ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 8672

3726 HSTA HB 684

607

Blue Bird commends your efforts in addressing the potential problems regarding the seat belt issue and in recommending that other's provide their input to NHTSA. Blue Bird is hopeful that input like yours will encourage NHTSA to do the research that is so desperately needed to resolve the safety issues that have been raised.

Thank you for your interest in safety and in Blue Bird.

Have a Safe Day!

Very truly yours,

Thomas D. Turner
Manager
Engineering Services

fvc/1268

enclosure

c: Wilbur Rumph

Tom

BLUE BIRD
BODY COMPANY

P.O. BOX 937 AC-912/825-2021
FORT VALLEY, GEORGIA 31030

March 1, 1984

Ms. Diane Steed
Administrator
National Highway Traffic Safty Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Reference: 49CFR PART 571.222, School Bus Seating and Crash Protection

Dear Ms. Steed:

The National Highway Traffic Safety Administration and others have on several occasions made statements to the effect that school bus seats manufactured in compliance with Federal Motor Vehicle Safety Standard Number 222 School Bus Seating and Crash Protection, effective April 1, 1977, have sufficient strength to support the after-market installation and effective use of passenger seat belts. Blue Bird Body Company in the interest of promoting safety, would like to discuss the history of the NHTSA calculations on which the above statement is based in order to show that seats manufactured in compliance with FMVSS 222 are not necessarily and automatically strong enough to support seat belt loading.

Based on our records and knowledge of the history of FMVSS 222, the preamble to Docket 73-3; Notice 05, F.R. Volume 41-Number 19-Wednesday, January 28, 1976, first contained the statement that the seats specified by FMVSS 222 provide the strength necessary to absorb seat belt loads. The preamble contained the following statement:

> NHTSA calculations demonstrate that the strength characteristics of the seat specified by the standard to provide the correct amount of compartmentalization also provide the strength necessary to absorb seat belt loads. This means that an operator or school district may safely attach seat belts to the seat frame, even where anchorages are not installed as original equipment. The seat is strong enough to take the force of occupants against the seat back if no belts are utilized, or the force of occupants against seat belts if occupants are restrained by belts attached to the seat frame through the anchorages provided.

This preamble presented and discussed comments received on previous proposals including 40 FR 17855, April 23, 1975, which proposed a lower loading bar force of 1700 W (5100 pounds for a three passenger school bus seat) for the seat performance forward requirements of Section S5.1.3.2, and a seat belt anchoraged force of 1500 W (4500 pounds for a three passenger school bus seat) for the seat belt anchorage performance requirements of Section S5.1.1.3. Since these forces would not be applied simultaneously to the seat frame in the forward direction, it was logical that a seat designed to withstand a force of 5100 pounds applied to the frame at any horizontal plane between 4 inches above and 4 inches below the seating reference point, could withstand a 4500 pound force applied to the frame near the bottom rear edge of the seat cushion where seat belt anchorages would logically be located. We believe that this April 1975 proposal and the earlier proposals are the basis for the belief that seats meeting FMVSS 222 strength performance requirements can withstand seat belt loading.

The final version of FMVSS 222 that was published and became effective April 1, 1977 specified a lower loading bar force of 700 W (2100 pounds for a three passenger school bus seat), did not include the seat belt anchorage requirements for large school buses (GVWR greater than 10,000 pounds), but did include seat belt requirements FMVSS 208, 209, and 210 for small school bus seats (10,000 GVWR and less). FMVSS 222, 208, 209 and 210 and subsequent NHTSA interpretations establish the requirements that small school buses must have seat belts at each seating position capable of withstanding a force of 5000 pounds. Although these requirements do not by law apply to large school buses, they are the only current FMVSS that address seat belts in school buses and must be considered state of the art and, therefore, also applicable to large school buses. Thus, a three passenger school bus seat in a large school bus that is designed to withstand a lower loading bar force of only 2100 pounds is not necessarily and automaticlly strong enough to withstand a 5000 pound seat belt force. (Note: A seat with seat belts with common anchorages must withstand the seat belt loading at each seating position simulteneously which is 15000 pounds for a three passenger seat.)

In summary, it is our conclusion that the statement that seats manufactured in compliance with FMVSS 222 have sufficient strength to support the after-market installation of seat belts, is based on the compatibility of the lower loading bar force of 5100 pounds and total seat belt forces of 4500 pounds proposed in April of 1975. In actuality the seats manufactured in compliance with the final version of FMVSS 222 must only be designed for a lower loading bar force of 2100 pounds while the required seat belt forces are from 5000 pounds to 15000 pounds depending on the anchorage arrangement. This major disparity in strength requirements of the large school bus seats should strongly discourage after-market installation of seat belt anchorages attached to the seat frames.

In further support of the above position, let me add that from personal observation, school bus seats designed for seat belt loading, such as those required in small school buses with 10,000 pounds GVWR and less, have a substantially different design with more massive lower frame components and stronger floor attachments than the standard school bus seats used in larger school buses.

Blue Bird Body Company wishes to go on record as stating that we offer school bus seats with seat belts that are specifically designed to meet FMVSS 222 requirements for both small school buses (10,000 pounds GVWR and less) and large school buses (GVWR greater than 10,000 pounds). The school bus seats without seat belts that are designed for use in large school buses are not designed to withstand seat belt loading. Blue Bird strongly discourages the after-market installation of seat belts on these seats if the belts are to be anchored to the seat frames.

Blue Bird Body Company neither recommends nor discourages the use of seat belts in school buses or non-school buses, or the after-market installation of seat belts in buses in service. We recommend to our customers that they study NHTSA R & D Report #DOT HS-804 985, and consult with NHTSA and their own legal and insurance counsel before ordering seat belts in new school buses that are not required to have seat belts, or before deciding to install after-market seat belts. We are forced to take this position due to the lack of any concrete or positive information regarding the desirability of seat belts from a strictly safety point of view. We urge NHTSA to conduct the necessary research to answer the following basic question:

> Are the occupants of a school bus with a GVWR of more than 10000 pounds safer with seat belts or without seat belts installed at each designated seating position?

An answer to this question must be obtained before the seat belt issue in buses and school buses can be resolved.

Thank you for your consideration of these most important matters. If we can be of any assistance to the agency concerning these or other safety related matters, please do not hesitate to call on us.

Very truly yours,

Thomas D. Turner
Manager
Engineering Services

fvc
(0611)

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

The Administrator

MAY 1 1984

Thomas D. Turner, Manager
Engineering Services
BLUE BIRD BODY COMPANY
P. O. Box 937
Fort Valley, Georgia 31030

Dear Mr. Turner:

This is in response to your letter which outlined the position of Blue Bird Body Company in the area of safety belts and seat strength as related to large school buses. Your discussion was most valuable and supplied a needed perspective to this complex and confusing issue.

As you know, this area of concern has received considerable attention from the public, the school bus transportation administrators, and the industry. Our present posture is to recommend a careful examination of specific needs and potential problems to anyone contemplating ordering school buses with safety belts. Part of this examination must entail an analysis of whether the addition of safety belts in a bus not originally designed for such belts, will properly restrain bus occupants.

In regard to your statement that the Federal Standards applicable to safety belts in small school buses (FMVSS No. 222, 208, 209 and 210) are considered "state-of-art" and applicable to the installation of safety belts in large school buses, we emphasize, as you have noted, that large school buses have no such requirement. This was emphasized in a response from our Chief Counsel to Thomas Built Buses, Inc., on January 19, 1984. I have enclosed a copy of this letter for your information.

We are currently examining the technical basis of strength evaluation which you quoted from the preamble of FMVSS No. 222, Notice 5, January 28, 1976. As you point out, there has been some confusion concerning the basis of National Highway Traffic Safety Administration's (NHSTA) comments that school bus seats built to conform with FMVSS No. 222 will also provide the strength necessary to absorb seat belt loads.

With respect to the issue whether the occupants of a large school bus that meets the Federal Motor Vehicle Safety Standards (FMVSS) No. 222 "compartmentalization" requirements are safer with or without seat belts, we do not believe that an adequate research program can be developed at this time to definitely answer that question for all crash types and severities for all sizes of children. FMVSS No. 222 relies on children of all sizes being " caught" by a relatively high padded surface that is strong enough to withstand most crashes, but that yields enough to absorb the energy of a child being thrown against it. The new seats are, in effect, relatively sophisticated automatic restraints that compensate for a wide range of occupant sizes and seating postures. From accident investigations over the past several years, the large school buses that meet FMVSS No. 222 seem to be protecting the occupants extremely well.

Lap belts are most effective in preventing ejection, which is a very frequent hazard in smaller vehicles such as passenger cars or small school buses. Particularly in large buses which meet the improved structural and restraint requirements of FMVSS Nos. 220, 221, and 222, ejection is not as severe a problem. The design of padded seat and lap belt systems that optimize occupant kinematics (i.e., the interaction of the occupant with the padded seats) for all sizes of children is extremely difficult. Further, assuring that lap seat belts are snugly and properly adjusted on the pelvic bone structure and not loosely worn in the abdominal region is very difficult without automatic locking retractors and/or careful (and constant) monitoring of the children. Since the overwhelming majority of crashes of larger school buses do not involve high crash severities, we must be particularly concerned about the lap belt positioning on the pelvis (or abdomen), and on lap belted occupant kinematics for these vehicles. Nontheless, while the injury record of the new large school buses that employ the automatic crash protection concepts of FMVSS's Nos. 220, 221, and 222 is good, about 85 percent of Americans do not wear their safety belts in cars and smaller vehicles where safety belts are definitely needed and have proven extremely effective. It may be that supplying lap belts and assuring their use in the larger school buses would help to develop a safety belt habit that will carry-over into the cars and smaller vehicles.

Accordingly, NHTSA is planning to conduct research in the near future in school districts that have lap belts in their large buses to try to measure this carry-over effect. This latter effect may be more important than the difficult task of trying to quantify the exact safety impact of seat belts in the large school buses. For improving directly the safety of the children riding in school buses, our accident data tells us that child pedestrian fatalities are now much more frequent than bus occupant fatalities. Accordingly, the purchase of additional or better cross-view mirrors and swing arm stop signals could provide a definite safety improvement.

Your thoughtful examination of these issues and your interest in school bus safety are deeply appreciated.

Sincerely,

Diane K. Steed

Diane K. Steed

Enclosure:
Letter to Thomas Built Buses, Inc.

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

400 Seventh St., S.W.
Washington, D.C. 20590

JAN 18 1984

Mr. Ron Marion
Specifications Engineer
Thomas Built Buses, Inc.
P.O. Box 2450
1408 Courtesy Road
High Point, North Carolina 27261

Dear Mr. Marion:

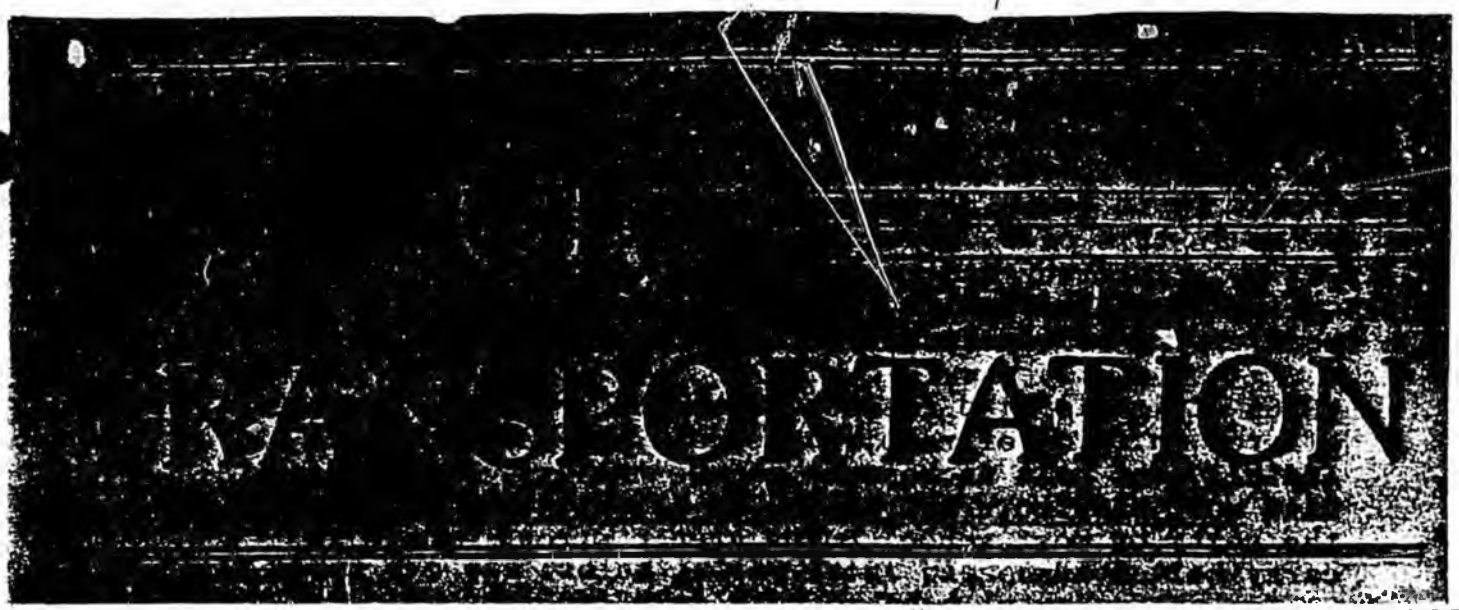
This responds to your letter of December 2, 1983, regarding the installation of seat belts on passenger seats for school buses with a GVWR over 10,000 pounds. As discussed below, seat belts installed on passenger seats in larger buses need not comply with any present seat belt requirements.

As correctly stated in your letter, there are presently no Federal safety standards concerning the installation of seat belts and anchorages for passenger seats in school buses with a GVWR over 10,000 pounds. Thus, a manufacturer may install seat belts for passenger seats on such school buses without having to certify that the belts and anchorages comply with Standards Nos. 208, 209 and 210. However, the National Highway Traffic Safety Administration encourages you to use seat belts and anchorages that will adequately restrain passengers in sudden stops and crashes.

Sincerely,

Frank Berndt
Chief Counsel

10/31/83



THE ONLY INDEPENDENT NATIONAL NEWS SERVICE FOR SCHOOL TRANSPORTATION DIRECTORS

Volume 3, Number 19 October 26, 1983

No Seat Belts, No Anchorages, Says NHTSA

The National Highway Traffic Safety Administration (NHTSA) has once again rejected a request from the Physicians for Automotive Safety (PAS) to require seat belts on school buses. The agency also rejected their request to at least require seat belt anchorages on school buses.

> In its notice of denial in the Oct. 17 *Federal Register*, NHTSA officials told the doctors for the third time, "currently mandated occupant protections in school buses provide an adquate level of safety protection."

Seat belts mandated by the federal government wouldn't protect students, unless state and local officials "were willing to take steps to ensure that the seat belts were actually used," NHTSA said. "Any jurisdiction willing to take such steps is free, under existing requirements, to order seat belts in their school buses. Those jurisdictions which are unable to take such steps or which would find adoption of such measures inappropriate...would be forced to purchase equipment which would not improve the level of safety in their school buses."

> In its two earlier denials, NHTSA said protection is adequate on school buses due to compartmentalization, that is, the close positioning of high-backed, thickly cushioned seats. But the doctors said school buses that meet the standards for compartmentalization don't protect students in rollover crashes. They cited the March 25 rollover of a school bus near Newport, AR, when nine passengers were killed and 27 injured. (SCHOOL TRANSPORTATION-Sept. 28, 1983)

(Continued on Page Two)

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The bus involved in that accident was manufactured just before federal standards for compartmentalization went into effect, NHTSA said. "The National Transportation Safety Board investigated this accident and concluded that it is doubtful that seat belts could have prevented any of the deaths in this case, given the [severe] nature of the crash impact. ...It is not clear why PAS believes that an accident involving a bus built prior to the effective date of a safety standard indicates that the requirements of that safety standard are ineffective."

> NHTSA officials also rejected both the arguments the PAS offered in favor of requiring school bus manufacturers to install seat belt anchorages at the factory. The doctors said most manufacturers refuse to install them, and anyway, the seats on most school buses aren't strong enough to carry belt loads.

NHTSA polled the major school bus manufacturers and found that most of them are willing to install the anchorages at the factory, if they're asked to. And none of them said their seats aren't strong enough.

> "Before Standard No. 222 [on school bus seats] was originally promulgated, NHTSA ran a series of calculations which showed that seats complying with the requirements of the standard could withstand 1,500 pounds of seat belt anchorage loads, and this ability would allow seat belts to be safely installed. Those calculations have not heretofore been challenged as erroneous. Further, this agency has no knowledge of any tests or analyses conducted by itself, the school bus manufacturers, PAS or any other party that casts doubt on the continuing validity of those calculations."

To support their request for seat belts, the doctors cited the good experience at Greenburgh, NY, which has seat belts on its school buses. (SCHOOL TRANSPORTATION-July 27, 1983)

> The success of one school district is not enough to persuade the federal agency to mandate belts for everyone, NHTSA officials said. "NHTSA is pleased to hear of the success of this program, and believes that it shows the wisdom of allowing local jurisdictions the option of choosing whether to equip their school buses with seat belts. Those districts which choose that option will presumably take some additional steps to ensure that the belts are used, and will achieve results similar to those experienced in Greenburgh," NHTSA observed.

* * *

NATIONAL DRIVER REGISTER COMMITTEE TO HOLD FIRST MEETING

The 15 newly appointed members of the National Driver Register Committee will hold their first meeting in Washington, DC, Dec. 13 and 14. It will be open to the public. The first order of business will be an update by staff of the National Highway Traffic Safety Administration (NHTSA) on the status of a conversion from the old, slow computer program to the new, exceedingly swift one.

Dateline Washington

Seat Belt Petition Denied

Although I generally do not like to reprint Federal Register documents in toto, I believe this document warrants an exception. The issue of seat belts on school buses is so current and intense that I believe this document will help you to answer questions and to understand the National Highway Traffic Safety Administration's position on the issue.

Karen Finkel

Federal Register / Vol. 48. No. 201 / Monday. October 17. 1983 / Proposed Rules

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

Federal Motor Vehicle Safety Standards; Denial of Petition for Rulemaking

AGENCY: National Highway Traffic Safety Administration (NHTSA). DOT.

ACTION: Denial of petition for rulemaking.

SUMMARY: This notice denies a petition for rulemaking filed by Physicians for Automotive Safety (PAS), asking this agency to mandate the installation of seat belts on all school buses. NHTSA believes that the currently mandated occupant protections in school buses provide an adequate level of safety protection, and that seat belts would not raise the level of protection for the occupants unless States and local jurisdictions were willing to take steps to ensure that the seat belts were actually used. Any jurisdiction willing to take such steps is free under the existing requirements to order seat belts in school buses. Those jurisdictions which are unable to take such steps or which would find adoption of such measures inappropriate or not effective would be forced to purchase safety equipment which would not improve the level of passenger safety in their school buses. For these reasons, the first part of this petition is denied.

PAS asked alternatively that seat belt anchorages be mandated on school buses if seat belts were not because "it is not possible to retrofit belts correctly in any buses on the road today." The agency rejects this rationale because PAS offered no evidence to support it. More important, agency calculations indicate that seat belts can be safely retrofitted on almost all school buses. Therefore, the second part of the PAS petition is also denied.

FOR FURTHER INFORMATION CONTACT: Robert N. Williams, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, D.C. 20590 (202–426–2264).

SUPPLEMENTARY INFORMATION: PAS has filed a petition requesting this agency to mandate the installation of seat belts on all new school buses or, alternatively, to mandate the installation of seat belt anchorages on all new school buses. In support of its requests, PAS asserted that school bus seats meeting the requirements of Standard No. 222, *School Bus Passenger Seating and Crash Protection*, do not offer restraint to passengers in lateral and rollover crashes unless seat belts are used. As evidence to support this assertion, PAS cited the March 25, 1983, crash of a school bus near Newport, Arkansas, which resulted in 9 deaths and 27 injuries.

PAS' request for the agency to require the installation of seat belts was made in two previous petitions, both of which were denied. As NHTSA explained in those denials, adequate passenger protection is provided in school buses by compartmentalizing the occupants between high-backed, well-padded, sturdy seats. The compartmentalization process protects occupants whether or not seat belts are used.

Fatalities in school buses have declined since the compartmentalization requirement took effect for new school buses on April 1, 1977. For the years 1975 to 1979, there were 87 people killed while riding in school buses, with an average of 17 persons killed each year. For 1980, there were 15 fatalities while riding in school buses, and for 1981, the last year for which complete statistics are available, there were 10 fatalities in school buses. These data support the agency's position that the "compartmentalization" concept does provide an adequate level of safety and that the safety protection for passengers has been raised over what it was before Standard No. 222 became effective.

Mandating seat belts in school buses would not raise the level of safety protection afforded to the occupants unless State and local jurisdictions were willing to take steps to ensure that the seat belts were actually used. Any jurisdiction willing to take such steps is free, under existing requirements, to order seat belts in their school buses. Those jurisdictions which are unable to take such steps or which would find adoption of such measures inappropriate or not effective would be forced to purchase equipment which would not improve the level of safety in their school buses.

It is important to emphasize that Standard No. 222 specifies only the minimum safety requirements applicable to all school buses. Nothing prohibits a State or local jurisdiction from requiring a higher level of safety protection in their school buses. Thus, any school district that wants to order seat belts in its school buses in free to do so. In its petition, PAS cited the experience of a Greenburgh, New York, school district with seat belts installed in school buses, and reported that the belts were being worn. NHTSA is pleased to hear of the success of this program, and believes that it shows the wisdom of allowing local jurisdictions the option of choosing whether to equip their school buses with seat belts. Those districts which choose that option will presumably take some additional steps to ensure that the belts are used, and will achieve results similar to those experienced in Greenburgh.

The only new information cited in the PAS petition concerned the tragic school bus accident in Arkansas on March 25 of this year. That accident showed, according to PAS, that the compartmentalization concept of passenger protection does not work. The National Transportation Safety Board (NTSB) investigated this accident and concluded that it is doubtful that seat belts could have prevented any of the deaths in this case, given the nature of the crash impact. Further, the school bus involved in that accident was built before Standard No. 222 became effective on April 1, 1977, and was never certified as complying with the standard. It is not clear why PAS believes that an accident involving a bus built prior to the effective date of a safety standard indicates that the

requirements of that safety st' 'ard are ineffective.

Since PAS has presented no new data or analyses in support of their contention that seat belts should be required on all new school buses, this part of the petition is denied for the same reasons earlier PAS petitions on this topic were denied.

PAS alternatively requested that seat belt anchorages be installed in all new school buses. PAS asserts in their petition that "it is not possible to retrofit belts correctly in any buses on the road today." PAS sought to support this assertion with two arguments. First, according to PAS, only two school bus manufacturers will install seat belts in the buses at the factory. The other school bus manufacturers, according to PAS, "claim that seats are not strong enough to carry belt loads."

To check this argument, NHTSA asked the School Bus Manufacturers Institute to conduct a poll of its six largest members. That poll found five of the six manufacturers would install seat belts at the factory if so asked by a purchaser. Further, none of the polled manufacturers attempted to justify not providing seat belts on the basis that the seats in the buses are not strong enough to withstand the loading.

The agency has no knowledge of any data or analyses which suggest that seats in school buses complying with Standard No. 222 are not strong enough to withstand such loading. Before Standard No. 222 was originally promulgated, NHTSA ran a series of calculations which showed that seats complying with the requirements of the standard could withstand 1500 pounds seat belt anchorage loads, and this ability would allow seat belts to be safely installed. Those calculations have not heretofore been challenged as erroneous. Further, this agency has no knowledge of any tests or analyses conducted by itself, the school bus manufacturers, PAS, or any other party which cast doubt on the continuing validity of those calculations. NHTSA will continue to rely on those calculations until some tests or analyses are run which suggest there may be reason to doubt their validity.

The second argument offered by PAS to explain its assertion concerning retrofitting problems was that the seat designs in some school buses cause seat belts to fail to perform properly. PAS asserted that installation of seat belts is possible in those school buses only if the belts are fed through the crack between the seat cushion and the seat back in an S-shaped path. PAS claims the belt, when so installed, would cause the seat cushion to depress in a crash situation, thereby creating a large amount of slack in the belt. According to PAS, this slack would defeat the energy absorption purpose of the belt and might even result in small passengers submarining under the belt.

Contrary to the PAS assertions, the limited padding thickness on current bus seat cushions and the angle of the seat belt from the anchorage to the point where it passes around the occupant's pelvis is such that only a very small amount of slack could be created in a crash situation. In fact, the situation differs little from that of seat belts in passenger cars, except that the seat cushions in passenger cars generally have much thicker padding than do school bus seats. The accident data for passenger cars indicate that the amount of slack in seat belts which results from seat cushion depression is negligible. Further, the agency is unaware of any data suggesting that the negligible slack gives rise to any safety problems. Accordingly, the agency denies the second part of PAS' petition, asking for seat belt anchorages to be mandated on all school buses. Anchorages can be installed along with seat belts, if a purchaser wishes to install seat belts on its school buses.

The denial of this PAS petition is based on a consideration of the currently available data. Should some new data become available indicating that current safety protection for occupants of school buses might be inadequate, the agency will take appropriate steps.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8)

Issued: October 11, 1983.

Kennerly H. Digges,

Acting Associate Administrator for Rulemaking.

[FR Doc. 83-27985 Filed 10-14-83; 8:45 am]

BILLING CODE 4910-59-M

	Can You Supply Full Size[1] School Buses w/Seat Belts	w/Anchorages Only	Minimum Order
American Transportation Corporation	Yes	Yes	25 or more
Blue Bird Body Company	Yes	Prefer not	1
Carpenter Body Company	No — only restraining belts for handicapped	No	—
Superior Bus Mfg. Ltd.	Yes	Yes	1
Thomas Built Buses, Inc.	Could in near future	No	10
Wayne Transportation Division	Yes	Yes	1

[1]66-passenger school buses.

NOTE: The majority of available seat belts are *seat mounted.*

SOURCE: School Bus Manufacturers Institute response to request from the National Highway Traffic Safety Administration, July 7, 1983.

Jonesboro Accident Report Issued by NTSB

Excessive speed, problems with highway design and traffic control signs, and inaccurate accident history all figured in the nine-fatality school bus crash near Newport, Arkansas last March 25, the National Transportation Safety Board reported on September 20, 1983.

The Board's investigation also disclosed that the Jonesboro School District bus was "in poor mechanical condition," but there was no evidence that this was a cause of the accident. Contributing to the accident, the Board found, were (1) "deficiencies in the intersection design" that produced the T-intersection in a 1977 highway realignment, and in the signing system that sought to warn of the curve and stop sign; and (2) the lack of reporting of a large number of minor accidents and incidents at the curve that would have alerted the state to the highway design and warning sign deficiencies. The school bus had many "band-aid repairs to major mechanical discrepancies." Before the crash, the driver described it to his riders as a "sorry bus." Despite two annual inspections and provisions for scheduled and unscheduled maintenance, the bus supplied by the Jonesboro School District was mechanically unsuitable for any long distance, high speed trip.

As a result of this accident investigation, NTSB recommends that the

MAILWAY TO PENNY LITTLE 3/21/86

March 17, 1986

Penny Little
Transportation Supervisor
Kenai School District
148 N. Binkley Street
Soldotna, Alaska 99669

Dear Penny:

I would appreciate your making the Kenai Peninsula Borough School Board aware of the following:

> Page 9 of the National Highway Traffic Safety Administration's June, 1985 publication titled Safety Belts in School Buses states:
>
> > The question of how many lap belts to install for a standard 39" bench seat depends on whether large or small children are being transported. The user makes this decision when ordering and manufacturers require that the purchaser specify the number of belts per seat. Consideration should be given to ordering belts equipped with retractors as this encourages proper fit of the lap belt. Alternatively, providing bus monitors would assure correct belt positioning. Because a child's body is less developed than an adult, abdominal injuries could occur if the belt is worn across the stomach, rather than low on the pelvis. An incorrectly installed and positioned safety belt may do more harm than good in low speed crashes.

The Board needs to consider liability involved for installing belts on large school buses that are not designed for or required by Federal or State legislation to have belts. The Board also needs to consider liability involved, and abdominal injuries that could occur to a child's body, if a belt is incorrectly installed or positioned

Sincerely,
Romayne Kareen, Administrator
Pupil Transportation Services

0277M

V. EQUIPPING NEW BUSES WITH SAFETY BELTS

The major school bus body companies offer safety belts in their new buses. Manufacturers report the cost for the addition of lap belts is in the range of $18 to $30 per seating position. The question of how many lap belts to install for a standard 39" bench seat depends on whether large or small children are being transported. The user makes this decision when ordering and manufacturers require that the purchaser specify the number of belts per seat. Consideration should be given to ordering belts equipped with retractors as this encourages proper fit of the lap belt. Alternatively, providing bus monitors would assure correct belt positioning. Because a child's body is less developed than an adult, abdominal injuries could occur if the belt is worn across the stomach, rather than low on the pelvis. An incorrectly installed and positioned safety belt may do more harm than good in low speed crashes.

NHTSA has been petitioned by the Wayne Corporation to amend FMVSS 222, to require that safety belts, when ordered on large school buses, conform to the requirements of FMVSS 208 (Occupant Crash Protection), FMVSS 209 (Safety Belts) and FMVSS 210 (Safety Belt Anchorages) as in passenger cars and small buses. Although FMVSS 222 does not require safety belts in large school buses, purchasers desiring safety belts often have no guidance concerning the installation and manufacturers have been reluctant to quote estimates without definitive specifications. Most manufacturers who install belts and anchorages, when ordered by the purchaser, voluntarily comply with these Standards, although not required to do so. A decision by NHTSA on whether to initiate rulemaking on the Wayne petition is expected this summer.

VI. RETROFITTING SCHOOL BUSES WITH SAFETY BELTS

Seven major companies manufacture large school buses for public, private and parochial schools and for school bus contractors. They are: AmTran, Bluebird, Carpenter, Crown, Superior, Thomas, and Wayne. These companies do not believe it is advisable to retrofit a school bus (pre-1977 or post-1977 construction) with a two point lap belt, nor do they recommend that their dealers do so. The National Coalition for Seat Belts on School Buses supports this industry position.

Several problems prevent successful retrofitting of pre-1977 manufactured buses. Seats may not be well anchored to the floor and, in many cases, have no padding to cover the metal seat frame. Also, the seat construction may be inadequate to withstand the forces generated by lap belts and could collapse with pupils belted to them.

7/1/85

SAFETY BELTS IN SCHOOL BUSES
JUNE 1985

National Highway Traffic Safety Administration
Traffic Safety Programs
Washington, DC

TABLE OF CONTENTS

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.

SAFETY BELTS IN SCHOOL BUSES

I. INTRODUCTION

School buses are the safest form of surface transportation, transporting some 21 million children to and from school each weekday. Most fatal injuries relating to school buses occur outside the bus, when children as pedestrians are struck by another vehicle or the bus itself--but not as school bus occupants. In 1983, there were 69 school bus related fatalities: 50 deaths were outside the bus as pedestrians; 2 were school bus drivers; and 17 were on-board school bus passengers.

Because of the greatly increased public discussion on the need for occupant protection in automobiles (i.e., safety belts and automatic protection devices), as a result of many States considering and passing mandatory safety belt use laws, and because all 50 States and the District of Columbia now have mandatory child passenger safety laws, the issue of safety belts on large school buses has become a topic of much discussion. Some parents also feel that children who have been taught to use child safety seats and safety belts in automobiles will get out of the habit if they ride regularly in a school bus that has no safety belts.

This paper provides information for decision-makers at the State and local levels so they can determine for themselves whether safety belts are desirable in large school buses in their areas.

II. ACCIDENTS, INJURIES, AND FATALITIES

In 1983, 390,000 school buses transported 21,500,000 pupils daily and accumulated three billion miles of travel over the course of the year. Given this tremendous exposure to all types of traffic and weather conditions, it is not surprising that school buses, on occasion, are involved in accidents. Fortunately, the overwhelming majority of these accidents are minor, involving only property damage or minor injury to the bus occupants. For example, from a survey of State departments of education and State traffic authorities, it is estimated that in 1983 there were 48,000 school bus accidents, but 46,000 involved property damage only (Reference #1). Less than half of these accidents were serious enough to warrant a police report, as reported in the table that follows.

From NHTSA's National Accident Sampling System (NASS) and the Fatal Accident Reporting System (FARS), we have estimates of the number of police reported school bus accidents and their injury consequences. FARS gives us absolute counts of the number of people killed in school bus accidents. (See Table 1.)

TABLE 1

AVERAGE ANNUAL ESTIMATES OF THE RESULTS OF SCHOOL BUS ACCIDENTS, 1981-83

(Based on NASS and FARS Statistics for 1981-1983, NCSA)

- 17,000 - 18,000 police reported accidents
- 5,000 - 6,000 injured passengers, of which
- 30 seriously injured (requiring hospitalization) passengers, and only
- An average of six fatal accidents with at least one passenger fatality
- An average of 11 passenger and 1-2 driver fatalities
- An additional 50 fatal accidents where the death occurs to a non-bus occupant: pedestrian, 35; motorcycle, 10; other vehicle, 5.

What these statistics illustrate so dramatically is that very few school bus passengers are killed or seriously injured. In 1983, 42,589 people were killed in traffic accidents (17 were school bus occupants) (Reference #2). In 1983, approximately 166,000 people were seriously injured in traffic accidents, 30 were school bus occupants (Reference #3). For a wide variety of reasons (protective laws, size of the bus, driver selection and training, etc.) school bus transportation is very safe. In the very few accidents where there are bus occupant fatalities, it is often the result of a bus being struck by a much larger vehicle (a heavy truck or a train) or the bus going off the road and striking a large fixed object.

III. NHTSA's AUTHORITY AND POSITION

AUTHORITY

There are two sets of regulations issued under different Acts of Congress that relate to the safety of school buses. The first of these, the motor vehicle safety standards issued by the National Highway Traffic Safety Administration (NHTSA) under the National Traffic and Motor Vehicle Safety Act of 1966 (Public Law 89-563; U.S.C. 1381-1426), apply to the manufacture and sale of new motor vehicles. In a 1974 amendment to the Act (P.L. 93-492), Congress expressly directed NHTSA to issue standards on specific aspects of school bus safety, including emergency exits, seating systems, windows and windshields, and bus structure.

These NHTSA standards became effective April 1, 1977 and apply to each school bus manufactured on or after that date. In addition, a number of special requirements were made in existing standards. The new standards issued were: "Bus Window Retention and Release" (FMVSS No. 217); "School Bus Rollover Protection" (FMVSS No. 220); "School Bus Body Joint Strength" (FMVSS No. 221); and "School Bus Passenger Seating and Crash Protection" (FMVSS No. 222) (Reference #4).

NHTSA also administers recommended guidelines for the use of State highway safety funds referred to as "section 402 funds," under the authority of the Highway Safety Act (Public Law 89-564; 23 U.S.C. 401-408). These guidelines cover a wide range of subjects, including pupil transportation. Unlike the motor vehicle standards, which impose requirements directly on manufacturers, these guidelines apply to the State highway safety programs, particularly those funded with Federal highway safety grants. The intent of these guidelines is to give the States the latest thinking and state-of-the-art materials on specific highway safety issues.

Highway Safety Program Standard 17 (HSPS 17), "Pupil Transportation Safety," sets forth guidelines for a State highway safety program for pupil transportation, including the identification, operation, and maintenance of school buses; training of personnel; and administration (Reference #5) The intent of guidelines is to provide the latest state-of-the-art thinking on specific highway safety issues rather than place requirements on a program.

NHTSA's POSITION

Federal Motor Vehicle Safety Standard (FMVSS) 222, "School Bus Passenger Seating and Crash Protection," sets requirements for the interior of large school buses which provide children a high level of protection without the need to "buckle up." The standard requires high and strong seats and seat backs, seat back padding, and seat spacing that reduces the chance of the occupant being thrown over the seat in front. The approach taken to bus safety is commonly referred to as compartmentalization. Compartmentalization, as outlined in the standard, requires strength in the entire seating system which includes the floor, the seat frame and the fastening of the frames to the floor while at the same time providing seat system padding and flexibility to absorb energy in a crash. The specific compartmentalization requirements are summarized in the Appendix .

The NHTSA compartmentalization position is based on extensive research, crash testing, and performance history for over 20 years. References 6 thru 11 in the bibliography provide the supporting technical documentation for this policy.

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, provides a high level of safety protection.

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

It is important to emphasize that FMVSS No. 222, "School Bus Passenger Seating and Crash Protection," specifies the minimum safety requirements applicable to school buses. Nothing prohibits a State or local jurisdiction from purchasing buses equipped with safety belts. School districts that want to provide safety belts in their large school buses are free to do so.

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

IV. EFFECTIVENESS OF BELTS

There are several technical considerations that have entered the debate of protecting school bus passengers in accidents. These considerations include the effectiveness of safety belts; installation requirements for belts on new buses; and, retrofitting belts on buses. Also, the possibility of belt use on buses increasing belt use in passenger cars has been raised. The discussion in this section will focus on large school buses, as small school buses are already required to have safety belts.

Because there are very few school bus passenger fatalities or serious injuries in a typical year, there is very little information available to determine the effectiveness of restraint systems. This is especially true of safety belts because less than one percent of all large buses currently are equipped with belts. To attempt to explore the question of effectiveness in greater detail, it is useful to examine the types of accidents in which buses are involved.

Table 2 shows that 50 percent of the occupant fatalities in school buses occur in rollover accidents and 14.7 percent of the occupant fatalities occur in side impact accidents. It is in these types of accidents that safety belts might be most likely to provide additional safety benefits to school bus occupants. One reason for this is ejections, which could be prevented by belts, represent one-fourth of all fatalities. However, some school bus accidents that involve fatalities are catastrophic so that it is unlikely that any type of occupant protection would make a difference. The National Transportation Safety Board (NTSB) investigation of the Jonesboro crash mentioned in Section VII is one example. On the other hand, there is a significant body of automobile accident data that demonstrates that lap belts save lives and reduce injuries. Overall, because of the limited accident data on school buses and extremely sparse data on belted occupants, estimates of how much additional protection might be provided by safety belts on buses in rollover and side impact accidents are, of necessity, conjectural.

Even if the introduction of safety belts would benefit some school bus occupants, especially in side impact or rollover accident situations, it is possible that a few of the occupants of buses involved in accidents would be at greater risk of injury as a result of wearing belts. Current compartmentalization countermeasures are most effective in frontal crashes that still account for 55.9 percent of all school bus fatalities. The high, well padded seats absorb the crash forces across the occupant's entire body. With lap belts, the midsection of the occupant's body remains at the seat while the head and upper portion of the body rotates forward. As a result, the head and face may strike the seat the occupant is facing with greater force than would have occurred in the absence of belts. Also, correct belt position over the pelvis is important as injuries could be caused by the belt being positioned over the abdomen.

TABLE 2

OCCUPANT FATALITIES BY PRINCIPAL DIRECTION OF IMPACT AND ROLLOVER

	PASSENGER CAR			SCHOOL BUS - LARGE (PASSENGERS ONLY)		
PRINCIPAL IMPACT DIRECTION	NO ROLLOVER	ROLLOVER	TOTAL	NO ROLLOVER	ROLLOVER	TOTA
	%	%	%	%	%	%
FRONT	41.5	6.8	48.3	20.6	35.3	55.9
SIDE	25.3	3.2	28.5	14.7	0	14.7
REAR	2.7	0.6	3.3	0	0	0
UNDERCARRIAGE	0.3	0.4	0.7	2.9	0	2.9
NON-COLLISION						
ROLLOVER	-	7.0	7.0	-	14.7	14.7
NO ROLLOVER	1.0	-	1.0	11.8	-	11.8
OTHER, UNKNOWN	5.3	5.9	11.2	0	0	0
	76.1	23.9	100	50.0	50.0	100
NUMBER OF AVER. ANNUAL EJECTIONS			5557			

PASSENGER CAR - FARS 1981-1983 - 72,376 Fatalities
SCHOOL BUS - FARS 1981-1983 - 34 Fatalities

Source: NHTSA Fatal Accident Reporting System Data Base.

In 1984, Transport Canada (the Canadian Ministry or Department of Transportation) conducted an extensive study of school bus safety which included a frontal crash test program for three different size school buses, comparable to post-1977 buses in the U.S. (Reference #12).

An excerpt from the report summary follows:

> "This School Bus Safety Study indicates that careful deliberation must be exercised before deciding whether or not to add lap belts to existing designs of occupant protection systems found in today's school buses. The barrier crash test results showed that the potential for head injury in frontal collisions increased, when lap belts were employed.
>
> This conclusion was reached after the subject of school bus safety was investigated in considerable detail. The investigation included a review of existing literature, discussions with bus manufacturers and operators, and a dynamic barrier crash program. The crash program provided data and photographic evidence, not before available, to compare the reaction of belted and unbelted test dummies in a frontal collision."

NHTSA has analyzed the results of the Canadian test and found them to be in general agreement with laboratory testing conducted within the United States. It should be recognized that the "compartmentalization" countermeasure was specifically designed to protect the occupant in frontal barrier tests, similar to those conducted by the Canadians. The low head injury readings for the unbelted dummies is indicative that compartmentalization performs as well in production buses as it did in the research tests which perfected the concept. The lap belted dummies also performed in a predictable manner in the Canadian tests. In NHTSA sponsored research on lap belted dummies in the automobile environment, lap belted dummies typically have higher head injury measurements than unbelted dummies.

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

V. EQUIPPING NEW BUSES WITH SAFETY BELTS

The major school bus body companies offer safety belts in their new buses. Manufacturers report the cost for the addition of lap belts is in the range of $18 to $30 per seating position. The question of how many lap belts to install for a standard 39" bench seat depends on whether large or small children are being transported. The user makes this decision when ordering and manufacturers require that the purchaser specify the number of belts per seat. Consideration should be given to ordering belts equipped with retractors as this encourages proper fit of the lap belt. Alternatively, providing bus monitors would assure correct belt positioning. Because a child's body is less developed than an adult, abdominal injuries could occur if the belt is worn across the stomach, rather than low on the pelvis. An incorrectly installed and positioned safety belt may do more harm than good in low speed crashes.

NHTSA has been petitioned by the Wayne Corporation to amend FMVSS 222, to require that safety belts, when ordered on large school buses, conform to the requirements of FMVSS 208 (Occupant Crash Protection), FMVSS 209 (Safety Belts) and FMVSS 210 (Safety Belt Anchorages) as in passenger cars and small buses. Although FMVSS 222 does not require safety belts in large school buses, purchasers desiring safety belts often have no guidance concerning the installation and manufacturers have been reluctant to quote estimates without definitive specifications. Most manufacturers who install belts and anchorages, when ordered by the purchaser, voluntarily comply with these Standards, although not required to do so. A decision by NHTSA on whether to initiate rulemaking on the Wayne petition is expected this summer.

VI. RETROFITTING SCHOOL BUSES WITH SAFETY BELTS

Seven major companies manufacture large school buses for public, private and parochial schools and for school bus contractors. They are: AmTran, Bluebird, Carpenter, Crown, Superior, Thomas, and Wayne. These companies do not believe it is advisable to retrofit a school bus (pre-1977 or post-1977 construction) with a two point lap belt, nor do they recommend that their dealers do so. The National Coalition for Seat Belts on School Buses supports this industry position.

Several problems prevent successful retrofitting of pre-1977 manufactured buses. Seats may not be well anchored to the floor and, in many cases, have no padding to cover the metal seat frame. Also, the seat construction may be inadequate to withstand the forces generated by lap belts and could collapse with pupils belted to them.

Guidelines for the installation of lap belts in any large school buses, regardless of age, are not provided by the bus dealers or manufacturers. In addition, none of the manufacturers is willing to retrofit post-1977 buses with lap belts.

Industry officials state the primary reason for not retrofitting buses is because the strength of a bus floor is subject to deterioration due to hostile weather conditions and varied maintenance. After only a few years of use, it is possible that the bus floor strength would be less capable of withstanding the forces of the bus seat with belted passengers in a crash situation. If retrofitting is to take place all systems, and especially the floor, must be of the same strength and condition as a new bus.

The National Coalition for Seat Belts on School Buses does not recommend retrofitting post-1977 built buses but does, however, provide some guidelines for those wishing to do so (Reference #13). NHTSA recommends that school districts wanting to retrofit school buses manufactured after 1977, should first make sure that they purchase lap belts that meet FMVSS 209. Also, if the manufacturer sells buses with a lap belt option, school districts should check to see how they are installed and, if possible, follow the manufacturer's installation method. Competent engineering advice should be sought prior to retrofitting safety belts in post-1977 manufactured buses.

VII. RELATED STUDIES

School bus safety issues have been reviewed by a number of other Federal, State, and local government agencies.

In 1983, the National Transportation Safety Board (NTSB), an independent Federal agency which investigates accidents and other transportation safety issues, reviewed the issue of occupant protection in school buses. The Board agreed with a NHTSA analysis which found that the safety standards for post-1977 buses appeared to be effective in eliminating or substantially reducing the majority of school bus occupant injuries. The NTSB report stated:

> "... the Safety Board does not believe there is sufficient justification at this time to recommend extending the mandatory passenger restraint system requirements to large school buses" (Reference #14).

The Board also recommended that school districts which choose to install safety belts on large buses should demonstrate a "strong and continuing commitment" to educate students on the importance of proper belt usage, and that all passengers on small school buses and school vans be required to wear their safety belts.

In 1983, the Los Angeles County Board of Supervisors requested a study on safety belt effectiveness (Reference #15). An ad hoc committee was established by the County Superintendent of Schools to assist in this investigation. It's findings were that school buses are statistically the safest form of ground transportation in the United States today. The compartmentalization concept protects the greatest number of children, both in the variance of age and size, and in most types of school bus accidents. California's requirements for school bus driver training and yearly inspection of vehicles also have contributed to the State's low fatality rate for pupil passengers. For the 1983/84 school year there were no school bus fatalities in California. There were 286 injuries: one severe, 86 moderate, and 199 complaints of pain. This is an excellent safety record for a system comprised of 18,680 buses traveling 245,544,885 miles.

As a result of this study, the Los Angeles County Board of Supervisors: (1) supports the federal position not to require safety belts in large school buses; and (2) upholds its current policy not to install safety belts in school buses.

The Legislative Council of Arkansas examined the feasibility of installing safety belts in school buses following a Jonesboro School District accident in 1983, in which nine people were killed. This accident occurred near Newport, Arkansas. The Council said, "It appears that based on the costs, the lack of data indicating a great fatality decline with the installation of seat belts, the possible dangers which could arise from the installation of the seat belts themselves, the outstanding safety record of school buses in general, the issue of seat belts in school buses could be left as a decision to be made by individual school districts and should not be mandated by the legislature" (Reference #16).

NTSB also investigated the Jonesboro accident and concluded "that is it doubtful that seat belts could have prevented any of the deaths in this case, given the nature of the crash impact" (Reference #14). Further, the school bus in that accident was built before FMVSS 222 became effective in April 1977.

Other studies on safety belt effectiveness include those of the Kentucky Legislative Research Commission (Reference #17) and the California Highway Patrol (Reference #18) both of which reached the same general conclusion as cited above in this report. However, the New York State Legislative Commission on Critical Transportation Choices has recommended that all school buses manufactured after July 1, 1986 for use in New York State be equipped with safety belts (Reference #19).

VIII. EXPERIENCE OF DISTRICTS WITH BELT EQUIPPED BUSES

There are about 22 school districts nationwide with large school buses equipped with safety belts. The table that follows presents information on the number of large buses with belts in each fleet, whether the school district has monitors, the type of belt installation, and buses on order or anticipated.

Two school districts in New York claim 80 percent usage -- with or without bus monitors, as reported by the National Coalition for Seat Belts on School Buses (NCSSB) in 1983 testimony to the New York State Legislative Commission on Critical Transportation Choices (Reference #20). Greenburgh's 36 large buses have no monitors and Ardsley's 11 equipped buses have monitors, yet both report similar belt usage rates.

It should also be noted that this information is anecdotal in nature and is gathered from the small number of school districts with a history of operating belt-equipped large school buses.

IX. LEGISLATION

Congressman Peter Kostmayer (D-Pa.) has introduced a bill (H.R. 749) providing incentive grants to encourage States to adopt and enforce laws requiring the use of safety belts by school children in new school buses. The bill was referred to the House Public Works Committee.

In addition, 20 States have introduced legislation this year concerning the installation and use of safety belts on school buses. Suffolk County, New York passed a local ordinance last year (Resolution No. 1008-1984) requiring that all school buses acquired after January 1, 1986, must "contain safety restraints for each space capable of seating a passenger." In addition, all school buses in the county must be in compliance by December 1996.

X. OTHER CONSIDERATIONS

A question exists over school bus belt use and the possible carryover effects of the students' belt-wearing to their use of belts in private vehicles. Little definitive information is available on this issue and research is complicated by the difficulty of finding groups for appropriate comparison. NHTSA is attempting to examine the relationship that belts on school buses have on habit and behavior reinforcement through selected case studies.

TABLE 3

SAMPLE OF SCHOOL DISTRICTS WITH BELTS IN BUSES

SCHOOL DISTRICT	NUMBER OF LARGE BUSES WITH BELTS	MONITORS USED	RETROFIT OR FACTORY INSTALLED	ON ORDER
Ardsley, NY	10	Yes	retrofit	
Catalian Foothills, AZ	5	No	retrofit	
Comsewogue, NY	26		factory installed	
Dalton, GA	7	Yes	factory installed	
Glencoe District #35, IL	5	Yes	factory	
Greenburgh, NY	55	No	factory	
Hartland, VT	3	No	factory installed	
Klamath Falls, OR	3			
Manchester, MA	5			
Marblehead, MA	5			
Middlebury, VT	1	No	factory installed	
Montgomery County, MD			factory installed	53
Oxford, MI	1	No		
Peacham, VT	1		retrofit	
Rochester, Michigan			factory installed	4
Shelburne, VT				2+
Skokie District #68, IL	11	No	retrofit	
Skokie District #72, IL	4		factory installed	
Waitsfield, VT	1	No	factory installed	
Weathersfield, VT	1		factory installed	
Wentzville, MO				7
West Orange, NJ	9		factory installed	
West Windsor, NJ	3	No	factory installed	
Wilmette District, IL	4	No	retrofit	
Williston, VT				2+
Worcester, VT	1	No	factory installed	

As of April 1985

The pupil transportation industry has raised several questions about potential hazards associated with belts. For example, a school bus driver wrote in the National School Bus Report, (Reference #21) "...my major concern is what would happen in an emergency evacuation, particularly with the little ones. It would be impossible to get them out in a hurry"(speaking about the large 60-66 passenger school bus). While there is no hard data on this for large school buses, a report from Nassau County, New York about a rollover accident involving a small, van-type bus, noted that 4 to 7 year old children were able to unbuckle themselves and escape without panic (Reference #22).

Another version of the problem that has been mentioned is that belts in large buses could leave small children dangling overhead in rollover accidents. The American Academy of Pediatrics is on record as stating, "This is true, but it is still preferable for children to be strapped in rather than thrown out of the seat or the vehicle at the time of an accident" (Reference #23). In NHTSA and NTSB investigations of major school bus accidents, ejections account for one-fourth of all fatalities (Reference #24). Data is currently being analyzed to determine if the age of the bus (pre-1977, post-1977) is a factor in ejection rates.

Transportation providers are also concerned that belts can be fastened easily to another belt across the aisle and act as a tripping hazard to entering or leaving pupils. The National Coalition for Seat Belts on School Buses has issued guidelines to help prevent this, stressing the importance of installing the short end of the belt on the aisle (Reference #13).

The question of how many belts to install on each seat must also be considered. If only young children are being transported, then three belts per seat could be specified. In most cases, however, the same school bus is used to transport both elementary and high school students. In this situation, a school district would have to specify the installation of two or three belts per bus seat.

XI. ALTERNATIVE INVESTMENTS IN SAFETY

Section II provides data that indicate that most school bus related fatalities occur outside the school bus. Many accidents might be avoided with improved driver training or vehicle maintenance. All of these areas might be competing for the same dollars used for installing belts on buses.

Most pupil fatalities occur when students are run over by their own bus or oncoming vehicles during loading and unloading. An educational program for both drivers and pupils should place special emphasis on existing hazards and how to avoid them. For instance, school bus drivers can have

their field of view blocked by the high hood of the bus which prevents them from seeing a small child near the front bumper. A safety education program which explains how to avoid this situation would help drivers save lives. Pupil transportation funds could also be used to purchase, for example, special mirrors which are available to allow the driver to see small children more easily or electro-mechanical sensing devices.

Money spent on good educational programs for school bus drivers pay dividends long after the training is completed. Over half the crashes involving school buses are due to driver error. Recognition of and countermeasures for these errors could reduce crashes and therefore the chance of injury or death to pupil passengers.

In cases where some vehicles are of pre-1977 vintage, funds could also be used to speed up the replacement schedule so that all buses in its fleet would meet the new safety requirements that became effective April 1, 1977.

Although mechanical defects causing accidents are small, funds to upgrade mechanics' skills would reduce the possibility of accidents and could also result in the fleet being maintained in better mechanical condition. Rigorous maintenance schedules for brakes, suspension, tires, etc. could also contribute to improved vehicle safety.

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XIII. APPENDIX

Outline of Safety Standards Pertaining to School Buses

Thirty of the fifty Federal Motor Vehicle Safety Standards (FMVSS) apply to buses, including school buses. Six of these are of special interest:

(1) FMVSS No. 217 Bus Window Retention and Release.

(2) FMVSS No. 220 School Bus Rollover Protection.

(3) FMVSS No. 221 School Bus Body Joint Strength.

(4) FMVSS No. 222 School Bus Seating and Crash Protection.

(5) FMVSS No. 301 Fuel System Integrity

(6) FMVSS No. 302 Flammability of Interior Materials.

Standards (1) thru (5) were mandated by congress in the "School Bus Act of 74" (P.L. 94-346). Number (6), Flammability of Interior Materials, applies to all vehicles, except motorcycles, and is designed to prevent deaths and injuries from fires originating in the interior of vehicles from sources such as matches and cigarettes. This is done by requiring that all interior materials have a low burn rate, (4 inches per minute, horizontal), allowing passengers sufficient time to evacuate the vehicle prior to serious fires involvement. Two of these standards were existing standards that were modified to include school buses:

FMVSS No. 217, Bus Window Retention and Release

This standard prescribes the minimum emergency exits; numbers, dimensions and opening characteristics for school buses in both size categories - under 10,000 pounds and over 10,000 pounds. It also provides for,

- Emergency door/starter interlock that prevents starting the school bus if the emergency door(s) are locked.
- An audible warning mechanism indicating the emergency door release mechanism is not in the "closed" position.
- Emergency exit identification, location, and instruction requirements.

FMVSS No. 301 Fuel System Integrity

This standard was fully effective for all vehicles under 10,000 pounds, except motorcycles, on September 1, 1977. It requires that fuel leakage be no more than one ounce per minute from any part of the fuel system when the vehicle is subject to:

(1) a 30 mph fixed barrier frontal collision at an angle of ± 30 degrees;

(2) a 30 mph rear end moving barrier collision and;

(3) a 20 mph moving barrier lateral collision;

A special test was precribed for large school buses over 10,000 pounds, and utilizes a moving barrier collision at 30 mph at any point (Other requirements such as fuel leakage limitation are the same).

The remaining three standards apply to school buses only:

FMVSS No. 220 School Bus Rollover Protection.

This standard applies to all school buses, and requires that a force of 1 1/2 times the unloaded vehicle weight be applied to the roof of the vehicle body structure. The downward vertical movement of the test plate cannot exceed 5 1/8 inches at any point, and emergency exits must be capable of being opened as specified in FMVSS No. 2[illegible].

FMVSS No. 221 School Bus Body Joint Strength

This standard applies only to large school buses over 10,000 pounds. It requires that"...each body panel joint shall be capable of holding the body panel to the member to which it is joined when subjected to a force of 60% of the tensile strength of the weakest joined body panel..."

FMVSS No. 222 School Bus Seating and Crash Protection

This standard applies to all school buses and is the basis of the "compartmentalization" concept of passenger protection.

School buses under 10,000 pounds must meet the following requirements:

- Conform to the restraint requirements of Standards 208, 209, and 210. (This is essentially the requirements for seatbelts (209) and associated anchorages (210).

All school buses must meet the following requirements except school buses over 10,000 pounds which are not required to comply with standards 208, 209, and 210.

- Conform to certain requirements for seatback height and and surface area.

  Each school bus passenger seat shall be equipped with a seat back that, in the front projected view, has a front surface area above the horizontal plane that passes through the seating reference point, and below the horizontal plane 20 inches above the seating reference point, of not less than 90 percent of the seat bench width in inches multiplied by 20.

- Seat backs must exhibit certain strength and deflection requirements, both forward and rearward:

  (The number of seating positions considered to be a bench seat is expressed by th symbol W, and calculated as the bench width in inches divided by 15 and rounded to the nearest whole number).

Seat performance forward

The following requirements must be met under the stated test conditions.

a) The seat back force/deflection curve shall fall within the zone specified.

b) Seat back deflection shall not exceed 14 inches;

c) The seat shall not deflect by an amount such that any part of the seat moves to within 4 inches of any part of another school bus passenger seat or restraining barrier in its originally installed position;

d) The seat shall not separate from the vehicle at any attachment point; and

e) Seat components shall not separate at any attachment point.

Apply a force of 700W pounds horizontally in the forward direction through the loading bar at the pivot attachment point in any horizontal plane ± 4 inches above or below the seating reference point of the school bus passenger seat behind the test specimen.

Apply additional force horizontally in the forward direction through the upper bar until 4,000W inch-pounds of energy have been absorbed in deflecting the seat back (or restraining barrier).

Seat performance rearward

The following requirements must be met under the stated test conditions.

a) Seat back force shall not exceed 2,200 pounds;

b) [In the case of a school bus manufactured on or after April 1, 1978, seat back deflection shall not exceed 8 inches;

c) The seat shall not deflect by an amount such that any part of the seat moves to within 4 inches of any part of another passenger seat in its originally installed position;

d) The seat shall not separate from the vehicle at any attachment point; and

e) Seat components shall not separate at any attachment point.

Position the loading bar so that it is laterally centered forward of the seat back with the bar's longitudinal axis in a transverse plane of the vehicle kand in the horizontal plane 13.5 inches above the seating reference point of the test specimen, and move the loading bar rearward against the seat back until a force of 50 pounds has been applied, then apply additional force horizontally rearward through the loading bar until 2,800W inch-pounds of energy has been absorbed in deflecting the seat back. Apply the additional load in not less than 5 seconds nor more than 30 seconds.

Seat cushion retention

The seat cushion shall not separate from the seat at any attachment point when subjected to an upward force of five times the seat cushion weight, applied in any period of not less than 1 nor more than 5 seconds, and maintained for 5 seconds.

Seat and Restraining barrier requirements

Each vehicle shall be equipped with a restraining barrier forward of any designated seating position that does not have the rear surface of another school bus passenger seat within 24 inches of its seatign reference point, measured along a horizontal longitudinal line through the seating reference point in the forward direction.

The horizontal distance between the rear of the front adjacent seat or the restraining barrier's rear surface and the seating reference point of the seat in front of which it is required shall be not more than 24 inches, measured along a horizontal longitudinal line through the seating reference point in the forward direction.

Head and Knee Impact Requirements

When any contactable surface of the vehicle within the zones specified is impacted from any direction at 22 feet per second by the head form, the axial acceleration at the center of gravity of the head form shall be such that the head impact criteria (HIC) value shall not exceed 1,000. The head form force distribution shall be such that the energy necessary to deflect the impacted material shall be not less than 40 inch-pounds before the force level on the head form exceeds 150 pounds. When any contactable surface within such zones is impacted by the head form from any direction at 5 feet per second, the contact area on the head form surface shall be not less than 3 square inches.

The head protection zones in each vehicle are the spaces in front of each school bus passenger seat which are not occupied by bus sidewall, window, or door structure and which, in relation to that seat and its seating reference point, are enclosed by the following planes;

a) Horizontal planes 12 inches and 40 inches above the seating reference point;

b) A vertical longitudinal plane tangent to the inboard (aisle side) edge of the seat;

c) A vertical longitudinal plane 3.25 inches inboard of the outboard edge of the seat, and

d) Vertical transverse planes through and 30 inches forward of the reference point.

The leg protection zones of each vehicle are those parts of the school bus passenger seat backs and restraining barriers bounded by horizontal planes 12 inches above and 4 inches below the seating reference point of the school bus passenger seat immediately behind the seat back or restraining barrier. When any point on the rear surface of that part of a seat back or restraining barrier is impacted from any direction at 16 feet per second by the knee form specified, the resisting force of the impacted material shall not exceed 600 pounds and the contact area on the knee form surface shall not be less than 3 square inches.

PROTECTION FOR SCHOOL BUS OCCUPANTS

ISSUE PAPER

P 2

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

September 1981

PROTECTION FOR SCHOOL BUS OCCUPANTS

ISSUE

Seat belts are required in all passenger cars, and in small buses, but they are not required in the large buses that transport the great majority of the nation's school children. A recurrent issue, particularly among parents of school aged children, is whether large school buses should also be required to have seat belts.

DISCUSSION

An early experiment by the Harran Transportation Company of North Merrick, N.Y., in 1960, revealed that safety belts were used more as weapons than as safety devices. Fleet supervisors viewed them as more trouble than they were worth. Also, an assessment of school bus usage reveals that school bus seats are often occupied by various sized and numbers of students. For example, it is common practice for three students between the ages of 5 and 12 years to occupy a 39-inch wide school bus seat. This same sized seat is used by two high school students. This use pattern presents a problem of effectively protecting all occupants of the school bus without adding undue cost to school districts.

The first formal tests conducted on seat belts for pupil passengers were conducted by the University of California at Los Angeles (UCLA) in the mid-1960s. This study recommended that seat belts not be used unless the low seat back height was increased to 28-inches measured from the base of the seat to the top of the seat back. It was further recommended that all seats be padded.

The NHTSA 1972 "School Bus Seat Restraint and Seat Anchorage Systems" study found that there seemed to be a "jack knife" effect resulting from the use of seat belts. In many instances a child's face would be aimed at the unpadded steel seat frame of the seat ahead when the bus made a sudden stop.

The crash tests conducted by UCLA were carefully reviewed by NHTSA, and then a series of school bus passenger seat and lap belt sled tests were initiated in the mid-to-late 1970s. Basic design changes were recommended for the bus seat. These seats were found to be the greatest contributor to occupant injuries. The low unpadded seats increased the chances of injury to a child's head, neck, and chest. The UCLA study recommended a 28-inch high back seat and NHTSA's tests confirmed that well padded seat backs higher than the conventional 20-inches would provide substantial additional protection to pupil passengers. NHTSA determined that within certain limits of seat spacing, compartmentalizing the pupil between high-strength, high-backed, well-padded seats would avoid a number of the problems posed by seat belts.

STANDARD INITIATION AND IMPLEMENTATION RATIONALE

While NHTSA was still engaged in school bus research, the Congress enacted the School Bus and Motor Vehicle Safety Amendments of 1974, which directed the agency to issue standards on several aspects of school bus safety. Bus seating was among the standards to be issued, so the agency duly undertook rulemaking and on February 22, 1973, issued Federal Motor Vehicle Safety Standard (FMVSS 222) School Bus Passenger Seating and Crash Protection which became effective on April 1, 1977.

The Standard addresses principally three aspects of seating occupant protection: (a) seat and seat anchorage strength, (b) seat and restraining barrier height and surface area, and (c) padding on contactable surfaces within the occupant's seat space. FMVSS 222 relies on the concept of compartmentalization between well-padded and well-constructed seats to provide occupant protection on buses over 10,000 pounds. (Type I)*

The requirements of the Standard provide the essential elements for the compartmentalization concept. These elements also provide the impetus for NHTSA's position relative to occupant protection in school buses. This position reflects the results of seat and vehicle construction research as well as assessment of actual use of school buses.

POSITION

The National Highway Traffic Safety Administration agrees that children should be protected on school buses but does not support a requirement for seat belts for passengers in large school buses. Improving the seating compartment eliminates the need for seat belts and provides sufficient crash protection.

*The buses under 10,000 pounds are required to have belts. Seat belts are required in the lighter buses because they experience more severe crashes than larger vehicles when involved in similar collisions.

ACCOMPANYING MATERIAL

School Bus Accident Problem

Almost 22 million pupils are transported daily to and from schools in the U.S. The annual mileage for some 400,000 school buses has reached 3 billion miles.

During 1979* there were 150 accidents involving large school buses in which fatalities occurred. Eighty-three were frontal crashes and 17 were rear-end crashes. Of the 205 persons killed, 18 were occupants of the bus and 78 were pedestrians run over by the bus or by a passing vehicle. There were 60,000 additional crashes in which approximately 4,500 pupils were injured. Most of these injuries occurred inside the bus. About 10 percent of these crashes were rollover accidents.

Federal Motor Vehicle Safety Standard 222, School Bus Passenger Seating and Crash Protection (FMVSS)

This Standard applies differently to school buses with gross vehicle weight ratings of over 10,000 lbs. and those under 10,000 lbs. The buses under 10,000 lbs, are required to have seat belts, because they experience more severe crashes than larger vehicles when involved in similar collisions.

FMVSS 222 prescribes passive protection for school bus passengers. The requirements fix principally on three aspects of seating occupant protection: (a) seat and seat anchorage strength, (b) seat and restraining barrier height and surface area, and (c) padding on contactable surfaces within the occupant's seat space. FMVSS 222 relies on the concept of compartmentalization between well-padded and well-constructed seats to provide occupant protection on buses over 10,000 lbs. (Type I).

The seat spacing requirements of FMVSS 222 have proven to be the most controversial aspect of the standard, largely because the reduced space between seats leaves less room for the legs of adults and older children.

The 20" school bus seat spacing distance (from seating reference point (SRP) to back of seat) became effective on April 1, 1976, due in part to the 1975 school bus strength testing project by the AMF Corporation (DOT-HS-801-714). The tests were conducted at the 25" seat spacing distance because it most closely reflected the industry's measurement practice. (The 25" measurement was taken from one seat back center to another and was approximately equivalent to the 20" distance from SRP with 1" thick seats.)

*Latest data available

Two major recommendations were developed from the seat strength integrity testing. They were: (1) reducing the maximum allowable seat spacing for school buses of Gross Vehicle Weight Rating (GVWR) greater than 10,000 lbs, and (2) amending the loading requirements on school bus seats. The test results yielded the 20" seat spacing which was recommended by NHTSA's technical staff.

When the standard went into effect, the padding industry was underdeveloped. The standard had produced seat back padding protection against injuries which took up as much as 3-inches of space, thus reducing seat space on normal buses to about 18" from SRP to seat back. Over the past few years the relatively small number of suppliers have improved the energy absorption quality of their product somewhat by experimenting with different material and densities. However, the product is still relatively underdeveloped, particularly in the area of deformation. There appears to be ambiguity regarding the amount of padding necessary; it has not yet been addressed nor specified.

On December 20, 1977, the NHTSA issued an interim final rule and an NPRM that would increase the maximum allowable seat spacing in large school buses from 20 to 21 inches. The Standard states that the "seats shall be spaced no more than 21-inches from the back of the front seat to the seating reference point (SRP)." The SRP is the manufacturer's design reference point which establishes the rearmost normal design riding position of a designated seating position in a vehicle. Prior to NHTSA's standard, measurements were taken from the interior center of the seat back. (Approximately 25-inches between seat backs was the distance most frequently used.)

NHTSA was unable to obtain critical information on the safety effects of various seat spacings through the results of the 1978 Engineering Test Facility (ETF) frontal impact school bus passenger seat and lap belt sled tests (DOT-HS-804-985). The main objective was to acquire data for possible rulemaking actions in response to docket petitions against FMVSS 222.

The sled tests were conducted at various speeds (10, 15, or 20 mph), seat spacing (20", 22", and 24"), seat configurations (route or activity bus seats), belted and unbelted, and dummy size (adult and child). The results of the tests showed that seat spacing had only a minor effect on the response characteristics of the adult dummy and only a slightly higher effect on the child dummy. The compartmentalization data showed that the six year old child dummy had 100 percent containment at all spacing and the adult dummy had partial ejection. These tests were frontal impacts with two dummies per seat, however, if the tests were oblique or angle impact the containment data would be somewhat less favorable as seat spacing increased. The major finding of the tests proved that compartmentalization in frontal crashes appeared to be more sensitive to seat back height than spacing.

Due to manufacturing tolerances, some school bus manufactur were, and still are, spacing their seats at lesser distance: to ensure that spacing did not exceed that prescribed maxim (to date there is not a prescribed minimum). A seat spacing specification of 21 inches permitted the 20-inch spacing of seats by taking manufacturing tolerances into account. A ra review of compliance testing showed that the 1977 manufactur school buses complied with the 20" requirement. The range w from 17 3/4" to 19 7/8" demonstrating variance of 2". A 20 inch distance should accommodate the upper leg (hip to knee) length of a 95th percentile adult male.

A recent solicitation of comments from manufacturers showed that approximately half of the manufacturer seat backs have tapered padding (Wayne, Carpenter, and Superior). Of those who taper, the average measurement of padding thickness was 2½" on the frame and 1" in the knee impact area. The signifi of restricting the maximum width of the padding is not a vita issue to seat spacing.

Special Activity Buses:

The conventional route school bus has had a dual utility for many of its users. Both public schools and contractors use conventional route buses for the transportation of students both to and from school, and special activities. The new redu seat spacing created severe problems for these users. They found the seats to be extremely uncomfortable for long distance travel and in the transportation of its large students, such as athletic teams. In response to this problem, the School Bus Manufacturers Institute (SBMI) petitioned NHTSA on March 7, 1977, to amend part 571.3 Definitions, by adding a separate definition for a subclassification of school bus to be called "school activity bus" and to amend FMVSS 222 as it would apply to a school activity bus. SBMI proposed that these buses have recliner-type or other type seats appropriate for long distance and activity trips. The seat spacing was to be anywhere up to 32-inches, the maximum used on commercial passenger buses, to ensure a comfortable trip. Their intention was that the bus be used only for special activity trips and not route trips.

The special use of activity buses has caused a great deal of concern to many. Most actively involved in this issue are the School Bus Manufacturers Institute (SBMI) and the National School Transportation Association (NSTA). SBMI's primary reasons for wanting a special category for activity buses is related to the comfort factor of the seating within the bus, the colors of the bus and the special needs for carrying athletic equipment and band instruments. On the otherhand, it is NSTA's view that permitting activity trips to be taken on special activity buses would place an economic burden on the already diminishing financia resources of school districts. In some cases dissatisfaction

with FMVSS 222 has caused school districts to avoid using buses built to the new specification as activity buses. The older equipment does not conform to safety standards, resulting in an increase in the possibility of injury with its continued use. Further, as the buses get older, maintenance problems and equipment failures will present a greater hazard.

Accidents and user information is fragmented regarding this issue. On the average each school district's activity buses transport roughly 32,000 pupils per year traveling an average distance of 45 miles per trip. Although the average distance is relatively short, some trips are hundreds of miles, often in darkness, and travel speeds are relatively high--i.e., highway speeds. NSTA conducted a survey in 1979 in an attempt to obtain information on usage. Their respondees included State Directors of Education, contractors, and public school fleet supervisors; each with a different perspective on activity trips. Through the NSTA survey it appears very little recordkeeping is done on the State and local level regarding accidents, miles traveled, environmental conditions during the trip, and driver training. In a review of the types of vehicles used for the activity trips, the older pre-standard buses were used more frequently than the post FMVSS 222 buses. These pre-standard buses give the passengers 25" or more of knee spacing making the ride much more comfortable.

SUMMARY

An analysis of the Engineering Test Facility (ETF) tests indicated that seat spacing in front impact accidents is not as critical, up to a point, as seat height. The accident data and research data do not support the assumption that increasing the seat spacing to the ETF maximum testing distance (24") will necessarily mean that "relief" or "pre-standard" comfort will be immediately noticeable in all school bus transportation. For rural passengers and activity trip users, however, this will be a welcome relief. School districts could then be able to continue dual utility using route buses as activity buses. However, this seat spacing will not permit reclining type seats.

National Transportation Safety Board

Washington, D.C. 20594

December 18, 1985

Ms. Penny Little
Transportation Supervisor
Kenai Peninsula Borough School District
148 North Binkley Street
Soldotna, Alaska 99669

Dear Ms. Little:

Thank you for your letter of September 13, 1985. As you requested, I have reviewed the section of the November 1982 National Coalition for Seatbelts on Schoolbuses handout "Seatbelts on Schoolbuses" which referred to four National Transportation Safety Board accident reports and offer the following comments: under the heading "Accident Investigations and Studies Advocating Seatbelts on Schoolbuses" none of these accidents involved a poststandard large schoolbus -- the type of vehicle which is the focus of the current debate over the installation of lapbelts for passengers on schoolbuses. Instead, the four cases involve an intercity coach, a tour bus, and two prestandard large schoolbuses. The four highway accident reports in question are enclosed.

At the end of the section on accident investigations, the handout quotes from the NTSB accident report on the tour bus crash in Denali National Park, Alaska: "Since 1967, the Safety Board has issued 13 Safety Recommendations requiring the installation and use of seatbelts in intercity and/or schoolbuses." The Safety Board has never issued a safety recommendation to install seatbelts for passengers on schoolbuses, either pre- or poststandard. The majority of our seatbelt-related recommendations apply to driver use only. We have recommended that all occupants of small schoolbuses and schoolbus vans be required to use the available restraints whenever these vehicles are in motion (lapbelts currently are available for both driver and passengers in these small vehicles). We are, however, reviewing this issue in light of recent crash tests and accident investigations. In addition, the basis for any recommendations we may have issued regarding seatbelts on intercity buses is largely irrelevant to the debate over lapbelts on poststandard schoolbuses. The two types of vehicles are too dissimilar; passengers on intercity buses are not afforded the crash protection afforded to passengers of schoolbuses built in accordance with Federal Motor Vehicle Safety Standards (FMVSS) 220, 221, 222 and 230; the interior and exterior designs are markedly different.

I have enclosed a printout of all Safety Board recommendations relating to schoolbuses; recommendations relating to seatbelts are marked. I also have enclosed a copy of a letter the Safety Board Chairman recently sent to Romayne Kareen, Administrator of Pupil Transportation Services for Alaska. Ms. Kareen also has been interested in the Safety Board's position on lapbelts for passengers on large schoolbuses.

Thank you for giving me the opportunity to comment on the National Coalition for Seatbelts on Schoolbuses handout.

Sincerely,

Barry M. Sweedler
Director
Bureau of Safety Programs

Enclosures

KENAI PENINSULA BOROUGH SCHOOL DISTRICT

148 North Binkley Street • Soldotna, AK 99669 • Phone 907/262-5846

September 13, 1985

Barry M. Sweedler
Director, Bureau of Safety Programs
National Transportation Safety Board
Washington, D.C. 20594

Dear Mr. Sweedler:

Thank you very much for your August 16th response to our school district's inquiry concerning the Safety Board's views on the need for seat belts in school buses. We appreciate the Board's time and efforts researching and studying this subject.

The State of Alaska is planning a statewide conference on school bus safety and seat belts. As in other states, this has become a touchy subject. Although the conference will not solely concern seat belts, I'm sure that will be the highlighted subject of the conference.

A representative of the National Coalition for Seat Belts on School Buses will be invited to speak at this conference, along with representatives of other concerned organizations. We are concerned that some of the information being distributed by this National Coalition may not be correct or may have been taken out of context, as it does not correspond with other information we have received.

Realizing you are a busy person, with a busy staff, the Alaska School Bus Safety Committee would still request your assistance and would appreciate your review of the enclosed materials being distributed to our legislative representatives by the National Coalition for Seat Belts on School Buses. There are several excerpts quoting the National Transportation Safety Board. Without the whole article to examine in its entirety, some of these quotes may be misleading.

I have also attached a copy of a proposed resolution that went before our Borough Assembly last month. The resolution was defeated; the action assisted by your August 16th letter. I have also enclosed a copy of a memorandum from our school district to the Assembly President concerning the district's position.

We would appreciate receiving any information you can provide that will clarify the enclosed information from the National Coalition as soon as possible. There is not very much time before the convention and we would certainly appreciate your expertise.

Please feel free to call me at (907) 262-5846 if you should wish to discuss this.

Sincerely,

Penny Little

Penny Little, Transportation Supervisor
Member, Alaska School Bus Safety Committee

Encl: as

National School Transportation Association
Post Office Box 2639 • Springfield, Virginia 22152 • Area Code 703-644-0700

December 6, 1985

Mr. Jim Burnett, Chairman
National Transportation Safety Board
Washington, DC 20594

Dear Mr. Burnett:

Enclosed is a brochure I received from a NSTA member which is being distributed by the National Coalition for Seatbelts on School Buses.

Under "supporters" of seat belts in school buses, the National Transportation Safety Board (NTSB) is listed.

I've reviewed the NTSB accident reports in NSTA's library and have been unable to find any which include NTSB's support of seat belts in school buses over 10,000 pounds. Therefore, would you provide me with the report numbers which include NTSB's recommendation/support for seat belts in this size school bus.

I look forward to your reply.

Thank you for your assistance

Sincerely,

Karen Finkel
Executive Director

bcc: Romayne Kareen

National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

February 6, 1986

Ms. Karen Finkel
Executive Director
National School Transportation
Association
Post Office Box 2639
Springfield, Virginia 22152

Dear Ms. Finkel:

Thank you for your letter of December 6, 1985, asking which NTSB highway accident reports contain safety recommendations or support for seatbelts for passengers on schoolbuses weighing over 10,000 pounds GVWR.

The Safety Board has never issued a recommendation in support of lapbelt use for passengers in schoolbuses over 10,000 pounds. Rather, in a 1983 letter to each State Governor on schoolbus safety, a copy of which is enclosed, the Board stated, " ... 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."

We appreciate your calling our attention to the brochure issued by the National Coalition for Seatbelts on School Buses which lists the NTSB as a supporter of seatbelts in schoolbuses. We have contacted the Coalition, advised them of our position, and requested that the correct position of the Board on this subject be reflected in any future publication.

Respectfully yours,

Jim Burnett
Chairman

Enclosures

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

HIGHWAY ACCIDENT REPORT

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

NTSB-HAR-81-7

UNITED STATES GOVERNMENT

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.

Driver Training

Shuttle busdrivers are required to successfully complete a 40-hour training course consisting of classroom instruction, a written test, and actual driving which concentrates on the driver's capability of traversing marked courses without upsetting markers placed along the route. The purpose of the driving is to demonstrate that the driver is aware of the position of all portions of the bus at all times, is able to interpret the driving reference points, and can safely negotiate narrow intricate patterns that may be similar to sections of the roadway that would be traveled later. Since drivers are restricted to about 4 summer months of driving with 8 months of layoff, returning drivers should be required to demonstrate their capability for annual certification.

Shuttle busdrivers have more extensive training but do not have the added responsibility of tour busdrivers who must divide their attention between driving and interpreting the flora and fauna for their passengers. Furthermore, the Safety Board believes that tour busdrivers should be required to take the 40-hour training course now perceived for shuttle busdrivers and be certified annually.

Tour buses in some national parks provide a driver who can concentrate on driving while a second person acts as an interpreter to explain the sights to the passengers. Although the traffic flow on the Denali National Park road is very light, the Safety Board believes that the primitive nature of the road requires the undivided attention of a well-trained driver.

More than half of the reported motor vehicle accidents in the park since 1979 occurred west of the Savage Check Station, a restricted travel area that carries less than half of the Park's traffic volume. Of the six reported bus accidents, four were caused by driver error. The two major bus accidents in 1969 and 1974 and the June 15 accident indicate a need for additional driver training.

This accident may have been prevented if the driver had been trained in being able to recognize certain distances from the road edge and in using practiced reference points, and had utilized the training while driving. Since motor vehicle drivers are seated on the left side, they usually know where the left side of their vehicle is positioned with respect to the roadway centerline or approaching traffic. However, awareness of the vehicle's right side with respect to the edge of the road is difficult. The angular relationship of the driver's line of sight over a point on the engine hood, onto the road surface, provides experienced drivers with an approximate judgment of the relationship of the vehicle's right side to the edge of the road.

Drivers of long wheel-base, blunt nosed (driver in front of steering axle) trucks and buses have special problems. The shorter distance between the driver's eye and the front end components reduces the accuracy of right side location determination. Most large vehicle drivers depend upon rearview mirror observations to confirm the lateral position of their vehicles on the roadway.

Figure 4 illustrates the limited rearview mirror field of vision of the tour buses. Obviously, movement of the driver's head will increase his field of vision. However, even if the driver were to stand up and look into the outside mounted mirrors, the front axle wheels would not be visible in the standard flat rear view mirrors.

The addition of properly adjusted convex mirrors would increase the driver's rearview field of vision to include both vehicle sides and the adjacent road surfaces. Convex mirrors, used in addition to the conventional flat outside mounted mirrors, would provide the tour busdrivers with the ability to relate the bus position with respect to the edge of the road, thereby reducing the possibility of other similar accidents.

The student driver was not able to explain why he drove off the roadway. He said that the bus was operating properly. He denied being distracted by the bus passengers and stated he was not speaking over the public address system at the time. He initially stated he thought he was dividing his attention between the roadway and some caribou at the side of the road. However, when confronted with the instructor driver's statement that the caribou were at least 1/2 mile from the accident scene, the driver became uncertain and stated he was not sure what had happened. Witnesses within the bus also gave different statements pertaining to the position of the caribou relative to the accident scene, but the preponderance of evidence indicates the bus had traveled well beyond the caribou. With no inside or outside distractions for the student driver, the Safety Board concludes that the student driver was not giving adequate attention to the driving task.

Medical Aid

After the accident, the student driver stated he did not know what to do and was not useful at the scene. The instructor driver, however, started first aid action immediately after the accident and had started to organize the less injured passengers to aid the more seriously injured by the time another bus arrived about 5 minutes later. Other buses arrived shortly thereafter with medically trained people on board. Within 30 minutes, each injured person had at least one person rendering care, with one physician circulating among the injured on the ground and another physician checking those who had been carried to another bus. By the time the helicopters with other medical personnel arrived about 2 hours after the accident, all possible field treatment had been accomplished and the victims were ready to be transported. The aid of the bus passengers was invaluable during the interim while park personnel were being summoned to the scene.

Highway Standards

Traditionally, the philosophy of the NPS has been to provide somewhat limited roadway facilities in its parks to avoid impingement upon the environment. This is exemplified by the Park Road Standards, where the various classifications of park roads are defined in terms of maximum width and maximum shoulder width. The NPS Road Standards specify that a major two-way park road should have a surface width not to exceed 22 feet and a shoulder width not to exceed 3 feet. The next lower classification, a minor two-way park road, specifies that the surface width not exceed 20 feet, with 3-foot-wide shoulders. The Denali Park Road is classified by the NPS as a major park road, but the road's width in the area of the accident varied from 13 to 15 feet with no shoulders. Although these dimensions are less than the maximum for this classification, they are also less than the criteria for the next lower classification of a minor two-way park road. Apparently, the NPS Road Standards do not intend that the maximum value for minor two-way roads be the minimum for major two-way roads. Consequently, a 6-foot-wide path meets the classification of the major NPS Road Standard as well as the criteria for the minor NPS Road Standard. The standard does not provide a definitive guide.

January 10, 1985

Ms. Lane T. Welch
1205 Greenridge Road
Jacksonville, Florida 32207

Dear Ms. Welch:

Thank you for your letter asking about seatbelt requirements on schoolbuses.

Forty-nine States plus the District of Columbia have now enacted child passenger protection laws. The Safety Board is not aware that any of these laws require child passengers in schoolbuses to be restrained.

Federal safety standards do not require large conventional size schoolbuses to have seatbelts for every passenger so very few large schoolbuses have lapbelts for each passenger. (Only the driver is required by Federal regulation to have a belt.) Instead, all schoolbuses manufactured since April 1977 are required to protect passengers by other means. The new standards require that the walls and roof of the bus be strengthened to protect passengers during rollover, that the vehicle body joints be strengthened to prevent ejection of schoolbus occupants during an accident, and that the seatbacks be padded to avoid injuring passengers (seats previously had exposed metal frames). The seats also are placed closer together and the seatbacks have been heightened to "compartmentalize" passengers, a form of automatic or passive protection (protection not requiring action by the passenger).

The U.S. Department of Transportation (DOT), the Federal agency which sets vehicle safety standards, did consider requiring seatbelts on large schoolbuses but chose instead to require manufacturers to provide the passive protection I just described above. Individual school districts, however, are free to install seatbelts on new schoolbuses at their own option. (Approximately 17 school districts at this time have ordered or retro-fitted large schoolbuses with lapbelts for each occupant.)

The Safety Board does not believe that the Federal Government should mandate seatbelt installation for passengers of large schoolbuses at this time. (See enclosed letter to Governors.) Our continuing investigation of schoolbus accidents indicates that the current Federal standards are working to protect child passengers in post-1977 schoolbuses from death and serious injury.

ROUTING SYMBOL									
DATE									
INITIALS									

SUBJECT FILE COPY

NTSB Form 1320.24 (3/78)

Current Federal safety standards require lapbelts to be installed for all passengers and drivers of small schoolbuses and vans sold for school transportation (in addition to the other safety improvements mentioned above). The Safety Board has recommended that States take action to ensure that all occupants of these small schoolbuses and vans buckle up when the vehicle is in motion, because these vehicles, with their smaller vehicle bodies, offer far less crash protection than large schoolbuses. (See enclosed letter to Governors.)

Thank you for your interest in highway safety.

Sincerely,

Suzanne Stack
Bureau of Safety Programs

Enclosure

S. STack:mhi:Sp-10 1/10/85

ROUTING SYMBOL									
DATE									
INITIALS									

SUBJECT FILE COPY

NTSB Form 1320.24 (3/76)

National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

October 22, 1985

Ms. Romayne Kareen
Administrator
Pupil Transportation Services
Alaska Department of Education
801 West 10th Street
Pouch F
Juneau, Alaska 99811

Dear Ms. Kareen:

Thank you for your recent letter. The answers to your specific questions appear below and are based on a review of all schoolbus accident reports published by the Safety Board.

1a. Has the Safety Board issued findings which state that lives would have been saved had seatbelts been installed and used by occupants of pre-standard large schoolbuses?

In reports on the investigations of two accidents in the 1970's involving pre-standard large schoolbuses, the Safety Board concluded that seatbelt use and certain bus modifications might have affected the outcome for some passengers who were fatally injured.

In the report on an accident in which a Penn Central freight train collided with a schoolbus at a highway railroad grade crossing near Congers, New York, on March 24, 1972, (Report No: NTSB-RHR-73-1), the Safety Board stated:

> At least two of the five fatalities were ejected as a result of floor separation and the lack of availability and use of occupant restraint system. (page 27)

We went on to say:

> Contributing to the number of fatalities and the severity of injuries were: (1) lack of structural integrity of the body of the schoolbus; (2) the absence of highback padded seats and an occupant-restraint system in the schoolbus; (3) presence of standing students in the bus; and (4) the action of the coupler of the lead locomotive, which caused the crash force to be concentrated on the bus.

In a collision between a tractor-semitrailer and a schoolbus near Rustburg, Virginia, on March 8, 1977, (Report No: NTSB-HAR-78-1), the Safety Board stated:

> The availability of occupant restraints and the presence of an adequate restraining barrier would have prevented the ejection of the schoolbus passenger. (The ejectee died.) (page 23)

In the same report, we also concluded that: "the availability and use of occupant restraints or containment in the bus could have reduced the number and severity of injuries sustained by bus occupants" and that "higher seat backs and controlled deformation may have provided sufficient compartmentalization to have restrained the occupants and reduced the severity of injuries."

Clearly, discussion of seatbelt use was in the context of other changes needed in the schoolbus body and interior construction. Our findings were issued at a time of intense debate over what should be included in the Federal schoolbus safety standards then being formulated. The Safety Board's position on various aspects of this complex issue, has been, like many other experts' positions, modified over time to reflect the best evidence available.

Moreover, despite these findings the Safety Board never recommended nor supported the retrofit of these pre-standard buses with lap belts. Indeed, the Safety Board has been careful to point out in recent accident reports involving pre-standard large schoolbuses that "the wooden floor and tubular steel seats within [the pre-standard] schoolbus were not designed to accommodate occupant restraints and would have had to have been substantially upgraded to do so." (Willow Creek, California, Schoolbus Crash, February 24, 1983, NTSB/HAR-83/05)

1b. Has the Safety Board issued findings which state that lives would have been saved had seatbelts been installed and used by occupants of post-standard large schoolbuses?

The Safety Board has never issued a finding that lapbelt use would have prevented a schoolbus passenger fatality in a crash involving a large, post-standard schoolbus.

2a & b. Has the Safety Board issued recommendations stating that seatbelts should be installed on either pre-standard or post-standard buses?

The Safety Board has never issued a recommendation that seatbelts be installed for all passengers on either pre- or post-standard large schoolbuses. For your information, a computer print-out of all Safety Recommendations issued by NTSB relating to schoolbus accidents has been enclosed.

You may have noticed that I have answered your first two questions in terms of NTSB's findings and recommendations pertaining to passengers only. The Board has issued many findings and recommendations relating to seatbelt availability and use by schoolbus drivers (These are marked in the print-out.), but they have little or no relevance to the discussion of whether lapbelts should be installed for all passengers on post-standard large schoolbuses. Lapbelts now are routinely available to all schoolbus drivers, and the NTSB has recommended, in conformance with HSPS #17, that drivers be required to buckle-up whenever the vehicle is in motion since drivers need to retain control of the vehicle at all times. Drivers also are not afforded the protection passengers receive from compartmentalization. The driver's environment with the dashboard, gearshift, windshield, and bus stairwell is considerably more hostile than that faced by student passengers.

3. (omitted, not applicable)

4. Is the Safety Board of the opinion that compartmentalization offers little or no protection in lateral collisions or rollovers?

The Safety Board has not concluded that compartmentalizaton offers little or no protection in lateral collisions or rollovers. Our ongoing schoolbus safety study includes several accidents of this type, and we will address this issue in the study report. We will be pleased to provide you with a copy of the report when it becomes available.

5. Do lateral collisions and rollovers account for approximately 24% of all school bus accidents? If not, what is the percentage?

The Safety Board does not investigate all schoolbus accidents, nor does it know of a data base with a census of such accidents. In addition, we do not know of any recent studies which attempt to identify the percentage of schoolbus accidents which are lateral collisions or rollovers. However, David Soule of the U.S. Department of Transportation's National Highway Traffic Safety Administration did use data from newspaper accounts of injury-producing schoolbus accidents during July 1968 - June 1973 to classify the types of collisions in which schoolbuses were involved. These data indicated that approximately one-third of injury-producing collisions were side impact or rollover accidents.

I hope I have answered your questions.

Respectfully yours,

Jim Burnett
Chairman

Enclosures

"SCHOOL BUS CRASHES, INJURIES AND FATALITIES
FIVE YEAR SUMMARY
July,1968 - June,1973

YEAR	NO. ACC.	NO. INJURED			FATALITIES			TYPE OF COLLISION				
		In Bus	Out-side	Other Vehicle	In Bus	Out-side	Other Vehicle	Front	Rear	Side	Roll Over	Struck Ped. Non-Collision Not Specified
'68-69	1587	2826 80.0%	72 1.2%	649 17.8%	30 23.6%	38 29.9%	59 46.5%	319 20.0%	226 14.2%	234 14.7%	150 9.4%	658 41.7%
'69-70	2249	3185 77.5%	101 2.2%	836 20.3%	27 19.8%	39 28.5%	71 51.7%	460 20.4%	279 12.5%	351 15.6%	182 8.1%	977 43.4%
'70-71	2106	3243 77.7%	93 2.2%	840 20.1%	10 7.9%	46 36.2%	71 55.9%	413 19.6%	252 12.0%	304 14.4%	178 8.5%	959 45.5%
'71-72	2209	4178 83.1%	65 1.3%	782 15.6%	41 27.5%	46 30.9%	62 41.6%	440 19.9%	367 16.6%	318 14.4%	163 7.4%	921 41.7%
'72-73	1854	4213 85.7%	23 .5%	678 13.8%	49 37.7%	29 22.3%	52 40.0%	483 26.1%	371 20.0%	217 11.7%	165 8.9%	618 33.3%
'73-74												
	10,005	17,645	354	3,785	157	198	315	2,115	1,495	1,424	838	4,133
		81.0%	1.6%	17.4%	23.4%	29.6%	47.0%	21.1%	14.9%	14.2%	8.4%	41.3%

This information is taken from data compiled from newspaper reports of school bus collisions by the School Bus Manufacturers Institute, TBEA, Washington, D.C.

David H. Soule, Pupil Transportation Specialist
National Highway Traffic Safety Administration
Washington, D.C. 20590

STATE OF ALASKA

DEPARTMENT OF EDUCATION

DIVISION OF MANAGEMENT LAW AND FINANCE

BILL SHEFFIELD, GOVERNOR

GOLDBELT PLACE
801 WEST 10th STREET
POUCH F
JUNEAU, ALASKA 99811

September 9, 1985

James Burnett, Chairman
National Transportation Safety Board
Washington, D.C. 20594

Dear Mr. Burnett:

Thank you for your letter dated September 3, 1985, and the accompanying material, concerning seat belts on school buses.

I appreciated the information provided in your letter, and the information provided by Ms. Stack during my conversation with her in February. However, I have not yet received written answers to each of the five questions posed in my January 24, 1985 letter. A copy of that letter is enclosed for your information.

May I have a written response to the questions by October 15, 1985? I will look forward to hearing from you.

Sincerely,

Romayne Kareen

Romayne Kareen, Administrator
Pupil Transportation Services

Enclosure

cc: Larry Huxel

8448M

9/6/85

National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

September 3, 1985

Ms. Romayne Kareen
Administrator
Pupil Transportation Services
Alaska Department of Education
801 West 10th Street
Pouch F
Juneau, Alaska 99811

Dear Ms. Kareen:

Please accept my apologies for the time it has taken to answer your letter of July 12. It had been my understanding that the answers our schoolbus specialist, Suzanne Stack, had provided to the questions in your letter of January 25, and when you telephoned her in February, had been sufficient.

The Safety Board's position on whether lapbelts should be required for passengers on large schoolbuses was expressed in a report and letter sent in September 1983 to State Governors. That letter stated:

> Because preliminary analysis indicates that these new standards [FMVSS 220, 221, 222] 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.

Schoolbus accidents that result in injury are very uncommon, and if injuries do occur, they most often are minor to moderate. Fatal or serious injuries are extremely rare, occurring in very severe crashes. In these accidents, intrusion of the bus structure into the passenger compartment is a common cause of fatal or serious injury.

As Ms. Stack mentioned, the Safety Board is conducting a study of the real-world crash performance of schoolbuses manufactured after April 1, 1977, to assess the effectiveness of the Federal schoolbus safety standards in mitigating passenger injuries. This study was specifically undertaken after the Board's report because there was limited real-world accident experience available on the post 1977 buses. So far, we have investigated about 30 accidents involving large, post-standard schoolbuses, but the study is not complete.

As you know, understanding of the exact role of occupant restraint systems in reducing crash losses has grown over time, and is still not perfect. The Safety Board's position on various aspects of this complex issue has, like many other experts' positions, been modified over time to reflect the best evidence. We hope that this study and a complementary study of occupant restraints in motor vehicles will be able to clarify remaining uncertainties in the area of school vans and schoolbuses, both large and small. So far, we have not learned enough to cause us to modify our position.

The Board does not investigate all schoolbus accidents, nor does it compile a data base on all such accidents. Your best source for information on specific accident types is the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA). I am enclosing a table prepared by NHTSA which shows the percentage of rollovers and lateral collisions (the two terms are not exclusive) in fatal accidents.

Enclosed are duplicates of some of the accident reports Ms. Stack sent to you, in addition to a few that have just been published. I also asked Ms. Stack to include some accident investigations from the very early days of the Board.

I hope I have clarified the Board's position.

Respectfully yours,

Jim Burnett
Chairman

Enclosures

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF EDUCATION

DIVISION OF MANAGEMENT LAW AND FINANCE

GOLDBELT PLACE
801 WEST 10th STREET
POUCH F
JUNEAU, ALASKA 99811

July 12, 1985

James Burnett, Chairman
National Transportation Safety Board
Washington, D.C. 20594

Dear Mr. Burnett:

I am inquiring as to the status of the response to my January 25, 1985 letter, copy enclosed. I received some information verbally several months ago from one of your staff members, but have not yet received the requested written response.

Thank you in advance for your assistance.

Sincerely,

Romayne Kareen

Romayne Kareen, Administrator
Pupil Transportation Services

Enclosure

7929M

STATE OF ALASKA

DEPARTMENT OF EDUCATION

DIVISION OF MANAGEMENT LAW AND FINANCE

BILL SHEFFIELD, GOVERNOR

GOLDBELT PLACE
801 WEST 10th STREET
POUCH F
JUNEAU, ALASKA 99811

January 25, 1985

James Burnett, Chairman
National Transportation Safety Board
Washington, D.C. 20594

Dear Mr. Burnett:

I am inquiring as to the findings of the National Transportation Safety Board regarding accidents involving school buses.

I would appreciate a written response to the following questions:

1. Has the Safety Board issued findings which state that lives would have been saved had seat belts been installed and used by occupants of:

    a. school buses, with a gross vehicle weight rating of over 10,000 pounds, manufactured prior to implementation of the compartmentalization standards?

    b. school buses, with a gross vehicle weight rating of over 10,000 pounds, manufactured after implementation of the compartmentalization standards?

2. Has the Safety Board issued recommendations stating that seat belts should be installed on:

    a. school buses, with a gross vehicle weight rating of over 10,000 pounds, manufactured prior to implementation of the compartmentalization standards?

    b. school buses, with a gross vehicle weight rating of over 10,000 pounds, manufactured after implementation of the compartmentalization standards?

3. If the answer to either 3.a. or 3.b. is yes, has the Safety Board issued recommendations as to whether there should be two belts per seat, or three belts per seat?

4. Is the Safety Board of the opinion that compartmentalization offers little or no protection in lateral collisions or rollovers?

5. Do lateral collisions and rollovers account for approximately 24% of all school bus accidents? If not, what is the percentage?

I would also appreciate your sending a copy of each Highway Accident Report issued by the Safety Board on accidents involving school buses with a gross vehicle weight rating of over 10,000 pounds.

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

Sincerely,

Romayne Kareen

Romayne Kareen, Administrator
Pupil Transportation Services

cc: Commissioner Raynolds
Jim Tozer

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/65 --

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-007
ISSUE DATE: 9/18/68
ADDRESSEE: STATES
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE STATES NOT NOW HAVING A REQUIREMENT THAT THE DOOR OF A SCHOOL BUS BE OPENED FOR A SUFFICIENTLY LONG PERIOD WHILE STOPPED TO ALLOW THE WHISTLE OR HORN OF A TRAIN TO BE HEARD AT UNPROTECTED RAILROAD GRADE CROSSINGS, CONSIDER ESTABLISHING SUCH REQUIREMENT.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-008
ISSUE DATE: 11/08/68
ADDRESSEE: FHWA
ADDRESSEE: FRA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION AND THE FEDERAL RAILROAD ADMINISTRATION: STUDY THE QUESTIONABLE AUDIBILITY OF EXTERNAL SOUND SIGNALS WITHIN MOTOR VEHICLES AND TO WORK TOWARD CREATING A UNIFIED SYSTEM OF WARNINGS AND RELIABLE RECEPTION WHICH COULD BE MADE EFFECTIVE THROUGH FEDERAL REGULATIONS OR STATE LAWS. A SIMILAR RECOMMENDATION WAS MADE ON JANUARY 15, 1958, IN THE BOARD'S REPORT OF A GRADE-CROSSING ACCIDENT WHICH OCCURRED NEAR SACRAMENTO, CALIFORNIA.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-009
ISSUE DATE: 11/08/68
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: CONSIDER THE NEED FOR REQUIREMENTS FOR STRUCTURAL STRENGTH OF SCHOOL BUS BODIES IN CONNECTION WITH ITS STUDY OF DESIRABLE STANDARDS FOR PROTECTION OF SCHOOL BUS OCCUPANTS. IN PARTICULAR, THE BOARD RECOMMENDS THAT PROGRAM A.1.1.4 OF THE NATIONAL HIGHWAY SAFETY BUREAU, TITLED 'DESIGN, FABRICATION, AND TEST OF A SAFE SCHOOL BUS INTERIOR,' BE EXPANDED IN SCOPE TO INCLUDE CONSIDERATION OF STRUCTURAL INTEGRITY AND INTRUSION INTO THE SCHOOL BUS INTERIOR.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-010
ISSUE DATE: 11/08/68
ADDRESSEE: FHWA
ADDRESSEE: LOCAL SCHOOL GOVERNING BO
ADDRESSEE: STATES
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION, STATES, AND LOCAL SCHOOL GOVERNING BODIES: INCLUDE SCHOOL BUS ROUTING TO AVOID GRADE CROSSINGS WHENEVER POSSIBLE IN THE CRITERIA FOR SCHOOL BUS OPERATING SAFETY.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/95 --

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-011
ISSUE DATE: 11/08/68
ADDRESSEE: LOCAL SCHOOL GOVERNING BO
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT WHEN IT IS ABSOLUTELY NECESSARY THAT SCHOOL BUSES OPERATE OVER UNPROTECTED GRADE CROSSINGS, PROVISIONS SHOULD BE MADE FOR A RESPONSIBLE INDIVIDUAL, OTHER THAN THE DRIVER, TO ALIGHT AND DETERMINE THAT NO TRAIN IS APPROACHING, AND TO SIGNAL THE DRIVER TO PROCEED OVER THE CROSSING.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-012
ISSUE DATE: 11/08/68
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: ESTABLISH A VEHICLE SAFETY STANDARD TO PROTECT DRIVER VISION AGAINST EXTERNAL SUN GLARE.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-013
ISSUE DATE: 11/08/68
ADDRESSEE: FRA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL RAILROAD ADMINISTRATION: UNDER ITS AUTHORITY TO REGULATE RAILROAD BRAKES, STUDY THE EXISTING STATE OF THE ART OF RAILROAD PASSENGER AND FREIGHT BRAKE SYSTEMS, AND ISSUE DESCRIPTIVE REPORTS OF THE CAPABILITIES OF SUCH SYSTEMS TO EFFICIENTLY STOP TRAINS IN AN EMERGENCY.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-014
ISSUE DATE: 11/08/68
ADDRESSEE: STATES, THE SEVERAL, BOAR
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL EDUCATION ASSOCIATION, THE NATIONAL PROFESSIONAL DRIVER EDUCATION ASSOCIATION, AND THE SUPERVISORS OF DRIVER TRAINING OF THE BOARDS OF EDUCATION OF THE SEVERAL STATES: REVIEW THEIR DRIVER TRAINING PROGRAMS TO INSURE THAT, IN THE NORMAL COURSE OF DRIVER INSTRUCTION FOR ALL TYPES OF DRIVERS, SPECIFIC ATTENTION BE PAID TO THE VISUAL AND PERCEPTUAL TASK OF SEARCHING A LOCATION OF POSSIBLE HAZARD TO ASCERTAIN THAT THE HAZARD IS NOT PRESENT.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-015
ISSUE DATE: 11/08/68
ADDRESSEE: AMERICAN ASSOCIATION OF M
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS: PLACE GREATER EMPHASIS ON PROPER GRADE CROSSING PROCEDURES DURING THE EXAMINATION PROCESS FOR DRIVERS' LICENSES APPLICANTS.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-016
ISSUE DATE: 11/08/68
ADDRESSEE: FRA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL RAILROAD ADMINISTRATION: STUDY THE VISUAL EFFECTIVENESS OF THE WHITE, FIXED, SEALED-BEAM HEADLIGHTS ON LOCOMOTIVES IN CONTRAST WITH THE BRIGHT DAYLIGHT AS COMPARED WITH AN OSCILLATING OR GYRATING HEADLIGHT UNIT, A FLASHING STROBE LIGHT OR OTHER HIGH INTENSITY-TYPE LIGHT, POSSIBLY OF A MORE CONTRASTING COLOR.

LOG NUMBER: H-0003
RECOMMENDATION NUMBER: H-68-017
ISSUE DATE: 11/08/68
ADDRESSEE: ASSOCIATION OF AMERICAN R
ADDRESSEE: FRA
ADDRESSEE: RAIL[illegible]JS OPERATING IN NO
ADDRESSEE: STATES
NTSB STATUS:
CLOSED -- RECONSIDERED

THE NSTB RECOMMENDS THAT THE OFFICE OF HIGH SPEED GROUND TRANSPORTATION, THE ASSOCIATION OF AMERICAN RAILROADS, RAILROADS OPERATING IN THE NORTHEAST CORRIDOR, AND STATES HAVING SAFETY REGULATORY AUTHORITY OVER RAILROADS: CONSIDER THE IMPLICATIONS OF THIS ACCIDENT ANALYSIS FOR LOGICAL AND NECESSARY TRAIN OPERATING SPEED REDUCTIONS UNDER RESTRICTED VISIBILITY WHEREVER TRACKS CROSS UNPROTECTED GRADE CROSSINGS. THE TIME NEEDED BY MOTOR VEHICLES TO CROSS TRACKS REQUIRES THAT DRIVERS BE ABLE TO DETECT THE TRAIN AT A CONSIDERABLE DISTANCE IN ORDER TO BE CERTAIN OF CROSSING SAFELY. THIS DISTANCE, AS ILLUSTRATED BY THIS CASE AND OTHERS, IS ALREADY BEYOND THE RANGE OF TYPICAL PRESENT-DAY TRAIN HORNS WHEN THE ACTUAL CONDITIONS UNDER WHICH THE HORN IS TO BE HEARD ARE CONSIDERED. CONDITIONS WHICH LIMIT AUDIBILITY AT A DISTANCE, INCLUDING ENCLOSED VEHICLE PASSENGER COMPARTMENTS, LOCAL VEHICLE NOISES, AND RESTRICTED USE OF HORNS OR BELLS, ARE NOW FOUND SO FREQUENTLY AS TO BE A NORMALLY ANTICIPATED SITUATION. AS TRAIN SPEEDS RISE, PERSONS CROSSING A GRADE CROSSING MUST RELY INCREASINGLY ON ABILITY TO SEE APPROACHING TRAINS IN ORDER TO DETERMINE THAT IT IS SAFE TO PROCEED.

LOG NUMBER: H-0011
RECOMMENDATION NUMBER: H-70-014
ISSUE DATE: 8/27/70
ADDRESSEE: NATIONAL EDUCATION ASSOCI
NTSB STATUS:
CLOSED - NO LONGER APPLICABLE

THE NTSB RECOMMENDS THAT THE NATIONAL EDUCATION ASSOCIATION AND THE SCHOOL-BUS MANUFACTURING INDUSTRY: ADOPT A POLICY OF USING FASTENING METHODS WHICH INHIBIT THE RAISING OF SHARP EDGES AND WHICH PROVIDE MUCH GREATER EFFICIENCY OF JOINTS TO PREVENT THE DISINTEGRATION OF SCHOOLBUS BODIES. THIS POLICY MIGHT WELL BE IMPLEMENTED BY VOLUNTARY SPECIFICATIONS ADOPTED BY THE NATIONAL EDUCATION ASSOCIATION AND USED BY SCHOOLBUS PURCHASERS AND MANUFACTURERS.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0011
RECOMMENDATION NUMBER: H-70-015
ISSUE DATE: 8/27/70
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY SAFETY BUREAU: INCLUDE IN ITS ACCIDENT RESEARCH INVESTIGATIONS AND STUDIES A SEARCH FOR EVIDENCE OF THE NATURE OF SCHOOLBUS DISINTEGRATION AND THE SIGNIFICANCE OF THE DISINTEGRATION PHENOMENA IN INJURY CAUSATION.

LOG NUMBER: H-0011
RECOMMENDATION NUMBER: H-70-016
ISSUE DATE: 8/27/70
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY SAFETY BUREAU: CONTINUE ITS CONSIDERATION OF THE RECOMMENDATION CONCERNING SCHOOL-BUS SAFETY MADE BY THE SAFETY BOARD IN ITS REPORT OF THE GRADE-CROSSING ACCIDENT AT WATERLOO, NEBRASKA, WHICH OCCURRED OCTOBER 2, 1967.

LOG NUMBER: H-0020
RECOMMENDATION NUMBER: H-71-033
ISSUE DATE: 4/22/71
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE BOARD HAS DISCUSSED ITS SPECIAL STUDY 'INADEQUATE STRUCTURE ASSEMBLY OF SCHOOLBUS BODIES' WITH THE VEHICLE EQUIPMENT SAFETY COMMISSION (VESC), OFFICERS AND MEMBERS OF THE SCHOOLBUS MANUFACTURING INSTITUTE AND OF THE WARD COMPANY. VESC WILL ISSUE STANDARDS, WARD SCHOOLBUS MANUFACTURING COMPANY INDICATED THEY WOULD WELCOME A NHTSA STANDARD SPECIFYING JOINT STRENGTH AND SCHOOLBUS BODY STRENGTH. THE BOARD URGES THE NHTSA TO MOVE EXPEDITIOUSLY IN THIS FIELD.

LOG NUMBER: H-0020
RECOMMENDATION NUMBER: H-71-033A
ISSUE DATE: 8/26/70
ADDRESSEE: NATIONAL EDUCATION ASSOCI
NTSB STATUS:
CLOSED - NO LONGER APPLICABLE

THE NTSB RECOMMENDS THAT THE NATIONAL EDUCATION ASSOCIATION AND THE SCHOOLBUS MANUFACTURING INDUSTRY: ADOPT A POLICY OF USING FASTENING METHODS WHICH INHIBIT THE RAISING OF SHARP EDGES AND WHICH PROVIDE MUCH GREATER EFFICIENCY OF JOINTS TO PREVENT THE DISINTEGRATION OF SCHOOLBUS BODIES. THIS POLICY MIGHT WELL BE IMPLEMENTED BY VOLUNTARY SPECIFICATIONS ADOPTED BY THE NATIONAL EDUCATION ASSOCIATION AND USED BY SCHOOLBUS PURCHASERS AND MANUFACTURERS.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0020
RECOMMENDATION NUMBER: H-71-033B
ISSUE DATE: 8/26/70
ADDRESSEE: FHWA (NHSB)
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY SAFETY BUREAU: INCLUDE IN ITS ACCIDENT RESEARCH INVESTIGATIONS AND STUDIES A SEARCH FOR EVIDENCE OF THE NATURE OF SCHOOLBUS DISINTEGRATION AND THE SIGNIFICANCE OF THE DISINTEGRATION PHENOMENA IN INJURY CAUSATION.

LOG NUMBER: H-0020
RECOMMENDATION NUMBER: H-71-033C
ISSUE DATE: 8/26/70
ADDRESSEE: FHWA (NHSB)
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY SAFETY BUREAU: CONTINUE ITS CONSIDERATION OF THE RECOMMENDATION CONCERNING SCHOOLBUS SAFETY MADE BY THE SAFETY BOARD IN ITS REPORT OF THE GRADE-CROSSING ACCIDENT AT WATERLOO, NEBRASKA, WHICH OCCURRED OCTOBER 2, 1967.

LOG NUMBER: H-0031
RECOMMENDATION NUMBER: H-72-001
ISSUE DATE: 5/19/72
ADDRESSEE: STATES, ALL
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT ALL STATES: ENACT REQUIREMENTS FOR SCHOOL DISTRICTS OR ADMINISTRATIONS WITHIN THEIR JURISDICTION, THROUGH STATE FUNDING ASSISTANCE OR ANY OTHER APPROPRIATE AUTHORITY, FOR THE INSTALLATION OF SUITABLE RESTRAINT SYSTEMS (SEATBELTS OR OTHER APPROVED DEVICES) AT THE DRIVER'S POSITION IN ALL SCHOOLBUSES, AND FOR THE WEARING OF SUCH RESTRAINTS (OR THE USE OF SUCH DEVICES) AT ALL TIMES WHEN PERSONS ARE BEING TRANSPORTED IN SUCH SCHOOLBUSES.

LOG NUMBER: H-0031
RECOMMENDATION NUMBER: H-72-002
ISSUE DATE: 5/19/72
ADDRESSEE: NHTSA
NTSB STATUS:
OPEN - UNACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION AND THE VEHICLE EQUIPMENT SAFETY COMMISSION: IN CONSIDERATION OF THE UNNECESSARY HAZARDS POSED BY LOCATING SCHOOLBUS FUEL TANKS ADJACENT TO SERVICE DOORS, ACT PROMPTLY TO DETERMINE THE 'BEST' AND 'SAFEST' LOCATION FOR SCHOOLBUS FUEL TANKS AND TO SPECIFY SUCH LOCATION, AS WELL AS ANY PROTECTIVE SHIELD OR STRUCTURAL CHANGES, TO MINIMIZE THE LIKELIHOOD THAT A COLLICION WHICH MIGHT DISABLE THE SERVICE DOOR OR THE EMERGENCY EXIT WILL ALSO INITIATE A SCHOOLBUS FUEL TANK FIRE, AND VICE VERSA.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0031
RECOMMENDATION NUMBER: H-72-003
ISSUE DATE: 5/19/72
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION AND THE VEHICLE EQUIPMENT SAFETY COMMISSION: IN CONSIDERATION OF HAZARDS POSED BY SCHOOLBUS SERVICE DOORS WHICH OPEN IN SUCH FASHION THAT THE PRESSURE OF PERSONS FROM WITHIN THE BUS MIGHT HAMPER OR PREVENT THE EXPEDITIOUS OPENING OF SUCH DOORS IN AN EMERGENCY, ACT PROMPTLY TO DETERMINE THE SAFEST MODE OF SERVICE DOOR OPENING AND TO SPECIFY SUCH MODE OF OPENING IN APPROPRIATE STANDARDS.

LOG NUMBER: H-0038
RECOMMENDATION NUMBER: H-72-030
ISSUE DATE: 9/22/72
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: EXPEDITIOUSLY ADOPT A FEDERAL MOTOR VEHICLE SAFETY STANDARD TO CONTROL THE STRENGTH OF STRUCTURAL JOINTS OF SCHOOLBUSES. IN THIS CONNECTION CAREFUL CONSIDERATION SHOULD BE GIVEN TO REQUIREMENT 5.6 BODY STRUCTURE, OF THE VEHICLE EQUIPMENT SAFETY COMMISSION. THIS STANDARD SHOULD ALSO APPLY TO THE STRENGTHENING OF THE WINDOW COLUMNS OF SCHOOLBUSES.

LOG NUMBER: H-0047
RECOMMENDATION NUMBER: H-73-009
ISSUE DATE: 6/21/73
ADDRESSEE: DOT
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE DEPARTMENT OF TRANSPORTATION: SEEK LEGISLATION WHICH WOULD EXTEND THE USE OF FEDERAL FUNDS NOW AVAILABLE FOR GRADE-CROSSING SAFETY AND IMPROVEMENT ON THE FEDERAL HIGHWAY SYSTEM TO INCLUDE THOSE RAILROAD/HIGHWAY GRADE CROSSINGS ON NON-FEDERAL AID HIGHWAYS.

LOG NUMBER: H-0047
RECOMMENDATION NUMBER: H-73-010
ISSUE DATE: 6/21/73
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: IN ITS REVISION OF THE FEDERAL HIGHWAY SAFETY PROGRAM STANDARDS, CONTINUE THE REQUIREMENT WHICH STATES THAT SCHOOLBUS DRIVERS ARE TO 'BE QUALIFIED AS A DRIVER UNDER THE MOTOR CARRIER SAFETY REGULATIONS OF THE FEDERAL HIGHWAY ADMINISTRATION 49CFR 391, IF HE OR HIS EMPLOYER IS SUBJECT TO THE REGULATIONS' AND TO EXTEND THAT PROVISION (EXCEPT REGARDING DRIVER'S AGE) TO INCLUDE ALL DRIVERS OF SCHOOLBUSES REGARDLESS OF WHETHER THEY OR THEIR EMPLOYER IS SUBJECT TO THOSE REGULATIONS.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/35 --

LOG NUMBER: H-0047
RECOMMENDATION NUMBER: H-73-011
ISSUE DATE: 6/21/73
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: IN ITS REVISION OF THE FEDERAL HIGHWAY SAFETY PROGRAM STANDARDS, INCLUDE A PROVISION UNDER THE TITLE, PUPIL TRANSPORTATION SAFETY, WHICH WOULD REQUIRE THOSE PERSONS RESPONSIBLE FOR THE HIRING AND SUPERVISION OF SCHOOLBUS DRIVERS TO CONDUCT PREEMPLOYMENT INQUIRIES AND CONTINUED SURVEILLANCE TO ASSURE THAT OTHER EMPLOYMENT REQUIREMENTS OF SCHOOLBUS DRIVERS DO NOT ADVERSELY INFLUENCE THEIR SC[illegible]DRIVING.

LOG NUMBER: H-0047
RECOMMENDATION NUMBER: H-73-012
ISSUE DATE: 6/21/73
ADDRESSEE: NEW YORK
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE STATE OF NEW YORK AND ALL OTHER STATES: ADOPT AND IMPLEMENT ALL THE PROVISIONS OF THE PRESENT HIGHWAY SAFETY PROGRAM STANDARD NO. 17, PUPIL TRANSPORTATION SAFETY, WITH SPECIAL EMPHASIS ON THE PROVISIONS RELATING TO THE SELECTION AND TRAINING OF PERSONNEL (PERSONNEL, SECTION IV, C.1), THE SAFE ROUTING OF SCHOOLBUSES, AND THE ELIMINATION OF STANDEES IN SCHOOLBUSES (VEHICLE OPERATION, IV, C.5.).

[illegible]OG NUMBER: H-0047
[illegible]ECOMMENDATION NUMBER: H-73-013
ISSUE DATE: 6/21/73
ADDRESSEE: NEW YORK, DEPARTMENT OF E
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE STATE OF NEW YORK DEPARTMENT OF EDUCATION: EXPAND ITS PUPIL-TRANSPORTATION SAFETY ACTIVITIES IN ORDER TO PROVIDE LIAISON, MANAGEMENT CONSULTATION, AND SUPERVISION AT THE LOCAL LEVEL TO ASSURE COMPLIANCE WITH ITS POLICIES AND PROCEDURES. THE STATE'S PARTICIPATION ON THE LOCAL LEVEL SHOULD ALSO INCLUDE MORE ACTIVE ASSISTANCE IN TRAINING PUPIL-TRANSPORTATION PERSONNEL.

LOG NUMBER: H-0047
RECOMMENDATION NUMBER: H-73-014
ISSUE DATE: 6/21/73
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: ASSESS THE HUMAN FACTORS INVOLVED IN SEATBELT USAGE IN SCHOOLBUSES THROUGH A DEMONSTRATION PROJECT. THE PROJECT SHOULD INCLUDE A NUMBER OF BUSES EQUIPPED WITH SEATBELTS AND HIGHBACK, PADDED SEATS, WHICH ARE ENGAGED IN PUPIL TRANSPORTATION. (FINDINGS FROM THIS PROJECT WILL BE USEFUL FOR EVALUATION OF THE PROVISIONS FOUND IN THE PROPOSED MOTOR VEHICLE SAFETY STANDARD (DOCKET NO. 73-3), BUS PASSENGER SEATING AND CRASH PROTECTION).

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0047
RECOMMENDATION NUMBER: H-73-015
ISSUE DATE: 6/21/73
ADDRESSEE: INTERNATIONAL ASSOCIATION
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE INTERNATIONAL ASSOCIATION OF CHIEFS OF POLICE: USE ITS INFLUENCE AND RESOURCES TO REDIRECT THE ATTENTION OF LAW ENFORCEMENT AGENCIES TO THE NEED FOR UNIFORM ENFORCEMENT OF TRAFFIC LAWS PERTAINING TO RAILROAD/ HIGHWAY GRADE CROSSINGS (1963 IACP RESOLUTION F-19, HIGHWAY SAFETY POLICIES FOR POLICE EXECUTIVES). SUCH ENFORCEMENT SHOULD PROVIDE SPECIAL EMPHASIS ON THOSE CROSSINGS PROTECTED SOLELY WITH STOP SIGNS.

LOG NUMBER: H-0048
RECOMMENDATION NUMBER: H-73-016
ISSUE DATE: 5/22/73
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: ESTABLISH SEPARATE VEHICLE-TYPE CLASSES FOR TRANSIT BUSES, INTERSTATE BUSES, AND SCHOOLBUSES, BASED UPON EXACT DEFINITIONS OF THE INTENDED USE AND PERFORMANCE OF THE BUSES IN DEFINED HIGHWAY ENVIRONMENTS. FACTORS WHICH SHOULD BE CONSIDERED INCLUDE AT LEAST THE NUMBER AND CLASSES OF PASSENGERS CARRIED, THE MAXIMUM INTENDED SPEED OF OPERATION, THE CLASSES OF HIGHWAYS OVER WHICH OPERATION IS INTENDED, THE LUGGAGE-CARRYING CAPABILITY, THE DURATION OF TRIPS, AND THE INTENT TO PROVIDE FOR STANDING AND/OR SEATED PASSENGERS.

LOG NUMBER: H-0048
RECOMMENDATION NUMBER: H-73-017
ISSUE DATE: 5/22/73
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - NO LONGER APPLICABLE

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: REQUIRE, FOR THE TRANSIT-BUS CATEGORY, THAT SEATS HAVE THE CHARACTERISTICS OF THE PROPOSED RULEMAKING'S FIRST PERFORMANCE OPTION ONLY. STEPS SHOULD BE TAKEN LATER TO PROVIDE CRASHWORTHINESS FEATURES IN THE STRUCTURAL AREA OR TO MEET OTHER NEEDS TYPICAL OF THE STATED AND DEFINED UTILITY PERFORMANCE, E.G., THE NEED TO ACCOMMODATE STANDING PASSENGERS.

LOG NUMBER: H-0048
RECOMMENDATION NUMBER: H-73-018
ISSUE DATE: 5/22/73
ADDRESSEE: NHTSA
NTSB STATUS:
OPEN - UNACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: REQUIRE, FOR THE INTERSTATE-BUS CATEGORY, THE CUSHIONING PERFORMANCE CALLED FOR IN THE FIRST PERFORMANCE OPTION IN ORDER TO PROVIDE A DEFINED LEVEL OF PROTECTION FOR THOSE PASSENGERS WHO DO NOT USE AN INSTALLED RESTRAINT. THE SEAT STRENGTH PERFORMANCE AND SEATBELTS CALLED FOR IN THE PROPOSED RULEMAKING'S SECOND PERFORMANCE OPTION SHOULD ALSO BE REQUIRED. THE WARNING SYSTEM SHOULD NOT BE REQUIRED.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0048
RECOMMENDATION NUMBER: H-73-019
ISSUE DATE: 5/22/73
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ALTERNATE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: REQUIRE, FOR THE SCHOOLBUS CATEGORY, THE CUSHIONING PERFORMANCE CALLED FOR IN THE FIRST PERFORMANCE OPTION ALONG WITH THE SEAT STRENGTH PERFORMANCE AND SEATBELT ANCHORAGES AT EACH SEAT LOCATION PROPOSED IN THE SECOND PERFORMANCE OPTION. THE WARNING SYSTEM SHOULD NOT BE REQUIRED. CONSIDERATION SHOULD ALSO BE GIVEN TO ESTABLISHING A SEPARATE CATEGORY OF SCHOOLBUS FOR INTERMITTENT HIGHER-SPEED OR INTERSTATE-HIGHWAY OPERATION WHICH WOULD REQUIRE SEATBELTS TO BE INSTALLED.

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-004
ISSUE DATE: 4/30/74
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: EXPEDITE DEVELOPMENT AND IMPLEMENTATION OF A TRAFFIC-CONTROL SYSTEM OF POSITIVE GUIDANCE TO ASSIST DRIVERS IN REMAINING IN THE INTENDED PATHWAY AT NARROW HIGHWAY STRUCTURES.

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-005
ISSUE DATE: 4/30/74
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: RESTATE MORE PRECISELY THE DEFINITION OF NARROW BRIDGES IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND DETERMINE ITS ADEQUACY AND APPLICABILITY. (A REDEFINITION SHOULD BE CONSISTENT WITH THE INTENDED USE OF ANY SIGNING PLAN DEVISED UNDER NTSB SAFETY RECOMMENDATION H-74-4 OF THIS REPORT.)

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-006
ISSUE DATE: 4/30/74
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: REQUIRE ALL STATES TO BRING APPROACH GUARDRAIL SECTIONS AT BRIDGES ON FEDERAL-AID HIGHWAYS INTO COMPLIANCE WITH THE RECOMMENDED INSTALLATION DESCRIBED IN THE FHWA'S HANDBOOK OF HIGHWAY SAFETY DESIGN AND OPERATING PRACTICES.

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-007
ISSUE DATE: 4/30/74
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: EXPEDITE A PROGRAM TO IMPROVE, WHERE FEASIBLE, SUBSTANDARD BRIDGE-RAIL SYSTEMS ON EXISTING BRIDGES TO INCREASE RESISTANCE TO POCKETING OR PENETRATION BY IMPACTING VEHICLES OF ALL CLASSES AND REDIRECT THOSE VEHICLES. RESEARCH, INCLUDING CRASH TESTING, SHOULD ALSO BE EXPEDITED TO DEVELOP CRITERIA FOR MANDATORY STANDARDS FOR BRIDGE-RAIL AND GUARDRAIL DESIGNS FOR NEW BRIDGE CONSTRUCTION.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-008
ISSUE DATE: 4/30/74
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: ESTABLISH A PROGRAM TO IDENTIFY AND CORRECT CURB STRUCTURES ON EXISTING BRIDGES THAT CREATE UNNECESSARY HAZARDS TO THE CONTROL OF IMPACTING VEHICLES. ALL NEW BRIDGES SHOULD USE RAILINGS THAT ELIMINATE CURBS.

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-009
ISSUE DATE: 4/30/74
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: DEVELOP A PRECISE TECHNICAL DEFINITION OF CRASH CUSHIONS ON THE BASIS OF MINIMUM PERFORMANCE CRITERIA. THE FACTORS DEFINED SHOULD INCLUDE NOT ONLY CLASSES OF VEHICLES, BUT ALSO VELOCITIES AND ANGLES OF ATTACK, SO THAT STANDARDS CAN BE ESTABLISHED TO REQUIRE THE MOST EFFECTIVE USE OF CRASH CUSHIONS ON FEDERAL-AID HIGHWAYS. SUCH STANDARDS WOULD DESCRIBE SPEEDS AND IMPACT DIRECTIONS AT WHICH VEHICLE TYPES WILL BE ADEQUATELY HANDLED.

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-010
ISSUE DATE: 4/30/74
ADDRESSEE: NHTSA
NTSB STATUS:
OPEN - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: PROCEED WITH THE NOTICE OF PROPOSED RULEMAKING (DOCKET 73-3 NOTICE 1), TO PROVIDE FOR (1) INCREASED STRENGTH OF SEAT ANCHORAGES WHICH MORE FULLY USES THE ABILITIES OF STRUCTURES TO PROTECT PASSENGERS AND (2) MORE PROTECTION AGAINST GROSS SEAT DEFLECTION WHICH CAN PERMIT SEATS TO BE CARRIED AWAY.

LOG NUMBER: H-0056
RECOMMENDATION NUMBER: H-74-011
ISSUE DATE: 4/30/74
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: IDENTIFY TYPES OF BUS SEAT ANCHORAGES WHICH ARE SUBSTANTIALLY BELOW THE STRENGTHS OBTAINABLE BY SUCH SIMPLE CHANGES AS SUBSTITUTING A BOLT FOR A SHEET METAL SCREW. IF IT IS POSSIBLE TO IDENTIFY SUCH BUSES BY VISUAL INSPECTION, STEPS SHOULD BE TAKEN TO INFORM OWNERS OF THE POSSIBLE CHANGE FOR LOCAL RETROFIT PURPOSES.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0067
RECOMMENDATION NUMBER: H-75-001
ISSUE DATE: 5/22/75
ADDRESSEE: CALIFORNIA, RIVERSIDE COU
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE RIVERSIDE COUNTY ROAD COMMISSION: SURVEY THE ACCIDENT SCENE AND INSURE THAT THE TURN WARNING/ADVISORY SPEED SIGNS ARE INSTALLED IN A MANNER THATCONFORMS WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

LOG NUMBER: H-0067
RECOMMENDATION NUMBER: H-75-002
ISSUE DATE: 5/22/75
ADDRESSEE: CALIFORNIA, RIVERSIDE COU
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE RIVERSIDE COUNTY ROAD COMMISSION: PROVIDE DELINEATION OF THE PATHWAY AROUND THE TURN.

LOG NUMBER: H-0074
RECOMMENDATION NUMBER: H-75-022
ISSUE DATE: 9/18/75
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: INITIATE A PROGRAM OF DYNAMIC ROLLOVER TESTING OF SCHOOLBUSES TO PROVIDE DATA, IN COMBINATION WITH DATA ALREADY OBTAINED FROM STATIC TESTING, TO BE USED TO DEVELOP A PERFORMANCE REQUIREMENT THAT WILL INSURE REASONABLE STRUCTURAL INTEGRITY IN ROLLOVER ENVIRONMENTS.

LOG NUMBER: H-0076
RECOMMENDATION NUMBER: H-75-031
ISSUE DATE: 9/22/75
ADDRESSEE: GEORGIA, POLK SCHOOL DIST
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE POLK SCHOOL DISTRICT, STATE OF GEORGIA: ESTABLISH A FORMAL PROCEDURE FOR FREQUENT FIELD CHECKS OF SCHOOLBUS DRIVERS TO INSURE THEIR COMPLIANCE WITH THE DISTRICT'S SAFETY POLICIES AND THE STATE OF GEORGIA'S UNIFORM RULE OF THE ROADS.

LOG NUMBER: H-0083
RECOMMENDATION NUMBER: H-76-001
ISSUE DATE: 3/01/76
ADDRESSEE: CALIFORNIA
NTSB STATUS:
CLOSED - SUPERSEDED

THE NTSB RECOMMENDS THAT THE STATE OF CALIFORNIA: INSURE THE IMPLEMENTATION OF ALL THE PROVISIONS OF FEDERAL HIGHWAY SAFETY PROGRAM STANDARD NO. 17, 'PUPIL TRANSPORTATION SAFETY,' ESPECIALLY THE PROVISIONS RELATING TO THE SYSTEMATIC PREVENTATIVE MAINTENANCE AND THE SEMIANNUAL INSPECTION OF SCHOOLBUSES.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0100
RECOMMENDATION NUMBER: H-77-001
ISSUE DATE: 2/15/77
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ALTERNATE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: EXAMINE AND REPORT TO THE BOARD ON THE EFFECTIVENESS OF FEDERAL HIGHWAY ADMINISTRATION EFFORTS TO ESTABLISH ROADWAY MAINTENANCE PROGRAMS THAT COMPLY WITH HIGHWAY SAFETY PROGRAM STANDARD NUMBER 12. THIS REPORT SHOULD, AS A MINIMUM, REVIEW: (1) THE ADEQUACY OF INFORMATION ABOUT POST-CRASH CORRECTIVE MAINTENANCE PROCEDURES AND DEVICES IN THE FHWA MAINTENANCE POLICY; (2) THE AVAILABILITY AND IMPLEMENTATION OF TRAINING PROGRAMS IN, AND UP-TO-DATE STANDARDS FOR, POST-CRASH CORRECTIVE MAINTENANCE; AND (3) A SAMPLE OF ACCIDENTS TO ASSESS POST-CRASH MAINTENANCE PRACTICES WITHIN EACH FHWA REGION.

LOG NUMBER: H-0101
RECOMMENDATION NUMBER: H-77-002
ISSUE DATE: 2/15/77
ADDRESSEE: IOWA, DEPARTMENT OF TRANS
NTSB STATUS:
CLOSED - NO LONGER APPLICABLE

THE NTSB RECOMMENDS THAT THE STATE OF IOWA DEPARTMENT OF TRANSPORTATION: ADHERE TO THE MAINTENANCE PRINCIPLES OF HIGHWAY SAFETY PROGRAM STANDARD NUMBER 12 AND ESTABLISH PROCEDURES THAT WILL INSURE APPROPRIATE, COST-EFFICIENT, AND TIMELY CORRECTIVE REPAIR OF DAMAGED HIGHWAY SAFETY EQUIPMENT.

LOG NUMBER: H-0101
RECOMMENDATION NUMBER: H-77-003
ISSUE DATE: 2/15/77
ADDRESSEE: IOWA, DEPARTMENT OF TRANS
NTSB STATUS:
CLOSED - NO LONGER APPLICABLE

THE NTSB RECOMMENDS THAT THE STATE OF IOWA DEPARTMENT OF TRANSPORTATION: INCORPORATE THE GENERAL PRINCIPLES AND STANDARDS IDENTIFIED IN THE HANDBOOK OF HIGHWAY SAFETY DESIGN AND OPERATING PRACTICES AND THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 118 INTO THOSE DESIGNS ESTABLISHED FOR CORRECTIVE REPAIR OF DAMAGED HIGHWAY SAFETY EQUIPMENT.

LOG NUMBER: H-0107
RECOMMENDATION NUMBER: H-77-009
ISSUE DATE: 8/23/77
ADDRESSEE: FHWA
ADDRESSEE: FRA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION AND FEDERAL RAILROAD ADMINISTRATION: COMBINE EFFORTS TO DEVELOP AND IMPLEMENT A UNIFORM SYSTEM OF WARNINGS TO ATTRACT THE ATTENTION OF MOTOR VEHICLE DRIVERS APPROACHING RAILROAD/HIGHWAY GRADE CROSSINGS.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0108
RECOMMENDATION NUMBER: H-77-010
ISSUE DATE: 8/23/77
ADDRESSEE: NEBRASKA, CITY OF STRATTO
NTSB STATUS:
OPEN - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE CITY OF STRATTON: IN COOPERATION WITH THE BURLINGTON NORTHERN RAILROAD, INC., INSTALL AN IMPROVED RAILROAD/HIGHWAY GRADE CROSSING PROTECTION SYSTEM ON BEAVER AVENUE IN ACCORDANCE WITH THE RECOMMENDED PRACTICES OF THE ASSOCIATION OF AMERICAN RAILROADS (1974).

LOG NUMBER: H-0114
RECOMMENDATION NUMBER: H-77-011
ISSUE DATE: 10/13/77
ADDRESSEE: FHWA (BMCS)
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION, PREPARE AND ISSUE AN ADVISORY DOCUMENT CITING THE PROPER TECHNIQUES FOR INSPECTING AIR COMPRESSOR DRIVEBELTS. THE BULLETIN SHOULD BE DISSEMINATED WIDELY THROUGHOUT THE COMMERCIAL MOTOR CARRIER INDUSTRIES AND TO ALL AGENCIES CHARGED WITH THE REGULATION OF INTRASTATE MOTOR CARRIER SAFETY.

LOG NUMBER: H-0114
RECOMMENDATION NUMBER: H-77-012
ISSUE DATE: 10/13/77
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - SUPERSEDED

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: DEVELOP BRIDGE RAILING DESIGNS THAT WILL MEET PERFORMANCE STANDARDS TO BE ESTABLISHED BY FHWA FOR VARIOUS CLASSES OF VEHICLES AND THAT WILL BE SUFFICIENT IN NUMBER TO MEET THE VARIOUS STATE REQUIREMENTS WITH REGARD TO CLIMATIC AND OTHER PHYSICAL CONDITIONS THAT AFFECT THE OPERATION AND MAINTENANCE OF A ROADWAY SYSTEM. SUCH BRIDGE BARRIER RAILING DESIGNS SHOULD BE AVAILABLE TO STATES THAT DO NOT DESIRE TO DEVELOP THEIR OWN DESIGNS IN ACCORDANCE WITH MANDATORY PERFORMANCE STANDARDS ISSUED BY FHWA.

LOG NUMBER: H-0114
RECOMMENDATION NUMBER: H-77-013
ISSUE DATE: 10/13/77
ADDRESSEE: FHWA
NTSB STATUS:
OPEN - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: INVESTIGATE THROUGH DYNAMIC CRASHTESTING AND ANALYTICAL PROCEDURES THE EFFECTS OF VARIOUS GEOMETRIC CONFIGURATIONS AND ADJACENT ROADWAY SURFACES ON THE PERFORMANCE OF TRAFFIC BARRIER RAIL SYSTEMS. THE INVESTIGATION SHOULD ALSO CONSIDER HOW MAINTENANCE PRACTICES OR THE LACK OF MAINTENANCE AFFECTS THE PERFORMANCE OF THE BARRIER RAIL SYSTEMS.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0114
RECOMMENDATION NUMBER: H-77-014
ISSUE DATE: 10/13/77
ADDRESSEE: FHWA
NTSB STATUS:
OPEN - UNACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: IN COOPERATION WITH THE STATES, ESTABLISH PRIORITY GUIDELINES FOR IMPROVING, THROUGH MODIFICATION OR RETROFIT, THE PERFORMANCE OF EXISTING TRAFFIC BARRIER RAIL SYSTEMS AT BRIDGES. CONSIDERATION SHOULD BE GIVEN IN THE PRIORITY GUIDELINES TO THE POTENTIAL FOR MULTI-FATALITY ACCIDENTS INVOLVING HIGH OCCUPANCY VEHICLES SUCH AS BUSES.

LOG NUMBER: H-0114
RECOMMENDATION NUMBER: H-77-015
ISSUE DATE: 10/13/77
ADDRESSEE: FHWA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE FEDERAL HIGHWAY ADMINISTRATION: IN COOPERATION WITH THE STATES, DETERMINE IF THE CURRENT DESIGN AND PLACEMENT OF GUIDE, DIRECTIONAL, ADVISORY, AND WARNING SIGNS, AND OTHER NECESSARY TRAFFIC CONTROL DEVICES ON HIGHWAY EXIT RAMPS ARE ADEQUATE TO PROVIDE A DRIVER WITH UNDERSTANDABLE AND PERFORMANCE-RELATED INFORMATION NECESSARY FOR THE SELECTION AND SAFE NEGOTIATION OF THE DESIRED RAMP. THE RESULTS OF THE INVESTIGATION SHOULD BE USED TO IMPROVE THE CRITERIA CONTAINED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

LOG NUMBER: H-0116
RECOMMENDATION NUMBER: H-77-016
ISSUE DATE: 10/13/77
ADDRESSEE: CALIFORNIA, DEPARTMENT OF
NTSB STATUS:
CLOSED - UNACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE CALIFORNIA DEPARTMENT OF TRANSPORTATION: ERECT AT THE APPROACH TO THE MARINA VISTA OFFRAMP AN EXIT SIGN THAT INCORPORATES A DIAGRAM OF THE CURVATURE OF THE RAMP TO ILLUSTRATE ITS SEVERITY AND RELOCATE OR SUPPLEMENT THE ADVISORY EXIT SPEED SIGN TO IMPROVE ITS WARNING TO APPROACHING DRIVERS.

LOG NUMBER: H-0115
RECOMMENDATION NUMBER: H-77-017
ISSUE DATE: 10/13/77
ADDRESSEE: CALIFORNIA, HIGHWAY PATRO
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE CALIFORNIA HIGHWAY PATROL: INITIATE A PROGRAM THAT WILL INSURE THE AVAILABILITY OF INFORMATION ABOUT CARRIER TERMINAL RATINGS AND THEIR MEANINGS TO ALL USERS OF CHARTER-PARTY AND SCHOOLBUS CARRIERS' SERVICES.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0115
RECOMMENDATION NUMBER: H-77-018
ISSUE DATE: 10/13/77
ADDRESSEE: CALIFORNIA, HIGHWAY PATRO
NTSB STATUS:
CLOSED - ACCEPTABLE ALTERNATE ACTION

THE NTSB RECOMMENDS THAT THE CALIFORNIA HIGHWAY PATROL: MODIFY THE ENFORCEMENT POLICY SET FORTH IN ITS MOTOR VEHICLE SAFETY OPERATIONS PROGRAM TO PROVIDE FOR LETTERS OF WARNING AND/OR THE INITIATION OF CHARGES AGAINST THOSE CARRIERS/TERMINALS UPON THE RECEIPT OF A SECOND CONSECUTIVE "C" RATING.

LOG NUMBER: H-0115
RECOMMENDATION NUMBER: H-77-019
ISSUE DATE: 10/13/77
ADDRESSEE: CALIFORNIA, HIGHWAY PATRO
NTSB STATUS:
OPEN - ACCEPTABLE ALTERNATE ACTION

THE NTSB RECOMMENDS THAT THE CALIFORNIA HIGHWAY PATROL: MODIFY ITS MOTOR CARRIER SAFETY OPERATIONS PROGRAM TO REQUIRE THAT EACH CARRIER IS HELD RESPONSIBLE TO INSURE THAT ALL DRIVERS -- BOTH NEW AND EXPERIENCED -- ARE PROPERLY TESTED AND EXAMINED TO ASSURE THEIR DRIVING CAPABILITY AND THAT SUCH DRIVERS ARE THOROUGHLY FAMILIAR WITH ALL OF THE OPERATIONAL FUNCTIONS AND CONTROLS OF EACH VEHICLE THEY DRIVE.

LOG NUMBER: H-0138
RECOMMENDATION NUMBER: H-78-006
ISSUE DATE: 3/08/78
ADDRESSEE: VIRGINIA, STATE BOARD OF
NTSB STATUS:
OPEN - UNACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE VIRGINIA STATE BOARD OF EDUCATION: REVISE ITS SCHOOLBUS OPERATING REGULATIONS TO ELIMINATE THE PROCEDURAL REQUIREMENT FOR THE STOPPING OF SCHOOLBUSES ON THE MAIN PORTION OF A ROADWAY WHEN PICKING UP OR DISCHARGING PASSENGERS, AND ADD A REQUIREMENT THAT CONFORMS WITH HIGHWAY SAFETY PROGRAM STANDARD NO. 17 WHICH CALLS FOR LOADING AND UNLOADING ZONES OFF THE MAIN TRAVELED PORTION OF THE HIGHWAY WHEREVER PRACTICABLE.

LOG NUMBER: H-0138
RECOMMENDATION NUMBER: H-78-007
ISSUE DATE: 3/08/78
ADDRESSEE: VIRGINIA, STATE BOARD OF
NTSB STATUS:
OPEN - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE VIRGINIA STATE BOARD OF EDUCATION: REVISE ITS SCHOOLBUS DRIVER TRAINING PROGRAM TO PLACE GREATER EMPHASIS ON DEFENSIVE DRIVING PROCEDURES AS THEY RELATE TO OBSERVING SURROUNDING TRAFFIC BEFORE STOPPING TO PICK UP OR DISCHARGE PASSENGERS.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER:	H-0140	THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY
RECOMMENDATION NUMBER:	H-78-008	ADMINISTRATION: DETERMINE WHETHER THE STATES OF FLORIDA,
ISSUE DATE:	3/08/78	MARYLAND, NORTH CAROLINA, AND SOUTH CAROLINA ARE IN
ADDRESSEE:	NHTSA	COMPLIANCE WITH HIGHWAY SAFETY PROGRAM STANDARD NO. 5,
NTSB STATUS:		'DRIVER LICENSING,' AND IF FOUND NOT IN COMPLIANCE, TAKE
CLOSED - ACCEPTABLE ALTERNATE ACTION		NECESSARY ACTION TO ENCOURAGE THEM TO MODIFY THEIR PROGRAMS TO COMPLY.

LOG NUMBER:	H-0140	THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY
RECOMMENDATION NUMBER:	H-78-009	ADMINISTRATION: EXPAND HIGHWAY SAFETY PROGRAM STANDARD NO.
ISSUE DATE:	3/08/78	17, 'PUPIL TRANSPORTATION SAFETY,' TO PROVIDE THAT NO
ADDRESSEE:	NHTSA	PASSENGERS OCCUPY SEATS IN EITHER THE FOREMOST OR REARMOST
NTSB STATUS:		ROWS OF PASSENGER SEATS UNTIL ALL OTHER SEATS HAVE BEEN
CLOSED - ACCEPTABLE ALTERNATE ACTION		OCCUPIED.

LOG NUMBER:	H-0140	THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY
RECOMMENDATION NUMBER:	H-78-010	ADMINISTRATION: MODIFY FEDERAL MOTOR VEHICLE SAFETY
ISSUE DATE:	3/08/78	STANDARD NO. 217 TO PROVIDE FOR ADDITIONAL EMERGENCY EXIT
ADDRESSEE:	NHTSA	POINTS TO FACILITATE ESCAPE FROM AND ACCESS TO SCHOOLBUSES
NTSB STATUS:		REGARDLESS OF THE VEHICLE'S ATTITUDE FOLLOWING A COLLISION
CLOSED - ACCEPTABLE ALTERNATE ACTION		OR OVERTURN. SUCH EXITS SHALL BE IN ADDITION TO THE CURRENT OPTIONS SET FORTH IN FMVSS NO. 217.

LOG NUMBER:	H-0140	THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY
RECOMMENDATION NUMBER:	H-78-011	ADMINISTRATION: REVIEW AVAILABLE ACCIDENT STATISTICS
ISSUE DATE:	3/08/78	INVOLVING 1975 AND LATER MODEL SCHOOLBUSES EQUIPPED WITH
ADDRESSEE:	NHTSA	SEATING ARRANGEMENTS THAT COMPLY WITH FEDERAL MOTOR VEHICLE
NTSB STATUS:		SAFETY STANDARD NO. 222 TO DETERMINE IF THE SPECIFIC
OPEN - ACCEPTABLE ACTION		SEATING, RESTRAINING BARRIER, AND IMPACT ZONE REQUIREMENTS FOR SCHOOLBUSES HAVE REDUCED THE INJURIES SUSTAINED BY OCCUPANTS ON THESE SCHOOLBUSES WHEN INVOLVED IN COLLISIONS AND ROLLOVERS. A REPORT OF THE FINDINGS SHOULD BE SUBMITTED TO THE NATIONAL TRANSPORTATION SAFETY BOARD AT THE EARLIEST OPPORTUNITY.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0139
RECOMMENDATION NUMBER: H-78-012
ISSUE DATE: 3/08/78
ADDRESSEE: FHWA (BMCS)
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE BUREAU OF MOTOR CARRIER SAFETY OF THE FEDERAL HIGHWAY ADMINISTRATION: REVISE ITS ENFORCEMENT POLICY WHICH NOW PRECLUDES THE FILING OF CHARGES AGAINST DRIVERS AND CARRIERS IN VIOLATION OF THE FEDERAL MOTOR CARRIER SAFETY REGULATIONS UNLESS THEY HAVE PREVIOUSLY BEEN SERVED WITH A COPY OF THE SAFETY REGULATIONS, TO PERMIT THE FILING OF CHARGES FOR VIOLATIONS UNDER SEVERE CIRCUMSTANCES SUCH AS PREVENTABLE, FATAL HIGHWAY ACCIDENTS.

LOG NUMBER: H-0139
RECOMMENDATION NUMBER: H-78-013
ISSUE DATE: 3/08/78
ADDRESSEE: FHWA (BMCS)
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE BUREAU OF MOTOR CARRIER SAFETY OF THE FEDERAL HIGHWAY ADMINISTRATION: REQUEST FROM THE INTERSTATE COMMERCE COMMISSION THE IDENTITY AND CATEGORIES OF ALL CURRENT ICC-REGISTERED CARRIERS OPERATING IN INTERSTATE COMMERCE AND OF FUTURE REGISTRANTS AS SOON AS POSSIBLE FOLLOWING THEIR REGISTRATION.

LOG NUMBER: H-0137
RECOMMENDATION NUMBER: H-78-014
ISSUE DATE: 3/08/78
ADDRESSEE: NORTH CAROLINA, GOVERNOR
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE STATE OF NORTH CAROLINA: REVIEW ITS DRIVER IMPROVEMENT PROGRAM, REQUIRED BY HIGHWAY SAFETY PROGRAM STANDARD NO. 5, TO IDENTIFY PROBLEM DRIVERS AND INSURE THAT SUCH DRIVERS ARE NOT PERMITTED TO OPERATE COMMERCIAL VEHICLES.

LOG NUMBER: H-0137A
RECOMMENDATION NUMBER: H-78-045
ISSUE DATE: 6/07/78
ADDRESSEE: STATES, ALL GOVERNORS
NTSB STATUS:
OPEN - INITIAL RESPONSE RECEIVED

THE NTSB RECOMMENDS THAT EACH STATE: REVIEW ITS DRIVER LICENSING PROGRAM(S) TO INSURE THAT IT CONFORMS THE ONE-LICENSE CONCEPT AND THE DRIVER IMPROVEMENT PROGRAM SUGGESTED BY HIGHWAY SAFETY PROGRAM STANDARD NO. 5, DRIVER LICENSING, AND BY THE GUIDELINES SET FORTH IN CHAPTER 6 OF THE UNIFORM VEHICLE CODE.

LOG NUMBER: H-0165
RECOMMENDATION NUMBER: H-79-008
ISSUE DATE: 3/22/79
ADDRESSEE: MICHIGAN
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE STATE OF MICHIGAN: PROVIDE AT LEAST AN ANNUAL MOTOR VEHICLE INSPECTION PROGRAM FOR VEHICLES THAT SEAT 10 OR MORE PERSONS AND BUSES THAT ARE NOT PRESENTLY REQUIRED TO BE INSPECTED.

ALL SCHOOL BUS
NTSB SAFETY RECOMMENDATIONS
-- AS OF 10/03/85 --

LOG NUMBER: H-0166
RECOMMENDATION NUMBER: H-79-009
ISSUE DATE: 3/22/79
ADDRESSEE: GEORGIA, DEPARTMENT OF TR
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE STATE OF GEORGIA: CONTINUE PAVEMENT EDGE LINES THROUGH THE LENGTH OF AN EXIT RAMP AT LOCATIONS WHERE THESE LINES HAVE BEEN TERMINATED PRIOR TO THE RAMP'S ENDING.

LOG NUMBER: H-0165
RECOMMENDATION NUMBER: H-79-010
ISSUE DATE: 3/22/79
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: REQUEST THAT THE INDIVIDUAL STATES IDENTIFY INDIVIDUALS OR GROUPS IN THE STATE THAT TRANSPORT PERSONS ON A NONSCHEDULED, NOT-FOR-HIRE BASIS, WITH GROUP- OR INSTITUTION-OWNED VEHICLES THAT HAVE A SEATING CAPACITY OF 10 OR MORE PERSONS AND ENCOURAGE THE STATES TO DISSEMINATE MATERIAL TO THESE GROUPS ON VEHICLE MAINTENANCE.

LOG NUMBER: H-0164
RECOMMENDATION NUMBER: H-79-011
ISSUE DATE: 3/22/79
ADDRESSEE: NHTSA
NTSB STATUS:
CLOSED - ACCEPTABLE ACTION

THE NTSB RECOMMENDS THAT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION: REQUEST THAT EACH STATE IDENTIFY INDIVIDUALS OR GROUPS THAT TRANSPORT PERSONS ON A NOT-FOR-HIRE BASIS, WITH VEHICLES THAT SEAT 10 OR MORE PERSONS AND TO DISSEMINATE INFORMATION ABOUT THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S SCHOOLBUS DRIVER INSTRUCTIONAL PROGRAM AND THE NATIONAL SAFETY COUNCIL'S DEFENSIVE DRIVING COURSE TO THESE INDIVIDUALS AND GROUPS.

LOG NUMBER: H-0164A
RECOMMENDATION NUMBER: H-79-031
ISSUE DATE: 5/15/79
ADDRESSEE: STATES, ALL GOVERNORS
NTSB STATUS:
OPEN - INITIAL RESPONSE RECEIVED

THE NTSB RECOMMENDS THAT EACH STATE: ENACT LEGISLATION TO REQUIRE THAT THE DRIVER OF ANY MOTOR VEHICLE WITH A SEATING CAPACITY OF MORE THAN 16 PASSENGERS, WHETHER SO EMPLOYED OR ACTING VOLUNTARILY, SHALL POSSESS, IN ADDITION TO A PROPERLY CLASSIFIED STATE DRIVERS LICENSE, A CERTIFICATE AUTHENTICATING SUCH DRIVER'S SUCCESSFUL COMPLETION OF A BUSDRIVER TRAINING COURSE WHICH CONFORMS TO HIGHWAY SAFETY PROGRAM STANDARD NO. 17, PUPIL TRANSPORTATION SAFETY.
