies the actual description of the dispositions of the dummies, and we may safely draw our

own conclusions simply by employing a reasonable understanding of the English language.

In conclusion, the time for testing the compartmentalization theory on our children has come to an end. The original intent of the 1977 safety regulations was to implement both the compartmentalization theory and seat restraints. The AMA, the National PTA, the American Academy of Pediatrics and Physicians for Automotive Safety and other interested and informed groups support the belting of children in school buses. As concerned parents we urge the North Salem Board of Education not only to join in this support for seat belts on school buses but to implement their immediate installation.

Nancy Bogel

Angela Eidelman, DESIGN ENGINEER*

Eileen Mendelsohn

Allan Mendelsohn

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The University of Michigan

COLLEGE OF ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING
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ANN ARBOR, MICHIGAN 48109-2121

DATE January 23, 1986

TO Colleagues concerned about Child Passenger Safety

FROM Kathleen Weber, MA
John W. Melvin, PhD
The University of Michigan
Department of Mechanical Engineering
& Applied Mechanics

RE Transport Canada School Bus Safety Study

John W. Melvin
Kathleen Weber

The School Bus Safety Study, conducted by Transport Canada in 1984 and reported to the public in January 1985, is being used by opponents of belts on school buses to "prove" that such belts would be dangerous for school bus occupants. We do not agree with the interpretation of the results presented by the authors nor with the secondary interpretations that are being widely communicated to the public. We believe that our collective experience of over twenty years in the occupant protection field makes us qualified to offer our opinions on the topic.

Although there are many questions related to the motivation for the study, the test procedures, the dummies, the significance of the measurements taken, and the validity of the judgements made, we will address primarily the problems of head and neck injury prediction as related to the dummies used. Our discussion will also be limited to the test and results of the large school bus crash.

By way of background, a single crash test using a large Blue Bird school bus was conducted. The bus was occupied by six 5th-percentile female dummies, which approximate the size and weight of a 14-year-old child, and two 6-year-old size dummies. Half the 5th-percentiles were restrained by lap belts and half were unrestrained, but both 6-year-olds were unrestrained. According to a spokesperson for the Road and Motor Vehicle Safety Branch of Transport Canada, the selection of the larger dummy as the primary test device was due to the fact that teenagers were receiving the majority of the injuries in Canadian school bus crashes. The reason given for not including restrained 6-year-olds in the test was that more dummies were not available. Thus we have a situation in which it was known that unrestrained teenagers were already being injured in school buses, and an effort was being made to improve that situation. It is therefore curious that a conclusion from the study that "the passive

occupant protection of the seating system...functions as intended during frontal impacts and provides excellent protection for occupants" could be taken as closing the issue. Clearly the conclusion, if valid, is very limited in its real-world application. It is also unfortunate that one of the 6-year-old dummies was not restrained for comparison purposes, and it should be noted that the bus itself suffered some serious structural failures that affected the test results.

HEAD INJURY. The injury measure used is called the Head Injury Criterion (HIC), and the report correctly states that there is some question "as to whether or not a HIC value of 1000 is a conclusive measure of serious head injury, particularly for children." Although the belted dummies did measure higher HIC values than the unbelted dummies, the highest HIC value was only 731, which is well below the 1000 limit and in the range found with the very best child restraint systems tested at the same impact speed. The reason for the higher values among the restrained dummies is also quite clear and supports the need for occupant restraints on buses. While the restrained dummy heads contacted the padded seatbacks (which, as the report indicates, could have been better padded), the unrestrained dummies hit the top of the seatbacks with their necks instead, where no load cells or accelerometers were mounted. It is interesting that one of the unrestrained dummies "rolled inboard and fell in the aisle, striking its head on the instrumentation box mounted on the floor." This type of uncontrolled occupant motion cannot be tolerated in any public school transportation system. It should also be noted that a shorter belted dummy, such as one representing a 6-year-old child, would probably have missed the seatback entirely while still being safely retained in its seating position.

NECK INJURY. Because of the different interactions with the seatbacks between the restrained and unrestrained dummies, the neck was affected in different ways. As noted above, the unrestrained dummy necks interacted directly with the tops of the seatbacks, but the dummies were not equipped to measure the resulting loads and thus no reliable injury prediction can be made. When the restrained dummy heads hit the seatbacks, the heads rotated rearward causing neck extension (rearward bending) of varying amounts. The dummy in the seat with normal spacing experienced slight bending of the neck. The neck of the dummy in a more narrowly spaced rear seat bent approximately 75 degrees. Finally, the neck of the dummy in the front seat, which was even more narrowly spaced initially from a forward restraining barrier and was pushed considerably closer due to bus structural failure, bent rearward approximately 90 degrees. The report claims in its summary that "The neck extension of several restrained dummies was judged to be life threatening." Nowhere in the report, however, is there any discussion of or reference to the biomechanical justification for this judgement. Furthermore, the analysis section, in

referring incorrectly to "neck flexure" and "flexion" (forward bending), states "There is, however, no criteria available to judge the possible severity of injury that could result from this bending." The report points out that the dummy neck is unrealistically stiff but fails to also recognize that the torso is rigid. This has the effect of transferring the entire upper-body bending motion to the only flexible unit, the neck. The rearward bending of the head observed in these tests is also routinely observed in interactions of dummies with HPR windshields and certain airbag designs. We know from field experience that humans bend differently than these stiff dummies and do not tend to suffer "life threatening" neck injuries in these situations. Finally, the biomechanical research of H.J. Mertz and L.M. Patrick indicates that the human neck can withstand neck extension of at least 80 degrees without injury.

CONCLUSION. We do not believe that the Canadian School Bus Safety Study can be used to draw the conclusion that the use of belts on recent-model large school buses poses a potential danger to the occupants. No case can be made from the results of this test program that belted children will have an increased likelihood of severe head and neck injuries in frontal crashes. Although the best possible occupant restraint system would include a shoulder belt as well as a lap belt, which is the approach now being pursued by Transport Canada, this possibility is probably far in the future. In the absence of any definitive evidence to the contrary, we firmly believe that newly purchased large school buses should be equipped with lap belts to provide their occupants with protection similar to that available in the rear seats of automobiles.



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December 23, 1985

The Honorable Norman J. Levy
Chairman, New York State Senate
Committee on Transportation
The Capitol
Albany, New York 12248

Dear Senator Levy:

I appreciated being asked to participate in the 12/16/85 Hearing on Safety Belts in School Buses conducted by the New York State Senate Committee on Transportation. The focus of the hearing was on the relevance of the 1984 Canadian Crash Tests in which lap type safety belts were used to restrain one half of the anthropomorphic dummies seated in their experimentally crashed buses.

After review of the written report of these tests conducted by Transport Canada under the direction of Mr. William Gardner and of the video tape widely distributed in the United States, I have concluded that the Canadian tests are not relevant to the United States and, particularly New York State. My reasons are as follows:

1. Anthropomorphic dummies as specified in Part 572 of the United States Department of Transportation Federal Motor Vehicle Safety Standards were used. These dummies do not accurately model the flexibility of the human spine, and particularly the spine of a child. The stiffness of the dummy spine induces excess velocity in the head by the time the head contacts the seat in front of a belted dummy. The additional stiffness also prevents contact of the chest, shoulders and upper extremities with the seat in front. This contact would share loading and reduce the head accelerations and the Head Injury Criterion (HIC). The Part 572 dummy was recognized in the FMVSS in 1972 and has not been upgraded in spite of the availability of much more representative dummies: ie; the Hybrid 3 dummy.
2. Adult injury criteria were used. The HIC of 1000 is almost certainly not applicable to children. Experimental studies have demonstrated that arterial vessel walls in the brain of children are significantly more resistant to tearing than similar adult tissues. The skulls of children are more flexible and elastic and better able to tolerate impact trauma than the adults. No consensus exists concerning a child's HIC but it is my personal impression that it is greater than 1500 and possibly 2000 rather than the 1000 used for adult.

Honorable Norman J. Levy

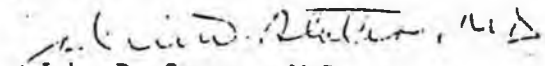
-2-

December 23, 1985

I want to express my gratitude to you for carrying on the pioneering traditions of the NYS Senate Committee on Transportation in traffic safety legislation. I also worked with Senator Edward Spino and more recently with Senator John Cammerer. Enactment of the New York State Safety Belt Use law is a product of your leadership and the traditional dedication of the committee to highway safety for New York State and the nation as a whole.

Sincerely,

JDS/rmk


John D. States, M.D.
Chairman, New York Coalition
for Safety Belt Use, Inc.

Reference: Re - Child Injury Tolerances M. Dejeammes, et al, "Exploration of Biomechanical Data Towards a Better Evaluation of Tolerance for Children Involved in Automobile Accident:", 1983 STAPP Car Crash Conference, Society of Automotive Engineers,
M. Dejeammes, et al, "Road Accident Epidemiology Among Children - Investigation at Marseille's Hospital", Society of Automotive Engineers #831667.

Canadian School Bus Safety Tests
April 1985

The Canadian test results proved several things about bus safety. For those considering installing seatbelts on larger, Type I buses, it proved:

1. that passengers restrained by lap belts in a school bus did remain within their compartment,
2. that restrained passengers and their seats did withstand the force of the collision, and
3. that all belted dummies received HIC (a generally accepted injury level) levels lower than 1000.

As expected, the unrestrained dummies received lower HIC levels than the belted ones in the severe front-end collision, but this study also showed the unbelted dummy in the center of the bus (ATD #4) did not remain within the compartment and actually landed in the aisle of the bus.

Another unrestrained dummy (ATD #1) received a slightly higher than allowable chest acceleration.

Seatbelts on school bus proponents have always stressed the need for the children to stay within the compartment in order for the compartmentalization feature to work. The dummy mentioned above which landed in the aisle and the dummy in a van (ATD #2) which was thrust through the front barrier, contacted the dash, and landed in an upside down position on the door operating mechanism, further demonstrates the need.

Also, seatbelt proponents have also stressed the need for children to be restrained in the event of lateral collisions or rollovers. Unfortunately, this study was limited in its realm and did not study the effects of seatbelted versus nonseatbelted dummies in lateral collisions. Therefore, I feel its findings are inconclusive.

The areas of concern raised by the study surround our smaller buses and vans which have higher acceleration forces during a crash because of their smaller mass. The high HIC levels of the belted dummies need to be further explored but should not be cause for alarm. The NHTSA new car tests on 1984 models reveal similarly high HIC levels for both drivers and passengers, (see attached results) yet we don't see a great number of head injuries to belted occupants in cars. In fact, a Mercedes Benz 300SD equipped with driver air bag and belt tensioning device recorded HIC levels of 890. The Canadian study itself questions the accuracy of these levels for children. They state: "The level of 1000 has been challenged by researchers in France & other countries and the validity of the mathematical expression itself can be questioned.... Certainly, a HIC of 1000 is probably not the best value for a limit of human tolerance."

Besides the fact that the Canadians only tested one type of severe collision, other inadequacies exist. These relate to the dummies used and the stiffness of the seats. Attached is a letter from Dr. John D. States, MD., a member of the National Motor Vehicle Safety Advisory Council 1970-1976, Chairman of the Crashworthiness Committee and a member of the School Bus Body Task Force of the Truck Body & Equipment Association, Inc., in which he further discusses these points.

Bridget A. Ernst
Regional CoCoordinator
National Coalition for
Seatbelts on School Buses

Attachments



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December 27, 1984

The Editor
School Transportation Director
Federal News Services, Inc.
960D National Press Building
Washington, D. C. 20045

To The Editor:

The article, "Seatbelts Flunk Canadian Test" (Volume 4 No.22, December 12, 1984) may be inaccurate and misleading to your membership and other readers who must make decisions concerning the purchase and operation of school buses. At this time no written report by the workers who conducted the tests reported in your article has been made available to the scientific community. Many questions are raised, the answers to which may lead to completely different conclusions from those reported in the above article. Some of my own concerns are as follows:

1. Part 572 dummies were used. It is well known that the neck and spines of these dummies are very stiff and do not model the performance of the human spine at all well. The shortcomings were well recognized by 1972 and an improved version with a more supple, although still quite stiff spine was introduced by Highway Safety Research Institute of the University of Michigan. The stiffness of the neck and spine of the Part 572 dummy will exaggerate head loading because it delays or prevents shoulder and chest contact with the seat back. Shoulder and chest contact should occur in this accident configuration and reduce head loads but can occur only if the spine is sufficiently flexible to permit extension.
2. The particular seats used in the experiment were particularly stiff according to one of the investigators with whom I spoke. These seats should be carefully examined to identify any structure which might increase head loading if the force is delivered from a non-horizontal direction.

There may be other considerations which will grossly alter the interpretation of the raw data that are unidentified at this time. In summary, it is vital that the Canadian study be carefully scrutinized by its own authors and by the scientific community before it is incorporated in administrative and public policy.

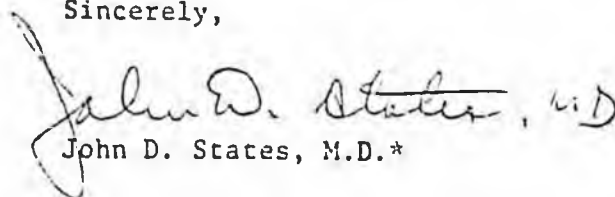
To The Editor

-2-

December 27, 1984

School bus safety belts remain a vital need for our youngest students. Virtually every state in the United States now requires that preschool children use either child restraints or adult restraints while traveling in passenger cars. These young people should be able to continue this life saving habit when they begin traveling to school in school buses. Only by equipping school buses with safety belts will this be possible.

Sincerely,

Handwritten signature of John D. States, M.D. in cursive script, with the initials "J.D." written at the end of the signature.

JDS/rmk

*Dr. States was a member of the National Motor Vehicle Safety Advisory Council 1970-1976, Chairman of the Crashworthiness Committee and a member of the School Bus Body Task Force of the Truck Body and Equipment Association, Inc. 1973-1974.