ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 8072

3724 HSTA HB 679 - HB 684

600

STATE OF ALASKA 1986 LEGISLATIVE SESSION
FISCAL NOTE

Revision Date : _____

REQUEST

Bill/Resolution No. : _____
Title : An Act Relating to the Purchase of Alaska Products; and Providing for an Effective Date
Sponsor : Honorable Bill Sheffield, Govenor
Requestor : _____
Date of Request : February 13, 1986

FISCAL DETAIL

Agency Affected : DOT&PF
BRU : Regional Design & Construction Engineering & Operations Stds.
Components : _____

EXPENDITURES/REVENUES : (Thousands of Dollars)

OPERATING	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
PERSONAL SERVICES	24.0	12.0	12.0	12.0	12.0	12.0
TRAVEL	Ø					
CONTRACTUAL	10.0					
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	34.0	12.0	12.0	12.0	12.0	12.0
CAPITAL	17.5	17.5	17.5	17.5	17.5	17.5
REVENUE						

FUNDING : (Thousands of Dollars)

GENERAL FUND	51.5	29.5	29.5	29.5	29.5	29.5
FEDERAL FUNDS	Ø					
OTHER	Ø					
TOTAL	31.5	29.5	29.5	29.5	29.5	29.5

POSITIONS :

FULL-TIME	Ø	Ø	Ø	Ø	Ø	Ø
PART-TIME						
TEMPORARY						

ANALYSIS : Attach a separate page if necessary

SEE ATTACHED.

Joseph Hingsam, Director 2/15/86

Prepared by : Loren L. Rasmussen
Division : Engineering and Operations Standards
Phone : 465-2960
Date : 2/15/86

Approved by Commissioner : _____
Agency : DOT&PF
Date : 2/15

Distribution (by Agency preparing fiscal note) :
- Legislative Finance
- Legislative Sponsor
- Requestor
- Office of Management and Budget
- Impacted Agency(ies)

10/25/85

Purchase of Alaska Products
Items to Consider in Fiscal Note

(A) Projects financed with State money (36.15.030)

(1) DOT&PF
(2) Municipalities (grants)
(3) School Construction (grants and debt retirement)
(4) University of Alaska
(5) All State Agency's Including:
    (a) Alaska Power Authority
    (b) Alaska State Housing Authority

(B) Development of Specifications (36.15.040)

(C) Identifying Alaska Products in a Project (36.15.040)

(D) Bid Evaluations

(E) Penalty for Failing to Use (36.15.070)
Non-Responsible Bidders List

(F) Classification of Alaska Products (DOC) (36.15.080)
1. Added Value - Regulations
2. Lists of Products

(G) Consideration for Legal Costs

FISCAL NOTE
(DOT&PF Only)

ALASKA PRODUCTS

(A) DOT&PF projects financed with State money

$35,000,000 (From FY87 Executive Budget pg. 132)

From brief discussions with Hawaii it appears that their products law effects about 1% of their bids. For analysis purpose, DOT&PF will assume the same. We would also assume the average percentage preference of 5%. The following products would also be assumed to be the type which would be produced in Alaska - from our discussions with Hawaii.

1. Reinforced concrete culvert, storm drain, sewer pipe and manhole sections.
2. Precast - reinforced or prestressed concrete.
3. Prestressed beams, piling and panels.
4. Reinforcing steel bars.
5. regulatory, traffic and construction signs.
6. Forest products.

C.I.P.

35,000,000 x .01 x .05 = $17,500
(assumed for all years)
($ not inflated for future years)

(B) Development of Specifications

Range 21 Technical Engineer

Assume $\frac{2 \text{ man mo.} \times \$72,000}{12}$ = $12,000

(Only required in the first year)

(C) Identifying Alaska Products

Assume $\frac{1 \text{ man mo.} \times \$72,000}{12}$ = $ 6,000

(D and E) Bid Evaluation and Control During Construction

Assume $\frac{1 \text{ man mo.} \times \$72,000}{12}$ = $ 6,000

(F) Classification of Products

Minimal Effect on DOT&PF

(G) Consideration for Legal Costs $10,000

SUBTOTAL $34,000

* No new positions were included because the new work load is divided between the divisions.

SUMMARY OF GOVERNOR'S FY 87 CAPITAL BUDGET
(stated in $ thousands)

AGENCY	GENERAL FUND	FEDERAL	OTHER	TOTAL
Office of the Governor	$ -	$ -	$ -	$ -
Administration	4,530.1	-	750.0	5,280.1
Law	-	-	-	-
Revenue	77.6	-	5.7	83.3
Education	34,108.7	672.4	-	34,781.1
Health and Social Services	12,989.0	-	-	12,989.0
Labor	50.0	380.0	916.5	1,346.5
Commerce and Economic Development	59,237.5	-	4,188.2	63,425.7
Military and Veterans' Affairs	1,000.0	300.0	-	1,300.0
Natural Resources	6,063.0	2,190.0	-	8,253.0
Fish and Game	2,019.0	600.0	850.0	3,469.0
Public Safety	3,008.7	-	-	3,008.7
Transportation and Public Facilities	35,268.3	253,074.2	34,950.0	323,292.5
Environmental Conservation	23,926.9	-	-	23,926.9
Community and Regional Affairs	5,775.0	4,725.8	-	10,500.8
Corrections	1,000.0	-	-	1,000.0
University of Alaska	18,845.4	1,600.0	-	20,445.4
Legislature	-	-	-	-
Court System	1,115.0	-	-	1,115.0
Municipal Grants	139,394.9	-	2,155.0	141,549.9
Grants to Unincorporated Communities	806.7	-	-	806.7
GRAND TOTAL	$349,215.8	$263,542.4	$43,815.4	$656,573.6

STATE OF ALASKA 1986 LEGISLATIVE SESSION
FISCAL NOTE

Revision Date : _____

REQUEST

Bill/Resolution No. : _____

Title : An act relating to the purchase of Alaska products.

Sponsor : Governor

Requestor : _____

Date of Request : 2/14/86

FISCAL DETAIL

Agency Affected : Labor

BRU : Administrative Services

Components : Special Services

EXPENDITURES/REVENUES : (Thousands of Dollars)

OPERATING	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
PERSONAL SERVICES		27.6	9.2	9.2	9.2	9.2
TRAVEL		.8				
CONTRACTUAL		7.0	1.0	1.1	1.2	1.3
SUPPLIES		.4	.2	.3	.4	.5
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		35.8	10.4	10.6	10.8	11.0
CAPITAL						
REVENUE						

FUNDING : (Thousands of Dollars)

GENERAL FUND		35.8	10.4	10.6	10.8	11.0
FEDERAL FUNDS						
OTHER						
TOTAL		35.8	10.4	10.6	10.8	11.0

POSITIONS :

FULL-TIME						
PART-TIME		1.0	1.0	1.0	1.0	1.0
TEMPORARY						

ANALYSIS : Attach a separate page if necessary

See Attached

Prepared by : Judy Knight Phone : 465-2720

Division : Administrative Services Date : 2/15/86

Approved by Commissioner : Jim Robison Date : 2/15/86

Agency : Labor

Distribution (by Agency preparing fiscal note) :

Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)

10/25/85

CONTINUATION of FISCAL NOTE ANALYSIS

For Bill/Resolution No. _____

"An act relating to the purchase of Alaska products; and providing for an effective date."

This legislation requires the adoption of regulations to establish the value added in the state for materials and supplies produced or manufactured in Alaska tnat are used in state and/or local construction projects, and a list of the products will be published annually. The assumptions are as follows:

1. A part time Labor Economist I will be hired to develop this program between July 1, 1986 and March 30, 1987. A part time Labor Economist I will maintain and update the list annually between October and December.

2. Hearings will be h ' in the fall of 1986 to collect public input cn regulations developed for the collection of value added information.

3. Departmental staff will determine available supplies and materials that meet the value added criteria; and determine the value added of these supplies and materials by each of three classes.

4. The first list of supplies and materials will be published by January 1, 1987.

5. The Department of Labor will maintain the list of contractors penalized under this bill; but the Department of Labor has no direct role in monitoring compliance of firms who say they will use Alaska products.

The costs to implement this bill include personal services for a part time (9 mo.) Labor Economist, and travel ($800) to Anchorage and Fairbanks for public hearings on the regulations. Contractual services include toll phone and postage ($2,000), printing and advertising ($1,000), legal fees ($2,000) and other miscellaneous items ($1,500). Office supplies will cost $400. Future years will require 3 months of a part time Labor Economist and miscellaneous contractual services and commodities.

Position Title	No. of Positions	Range/Step	Bang Unit	Geo	Approv.	Disapp
Labor Economist I	1	14A	GGU			
Time Status	**Staff Months**	**RP Number**	**Location**	**Election District**		
PPT	9		Juneau			

Type of Expenditure		Amount
1	2	3
Salary	21,978	
Benefits	7,335	
Premium Pay		
Other		
Total Personal Services		29,313
Travel		
Contractual		2,000
Commodities		400
Equipment		
Other		
Total Cost		31,713

Receipt Code	Funding Source		
	Federal Receipts	1002	
	G. F. Match	1003	
	General Funds	1004	31,713
	I-A Receipts	1005	
	Program Receipts	1028	
	CIP Receipts	1061	
	Other		

For B&M Use Only
Key Number ___ - ___ - ___ - ___ - ___

Justification

This position will determine the value added associated with products produced or manufactured in Alaska and used in state and/or local construction projects. In addition, this position will have primary responsibility for the development, maintenance and publication of a list of these materials and supplies. Specifically the duties would include:

1. Coordinating the preparation and implementation of regulations associated with this bill.
2. Creating a data base containing supplier information, products, and value added statistics.
3. Determine the value added associated with construction supplies and categorize the supplies into the three product classifications.
4. Determine the validity of value added related statistics provided by suppliers.
5. Prepare and coordinate the publication of the annual list of Alaska produced products.

The costs specific to this position include contractual service costs for toll phone and postage ($1,000) and other miscellaneous items ($1,000).

Request For New Position

Agency Labor

BRU Administrative Services

Component Special Services

FY 87

HOUSE
COMMITTEE REPORT

4/21

(7)
Date referred: 2/17/86

JUDICIARY

FURTHER REFERRALS: FINANCE

DATE: 4/17/86

The STATE AFFAIRS Committee has considered HB 679

"An Act relating to the purchase of Alaska products; and providing for an effective date."

and recommends:

[ ] do pass

[ ] do not pass

[ ] do pass with attached amendment(s)

[ ] no recommendation

[X] replace with CSHB 679(SA) [X] same title [ ] new title

and recommends Do Pass

[ ] further referral to the ________ Committee

and attaches:
[ ] letter of intent
[ ] first fiscal note
[ ] new fiscal note
[X] zero fiscal note

SIGNING DO PASS: New

Katie Hurley
[signature]
Roger Jenkins
Betty Cato
[signature]

SIGNING OTHER RECOMMENDATIONS:

[signature] No Rec
[signature] no rec
[signature] - no Rec

Katie Hurley
Chairman

RECORDS CERTIFICATION

I, the undersigned, an employee of the State of Alaska, do hereby certify that the microfilm images on this microform are accurate reproductions of the original records of the State of Alaska as accumulated during the regular course of business, and that it is the established policy and practice of this State to microfilm its records and to dispose of the original records after microfilm reproductions have been made.

Signature of Camera Operator

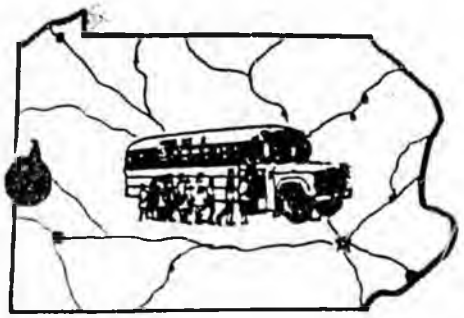
9/11/89
Date

02-519 (REV 8/78)

HB

6884

10/3/84



THE YELLOW NUGGET

PUPIL TRANSPORTATION ASSOCIATION OF PENNSYLVANIA, INC.

VOLUME 10, NUMBER 1 NEWSLETTER SUMMER 1984

Science Fair Winner

SIXTH GRADER STUDIES SEAT BELT ISSUE

The controversial subject of seat belts for school buses is touching all ages and segments of the population, not just professional school transportation personnel. Kim Dahlin, a sixth grade student at the Susquenita Elementary School, Susquenita School District, Dauphin county, took this issue as her subject for the Elementary Science Fair this spring and was delcared first place winner.

Kim's results--that seat belts should not be used on school buses--represent a change of opinion in her sampling of 281 people ages 6 to 56 years and over and are based largely on facts obtained through cooperation with the Pennsylvania State Police and the Rohrer Bus Service, Duncannon.

The idea formed when Kim realized that she and her family, Mr. and Mrs. Steve Dahlin and brother Troy, always "buckle up" when they get in the family car, but no one on a school bus even has an opportunity to do so. She observed that it is now law to provide and use a safety device for children 4 and under, so she felt the lack of seat belts on school buses indicated a lack of concern for the safety of older children.

Kim thought there should be seat belts on school buses and so did 173 of the 281 people who responded to her questionnaire.

Kim began with the hypothesis: ". . .to prove that seat belts should be put in school buses for the safety of us kids: 'Seat belts save lives' and injuries."

To gather information she prepared and distributed 500 questionnaires to people from 6 to 56 years and over, including school bus drivers; obtained printed information from the Pennsylvania State Police and the Pennsylvania Dept. of Highway Safety; met with Carroll Miller, manager, school bus operations, Rohrer Bus Service.

Of the 281 completed and returned questionnaires, 173 people thought seat belts should be put on school buses. Their reasons were:

- 144--to prevent flying around which causes injuries
- 35--to keep kids in their seats so they don't bother the bus driver
- 9--to limit number of kids to one seat or no reason given

But 108 people thought seat belts should not be on school buses, and their reasons were:

- 20--children wouldn't listen and wear seat belts
- 19--children could not get out of the bus fast enough in emergencies
- 12--with three children in a seat, seat belts wouldn't work (too crowded)
- 44--no reason listed

Ten school bus drivers also listed their reasons for opposing the installation of seat belts:

- Young children cannot work them; also too loose
- Used as a weapon
- Wouldn't keep them on
- With three high school students on a seat, seat belts would not work
- Everyone would have to unbuckle to let the person on the inside of the seat out
- Vandalism--torn, cut, slashed, jammed, muddy

Specific information swayed Kim away from her original theory. From State Police Corporal Ken Mettler she learned that in this state from 1974-84 the accidents that resulted in death of students have all happened outside the school bus. The number of school bus accidents has increased, but the number of students either injured or killed has dropped.

From the Rohrer Bus Service she learned:

- Because seats are too close together, a child wearing a seat belt will take the full impact of the collision on the head, face, and neck.
- Lap seat belts worn on young children can cause crushed kidneys, ruptured bladders, and other internal injuries when involved in an accident.
- Buses that have tried seat belts have had more injuries from seat belts being used as weapons.
- Young children are sometimes unable to open seat belts and could be trapped in an emergency. In cases of bus rollovers, children could be hanging upside down and unable to unfasten belts to get out of the bus.
- Bus seats have had extra padding added so there are no metal parts to injure children.
- Bus seats have been moved closer to compartmentalize for protection.
- New window and door designs keep children from being thrown out of the bus.
- The heavy steel frame under the bus floor provides tremendous protection. Installing seat belts on the floor would weaken the floor structure.
- Bus bodies will absorb a lot of the shock during an accident.

Kim concluded her project by saying, "In my hypothesis I tried to prove that seat belts should be put on school buses to save lives and injuries. What I found out is that I was wrong and seat belts would cause more injuries than without them. Seat belts are not needed in school buses. What is needed is an adult on each bus to control the children so the bus driver can concentrate on the road and safe driving."

insurance institute for highway safety

the highway loss reduction

Status Report

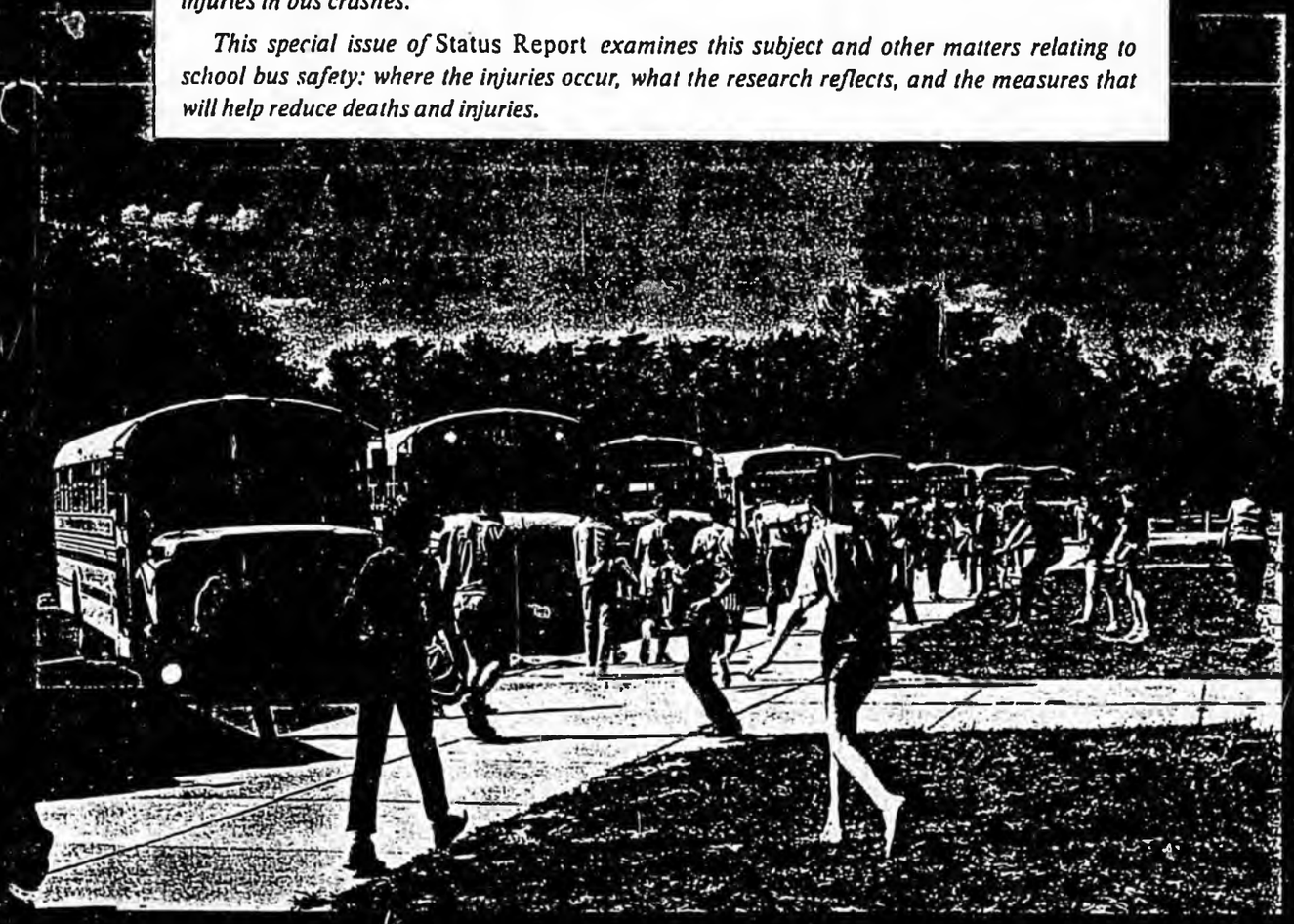
Vol. 20, No. 5 May 11, 1985

A Special Issue

SCHOOL BUSES AND SEAT BELTS

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

This special issue of Status Report *examines this subject and other matters relating to school bus safety: where the injuries occur, what the research reflects, and the measures that will help reduce deaths and injuries.*



The Insurance Institute for Highway Safety is an independent, nonprofit, scientific and educational organization. It is dedicated to reducing the losses—deaths, injuries and property damage—resulting from crashes on the nation's highways. The Institute is supported by the American Insurance Highway Safety Association, the American Insurers Highway Safety Alliance, the National Association of Independent Insurers Safety Association and several individual insurance companies

School Buses and Lap Belts

About 18 school districts throughout the country now require new school buses to be equipped with lap belts, and many more are considering such a rule in response to parent groups that are lobbying state capitols and school boards.

Carol Fast, founder and president of the National Coalition for Seat Belts in School Buses, says the movement is growing rapidly. "The issue is timely," notes Fast, crediting new child restraint laws for the interest. She says her group has 40 regional coordinators with coalitions set up in nearly every state.

Some children entering first grade have always traveled restrained in child safety seats or safety belts, Fast says. When they get on buses that are not equipped with belts, they become "apprehensive," and their parents become apprehensive as well. "They know that it's a good thing to wear belts in cars," reminds Fast. "And they don't understand why there are no belts in buses."

In 1973, when the National Highway Traffic Safety Administration (NHTSA) began formally considering improving school bus safety standards, the agency proposed raising the backs of seats to a height of 28 inches, about the same height as an extended head restraint in a passenger car. NHTSA also said it would consider requiring lap belts. (See *Status Report*, Vol. 8, No. 5, Feb. 26, 1983.) A requirement for combination lap and shoulder belts was, and still is, considered not feasible.

In 1974, NHTSA abandoned the lap belt option. Citing "practical objections" raised by the majority of groups commenting on the standard. NHTSA said it "determined that a passive system of occupant containment by the seating system or a restraining barrier offers the most reliable crash protection in a school bus situation."

By raising the backs of seats, making them more yielding, and requiring padding to protect a child's knees, torso, head, and face, NHTSA engineers believed that the crash load would be spread more evenly over a child's body.

The use of a lap belt, however, could cause the child to double over the belt in a frontal crash, pivoting forward and striking his or her head on the back of the seat in front. Such an action would concentrate the force of the crash load on the child's face and head, which would increase the risk of head injury. Nevertheless, the agency said it would require the installation of belt anchorages in case school districts wished to install them.

By 1976, when the final school bus occupant protection rule, Federal Motor Vehicle Safety Standard (FMVSS) 222, was issued, the height requirements for the backs of seats were reduced eight inches to 20 inches, and all provisions for belt anchorages were gone. In a *Federal Register* notice, NHTSA said tests by AMF Corporation indicated that the lower seat back height would provide "sufficient compartmentalization" for occupants. The seat back height was lowered because bus operators said they would not be able to watch the pupils with the higher seats.

As for lap belt anchorages, NHTSA said that in view of comments from bus manufacturers and operators questioning their utility, that the agency would not require their installation. The notice indicated NHTSA intended to study the matter further and that in the meantime, lap belts could safely be attached to the seat frame by the users. But for smaller buses under 10,000 pounds, NHTSA required that they be equipped with lap belts. The reason for that, said NHTSA, was their smaller size could result in much more severe crashes.

In 1978 NHTSA conducted sled tests of belted and unbelted dummies and observed that belted dummies experienced a violent whipping effect that warranted further study. Subsequent petitions for reconsideration of FMVSS 222 filed by Physicians for Automotive Safety (PAS) and Action for Child Transportation Safety were rejected by NHTSA in 1981 and 1983, without additional tests.

The physicians' and parents' groups question the efficacy of those tests and subsequent tests performed recently by the Canadian Ministry of Transport. However, the chief value of seat belts in school buses, they argue, is educational.

'It's a Very Emotional Issue'

Some pupil transportation supervisors have questioned whether riders will use lap belt buckles as weapons, and others have been skeptical about getting children to use the lap belts without having a monitor aboard the bus. In reality, districts that have installed lap belts do not report them being used as weapons. A spokesman for the Greenburgh Central School District in New York, where lap belts have been required since 1978, says that drivers report students who refuse to follow the belt use rule to school officials, making monitors unnecessary.

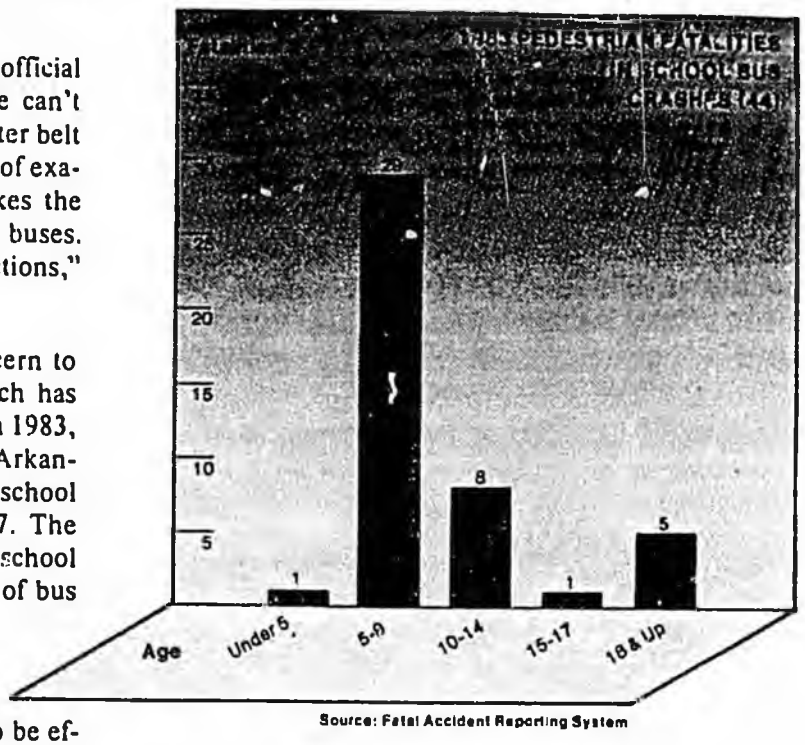
"It's a very emotional issue," Fast admits. It has pitted parents and physicians against NHTSA, bus owners, bus drivers, and school fleet administrators.

Fast says her group is willing to trade off less protection in frontal impacts to gain more protection in side impacts and rollovers. Data showing that belted dum-

mies fare worse than unbelted dummies in frontal impacts are presented out of context, she said.

"It's a very awkward situation," a NHTSA official told *Status Report*. "It gives us butterflies. We can't really argue with the concept of establishing better belt habits in children," but, he adds, the possibility of exacerbating head injuries in frontal impacts makes the agency reluctant to endorse seat belts for school buses. "We'd like to leave it open to the local jurisdictions," he concludes.

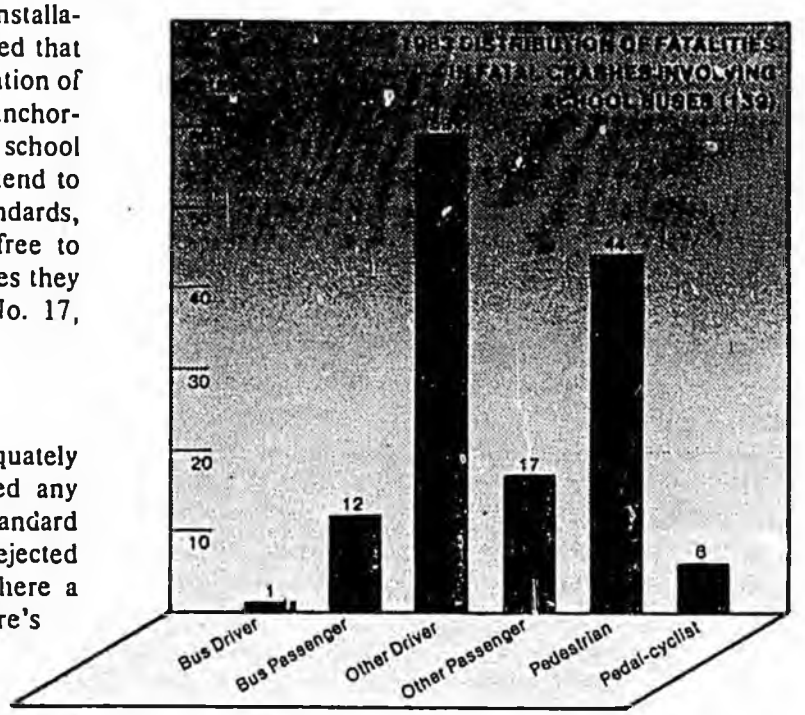
School bus safety has been a matter of concern to the National Transportation Safety Board, which has over the years examined bus crashes in depth. In 1983, following its study of a prestandard bus crash in Arkansas, the safety board said it believed that most school buses will be of poststandard vintage by 1987. The board is conducting an evaluation of post - 1977 school buses of all sizes to ascertain the effectiveness of bus safety standards.



Source: Fatal Accident Reporting System

The board concluded: "because preliminary analysis indicates that these standards appear to be effective in eliminating or substantially reducing the majority of school bus passenger injuries, the safety board does not believe there is sufficient justification at this time to recommend" the mandatory installation of lap belts in large school buses.

When in 1983, NHTSA chief Diane Steed rejected the latest PAS petition seeking the mandatory installation of belt anchorages in large buses, she noted that the safety board did not recommend the installation of belts and added that if the agency mandated anchorages, it would "impose a financial burden on all school bus purchasers, regardless of whether they intend to install belts in the buses. Under the present standards, districts...that want belts in their buses are free to order buses with belts or to install them in buses they already own." (See *Status Report*, Vol. 18, No. 17, Nov. 22, 1983.)



'They Don't Want Any Injuries'

Fast and other critics say NHTSA hasn't adequately studied the issue. NHTSA has not conducted any rollover or side impact crash tests of poststandard buses, Fast notes. Children are being partially ejected through windows, says Fast, citing a case where a child's arm was nearly cut off in an impact. "There's no 'compartmentalization' in a side or rollover crash," observes Fast.

Parents are reluctant to accept assurances that belts are not necessary, Fast continues. "They don't want 'minor' injuries. They don't want *any* injuries."

(Cont'd on page 4)

'The Confusion Continues'

School Buses and Lap Belts

(Continued from Page 3)

John States, M.D., an orthopedist and professor at the University of Rochester, says that large school buses are already very safe vehicles. The primary purpose for getting belts into school buses, says States, who has worked in New York to promote them, is: "We're out to save lives in the c[illegible]"

States says belts are a good idea because of the educational carryover It's confusing, he says — along with others — to tell children that belts are a good thing in cars but not necessary in school buses. However, both States and Fast acknowledge there are no studies indicating a correlation between belt use on school buses and belt use in automobiles.

States discounts tests showing that lap belts may increase the crash force on children's heads in frontal impacts. Dummies that have been used are "too stiff," he said, to give a true measurement of what happens in a crash. (See "Canadian Crash Tests," Page 5.)

So far, only the Wayne Corporation, a bus manufacturing company, has agreed to provide predrilled holes in their seats so that school districts can retrofit their buses with lap belts.

Wayne's vice president for product assurance, Robert Kurre says that when the company installs belts in large buses, it uses the seats that it installs on small school buses, which are required to be equipped with lap belts. They come with an additional leg support and braces in order to withstand the added force that a seat belt would concentrate in a crash. This was despite a NHTSA ruling that the present seats are adequate in a crash.

Kurre says the company goes to the additional expense because of potential liability problems. The cost of installing seat belts is $1,200 to $1,500 per bus, he said.

In October 1984, Wayne petitioned NHTSA to amend FMVSS 222 to set a standard covering the installation of safety belts in school buses. In its petition, Wayne said, "pro seat belt organizations have taken up NHTSA's suggestion and are lobbying local authorities to specify seat belts in their new bus purchases. In some instances, pressure has been so great that local authorities are attempting to retrofit older buses with seat belts."

Wayne reported that over 35 bills have been filed in 13 state legislatures seeking to require seat belts, and U.S. Rep. Peter Kostmayer, Pennsylvania Democrat, has filed a bill to provide federal incentive grants to states requiring them.

"The controversy surrounding the seat belt debate has created confusion rather than enlightenment," Wayne said. "Questions have been raised and conflicting information bandied about concerning the number

(Cont'd on page 11)

School Bus Statistics: It's Safer Inside

School buses provide one of the safest modes of transportation available, according to the National Highway Traffic Safety Administration. Since 1977 NHTSA reports an average of 12 school bus occupants have died each year in crashes...

The most dangerous place for a child is not the interior of a school bus, but its exterior. An average of 66 children are killed each year as they enter or exit school buses, NHTSA says. In 1983, the last year for which data are available for such pedestrian fatalities, NHTSA reported 44 pedestrian deaths. Two-thirds of them were children under nine years of age.

Of the 139 people killed in fatal school bus crashes in 1983, only 18 were riding in buses. The remainder were pedestrians, bicyclists, other drivers, and their passengers.

State data on school bus crash injuries are incomplete. Where numbers have been collected, all injuries are lumped together making it impossible to distinguish between scratches and more serious injuries. Although the Department of Transportation and National Transportation Safety Board have attempted to study bus crashes that do not involve fatalities, investigation teams have been stymied because so few crashes occur that offer sufficient data.

The only figures available come from the National Safety Council and those are derived from state data and amount to no more than rough estimates. However, for the 1982-83 school year, the safety council estimates that 3,300 pupils were injured in 2,000 school bus crashes.

Photographs from Transport Canada Film

Large buses are safer for riders.

Large bus absorbs crash forces, lessens injuries.

Canadian Crash Tests

Will Lap Belts Do More Harm Than Good?

Recent tests conducted by the Canadian government indicate that in severe frontal impacts, lap belts in school buses could do children more harm than good.

The 1985 study of lap belt performance in frontal impacts was conducted by Transport Canada, the equivalent of the U.S. Department of Transportation. The Canadians conducted three full-scale 30 mph barrier impacts using various sizes of dummies, some equipped with instruments to record injury levels. The vehicles tested were a 66-passenger Blue Bird school bus, which meets U.S. standards designed to protect unbelted occupants, and two smaller buses seating 20 and 22 passengers.

The lap belted dummies on the large bus recorded head impacts two to three times more severe than the unbelted dummies. But by far the worst scores were recorded by the lap belted dummies on the small buses.

The results were not surprising, says Dr. Kennerly Digges, deputy associate administrator for research at the National Highway Traffic Safety Administration (NHTSA). In 1978, sled tests by the safety agency showed that lap belts "caused an increase in peak accelerations," resulting in harder head impacts with seat backs.

Digges noted, as have other NHTSA officials, that in side and rollover crashes, belts would provide safety benefits to school bus occupants. However, he contends that lap belts for large buses are a poor investment from a cost-benefit point of view. "You'd be better off spending the money on better brakes and better drivers," he says.

In Canada, large school buses meet safetv standards that are smiliar to U.S. requirements. However, small Canadian school buses weighing less than 10,000 pounds are not equipped with lap belts and the head protection zone and seat spacing measurements differ from U.S. requirements.

Transport Canada concluded that in the tests "the belted dummies experienced higher head accelerations, lower chest accelerations, and more severe neck extension than did the unbelted [dummies]. This indicates that if lap belts are installed on current designs of school bus seats, a greater potential for head injury exists."

The report said that the "passive occupant restraint system (compartmentalization) required [by Canadian safety standard 222] since 1980 functions as intended during frontal impacts and provides excellent protection for occupants."

The "School Bus Safety Study" was written by G.N. Farr, an automotive safety engineer with the crashworthiness section of Transport Canada. The tests were conducted under contract with Calspan, a private research company.

William T. Gardner, head of crashworthiness engineering for Transport Canada, says the tests were conducted because it might be more damaging to add lap belts and previous studies indicated that head and neck injuries might be aggravated by them. The tests were done to answer those questions. About 55 percent of all school bus crashes in Canada during 1981 were frontal, the report noted.

The engineers tested a 66-passenger 1984 Blue Bird bus, a 1984 Campwagon van conversion type, 20-passenger bus, and a 1984 Thomas Minotour I, 22-

(Cont'd on page 6)

Full-size bus: seat cushions impact.

...But belted dummy's head bears brunt of load.

(Continued from Page 5)

passenger bus built on a Ford school bus chassis. All three are commonly used throughout Canada, the study said.

For the test series, 4-foot, 10-inch, 5th percentile adult female anthropomorphic dummies were used in each bus. Three were belted and three were unrestrained in each bus. Each was instrumented to determine head and chest acceleration during the crash. Some of the dummies were instrumented to measure knee and upper leg injury data. Other, smaller dummies were placed on the large bus to provide a photographic comparison with the larger dummies.

None of the test dummies were certified for compliance testing under U.S. Federal Motor Vehicle Safety Standard (FMVSS) 208. Therefore, a calculated head injury criterion (HIC) level of 1,000 for the dummies used in these tests cannot be correlated with the HIC level of 1,000 set as the upper limit under the U.S. occupant safety rule. However, the measurements obtained in the Canadian crash tests can be used to compare lap belted and unbelted performance of the dummies used in each of the school bus tests.

The barrier crashes of the two smaller buses showed that in all cases, the dummies secured by lap belts measured HIC values exceeding 1,000—and in some cases, scores in the 2,000 plus range were calculated. All unrestrained dummies had HIC values of less than 1,000.

"From these results," the Farr report said, "it must be concluded, that for frontal impacts, the restrained occupant would receive more severe head injuries than the unrestrained one. One can further conclude that injuries could very likely be life threatening."

The test films showed that many of the belted dummies' heads struck the seats in front of them so violently that the force bent the heads back on the necks at almost a 90 degree angle. The action was severe enough to be judged to cause serious injury, Farr said.

In the large school bus, the HIC values for the lap belted dummies were about three times greater than for the unrestrained dummies. However, none measured HIC values in excess of 1,000.

The reason they didn't, says Transport Canada's Bill Gardner, is that a 30 mph barrier crash of the small

(Cont'd on page 8)

Busette: "Soft" landing for the unbelted.

Belted copassengers could have fatal injuries.

SUMMARY OF CRASH TEST RESULTS

Dummy Number	Belted	Unbelted	HIC*	Chest* Acceleration (g)	
1		X	NA	60.4	**Large Bus**
2	X		649	40.8	Bluebird, 66 Passenger
3	X		629	28.1	Weight 8147 kg
4		X	220	34.2	Velocity 48.8 km/h
5		X	205	48.2	Deceleration 15 g
6	X		731	25.0	Dynamic Crush 1371 mm
					Body Slide 775 mm
1	X		2,505	40.1	**Busette**
2		X	893	47.9	Thomas Minotour, 22 Passenger
3	X		1,144	38.6	Weight 4033 kg
4		X	741	59.8	Velocity 47.0 km/h
5	X		1,173	42.4	Deceleration 19.5 g
6		X	494	44.9	Dynamic Crush 729 mm
					Body Slide 381 mm
1	X		2,016	32.5	**Small Bus**
2		X	369	21.1	Van Conversion Type
3	X		2,195	32.2	Campwagon, 20 Passenger
4		X	946	42.0	Weight 3056 kg
5	X		1,711	37.5	Velocity 47.1 km/h
6		X	607	24.4	Deceleration 49 g
					Dynamic Crush 495 mm
					Body Slide 0

*HIC (Head Injury Criterion) data not comparable to scores obtained by dummies used for testing under FMVSS 208. Generally, the higher the HIC, the greater the likelihood of injury.

Source: Transport Canada

(Continued from Page 6)

bus is much more severe than that of a 66-passenger bus. The smaller buses are much stiffer than the large bus and, in addition, the smaller buses stop much more quickly. Because the large bus body slides on the frame and its front end crushes, much of the crash force is absorbed before it is transferred to the occupants.

The high head injury loads measured by the dummies were, in part, a result of the stiffness of the dummies used in the test, the report noted. Gardner pointed out that the severity of the rearward flexure experienced by the dummy heads after they hit the seats in front of them is particularly noteworthy because the stiffness of the dummies should have acted to decrease the amount of flexion.

During the crash of the large school bus, two unrestrained dummies the size of six-year-olds struck the seat backs below the seat back frame spreading the forces of the crash over the dummies' bodies. "It is expected that this size of child would be better protected by the 'compartmentalization' concept than a larger child," Farr said.

An adult-sized lap belted dummy in the driver's seat of the large school bus was struck in the head by the steering column in the crash. The driver probably would have suffered serious or fatal injuries in the crash, Farr concluded.

There were other problems noted. On the Blue Bird bus, the fuel tank cap was punctured. "If a rollover had occurred," Farr said, "a significant leakage of fuel would probably have occurred."

On the Thomas Minotour bus, a gasoline tank hose broke loose. "If even a partial rollover had occurred," Farr reported, "a major fuel spill would have happened."

During the crash of the school van, two of the three left side windows shattered, hurling "a tremendous number of small shards of tempered glass" throughout the bus interior. Had the bus been filled with children, the glass could have caused severe eye and body injuries, Farr said. He suggested that window glazing and fuel systems receive further attention from ministry scientists.

Because of the Canadian test results, the U.S. National Transportation Safety Board, which is conducting an evaluation of large FMVSS 222 buses, has decided to expand its study to examine how well small, van-type school buses are protecting their occupants in crashes. (See "Safety Board Studies," Page 11.)

Railroad Crossings

School districts should establish and enforce procedures for checking on whether bus drivers are stopping at railroad crossings, the National Transportation Safety Board recommends.

The recommendation was issued following the board's examination of a train collision with a school bus near Carrsville, Virginia, in 1984. A 108-car train collided with the bus as the driver was trying to back off the tracks. Board investigators found that the driver failed to stop before she started to cross the tracks. The train hit the front of the bus, which was knocked off its chassis. The body then rolled over. Two of the 26 students were seriously injured and the driver died. Board investigators learned that it was not unusual for bus drivers in that school district to fail to stop at rail crossings.

Retrofitting School Buses With Lap Belts? Handle With Care

School districts that retrofit their school buses with lap belts should be very careful about their installation, say officials of the National Highway Traffic Safety Administration (NHTSA) and the Wayne Corporation, a bus manufacturing company.

Under no circumstances should belts be added to buses that were manufactured before 1977. The old bus seats have an exposed rail. Because of the dynamics of a crash, lap belts would actually increase the force with which an occupant's head would strike the rail.

NHTSA has said that it is safe to attach the lap belts to the current seats in poststandard (1977) buses. That statement is still true, says Ralph Hitchcock, director of NHTSA's office of vehicle safety standards.

Hitchcock says that if school districts want to retrofit school buses that were manufactured after 1977, they should first make sure that they purchase lap belts that meet Federal Motor Vehicle Safety Standard (FMVSS) 209. Also, if the manufacturer sells buses that have a lap belt option, school districts should check to see how they are installed and, if possible, follow the manufacturer's installation method.

In general, belts should be attached to the seat frame: if the belts are attached to the floor, children's

feet will get tangled in them and they will probably get dirty, thus discouraging their use, Hitchcock noted. Some frames are manufactured with predrilled holes for installation of the lap belts. Others have a round bar about which the belt can be wrapped and fastened. Still others require that belt brackets be welded to the seat frame.

In the case of buses that require welding, Hitchcock says some school districts have contracted the work out to local garages. Such a practice often results in faulty workmanship, he says, because garage personnel are usually not familiar with the strength requirements necessary to ensure safe restraint. If the belt brackets must be welded to the seat frames, Hitchcock said, professional engineers should check the installation.

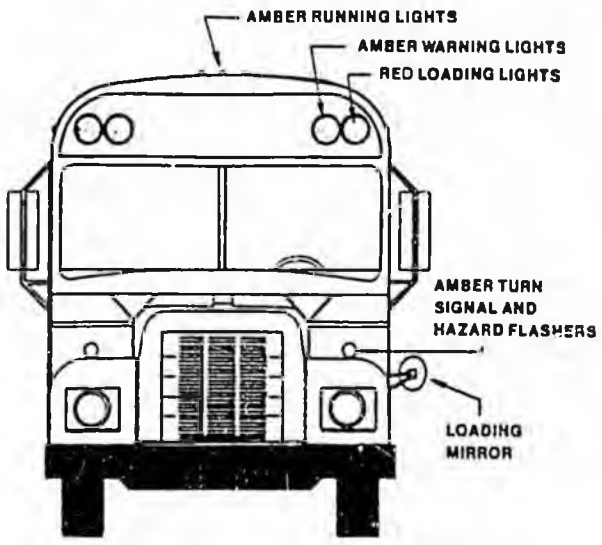
When Wayne installs belts, it provides seats equipped with an extra leg mounted at the midpoint of the seat. Braces are added to both legs. The additional reinforcement helps spread crash forces evenly to the seat frame and body wall. A Wayne representative said the seats are identical to those they install in small school buses.

Such a practice is probably not necessary, Hitchcock says, given the infrequency of very severe crashes. However, school districts that choose to retrofit their buses should at least be aware of some of the drawbacks of not reinforcing the seats in their large buses. In the rare case of a violent crash, it is possible that unbelted occupants would be hurled into the back of a seat in which belted occupants are sitting. It is not clear that the seat holding the belted occupants would be able to sustain the load.

In the small buses meeting FMVSS 222, the bus occupant seating and protection rule, the seats are required to withstand 5,000 pounds of crash force, a considerably stronger requirement than that required for the seats on large buses. NHTSA set the higher requirement for small buses because small van-type bus crashes are likely to be much more violent than large bus crashes.

If money wasn't limited, says Hitchcock, and installation were readily available, the ideal belts to install in school buses would be combination lap and shoulder belts. Those systems would solve the problem of jackknifing in frontal crashes, and would do a better job of keeping heads, arms, and shoulders where they belong in a rollover crash.

School districts considering whether they want to install belts should consider the routes and speeds of their buses, Hitchcock noted. For example, school districts with buses traveling over mountainous terrain at high speeds might find belts more useful than urban and suburban districts with more flat terrain where buses travel relatively slowly.



Two Texas Studies Probe Illegal Passing Of School Buses

An evaluation of stop arms on school buses reveals the stop sign on a swing arm can cut down illegal passing by 30 percent or more, a Texas study shows.

The research into their effectiveness followed a pilot study by the Insurance Institute for Highway Safety documenting that illegal passing of school buses stopped to load or discharge passengers is a dangerous problem. In recent years, bus drivers have reported increasing numbers of motorists breaking the law.

Since 1980, the Texas Department of Public Safety has reported a total of six school-bus-related pedestrian fatalities and 150 injuries — 35 of them incapacitating. In each case, the victim was under the age of 16 and was not struck by the school bus.

Researchers for the Insurance Institute for Highway Safety say that although some of the illegal passing is the result of deliberate decision-making by the motorist, some of it may be the result of confusion.

In the 1984 pilot study conducted for the IIHS by the Texas Transportation Institute, observers in two large urban school districts reported that on an average day, each school bus was passed illegally by about seven cars.

A total of six bus routes were observed, three of them in Houston and three in San Antonio, for a total of three days each. There were 8.33 illegal passes per day per bus in Houston, and 4.65 per day per bus in San Antonio. Over 77 percent of all the illegal passes occurred on multiple lane highways.

(Cont'd on page 10)

(Continued from Page 9)

However, 25 percent of the illegal passing occurred only after the passing vehicle first slowed down and many vehicles stopped when they were not required to do so. In addition, a survey of drivers also indicated they were confused by the complex light systems on today's school buses.

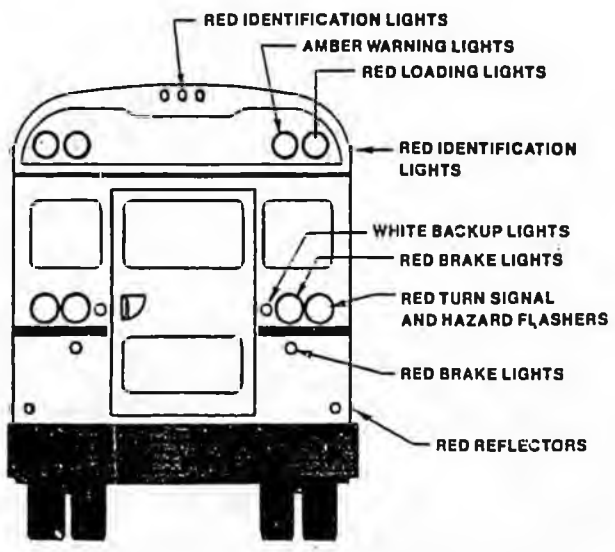
The rear of a new bus is equipped with 12 signal lights plus three running lights. (See figures.) Two of them are large red brake lights, and two of them are small red brake lights. There are two large yellow warning lights and two large red loading lights. There are also multiple sets of lights on the fronts of buses. In general, the public is required to stop only for the flashing red loading lights and may proceed with caution at any other time.

In the pilot study, drivers were asked whether they would or would not stop for various combinations of light signals. Although the survey probably elicited cautious responses, 6 to 10 percent said they would not stop when, in fact, they would be required to stop. Forty-eight percent said they would stop if only warning lights were lit, 31 percent if only flashing red loading lights were lit, and 90 percent said they would stop for loading lights if they were on the opposite side of a divided highway — where they are not required to stop.

In the later study which was mandated by the Texas legislature, the Texas Transportation Institute observed the effects of adding a swing-out stop arm that is activated when the red loading lights are illuminated. This study revealed that the stop arm lowered the likelihood of illegal passing by 30 percent or more.

Assuming that the 30 percent reduction in illegal passes is 50 percent effective in reducing collisions, the Texas Transportation Institute concluded, in Texas, "45 accidents [involving pedestrians] could be eliminated in 10 years."

A second survey of drivers showed considerable confusion over the meaning of the array of light signals on buses. However, the researchers did find that the stop arm "significantly enhanced" driver understanding.



Safety Standards

Since 1977, new school buses have been required to meet four sets of federal safety standards. They are:

- Federal Motor Vehicle Safety Standard (FMVSS) 220 covers school bus rollover protection. This rule is intended to produce adequate structural integrity of the bus during a rollover crash to minimize the roof crush and permit escape through the emergency exit.

- FMVSS 221, school bus body joint strength, requires interior and exterior body panel joints that will prevent or reduce panel separation in a crash.

- FMVSS 222, school bus seating and crash protection, sets occupant protection standards for passengers and establishes passive barriers to prevent or reduce injuries. This rule requires strengthened seats capable of withstanding crash forces. It also requires higher seat backs to help prevent whiplash in rear impacts. The backs of all seats must be padded to reduce injuries to occupants in frontal impacts and spread the impact. Seat backs are also required to yield in an impact in order to help absorb the crash forces.

- FMVSS 301, fuel system integrity, to prevent fuel spillage and fires in the event of an impact.

Small school buses weighing under 10,000 pounds must be equipped with lap belts at all seating positions. Large buses are required only to provide the driver with a lap belt.

SUMMARY OF DATA FOR SCHOOL BUS ROUTES			
	Percent With At Least One Illegal Pass	Number of Vehicles Passing at Stops With Illegal Passes	Number of Illegal Passes Per Bus Per Day
TREATMENT ROUTES (19)			
Before Tests	18	2	6
Treatment Period	9	1	2
CONTROL ROUTES (6)			
Before Tests	13	1	2
Treatment Period	14	1	2

Source: Texas Transportation Institute

Safety Board Studies Crashes to Evaluate Large Bus Protection

The National Transportation Safety Board is studying crashes of post-1977 large school buses to ascertain whether safety standards are adequately protecting occupants.

The safety board had expected to complete the study by the end of 1985, but following publication of Transport Canada's crash tests of large and small school buses, the board is now considering expanding the study to include crash investigation of vans equipped as school buses, and other small school buses. As part of the study, board investigators are seeking to evaluate whether buses should be equipped with lap belts.

"In the accidents we have seen so far, there is no clear pattern emerging that indicates lap belt installation would have made that much of a difference in serious or fatal injuries on large buses," a board official says.

One of the major problems with evaluation of lap belts, is the lack of school bus injury data, the official says. There is no uniform reporting of school bus related injuries. When they are reported, the injuries are lumped together so that there is no way to differentiate between minor scratches and severe injuries. The board is especially interested in investigating crashes of conventional large buses equipped with lap belts, and needs to be notified when and where they occur, the official said.

In 1983, the safety board said it did not believe there was sufficient data to justify a mandatory requirement for lap belts in large buses.

School Buses and Lap Belts

(Continued from Page 4)

of belts, their length, floor vs. seat anchorage, the type of buckle, adequacy of supporting structures, retrofitting, belt access, release, injuries, etc., and the confusion continues."

NHTSA should promulgate a rule specifying exactly how seat belts should be installed, said the manufacturer, so that school districts wishing to voluntarily adopt them and the manufacturers that produce them will have some guidance, and theoretically, some immunity from potential liability.

In Fairfax County, Virginia, the Board of Supervisors voted to appropriate $100,000 to provide seat belts for new school buses. Assistant Superintendant William Shadle says he can't spend the money yet because he is required to follow state specifications. And so far, the state has not decided whether it will issue interim specifications covering the installation of seat belts without NHTSA's guidance.

Shadle says that in the past school year, the county recorded 71 mishaps involving school buses. There were no deaths and the most serious injury was a dislocated shoulder. He adds that without putting an aide in every bus, a safety belt rule would be hard to enforce. "We have 800 buses with 5,400 daily runs in 180 schools," said Shadle. "I just can't get too enthusiastic. Of course, if we have to do it, we'll do it."

Some NHTSA officials believe the Wayne petition will be answered affirmatively soon. However, the proposal for rulemaking must be cleared by the White House's Office of Management and Budget, a detour that could delay the decision.

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V

FEASIBILITY OF REQUIRING SCHOOL DISTRICTS TO INSTALL SEAT BELTS ON SCHOOL BUSES

A REPORT PUBLISHED
BY
THE BUREAU OF LEGISLATIVE RESEARCH

Staff Report: 84-19

Date: September 20, 1984

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SCOPE OF STUDY

On March 25, 1983 a Jonesboro School District bus was involved in a traffic accident near Newport, Arkansas. The teacher-driver, four (4) other teachers and four (4) students were killed. This tragedy heightened the existing concern for school bus safety held by parents, interested citizens, school officials and the legislators. The installation of seat belts on school buses has been debated as a major increased safety factor for the past few years. This Staff Report will examine the feasibility and ramifications of installing seat belts on school buses. A major source of data was obtained from the Los Angeles (1983) seat belt study which compiled a large number of reports and articles as well as comments from various associations/ organizations having an interest in the seat belt study. In addition, the American Transportation Corporation of Conway, Arkansas - Milt Honea, President and Jerry Williams, Vice President of Marketing - provided considerable input.

Two study proposals have been referred to the Joint Interim Committee on Public Transportation for study of the school bus safety issue - Interim Study Proposal 83-4 by Representative George and Interim Study Proposal 83-27 (House Resolution 84) by Representative Foster. Interim Study Proposal 83-4 by Representative Lloyd George requires the joint interim committee to study "the overall safety of school buses of the type used in Arkansas for the purpose of determining practical structural changes that could be made in school buses to make them safer for passengers and operators." Interim Study Proposal 83-27 by Representative Foster requests that a study be made "of the feasibility of legislation requiring school buses in the State to be equipped with seat belts, to provide protection to school children from death or injury in cases where school buses are involved in accidents."

BACKGROUND

Federal Requirements on Seat Belts in School Buses

The National Highway Traffic Administration (NHTSA) is the federal agency responsible for establishing minimum federal standards for all motor vehicles. Their responsibility includes the safety and crashworthiness of all motor vehicles, including school buses.

The NHTSA does not require seat belts in school buses. They have been petitioned to require seat belts in school buses and to require the installation of seat belt anchorages to simplify placement of seat belts by local jurisdictions; however, they have denied the petitions stating that

> "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 used."

NHTS Administration Federal Register, Vol. 48 #201, Oct.,1983.

The Agency noted that any jurisdiction wishing to buy and install seat belts in school buses can do so.

Federal Standards

According to American Transportation (AmTran), a manufacturer of buses, federal motor vehicle standards must be adhered to for all bus-type vehicles. Effective April 1, 1977, however, four additional standards were added that increased the safety of school buses significantly.

1. Standard #220 - School Bus Rollover Protection

   This standard specifies performance requirements for the structural integrity of the passenger compartment of school buses when subjected to forces that can be encountered in rollovers. The standard requires that upon the application of vertical downward force to the bus roof equal to 1-1/2 times the vehicles unloaded weight, the vehicle roof shall not crush more than 5-1/2 inches, and the emergency exits shall be capable of being opened with the weight applied and after its release. This, along with each standard is tested, and if a bus chosen at random is not in compliance, all buses manufactured with the model text can be recalled.

2. Standard No. 221 - School Bus Body Joint Strength

   This standard addresses the problem of exposure of school bus passengers to sharp metal edges when during an accident body panels become separated from the structural components to which they have been fastened. It seeks to reduce the likelihood of lacerations by

requiring that body joints on school buses have a tensile strength equal to 60 percent of the tensile strength of the weakest joined body panels.

3. Standard No. 222 - School Bus Passenger Seating and Crash Protection

This standard specifies seating, restraining barrier, and impact zone requirements for school buses. This standard relies on compartmentalization between well-padded and well-constructed seats to provide occupant protection on school buses.

4. Standard No. 301 - Fuel System Integrity

The original standard specifies requirements for the integrity and security of fuel tanks, fuel tank filler pipes and fuel tank connections to minimize fire hazard as a result of collision in all passenger cars manufactured after January 1, 1968. This standard was amended to substantially upgrade the performance requirements. The effective date is September 1, 1975, with additional requirements. The effective date is September 1, 1976, and September 1, 1977. The standard now covers all vehicles under 10,000 pounds (except motorcycles) and requires preservation of fuel system integrity by limiting fuel spillage incidental to severe front, rear and lateral crash tests.

The Compartmentalization Concept (Standard 222) is considered by the Department of Transportation members of the National Association of Pupil Transportation Services and officials of AmTran to be the best solution for increased pupil safety on school buses. According to a publication by AmTran, entitled "The 5 most asked questions about School Buses" in 1983, compartmentalization is the best solution because of the following features:

1. Compartmentalization is more manageable. The protective surfaces exist in place without depending on any action by the children or any extra special supervision by the drivers. Seat belts require discipline and supervision to keep them clean, unraveled and in use.

2. Compartmentalization works equally well for 1, 2 or 3 students per seat.

   Today's 39" wide standard seats may contain three small children or two large ones or any combination in between.

Arranging seat belts to properly handle any combination is difficult, if not impossible; the best known solution with seat belts is to restrict each seat to two students and two belts, which has the disadvantage of sharply reducing the carrying capacity of bus fleets.

3. Compartmentalization works whether students have fully developed abdominal areas or not.

   Conventional seat belts, which are lap restraints only, are not suitable for small children whose abdominal area and bone structure are not adequately developed to take the force of a lap belt alone. They need the help of chest harnesses also, which adds to the complexity of a proper seat belt solution.

4. Compartmentalization, once it has done its energy absorbing job, leaves the student free to escape the bus. Seat belts could leave students strapped in, upside down, perhaps unconscious, in burning or flooding buses.

5. Compartmentalization is most affordable.

   Although not a part of the DOT reasoning, this is a factor to be considered. In evaluating the cost of seat belts alone, one should include the cost of retractors and chest restraints, also, since those appear needed. Even more important is the probability that a seat belt solution should lead to two students per seat and greater spacing between seats, thereby requiring more buses for the same student load.

Seat Belt Usage by School Districts

There are two districts in the United States which have installed seat belts on school buses - the Greenburgh Central School District #7 in New York and the Hartland Elementary School District in Vermont.

Acccording to data provided by the Greenburgh Central School District #7 which made a district decision to use seat belts, "No problems have arisen due to the installation of seat belts. Salvatore Corda, the Assistant Business Superintendent stated ". . . they have never had an instance where a child has been struck with a seat belt." Based on statistics provided, they are used by 80 percent of the pupils and repair costs have not been a significant factor. Seat belts are installed on the entire fleet of 60 buses and 20 buses. The Greenburgh District is located approximately 25 miles north of New York City, in a middle class area and serves a mixed ethnic population. The district serves kindergarten through 12th grade pupils and transports

3,200 students (2,500 public and 700 private school students) approximately 540,000 miles per school year. However, staff contacted another source to seek an unbiased opinion. According to the staff of Michael Joyce, Director of Transportation from Long Beach City school who has visited the New York District, use is not that high and repair problems are significant.

The Hartland Elementary School District in Vermont has purchased one new school bus with seat belts in the 1983-84 school year.

The Cost of Installing Seat Belts

According to American Transportation, there would be no problems manufacturing school buses with seat belts; however, there would be an increase in the cost of the bus. Presently, a new bus cost (with chassis which is purchased by buyer) is $21,000. The installation of the seat belts would add an additional $2,000 - $4,000 for a total cost of $23,000 - $25,000 for a new school bus. The seating capacity with the installation of seat belts would be reduced by 60%.

Review of Research Studies on Seat Belts in School Buses

The majority of research studies on seat belts were found to be undertaken in the 1960s and 1970s. No new studies were found other than the study report done by California which referred to the older studies listed. A synopsis is given of each study including the conclusion and/or recommendation.

1. The National Highway Traffic Safety Administration (NHTSA) in 1968-1974 conducted extensive research through crash sled tests. These crash tests concluded that passengers secured to bench seats in a bus by lap belts suffered the most severe injuries in the event of upset or collision. This was because the height and construction of the bench seats produced hazards to the head and upper portions of passengers seated behind.

2. The American Association for Automotive Medicine in 1975 advised against securing young children solely by lap belts in either passenger autos or buses because the abdominal section of young children is not sufficiently developed to withstand the stress caused by lap belts in event of collision.

3. The Virginia Polytechnic Institute and State in 1974, conducted additional studies of seat belts in school buses. Their findings questioned the

compliance of children using seat belts and the ability of drivers to enforce seat belt usage. In addition, the legal and educational barriers to seat belt installation were considered factors that would make seat belts impractical for school buses.

4. The National Motor Vehicle Research Foundation in 1972 conducted 200 crash tests with seat belts and concluded that at least 40 inches of unobstructed area must exist in front of the belted passenger in order to protect the passenger from frontal impact. The greatest danger to a seat belted passenger is impact injury to the head. Seats in buses are typically spaced 22 to 28 inches apart.

5. The National Association of Independent Insurers in 1974 questioned the legal liabilities created by buses equipped with seat belts. Their concern is the enforcement in seat belt usage, and anchorages for seat belts as obstructions to children walking in the bus during boarding and disembarking.

6. The National School Transportation Association in 1976-77 computed the cost of safety belt systems in school buses. Their conclusions were that the economics of seat belts due to hazard, enforcement, vandalism and additional factors were not cost effective. The net result would be loss of bus services with additional children placed on the streets to find their own way to school.

7. The California Highway Patrol commissioned the Southwest Research Institute in 1976 to study seat belts in school buses and concluded:

"a. The interior of an auto is not similar to that of a bus in that appurtenances such as steering wheels, dashboards, door handles, etc., are not present in bus passenger compartments.

b. Should a major accident occur in an auto, it is relatively easy to release seat belts and remove passengers from outside the vehicle. Belted passengers in a much larger bus could not be easily removed.

c. Bus drivers or aides would be tasked with insuring that belts are fastened, as unsecured belts would result in a tripping hazard for other students. Given a bus load of 65 children, the amount of time required to check belts at each stop would be prohibitive.

d. Factors such as vandalism to belts and the possible use of belts as weapons were also cited by the

Highway Patrol as reasons why the device should not be employed."

SUMMARY

The information provided can best be summed up in a listing of pros and cons regarding the use of seat belts in school buses. The listing includes information derived from the listed study, conversations with American Transportation officials, magazine articles, legislators and everyday citizens.

Pros	Cons
Riders are better off restrained than unrestrained if the bus rolls over, crashes into another object, or stops suddenly.	The danger of a small child being trapped by seat belts in a crashed vehicle is greater with seat belts.
Because law requires seat belts in cars, and it is a proven fact they decrease the chances of death in case of impact, children who ride in school buses should also be required to wear seat belts so they can get into the habit of buckling up and we should make every effort to decrease the death percentage.	Seat belts would be used as weapons, thus an increase in accidental injury rate.
	Seat belts would require an assistant to the driver, a supervisor, thereby increasing cost.
	Monitors of expensive equipmnent would be required to ensure that students wore belts and were properly belted.
	Seat belts would be vandalized, thus a great replacement expense.
	There is significant cost to installing seat belts plus a 60% loss in the number of passengers each bus can carry.

Seat belts do not provide total protection as heads, faces, necks and upper torso are permitted to rotate, thus causing possible serious injuries.

Conventional seat belts are not suitable for small children whose abdominal area and bone structure are not adequately developed to take the force of a lap belt alone.

Liability insurance for the use of seat belts due to the possible hazards of the safety devices, in itself, could be excessive.

CONCLUSION

According to data provided by the Public Safety Administration, AmTran and other various articles, school transportation is the safest form of transportation in existence. Twenty-one million children are transported 3 billion miles in the U. S. each year on approximately 380,000 buses.

In 1982, the last year for which data is available, the rate of fatalities in school bus accidents per hundred million vehicle miles was 0.29 (8 deaths). American Transportation Company, Inc., Safety Legislation Concerning School Buses, prepared for the Joint Interim Committee on Public Transportation, May, 1984.

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 to the installation of the seat belts themselves, the outstanding safety records 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.

Legislators could consider stiffer penalties to enforce the existing law that prohibits motorists from passing school buses when they are stopped.

Most school bus fatalities have occured at the loading and unloading point. National School Bus Report, March, 1984. In addition, a large percentage of these fatalities were caused by the driver running over the child passing in front of the bus because he/she could not see that the child had stopped in front of the bus. Arkansas could consider a structural requirement to cut down the possibilities of incidents such as this occuring. However, it is probable that future Federal requirements will eliminate this problem on a national level. Without a doubt, improved driver training programs, stiffer driver requirements, as well as increased maintenance inspections are needed. The major factor contributing to the March 25, 1983 school bus accident near Newport, Arkansas was attributed to "human error."

ANCHORAGE SCHOOL DISTRICT
ALL LEGISLATORS
ANCHORAGE SCHOOL DISTRICT
ANCHORAGE Avenue
P.O. Box 196614
Anchorage, Alaska 99519-6614
AREA CODE [907] 333-9561

March 6, 1986

The Honorable Mike Navarre
Alaska State Legislature
Pouch V (MS 3100)
Juneau, Alaska 99811

Dear Representative Navaree:

House Bill No. 684 relating to school vehicle safety requires seat belts and special safety devices to be installed on all vehicles that are used to transport students. Additionally, it requires seat backs to be at least 28 inches high if the vehicle is over 10,000 pounds. These two issues have been discussed in many states across the country and by national transportation organizations. The general feelings of these national transportation organizations and many school districts, are that the safety of students is of utmost importance in the minds of school administrators and transportation officials. The question is, how best can this safety be provided to the students? There are those who support the use of "seat belts" and those who support "compartmentalization". The current research is not clear on what method is the most appropriate to be used on school vehicles.

Some of the positions taken by various states and national organizations can be found in the Alaska Department of Education publication School Buses and Seat Belts. Some of the positions taken by various groups were:

The U. S. Department of Transportation in Issue Paper HS-806-000 dated September, 1981 states:

"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 National Safety Council in its policy statement Protecting Pupil Passengers in School Buses dated June 28, 1984, states:

"The Council recommends that until further research and testing demonstrate that pupils will be safer by the installation of seat belts in school buses, the Council believes that passive protection provided by compartmentalization as required by the current (1977) federal standard on school bus seating and crash protection, protects seated pupil passengers in school buses with gross vehicle weight ratings (GVWR) greater than 10,000 pounds."

The Board of Directors of the National School Transportation Association (NSTA) in its Spring, 1984 special edition of National School Bus Report, states:

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

The Department of Education, State of Alaska, in 1983 appointed a committee of school bus company representatives and school transportation officers to study school bus safety issues. In February 1985, the committee issued a resolution that since has been endorsed by the Alaska School Transportation Association and the Alaska Association for Pupil Transportation. The resolution states:

"The Alaska School Bus Safety Committee is agreed in its opinion that no legislative or regulatory action be taken in the State of Alaska to require seat belts on school buses until an authoritative body of test data has been produced showing conclusively that the overall safety of the ridership on pupil transportation buses is significantly enhanced."

The Anchorage School District is very supportive of finding ways to improve the current transportation system regarding safety and will continue to work toward that end by using task force review and on-site safety audits. We do believe, that at this time, the research is not clear or conclusive on the use of seat belts or school buses and will not be supporting House Bill No. 684.

Sincerely,

E. E. (Gene) Davis, Ed.D.
SUPERINTENDENT

mp

cc Representative Mike Miller, Juneau, Alaska
L. T. Freeman, Assistant Superintendent for Business Management
Carl LaMarr, Assistant Superintendent for Administrative Services
Bill Miles, School District Lobbyist

Introduced: 2/17/86
Referred: Transportation,
Health, Education and Social
Services and Finance

IN THE HOUSE

BY NAVARRE AND M.M.MILLER
BY REQUEST

HOUSE BILL NO. 684

IN THE LEGISLATURE OF THE STATE OF ALASKA

FOURTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to school vehicle safety; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. AS 28.05 is amended by adding a new section to article 2 to read:

Sec. 28.05.100. SCHOOL VEHICLES. (a) Except as provided in (b) of this section, a school bus or other vehicle for transporting children that is purchased or leased by the state or a school district after the effective date of this Act must

(1) be equipped with seatbelts or, if the vehicle is to be used to transport children under four years of age, child safety devices meeting the standards of the United States Department of Transportation for child safety devices for infants; the number of seatbelts or child safety devices in each vehicle must be equal to the seating capacity of the vehicle;

(2) be equipped with seat backs that are at least 28 inches high, if the vehicle is over 10,000 pounds gross vehicle weight; and

(3) comply with the safety standards of the United States Department of Transportation for school vehicles.

(b) The Department of Public Safety may exempt a school vehicle from the provisions of (a) of this section to the extent necessary to accomodate a passenger who is confined to a wheelchair or who requires special equipment to ride in a school vehicle.

(c) The chief school administrator of each school district and

regional educational attendance area shall set standards for instruction in the use of seatbelts and child safety devices.

(d) The Department of Public Safety shall provide for periodic inspections of school vehicles to ensure compliance with this section.

(e) The driver of a school vehicle is not personally liable for injury to a passenger caused by failure of a passenger in a school vehicle to use a seatbelt or child safety device.

* Sec. 2. This Act takes effect immediately in accordance with AS 01.-10.070(c).

MEMORANDUM

State of Alaska

TO: State Board of Education

DATE: April 2, 1986

FILE NO.:

THRU: Larry Huxel, Director
Educational Finance &
Support Services

TELEPHONE NO.: 465-2865

SUBJECT: Seat Belts on Large School Buses

FROM: Romayne Kareen RK
Pupil Transportation Services

As indicated in our March 26, 1986 memorandum, attached is a one page summary indicating that there are two viewpoints on the issue of seat belts on large school buses, and that additional testing needs to be undertaken in order to answer the question "Would students be safer belted in school buses?".

A task force is being formed to gather and review factual information on the seat belt issue. We will apprise you of meetings, and invite your participation.

Attachment

SEAT BELTS ON SCHOOL BUSES

The traditional way of protecting occupants in passenger cars is through the use of seat belts. In school buses, it is through compartmentalization - containing children within a structurally reinforced passenger compartment of fully padded, high-back seats and crash barriers.

The National Highway Traffic Safety Administration, National Transportation Safety Board (NTSB), and National Safety Council are of the opinion that compartmentalization has worked extremely well and provides a high level of safety for occupants. Additionally, the NTSB which investigates school bus accidents, has stated that current safety standards appear to be effective in eliminating or substantially reducing the majority of school bus passenger injuries, and that there is insufficient justification at this time to recommend extending the mandatory passenger restraint system requirements to large school buses.

Testing conducted by the Canadian Government during 1984, concluded that: (1) compartmentalization provides excellent protection for occupants during frontal collisions; and (2) the use of lap belts in any current design of school bus may result in more severe head and neck injuries for a belted occupant than an unbelted one in a severe frontal collision.

Essentially, in compartmentalized buses, the seats are too close together to use lap belts safely. The National Highway Traffic Safety Administration needs to develop a separate set of interior design standards for lap-belt-equipped school buses. There need to be minimums established for how close the seats may be spaced to prevent injuries to lap-belted passengers.

The Coalition for Seat Belts on School Buses disagrees with official test results and positions of national transportation safety agencies, and has undertaken a movement to have seat belts installed in compartmentalized large school buses.

In summary, available data is interpreted differently by the Coalition and the school bus industry. Neither side has provided verifiable evidence to answer the basic question "Would students be safer belted in school buses?". To answer this question, the National Highway Traffic Safety Administration needs to conduct testing to include various sizes of dummies with all parts of the bodies calibrated; various sizes of school buses; various positions of impact such as front, side, rear and rollover; various crash speeds; and various distances between seats.

Recognizing that such testing may not be undertaken within the next year, a task force is being formed in Alaska to review the various viewpoints of the seat belt issue, and to study factual information available on the subject. A summary of the approach to be taken by the task force is included in the attached memorandum from Commissioner Pugh to Commissioner Lind.

Attachment

MEMORANDUM State of Alaska

TO: Marshall Lind
Acting Commissioner
Dept. of Education

DATE: March 25, 1986

FILE NO.

TELEPHONE NO:

FROM: John R. Pugh
Commissioner
Dept. of Health and Social Services

SUBJECT: Task Force to Address Issue of Seat Belts on School Buses

In February Ramayne Kareen, Pupil Transportation Officer on your staff, requested that our two departments reconcile our position statements regarding seat belts on school buses. Since that time, Division of Public Health staff have met on two occasions with Ms. Kareen and others to discuss this issue.

At the most recent meeting on March 6, Ms. Saundra Hutchins, who chairs the Alaska School Bus Safety Committee, explained to our staff the rationale on which the committee based its position on seat belts, and also reviewed the scope of the committee's activities and interests, which are much broader than that one issue. It was agreed that the committee should appoint a special task force to address the issue of seat belts on school buses. The task force would include selected committee members, as well as representatives of several groups who are concerned about this particular issue, but who haven't been involved previously in committee decisions. In addition, Ms. Hutchins plans to expand the representation on the regular committee to include some parents of school children.

I believe the establishment of this task force will provide a vehicle for continued study of this complex issue, a forum for discussion in which all views can be heard, and a means for pressuring the federal agencies responsible for setting safety standards to undertake the additional research and crash testing necessary to resolve the many unanswered questions of concern to both proponents and opponents of seat belts on school buses.

This department was requested to submit a list of organizations and suggested representatives to be appointed to that task force. I have enclosed a list with our recommendations.

In addition, I am enclosing a brief outline of activities which we think might be appropriate for this task force to undertake, as well as a list of questions to consider.

I understand that Ms. Hutchins plans to bring up this matter for consideration at the next regular meeting of the Alaska School Bus Safety Committee, which is on March 28.

The Department of Health and Social Services will support any efforts of the Department of Education to foster further consideration of this safety issue, and we look forward to participating in the process.

Attachments

cc: Romayne Kareen
Sandra Hutchins

Attachment A

Recommendations by the Department of Health and Social Services for organizations which should be involved in a task force on seat belts in school buses. These would be in addition to selected members of the Alaska School Bus Safety Committee.

Agency/Organization	Suggested Representative
1. Emergency Medical Services Section Division of Public Health Dept. of Health & Social Services	Gloria Way, Planner EMS/Injury Prevention, EMS Section P.O. Box H-06C Juneau, Alaska 99811 465-3141
2. Highway Safety Planning Agency Dept. of Public Safety	Ellen Moore HSPA P.O. Box N Juneau, Alaska 99811 465-4375
3. Alaska Chapter, American Academy of Pediatrics	Clint Lillibridge, M.D. State Chairman American Academy of Pediatrics 4001 Dale Street, #117 Anchorage, Alaska 99508 563-1984
4. National Coalition for Seat Belts on School Buses	Bridget Ernst, Regional Coordinator Box 3331 Homer, Alaska 99603 235-7240 or Laurel Osborne, Regional Coordinator Box 225 Galena, Alaska 99741 656-1345

ATTACHMENT B

Suggested Scope of Activities for the
Task Force on Seat Belts on School Buses

1. Review and disseminate to all interested parties information on all aspects of the issue: pros and cons of different types of seat belts on different types of buses; feasibility of installation and use; costs; crash test data and conclusions for both large and small buses, etc.

2. Review and disseminate to all interested parties new information on both sides of the issue as it becomes available.

3. Monitor related activities in other states and build up a file on documented experience with seat belts as more school districts opt for installation.

4. Identify areas of concern, and unanswered questions, that require more research and crash testing at the federal level. Push for appropriate action.

5. Identify problems with current federal standards which could be solved by modifying the regulations, and which do not require testing. Push for appropriate action.

6. Research actual number of school bus occupant injuries and deaths in Alaska in recent years, for both home-school trips and field trips: by year (before and after 1977 standards) and type of bus; by circumstances; by type of terrain involved; by type and severity of injury involved. Identify problems and gaps in acquiring this type of information.

7. Identify criteria for recommending the most appropriate protective measures for a given school district depending upon predominant terrain and road system, and other considerations.

April 1, 1986

Mr. Lawrence M. Slay, Jr.
P.O. Box 2665
Fairbanks, AK 99707

Dear Mr. Slay:

I appreciated receiving a copy of your March 12 letter to Dr. Burnley regarding seat belts on school buses.

There are advantages and disadvantages to installation of seat belts on large school buses. I am pleased to inform you that a task force is being formed to review the issue.

Until the issue is resolved it is my view that school districts should have a choice of operating school buses with or without seat belts. However, I caution districts that compartmentalization, currently required by Federal Safety Standards, and the use of lap belts are not compatible. This was evidenced by the 1984 Canadian Crash Tests.

During his presentation at the Conference on School Buses, Seat Belts and Safety, held during November 1985 in Anchorage, Mr. Tom Turner, school bus body engineer, discussed this incompatibility. In compartmentalized buses the seats are too close together to use lap belts safely. Seat spacing on large school buses is controlled by Federal Motor Vehicle Safety Standards. Those standards limit the space that may exist between the seats and barriers. This system of occupant protection works until the lap belt is added. With the lap belt added and the resultant passenger jackknife effect during frontal collisions, it is possible for the head to violently strike the seat back causing more life threatening injuries than if lap belts were not used.

A separate set of interior design standards needs to be developed by the National Highway Traffic Safety Administration for lap-belt-equipped school buses. Minimums need to be established for how close the seats may be spaced.

Please be assured that my Administration supports the use of seat belts in passenger cars and the use of appropriate occupant restraints in school vans which do not meet school bus construction standards.

Thank you for taking the time to express your concerns.

Sincerely,

/s/ Bill Sheffield

Bill Sheffield
Governor

cc: Representative Mike W. Miller
Representative Katie Hurley

bcc: Commissioner Marshall L. Lind
Department of Education

Romayne Kareen
Department of Education

CTS #86042HDC0020

BS/MLL/LH/RK/lb/mw

LAWRENCE M. SLAY
P.O. BOX 2665
FAIRBANKS, ALASKA 99707

MARCH 12, 1986

DR. KENNETH BURNLEY
SUPT. OF SCHOOLS
FAIRBANKS, NORTH STAR BOROUGH
P.O. BOX 1250
FAIRBANKS ALASKA 99707

DEAR DR. BURNLEY;

I AM WRITING TO YOU TO EXPRESS MY CONCERN THAT YOU ARE APPARENTLY OPPOSED TO SEAT BELTS, 28" SEAT BACKS AND A PUBLIC SAFETY INSPECTION OF THE SCHOOL BUSSES. I HAVE SPOKEN WITH MANY PARENTS ABOUT THIS PROGRAM AND HAVE YET TO FIND A PARENT WHOSE CHILD RIDES THE BUS, THAT IS OPPOSED.

IT IS INCONCEIVABLE TO ME THAT YOU HAVE NOT PUBLICALLY ENDORSED SEAT BELTS. WE HAVE A LAW REQUIRING THEM IN PERSONAL VEHICLES. I HAVE SEEN 5 SCHOOL BUSSES IN THE DITCH THIS WINTER. IS IT GOING TO REQUIRE A SEVERE ACCIDENT BEFORE YOU ACT? IS THE BUS OWNERS LOBBY SO STRONG THAT YOU DON'T WISH TO OPPOSE THEM?

OUR ALASKA ECONOMY IS NOT IN GOOD SHAPE AND YOU CONTINUE TO ASK FOR EVER INCREASING DOLLARS. LABOR UNIONS ARE CUTTING WAGES AND BENEFITS AND YOU ARE ASKING FOR MORE AND MORE. I BELIEVE THAT THE SEAT BELT PROGRAM IS SOMETHING NECESSARY FOR THE SAFETY OF OUR CHILDREN AND SHOULD BE SUPPORTED BY OUR SUPERINTENDANT. GOVERNOR SHEFFIELD HAS TOLD ME THAT HE SUPPORTS

	Initials	Date
Prepared By		
Approved By		

THIS PROGRAM. OUR FAIRBANKS DELEGATION SUPPORTS IT — WHY DON'T YOU? I UNDERSTAND THAT THE DEPT OF EDUCATION IN JUNEAU IS ALSO OPPOSED. PERHAPS WE NEED TO MAKE SOME NEEDED CHANGES, BOTH HERE AND IN JUNEAU.

AS A PTA WE ARE STARTING A CAMPAIGN OF SIGNATURES AND WE WILL HAVE A SAFE SCHOOL BUS PROGRAM FOR OUR CHILDREN.

Thank You

Laurence M. Slay Jr.

CC GOV SHEFFIELD ✓
MIKE MILLER
KATE HURLEY

CHILD TRANSPORTATION SAFETY IN AUTOS, BUSES

A Logical Discussion of Child Restraints — And No Need for School Bus Seat Belts

Presentation by Loretta Nistler, Alaska Motor Coaches, Inc., Delta Junction, Alaska, at the Seat Belt Symposium — Washington, D.C.

One of the most important factors in the safe transportation of children in automobiles is parental education and the application of that all-too-rare quality: common sense. I shudder every time I see a parent — and most often it's a mother — driving a car with an infant or toddler standing on her lap.

Where I live in Alaska, there is a herd of 400 free-ranging buffalo — yes, North American Bison. The adults weigh 1,500 to 2,200 pounds and they cross the highways when and where they choose. A panic stop — never mind a *collision* with 2,000 pounds of solid bison — even a panic stop will force a driver's body forward — and if there is a small child between the driver and the steering wheel, that child is sure to be injured to some extent. This is an unusual example. The hazard is much the same in congested urban traffic or on practically any road or highway in the nation.

Parents must be made to realize the dangers involved when a child is not only unrestrained in the automobile but is held between the driver and the steering wheel.

Education of parents could be at least partially achieved, I think, through the use of public service-type advertisements during the daytime television shows and during other periods which will reach the parents of small children. There are plenty of experts who know, far better than I, the best times of the television day to make this message effective. The televised material should be factual and sufficiently shocking to emphasize the terrible dangers to the child when parents do not use effective restraint devices, and especially in having the baby "help Mommy drive."

It is indeed unfortunate that many people haven't the sense or foresight to protect their own without government regulation, because there is a definite danger in attempting to over-regulate the public. Most intelligent, safety-conscious adults harbor some resentments at being told how they must do things. We Alaskans, of course, and many other Americans as well, are becoming more and more reluctant to be regulated — to have their personal freedoms of choice taken away.

Loretta Nistler

The use of energy absorbent materials in the lower dash area is an idea which has much merit — the padded dash concept which evolved in the auto industry better than 20 years ago has undoubtedly lessened many injuries and probably saved some lives. It would seem logical to extend this protective material to the lower portions of the dash assembly with the goal of protecting children; it could possibly be a factor, also, in minor accidents, thereby lessening the extent of injury to adult passengers.

Energy absorbent materials are already being manufactured into the frontal portions of most new cars. Rubber strips around bumpers, energy-absorbing bumpers and grills on cars, vans and pickup trucks could figure greatly in reducing the seriousness of injuries to pedestrians and cyclists. We had an excellent example of this in September in my small community. A 16-year-old boy was headed home from school at dusk, walking off the paved shoulder of a major highway. He was struck suddenly by a car which had veered off the road behind him. The car's front bumper came in contact with the boy's left leg. He was thrown to the ground and the late-model car sped off down the highway. Emergency medical technicians were certain the boy had a broken leg, however, x-rays revealed that he was merely bruised. Alaska State Troopers stated later that the energy-absorbing bumper of the newer-model automobile was the only reason the boy was not more seriously injured.

Realizing that the topic of this public meeting is related mainly to automobiles such as passenger cars and vans, my particular concern is for passengers inside school buses. My husband has been the school bus contractor for over 23 years in our rural community of Interior Alaska; I have been associated with the business for the past 16 years. We are active members of the Alaska School Transportation Association and I presently serve as secretary of that organization. I cannot speak from experience regarding accident situations. Due largely to our conscientious, well-trained drivers and a constant preventive maintenance program for our vehicles, we have had no accidents and, therefore, no injuries. But we must, as concerned citizens and responsible adults, be always on the alert for the unexpected.

School bus contractors and operators are the consumers for the school bus industry — the students are the users — we are at the extreme end of the rule-making process. Specifications and minimum standards are set and we are *told* how our buses will be built — we have no choice.

Inside the school bus, we have seen changes in design over recent years. Some of these are good and some are, we feel, not so beneficial.

During almost any public discussion of school bus safety, the matter of restraints such as seat belts is introduced. Restraints inside the school bus, except in those vehicles carrying the exceptional students — the physically and mentally handicapped youngsters, are impractical. The school bus driver, who is responsible for safety and discipline of 60 or 70 or 80 young passengers while he's contending with all sorts of road, traffic and weather conditions, does not need the added problems seat belts would present, not the least of which would be the added responsibility of seeing that each child was buckled up. Then there are the metal ends which some children would use to strike other passengers. Seat belt restraints in passenger cars are designed to keep a body from being thrown through doors or windows and from flying about within the vehicle in case of an accident. Inside the school bus, children are "compartmentalized" for protection. The buses are designed so that the padded seats protect the child forward and back, and window and door designs are such that a child cannot be thrown out of the school bus. Furthermore, the chassis design of school buses differs greatly from that of the passenger car. The heavy steel frame under the bus floor provides tremendous protection in the event of impact. Most school bus bodies will absorb a great deal of the

shock and energy produced in a crash situation. The family car does not offer this type of protection and the passengers take as much stress in a collision as does the automobile.

A recently completed study by the Department of Transportation — School Bus Passenger Seat and Lap Belt Sled Test — involved testing of nearly 50 different seating configurations, with and without seat belts. The final report (DOT HS 804985), in making its conclusions and recommendations states: "Lap belts do not appear to have a significant effect on the response characteristics of a 50th percentile adult male dummy . . .". Seat belts for bus drivers are mandatory, however, and should be worn at all times.

The people who write the national standards for school bus manufacture have, quite correctly, proceeded on the theory that protective surfaces inside the bus would serve better than restraint devices. However, Motor Vehicle Safety Standard No. 222 established a standard for seats which must be involved in a crash situation to reach their effectiveness. The new seats are a minimum of 24 inches high from the seat to the top of the back. They are designed to *contain* a child in the event of a crash. In the meantime, while we are prepared for that crash, and hoping it never occurs, those high-backed seats are creating new problems all their own. Young children — first grader Marcie, who is 42 inches tall and second grader Shannon, 43 inches tall, will not stay seated because they cannot see anything except the back of the seat in front of them. It's dark and there's nothing to see outside the window, so they stand up to talk to or play with other youngsters in front of them. Marcie's throat is then even with the top of the seat back. The only time the bus driver can see Marcie is when the child is standing up. The high seat backs prevent the bus driver from seeing, with a quick glance in the mirror, what is going on behind him or her. The higher-back seats provide much better cover for playing with knives, vandalizing the bus, abusing other children, and even using or selling dope.

Before Standard 222, there were no specific guidelines on the height of seat backs; they varied from 18 to 22 inches, with 20 inches being the average. The National School Transportation Association feels that a 22-inch seat back would be ideal.

The higher-back seats are designed to protect the children in the event of a crash, but they've done nothing to improve the day-to-day safety and behavior of the young passengers. It is the general consensus of the school bus operators with whom I've talked that a seat back height of 22 inches, on frames built strong enough to withstand the impact of a crash situation, and sufficiently padded with energy absorbent materials would not only provide a containment factor in the event of a crash but would also improve the everyday safety and discipline situation within the bus.

Recent improvements to school bus interiors include the addition of padded "modesty panels" directly in front of the first seat on each side of the bus. This panel complements the practice of containment to protect those children in the front seats. Some manufacturers install padded rub rails at shoulder height for the average, seated student. While this is not necessarily a safety requirement, it does increase passenger comfort.

Along with the improved padding on seats and the addition of the modesty panels, one seat has been shortened to allow clear access to the rear emergency door. The standard 66-passenger bus is, therefore, reduced to a 65-passenger rating.

All these improvements, however, result in less leg room between seats. There is no federal standard for minimum spacing -- only a requirement that the seats must be spaced no more than 25 inches apart, front to back, to "contain" the children in the event of an accident. In order to continue using the standard length bus chassis, manufacturers often space seats so closely together that they are uncomfortable for the older passengers.

With the possibility of temperatures such as minus 25 by the end of October and minus 45 by the end of November in Alaska, basketball is our most important high school sport — football is rather out of the question. About the only thing that keeps our teams from traveling is temperatures colder than minus 45 degrees. And the *closest* competition is 100 miles away. Because they recognize the school bus as the safest (and most economical) means of transportation — the teams travel by school bus. But they do not travel comfortably. Consider Bill, who is a guard; he's 6 feet tall — not at all tall for a basketball player — and he requires more than 24½ inches of seat space from rump to knee to sit comfortably, facing forward. Or Ray, who plays center; he's 6 feet, 4½ inches tall and needs 26 inches of seat space. Neither of these young athletes is extremely tall, yet they need at least 25 inches of seat space.

We needn't consider only the athletes — a freshman girl who is 5 feet, five inches tall and about 20 pounds overweight needs 24½ inches of seat space. A slender sophomore boy at 6 feet tall needs 23½ inches of space. A 1980 65-passenger bus on which we recently took delivery has seat spacing — leg room — which varies from 23 inches to 23¾ inches. This is not enough to allow older students to travel with any degree of comfort, whether on activity trips or simply to and from school.

Safety for passengers inside school buses is far greater today than it has ever been. With some refinements of the compartmentalization features already in use, our school buses will be even better equipped to provide safe and efficient transportation for thousands of youngsters every day.

Editor's Note: Daily we are asked, "If seat belts save lives in cars, why not in school buses?" Loretta states the reasons well.

COMMUNICATIONS WITH THE COMMUNITY AND MEDIA *continued from page 23*

In our state, we have found that working positively and constructively with the public and each form of media has benefited us all.

As we look at the headlines of today, we see reports of increasing inflation, fuel shortages, fuel cost increases, strikes, shutdowns of assembly lines. So much bad news that it begins to seem that there is no good news.

And in some areas, this may be true. However, the history of our times indicates that periods of strife, dissent and negativism have always been followed cyclically by cooperation, positive progress and optimism.

There is no doubt in my mind that we shall solve the issues facing each and every one of us, and come out of it even stronger in our individual and collective resolves to reach a new plateau of goal achievement and to upgrade those goals to even higher levels so that when we face the issues of the 1990s — we can look back and say, as Winston Churchill might have said it, "We had the tools — we did the job — and thank God for all of the supervisors, contracts, all of our co-workers and others who saw their duty — and did it."

Those of you in attendance, and others, are learning, or have learned how to cope with today's problems through conferences such as this, and through other means of communication.

KENAI PENINSULA BOROUGH SCHOOL DISTRICT

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

November 12, 1984

Agenda Item 9.c.

M E M O R A N D U M

TO: Board of Education

FROM: Thomas E. Overman, Associate Superintendent/Planning and Operations

SUBJECT: Seat Belts in School Buses

Penny Little, bus transportation supervisor, and I researched the issue of installing seat belts in school buses. Attached to this memorandum is Mrs. Little's report, as well as information provided by Romayne Kareen of the State Department of Education.

The following is a short summary of our findings:

(1) Large school buses are not automobiles. This may sound like a very simple conclusion; however, when one recalls the video tape presented to the board, it involved only automobiles. A school bus is much higher and larger, and, therefore, does not react in the same way in an accident as an automobile. Thus, its passengers are not affected in the same way as in an automobile. They are not in close proximity to doorways to be thrown out. The seat backs are built high and are padded, creating a compartment for the passengers to stay in. A case in point in recent district history would be the automobile/bus accident involving the Seward bus approximately four years ago. If you will recall, there were only minor injuries to any of the students aboard that bus, while the driver of the automobile was killed and the automobile itself was totally demolished.

(2) Seat belts in buses could cause increased injury due to the decrease in rapid bus evacuation time. Each year, the district runs evacuation procedures for students. If there was an accident, fast evacuation could become very essential to the safety of the students, when having to hurry and unfasten seat belts, etc., could create panic and cause a decrease in the amount of evacuation time. Therefore, in case of fire, or if a bus was in water, this could cost the lives of many of the students. There is also conflicting data that seat belts could be harmful to younger students in case of accidents.

(3) Statistics indicate that school bus transportation is the safest form of ground transportation in the United States. Most deaths involved in school buses occur outside the bus. At the present time, the district and the state are carrying on a joint effort in experimenting with a sonar device that is installed on the front and the rear of the bus, which will allow the driver to detect students in the driver's blind spots.

(4) Cost - There are two areas in which the use of seat belts would affect the cost of school bus transportation. The first would be the amount of time it would increase the routes. It has been estimated that the time for each stop would increase by approximately 25 seconds. This would increase the length of time approximately 30 minutes per route in the

Seat Belt Memo
November 12, 1984

AM and PM. This increase would not only affect the cost of the transportation, but also increase the amount of time students would be on board a bus. As the board is well aware, the district already has students riding extremely close if not over the maximum number of hours allowed by the state. The second cost area affected would be that of installing the seat belts on buses. It is estimated that on a new bus, it would increase the cost by approximately $2,000. To retrofit older buses, the cost is estimated at between $6,000 and $7,000 per bus. This increase would also be compounded by the fact that the capacity of buses would be reduced to two per seat. At the present time, most of our buses will hold 66 elementary students. This number would be reduced to approximately 44 per bus. To accomodate the decreased seating for elementary students, the district would have to add approximately 15 buses into its system. At the present cost per bus of $229.14 per day in the Kenai/Soldotna area, this increase would cost approximately $3,437 per day or an annual increase in transporation costs of $618,878. Currently, the State of Alaska does not require the use of seat belts in the buses, nor would the state help share in that cost if the district were to require it.

It is easy to realize the tremendous amount of emotion generated by this issue, as we are all concerned with the life of any child, whether in a school bus or not. However, it seems the district has taken some positive steps in not allowing school buses that are over ten years old to be used on a regular basis on our routes, and that all new buses being purchased must meet the current standards, thus having compartmentalization created by the high seats with the padding.

att: Letter from Penny Little
Letter from Romayne Kareen
Castoways Article

TEO/blm

KENAI PENINSULA BOROUGH SCHOOL DISTRICT

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

November 9, 1984

MEMORANDUM

TO: Thomas E. Overman, Associate Superintendent/Planning and Operations

FROM: Penny Little, Bus Transportation Supervisor

SUBJECT: Seat Belts in School Buses

In attempting to gather information regarding this subject, I've talked to contractors, bus manufacturers, state department people, drivers and other school district officials. None have a very positive attitude toward seat belts in large school buses. I've enclosed a copy of Ramayne Kareen's response to my inquiry for your information.

Below is a recap of discussions during the ASTA meeting I attended recently, in regard to seat belts on buses. No one attending the meeting (contractors, bus drivers, school administrators, manufacturers) was in favor of mandatory seat restraints on buses.

Ed Swain from Thomas Bus Company was present at the ASTA meeting. He stated that the Thomas Company would have no problem installing seat restraints in buses, but that they did not feel that seat restraints were the answer to safer busing and that the National Highway Traffic Safety organization did not either. Some of the concerns Mr. Swain pointed out are:

(1) Rapid bus evacuation would be impaired.
(2) Vandalism would increase.
(3) Malfunction of the restraint equipment was likely with a great amount of use.
(4) Various physical characteristics and age groups of students would mean constant adjustment.
(5) Monitoring restraint use would be very difficult.
(6) The cost effect would be significant.
(7) Legal liability could be a costly problem.
(8) Estimated additional time would be 25 seconds per stop (averaged).
(9) Only two elementary children would be able to sit in one large seat at the same time, resulting in more buses on the roads.

Some facts about buses vs automobiles in considering accidents are:

(1) Crash pulse of a bus is much longer than an auto.
(2) Slow down period is much less than a car.
(3) The padding of seats and energy absorption is much greater
(4) There is little chance of ejection from the bus because of the design. There are no doors to fly open.

Bus structures have been improved for passenger safety:

(1) Body structure has been improved.
(2) Roof strength has been increased.
(3) Fuel system guards have been installed, protecting the tank, lines, etc.

School buses have been proven to be the safest form of earthly transportation. Contributing factors are:

(1) Driver training.
(2) Good mechanics and maintenance.
(3) Effective bus purchases.

Injuries on buses total approximately 4200/year nationwide. This equates to about one injury per 1,000,000 miles. Most injuries and fatalities occur outside buses, in the area surrounding the bus. This is the area we should concentrate on for improved safety:

(1) Driver awareness
(2) Student awareness
(3) Motorist awareness

Some things we could do to improve our safety are:

(1) Install sonar devices on buses to detect any object (person) directly behind or in front of a bus in the driver's "blind spots".
(2) Install school crossing gates.
(3) Buy strictly buses with higher bodies and snub noses, increasing driver visibility.
(4) Hire bus monitors and crossing guards.
(5) Establish more detailed and longer driver training sessions - increase driver training time, both classroom and hands-on.

Several other safety suggestions are:

(1) Discard buses that are 10 years old, or older.
(2) Get kids out of cars and into buses when going to and from school or on activity trips.
(3) Put more money into driver training.
(4) Insure buses are better maintained and regularly serviced.
(5) Standardize bus systems. Lighting systems should all be the same nationwide. Some have a four light system, some an eight light system. This is confusing to motorists.
(6) Standardize mirrors. Some buses have too many mirrors, some not enough or the right type. Too many mirrors can give a driver vertigo.
(7) Mandate the use of the public address system on buses. Mr. Swain stated that it would cost a school district about $2,000 per bus to install seat restraints on new buses and between $6,000 and $7,000 to retrofit buses. The Thomas Bus executives are not in favor of retrofitting older buses (of course!). The entire seat would need to be replaced on existing buses.

There appear to be substantial legal liabilities in the mandatory seat restraint concept. These liabilities would fall on bus drivers, purchasing agents, bus contractors and the school district. All would probably carry responsibility for the child whose seat belt wasn't fastened. Of course voluntary vs mandatory seat restraints would change this liability somewhat, but would also open a can of worms. The question of who would then be liable if a child was wearing a seat restraint and was seriously injured - if the parent later maintained that he/she did not authorize this.

Both contractors and manufacturers maintain that if there are to be seat belts on buses, there will have to be set standards established. At this time, there are no set standards.

Canada is in the process of crash testing buses with seat belts. The United States government has representatives on site observing the results. We don't know at this point when the results will be availalbe, however we should share the information with the district when received.

Representatives attending ASTA all agreed that seat restraints should be used in cars, but emphasized that buses are not cars.

As an added thought, Dawn Carver estimates that our district would need approximately 15 buses if restraints were used because of the reduced seating capacity. At $229.14 per bus is would then cost the district $3437.10 per day, or $618,678 per year, plus contract COLA.

pl

STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF EDUCATION

DIVISION OF MANAGEMENT LAW AND FINANCE

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

October 30, 1984

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

NOV 7 1984

Dear Penny:

This is in response to your letter regarding safety belts on school buses.

If safety belts were mandated on school buses on a state-wide basis, we estimate that the capital outlay cost would be approximately $11,000,000. This amount was calculated as follows:

> Additional Bus Purchase Cost: $7,400,000 (The seating capacity would be reduced from three to a seat, to two to a seat. For 600 buses of average 65 passenger capacity, we would lose 13,000 seats necessitating an additional 200 buses. 200 buses @ $37,000 per bus = $7,400,000.)
>
> Retrofit Costs: $3,600,000 (600 buses would need to be retrofitted. A school bus manufacturer recently estimated that the cost to retrofit a 65 passenger bus would be approximately $6,000. 600 buses x $6,000 = $3,600,000.)

The U.S. Department of Transportation in Issue Paper HS-806-000 dated September, 1981, copy enclosed, states that "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 National Safety Council in its policy statement on "Protecting Pupil Passengers in School Buses" dated June 28, 1984, copy enclosed, states that "The Council recommends that until further research and testing demonstrate that pupils will be safer by the installation of seat belts in school buses, the Council believes that passive protection provided by compartmentalization as required by the current (1977) federal standard on school bus seating and crash protection protects seated pupil passengers in school

05-E5LH

buses with gross vehicle weight ratings (GVWR) greater than 10,000 pounds. (Compartmentalization involves protecting each passenger by his seat, his seat back and the back of the seat or restraining barrier immediately in front of him.)"

The Department of Education agrees with the positions of the National Highway Traffic Safety Administration and the National Safety Council. We do not plan to introduce a regulation requiring safety belts on school buses, or seek funding for installation of safety belts on large buses. If the district were to decide to require belts on buses, the expense would have to be absorbed at the local level.

If you desire additional information, please feel free to contact me.

Sincerely,

Romayne

Romayne Kareen, Administrator
Pupil Transportation Services

cc: Bill Thomson
Jim Tozer

Enclosures

February, 1983

CASTOWAYS

SEAT BELTS IN SCHOOL BUSES: THE CONTROVERSY REOCCURS

Legislation enacted January 1, 1983, requires children under 40 pounds to use seat belts and car seats while riding in their family automobiles. Parents can be cited and fined up to $50 for violations of this requirement.

The National Highway Traffic Safety Administration is currently conducting an awareness campaign to increase use of seat belts by the public in their automobiles. This campaign has included spot commercials on national television.

These state and federal mandates have raised the conscious level of citizens regarding the benefits for seat belt usage. Yet school buses are not usually equipped with seat belts. Some major newspapers have published editorials decrying this practice and calling for seat belts to be installed in school buses. Some school districts and many transportation directors have recently been pressured by parents to install seat belts in their buses.

CASTO and the entire school bus industry have been active in this issue for several years. A wealth of data exists from scientific studies regarding the use of seat belts in school buses. CASTOWAYS published an article written by Dan Stephens, San Diego Unified School District, and Charles Devlin, Los Angeles County Department of Education, in its February 1981 issue summarizing the conclusions of this research.

The article is again published in this issue to assist transportation supervisors and directors in their response to parents on the seat belt issue.

SEAT BELTS IN SCHOOL BUSES

Seat belts are a primary form of passenger protection in automobiles. They have dramatically reduced passenger injuries from impact in collisions and saved thousands of lives.

The success of seat belts in automobiles would appear to also apply to passengers in school buses. Yet buses, to this date, are not equipped with safety belts of any category.

The feasibility of equipping school buses with safety belts has been researched carefully by many governmental and private safety groups. Their tests, conducted sporadically over the last ten years, have unanimously concluded that seat belts in school buses do not serve the same purpose as they do in automobiles. Seat belts actually reduce safety and result in greater passenger injuries from impact collisions.

A summary of their conclusions are as follows:

1. The *University of California at Los Angeles* conducted crash sled tests using seat-belted dummies. The greatest injuries occurred to passengers that were seat belted in the bus. The least injuries occurred to passengers who sat unsecured in the bus. These passengers deflected their impact between seat benches. (1968)

2. The *National Highway Traffic Safety Administration* (NHSTA) conducted extensive research through crash sled tests. Those crash tests concluded that passengers secured to bench seats in a bus by lap belts suffered the most severe injuries in the event of upset or collision. This was because the height and construction of the bench seats produced injury hazards to the head and upper portions of passengers seated behind. (1968-1974)

3. The *National Motor Vehicle Research Foundation* conducted 200 crash tests with seat belts and concluded that at least 40 inches of unobstructed area must exist in front of the belted passenger in order to protect the passenger from frontal impact. The greatest danger to a seat belted passenger is impact injury to the head. Seats in buses are typically spaced 22 to 28 inches apart. (1972)

4. The *American Association for Automotive Medicine* advises against securing young children solely by lap belts in either passenger autos or buses. This is because the abdominal section of young children is not sufficiently developed to withstand the stress of caused by lap belts in event of collision. (1975)

6. The *Virginia Polytechnic Institute and State University* conducted attitudinal studies of seat belts in school buses. Their findings questioned the compliance of children using seat belts and the ability of drivers to enforce seat belt usage. In addition, the legal and educational barriers to seat belt installation were considered factors that would make seat belts impractical for school buses. (1974)

7. The *California Highway Patrol* commissioned *Southwest Research Institute* to study seat belts in school buses and concluded: (1976)

a. The interior of an auto is not similar to that of a bus in that appurtenances such as steering wheels, dashboards, door handles, etc., are not present in bus passenger compartments.

b. Should a major accident occur in an auto, it is relatively easy to release seat belts and remove passengers from outside the vehicle. Belted passengers in a much larger bus could not be easily removed.

c. Bus drivers or aides would be tasked with insuring that belts are fastened, as unsecured belts would result in a tripping hazard for other students. Given a bus load of 65 children, the amount of time required to check belts at each stop would be prohibitive.

d. Factors such as vandalism to belts and the possible use of belts as weapons were also cited by the Highway Patrol as reasons why the device should not be employed.

8. The *National Association of Independent Insurers* questions the legal liabilities created by buses equipped with seat belts. Insurers are concerned about enforcement in seat belt usage, and anchorages for seat belts as obstructions to children walking in the bus during boarding and disembarking. (1974)

9. The *National School Transportation Association* compared the cost of safety belt systems in school buses. Their conclusions were that the economics of seat belts due to hazard, enforcement, vandalism, and attitudinal factors were not cost effective. The net result would be loss of bus services with additional children placed on the streets to find their own way to school. (1974-76)

These conclusions demonstrated that what on the surface seemed a reasonable safety measure was instead impractical and hazardous. Yet maximum protection to passengers in a school bus from impact was still an important goal.

The National Highway Traffic and Safety Administration therefore investigated the feasibility of redesigning the interior passenger compartments of school buses. The research with crash sled tests resulted in a major seating and body design change, mandated for school buses manufactured after April 1, 1977:

1. Seats were redesigned to specific spacing with added padding to front and back, and increased back height for maximum impact deflection. The new design seats act as a compartmentalized padded cavity which, crash tests prove to be the most effective protection from impact yet designed for any vehicle.

2. Bus body construction was substantially increased for strength to withstand major impact from side, front and rear. Major strength improvements were also made to the school bus roof for rollover protection.

3. The protection from impact for the fuel system (tank and lines) was increased to minimize fuel spillage in event of collision or impact.

The primary key to safety of children riding school buses is the skill and judgment of the school bus driver. A considerable effort goes into recruiting, training and certifying school bus drivers. The state requires that all school bus drivers have 20 hours of classroom instruction and 20 hours of behind-the-wheel training. The San Diego Unified District expands this requirement for its drivers to 40 hours of classroom and workshop instruction and 20 hours behind-the-wheel training. They must pass a written and performance test administered by the California Highway Patrol. Drivers are then issued a School Bus Driver Certificate which is required before driving a bus with children. This certificate is issued by the Department of Motor Vehicles and will be revoked if a driver is cited for unsafe practices, even while off duty in his private vehicle. The placing of a driver behind the wheel of a school bus is therefore a serious process which is carefully maintained.

The combination of improvements in bus construction, routing system design and extensive training for school bus drivers produces the best safety record of any form of passenger transportation available on land or in the air today. The National Safety Council each year continues to rate school buses the safest form of passenger transportation. Safer than scheduled airlines, railroads, taxis, charter and municipal buses . . . fourteen times safer than the family automobile.

CASTO AND NAPT

BRIDGING THE GAP *by Mac Barnes*

Ever since I attended the national minimum standards conference in Warrensburg, Missouri in 1960, I have been acutely aware of the need for Californians to return to the United States and become part of the Union again as far as pupil transportation is concerned. Not that we need to change our standards or do things just like other states do. More to the point, we need to become part of the national process as it relates to pupil transportation. Efforts to bridge this gap, which has been so apparent, are moving along well thanks to efforts from a number of active CASTO members and leaders and to many of our friends in the National Association for Pupil Transportation (NAPT).

The theme for the NAPT Conference in November was "Moving Forward Together." This concept applies to many groups and organizations and, by no means is limited to CASTO. The concept implies the need for CASTO to move into national activity to a large degree. Last year in Redding, at the CASTO Spring Conference, an excellent step, not the first, was taken. NAPT President elect, Rod Johnson, was invited, attended, and participated in our conference along with Peter Greg, the Oregon Conference organizer, and others. We have had a California representative on the NAPT Board. Carol DeMeyer who has worked hard for sometime to bring CASTO into contact with NAPT. Through her efforts, several CASTO members served on NAPT committees this past year.

At the NAPT Conference in Portland, Rande Downer, Kern County, a CASTO member was nominated and elected to the NAPT Executive Board. Rande will do a great job and represent us well. This was the result of substantial work by many CASTO delegates who attended the conference, as well as Rande's excellent campaign efforts. With Rande on the NAPT board as well as Carol, we will be even more successful in aligning NAPT and CASTO in effective enterprises related to pupil transportation safety.

Affiliate means: to bring or receive into close connection, associate oneself; combine. Although there is no discussion about formal affiliation between CASTO and NAPT, affiliation resulting from CASTO members joining and participating in NAPT is on the upswing. Those of us from CASTO who attended the NAPT Conference in Portland were impressed by the delegates and their efforts to define, struggle with, and solve the same basic pupil transportation problems we experience in California.

Our experience at that conference validated our past efforts to bring us closer to our colleagues in other states. Our experience also stimulated us to renew and invigorate our efforts to bridge the gap. I heartily urge CASTO members to join in the work with NAPT. We will provide CASTO Chapter Presidents with relevant information, so that you may join us in bridging the gap and assisting national efforts related to safety for our pupils who ride our school buses.

KENAI PENINSULA BOROUGH SCHOOL DISTRICT

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

April 24, 1985

George Navarre, Representative
House of Representatives
Pouch V
Juneau, AK 99811

Dear Representative Navarre:

Mr. Overman, Associate Superintendent of Planning and Operations for our school district, has requested that I gather information pertaining to seat belts on school buses and mail it to you. This information is enclosed. I understand that Romayne Kareen has already furnished your aide with some information, so I have tried not to duplicate.

As you are aware, our district has experienced considerable pressure from a group of people in Homer to install seat belts on our buses. The Board of Education has taken no action to date. It is an emotional issue and sounds as good as motherhood and apple pie on the surface, however there are some facts you should be aware of.

Organizations dealing with school bus transportation, i.e. the National School Transportation Association, the State Department of Education, the Alaska School Bus Safety Committee, the Alaska Association for Pupil Transportation, the National Safety Council - do not endorse mandating the use of seat belts in large buses, at this time, without further research.

The National Safety Council in its policy statement on "Protecting Pupil Passengers in School Buses", dated June 28, 1984, states that "The Council recommends that until further research and testing demonstrate that pupils will be safer by the installation of seat belts in school buses, the Council believes that passive protection provided by compartmentalization as required by the current (1977) federal standard on school bus seating and crash protection protects seated pupil passengers in school buses with gross vehicle weight ratings greater than 10,000 pounds."

The U.S. Department of Transportation (HS-806-000, dated September, 1981) states 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 federal government does tests every year in California on buses from various manufacturers, testing for safety and safety improvements. They have repeatedly been approached by special interest groups to mandate seat belts in buses, but have still not agreed that they are needed.

The Alaska Department of Education, in their EMS to our school district, dated October 30, 1984, agrees with the positions of the National Traffic Safety Administration and the National Safety Council.

Our school district is operating the bus fleets with compartmentalized bus seating. Compartmentalization is recognized by bus safety experts as a necessary safety feature and has been federally mandated since 1978. All buses built after 1977 must have the high backed, well padded, controlled energy absorption, cushioned seats to act as a buffer in case of accidents or sudden stops.

Buses have to meet stringent safety codes. They are designed for student safety and are proven to be the safest form of ground transportation in the nation.

Our district had a head-on collision in Seward two years ago. There were no fatalities to students on the bus and only one slight injury from a rock flying through a window. The intoxicated driver of the auto that hit the bus was killed. Buses are structured much higher off the ground than automobiles. Their point of impact and their suspension system are designed for safety.

The Canadian government completed bus crash tests in Canada last December, which our government and other representatives witnessed. In these tests dummies were wired and half of them belted into three various sized buses, while the other three were left unbelted. Results show that **those who were belted sustained as great or greater injuries than those left unbelted.** Most were the result of head injuries. The seat belts acted as an anchor. Heads of the dummies were thrown forward with much greater impact than if they hadn't been belted and hit the backs of the seats harder than the unbelted dummies that moved more with the suspension of the bus and hit the seat backs with more than just their heads. (Romayne Kareen has furnished you with a copy of this report.)

Recently, Paul Stewart, State Director of Transportation in West Virginia, stated that their numerous studies do not show that seat belts would make busing students safer. He stated that last fall when one of their buses was hit by a train at a railroad crossing, had the

children been belted in, some would most probably have been killed. As it was, they were thrown to the other side of the bus. Instead of being crushed by the train, only a few minor injuries occurred. Of the three recent rollovers
they have experienced, the worst injury was a broken arm.

Some other arguments against seat belts in school buses are:

Rapid bus evacuation would be impaired.
Vandalism would increase.
Malfunction of the restraint equipment is likely with great and varied use.
Various physical characteristics and age groups of students would mean constant adjustment.
Monitors would possibly be needed.
It would take more time loading and unloading students. Buses would have to remain at stops for longer periods of time. Bus stops are where most of our kids are killed going to and from school.

Buses are not automobiles:
The crash pulse of a bus is much longer than an auto.
Slow down period is much less than an auto.
The padding of seats and energy absorption is much greater.
There is little chance of ejection from the bus because of the design. There are no doors to fly open in the passenger section.
The bus structure has been improved for passenger safety, the body structure and roof strength have been increased. Fuel system guards have been installed to help protect against fires.

At the request of our school board, the district contacted the National School Transportation Association and received the names of 12 school districts that were reportedly using seat belts in their buses. Of the 12 districts, 8 of them responded. Two of these had no buses with seat belts, and 1 had 19 buses, but only 1 special ed bus had belts. The others responded: 5 buses, 2 with belts; 20 buses, 10 with belts; 55 buses, 55 with belts; 14 buses, 5 with belts; and 4 buses, 4 with belts. All of these belted buses have monitors, with exception of the district in New York, which has monitors for only kindergarten students. Only 2 districts combine K-12 students on buses using seat belts. Although I believe there are now more districts using belts for students, this is the information we were able to come up with last December.

The fact is, most school bus related fatalities occur outside the bus. This is called the "death zone". Five times more student fatalities occur outside the bus than inside. The two school bus related fatalities in Alaska during the past two years occurred outside the bus. Both students were run over by their bus. This is the area where the state and individual districts should be concentrating on for improved safety.

The Alaska School Bus Safety Committee recognizes the need for improved safety in the **"death zone"**. The group is pilot testing safety sensors that detect objects (such as small children) directly in front or in back of the bus where the driver may not be able to view. Another pilot program being tested is the use of strobe lights. These lights flash (much like an airplane strobe) along with the regular flashing lights when a bus is stopped loading or unloading students. Their purpose is to call additional attention to the stopped bus for greater motorist awareness.

To improve school bus safety, the areas we need to concentrate on are:

(1) Bus driver awareness and training.
(2) Student awareness.
(3) Motorist awareness.

We need to, and are working toward stricter enforcement of laws governing motorists' infractions against school buses.

Funding for seat belts would have to come from somewhere. Our district sought and received price quotes ranging from $1,167 to $3,080 for three belts to a seat on a 66 passenger bus. If our district's buses had seat belts and monitors to monitor the use/misuse of seat belts, the monitors could cost as much as $107,866/year. Would the State of Alaska be willing to foot this bill? Additional buses would most probably be needed because the time involved in belting/unbelting would lengthen route times and seat width may not allow larger students enough room for three belts and three bodies to a seat. Who would be responsible for this expense?

In Homer, the State Highway Maintenance Department personnel report they do not have enough manpower or maintenance equipment to meet the needs of the community. The roads are in very poor condition and hazardous in many areas. We are not able to get our buses in and out of some of the roads on a regular basis. This is a real hazard. If time and monies are going to be spent to make our school busing operations safer, the direction should be were needed.

I hope that this information will be of benefit to you and that you will consider the enclosed materials.

Sincerely,

Penny Little

Penny Little
Transportation Supervisor

Encl: as

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF EDUCATION

DIVISION OF MANAGEMENT LAW AND FINANCE

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

October 30, 1984

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

Dear Penny:

This is in response to your letter regarding safety belts on school buses.

If safety belts were mandated on school buses on a state-wide basis, we estimate that the capital outlay cost would be approximately $11,000,000. This amount was calculated as follows:

> Additional Bus Purchase Cost: $7,400,000 (The seating capacity would be reduced from three to a seat, to two to a seat. For 600 buses of average 65 passenger capacity, we would lose 13,000 seats necessitating an additional 200 buses. 200 buses @ $37,000 per bus = $7,400,000.)
>
> Retrofit Costs: $3,600,000 (600 buses would need to be retrofitted. A school bus manufacturer recently estimated that the cost to retrofit a 65 passenger bus would be approximately $6,000. 600 buses x $6,000 = $3,600,000.)

The U.S. Department of Transportation in Issue Paper HS-806-000 dated September, 1981, copy enclosed, states that "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 National Safety Council in its policy statement on "Protecting Pupil Passengers in School Buses" dated June 28, 1984, copy enclosed, states that "The Council recommends that until further research and testing demonstrate that pupils will be safer by the installation of seat belts in school buses, the Council believes that passive protection provided by compartmentalization as required by the current (1977) federal standard on school bus seating and crash protection protects seated pupil passengers in school

buses with gross vehicle weight ratings (GVWR) greater than 10,000 pounds. (Compartmentalization involves protecting each passenger by his seat, his seat back and the back of the seat or restraining barrier immediately in front of him.)"

The Department of Education agrees with the positions of the National Highway Traffic Safety Administration and the National Safety Council. We do not plan to introduce a regulation requiring safety belts on school buses, or seek funding for installation of safety belts on large buses. If the district were to decide to require belts on buses, the expense would have to be absorbed at the local level.

If you desire additional information, please feel free to contact me.

Sincerely,

Romayne Kareen, Administrator
Pupil Transportation Services

cc: Bill Thomson
Jim Tozer

Enclosures

KENAI PENINSULA BOROUGH SCHOOL DISTRICT

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

October 10, 1984

Romayne Kareen
Pupil Transportation Coordinator
Department of Education
Pouch F
Juneau, AK 99811

Dear Romayne:

Due to national and local spotlighting of seat belt use, although a controversial issue, our board of education is receiving some pressure to install seat belts on our buses. I have presented them, along with any interested PCSs, all available information I have on the issue.

The board has requested that our administration research and report on the ramifications if we were to equip our buses with seat belts. Do you have any cost factors on a per bus basis? If so, will you please provide me with them.

Does the state plan to implement any regulation changes pertaining to seat belts? If the district were to decide to require seat belts on the portion of our buses structurally adequate for restraint installation, or on any new buses ordered, would the state be willing to share in the cost? If so, to what extent?

We will probably need to make our report at the first board meeting in November, Romayne, so would appreciate your information before October 29th, if possible.

Thanks for the help!

Sincerely,

Penny Little
Bus Transportation Supervisor

pl

April 30, 1985

MEMORANDUM

TO: ALL LEGISLATORS

FROM: CECIL WHITEHURST, PUPIL TRANSPORTATION SYSTEMS

SUBJECT: SEAT BELTS ON SCHOOL BUSES

Like the inevitable seasons, the controversy regarding the use of seat belts on school buses has constantly been on the scene for the last several years. The ever present debate continues to cause great trepidation among all people associated or connected with pupil transportation. Countless studies and tests have been accomplished and millions of words have been written and still the dissension exists between the two factions with no solution forseeable in the near future.

Unfortunately, aside from being controversial, the issue has become very emotional. This is regrettable because emotionalism and/or extreme dedication to a cause usually does not promote an atmosphere of openness and receptiveness necessary toward adopting the ultimate decision relevant to the common good.

Proponents of the use of seat belts on school buses pursue the adoption of that concept almost with blind dedication. Opponents of their use are also very dedicated when presenting their side of the debate. The issue needs to be examined realistically and put in the proper perspective.

Factual data emmanating from the results of extensive testing weigh heavily on the side of the opponents of the belts. Reports resulting from studies and tests throughout the nation for at least 13 years have pointed out with emphasis that seat belts for school bus passengers will not address the problem related to fatalities or injuries related to school buses. Agencies and institutions either taking part in the tests or sanctioning the results included the National Highway Traffic Safety Assn., Individual States (N.J.), Universities (U.C.L.A.), National Safety Council, and many independent organizations and private consultants. All resulting factual data is public information and has been published for years by trade journals and official reports.

Crash tests also have proven that school buses cannot be compared with automobiles because of its' structure and design. The specifications for the present seat configuration on school buses was established by the Federal Government as a direct result of crash tests. The seat standard mandates a high back with a 4 in. foam padding, presenting a padded barrier in front of each seat. These barriers provide a "compartmentalization" concept that has proved very effective in providing a safe pupil environment without the use of seat belts.

The results of the latest crash test conducted at the Motor Vehicle Test Center in Blainesville, Quebec was recently released by the Canadian Department of Transport. This test vindicated the "compartmentalization" philosophy now being incorporated on school buses. The study found that "head injuries were greater for the dummies that were restrained with seat belts" than those unrestrained.

Let us examine the findings from one more test that was conducted as far back as 1972 in the State of New Jersey. Taking part in the test were: Physicians for Automotive Safety, Ralph Nader's Organization, Orthopedic Surgeons, Anthropologists, State Senators and Assemblymen, State Directors of Pupil Transportation, Members of the U.C.L.A. Crash Team, P.T.A. Members, Students, Industry Representatives, N.J. Dental Society, N.J. Board of Education, Superintendents and others. The final decision from this group leaned toward the development of a safer bus environment. However, after in-depth evaluations, it did not recommend seat belts.

Statistical data from test results simply do not supply any evidence substantiating seat belts as an injury preventive device when applied to school buses.

Further examination of the available data reveals the one statistic that I feel is of paramount importance and probably supplies the key to the entire issue. The record will show that 75% of school bus related student fatalities occur off the school bus in an area known as the "death zone", which is approximately 4 feet of adjacent area surrounding the bus. These fatalities are caused either by the bus the student was riding on or motorists passing the bus during the loading or unloading process. The report futher reveals that of the remaining 25% student fatalities that occurred on the bus, seat belts would not have been a life saving factor because of the nature of the accidents that involve fatalities on school buses, i.e., railroad crossings, buses falling from heights (such as the one that occurred in Martinez, Calif. when a bus exited an off-ramp too fast, left the highway, fell 30 feet to the ground, and landed on its' top killing 29 students), buses falling into water, etc.

Therefore, if the informational data gleaned from unconnected studies, independent field testing, and accident investigations reveal the same results, the many agencies responsible for reporting results are in lockstep regarding the findings, and the student fatality data reflects a problem <u>not</u> associated with seat belts, then the obvious question has to be asked: Why the continuing controversy?

It becomes even more confusing when it is understood that both the proponents and opponents of seat belts are in pursuit of the same goal of safe transportation. It would appear to be advantageous and very productive if both factions would examine all available data with open minds programmed toward that common goal.

Another aspect of the debate is that seat belts on school buses are not cost effective based on the available data. This facet of the debate becomes very emotional because the question of "What price a child's life?" always arises. I certainly endorse that philosophy and agree that cost should not be an issue in this debate. However, my disagreement with proponents of the belts involving costs centers on the dispersment of the funds for maximum benefit.

There are many alternatives to seat belts that have surfaced from the results of field testing. These alternatives have proven their effectiveness toward the prevention of student fatalities. A variety of traffic and student control devices have been designed to attack the "death zone" and promote student safety. This equipment was listed in the January issue of School Bus Fleet magazine and include crossing arms (they swing out from the front bumper and force students to cross the street approx. 8 ft. in front of the bus), better mirror systems, strobe lights, back-up beepers, public address systems mounted outside the bus, and automatic snow/safety chains.

In addition to the equipment mentioned above that focuses on the "death zone", programs to improve driver training, boost mechanic's skills, enhance preventive maintenance procedures, and the improvement of State and District bus inspection programs have each demonstrated their worth in reducing student injury and death. Up-dating these programs would attack the other aspect of the 25% statistic by helping to eliminate this type of accident altogether.

Subsequent to this dedicated effort by all concerned, then the question of "What price a child's life?" can be addressed with sincerity because all monies available would have been utilized productively in proven areas of student safety.

Probably the two most important features of all of the above are the issues of school bus driver training, to ensure maximum efficiency behind the wheel, and bus inspection and maintenance, to ensure a safe vehicle on the road. The driver is the one ingredient that pulls everything together and makes it work. With adequate safety devices, a properly inspected and maintained bus, and a fully trained driver, our time, energy, and resources will have been properly applied to alleviate the problem of all types of student injuries and fatalities associated with school buses.

I respectfully urge you <u>not</u> to support legislation directed specifically and only to seat belts on school buses. Rather please consider mandating other programs that address the problem and have proven their effectiveness.

Cecil Whitehurst (Former Director of Transportation, Anch. School Dist.)
6631 Ea. 9th. Ave.
Anchorage, Alaska 99504
(907) 333-5708

A RESOLUTION OF

THE ALASKA SCHOOL BUS SAFETY COMMITTEE

RELATIVE TO SEAT BELTS ON SCHOOL BUSES

WHEREAS, the transportation of pupils is the safest form of ground transportation in the world, and

WHEREAS, the National Safety Council and the National Highway Traffic Safety Administration agree that the basic integrity of the current design of school buses and the compartmentalization concept provide adequate crash protection for school children, and

WHEREAS, the National Highway Traffic Safety Administration does not recommend that seat belts be used on school buses and has, in fact, rejected petitions to require seat belts on school buses, and

WHEREAS, statistics of crash tests conducted in the United State do not provide conclusive evidence that seat belts on school buses enhance the safety of school children, and may, in fact, reduce the safety of school children, and

WHEREAS, preliminary statistics of the recent crash test conducted by the Canadian Government indicate that seat belts do not enhance the safety of school children, and in fact, may jeopardize safety of school children in crash situations, and

WHEREAS, liability associated with the requirement to wear seat belts has not been fully identified nor the mechanics for enforcing the requirement determined, and

WHEREAS, total financial impact on the pupil transportation industry has not been fully assessed, and

WHEREAS, there is no evidence at this time to indicate that the issue is a safety issue, but rather it is an educational issue, and

NOW THEREFORE BE IT RESOLVED, that the Alaska School Bus Safety Committee is agreed in its opinion that no legislative or regulatory action be taken in the State of Alaska to require seat belts on school buses until an authoritative body of test data has been produced showing conclusively that the overall safety of the ridership on pupil transportation buses is significantly enhanced, and further

BE IT ALSO RESOLVED, that Alaska pupil transportation professionals should continue their ongoing efforts to reduce the incidence of external loading zone fatalities which exceed internal crash fatalities by a ratio of approximately 3 to 1 through state regulation of roadworthiness, in-depth school bus driver safety training, and preventative maintenance program for buses and that these same pupil transportation professionals should work diligently to develop a comprehensive program to promote loading and unloading zone safety awareness in the students' minds through classroom curriculum, in the motoring publics' mind through the public media, and in the parents' minds through use of parent-teacher associations and other concerned citizen groups.

Saundra L. Hutchins
Chairperson
Alaska School Bus Safety Committee

February 27, 1985
Date

School buses & seat belts

A discussion

Contents

Foreword

The success of seat belts in reducing injuries and deaths in automobile accidents appears at first glance to apply also to school buses. Yet school buses are not equipped with seat belts. Why not?

Next to parents, those most concerned about the safety of children on school buses are the people responsible for the pupil transportation program. These people—school bus drivers, school bus driver instructors, and school district administrators involved in the day-to-day operation of school vehicles—are familiar with the many issues concerning seat belts on school buses. The subject has been studied for many years at the national and state levels, and much information is available on both sides of the issue.

The purpose of this publication is to provide

- information on why seat belts are not installed on school buses
- research results on the use of seat belts on school buses
- the positions of national and state safety organizations on the seat belt issue.

School buses and safety

Why seat belts are used in automobiles

One purpose of seat belts is to prevent the person wearing them from being thrown out of a vehicle during a collision. But, unlike automobiles, school bus seats are not located opposite a door which could open and allow passengers to be ejected upon impact. School buses usually have only two doors. Neither is located beside a passenger seat.

A second purpose of seat belts is to prevent the wearer from striking sharp objects in the vehicle during an accident. Again, automobiles an school buses are not the same. School buses do not have steering wheels, dashboards, and door and window handles protruding into th passenger compartments. The only person in a school bus threatened by these objects is the bus driver, who wears a seat belt.

Other differences between automobiles and school buses

Passengers in school buses are protected by careful padding of seats, seat backs, sides and aisles. During a sudden impact the padding cushions students and absorbs most of the impact.

The outer construction of school buses and automobiles also is different. A school bus is encased in a metal frame much like a metal rib cage. In comparison, modern automobiles have little reinforcemen Also the passenger compartment in buses is well above the bumper height of automobile bumpers, so the impact of a collision is not at the same height as an automobile. And the impact is not as great on the passengers. This is the reason why interstate buses, public transit buses and school buses are exempt from safety belt requirements. The have a natural safety edge because they are bigger and heavier than automobiles and their interiors are designed to provide much more safety.

School buses are safer for other reasons as well. Other drivers easily se them because of their bright yellow color, flashing lights, special markings and low traveling speed. School buses are also recognized fo

the special cargo they carry—our children. These factors make drivers more cautious around school buses.

Federal school bus standards

The National Highway Traffic Safety Administration in the 1970s studied how to improve the interior of the passenger compartment of school buses. The research, based on many crash tests, resulted in major seating and body design recommendations. The federal government used these recommendations to require bus manufacturers to change the way school bus interiors were designed. The design changes required in school buses made after April 1, 1977 were:

- Seats were redesigned to meet specific spacing requirements.
- Seats were to be fully padded in front and back. Seat backs were heightened. These newly designed seats provided a padded cavity for passengers—a concept called compartmentalization—which crash tests proved to provide the most effective protection in a collision.
- School bus bodies were greatly strengthened to withstand heavy impacts from the side, front and rear. Improvements also were made to school bus roofs for protection in case of roll over.

Improvements were made to school bus fuel tanks and lines to lessen the possibility of fuel spillage during collision.

Compartmentalization

How does compartmentalization work? Upon vehicle impact, an unbelted child will slide forward on the seat and into the padded back of the seat ahead. This distributes the forces of impact and injuries most likely will be minor. On the other hand, the lap-belted child's hips will act as a fulcrum, throwing the upper body forward with great force. This may cause severe injuries to the abdominal region because of the pressures involved.

Tests conducted by the Southwest Research Institute in 1977 showed

that 40 inches or more of unobstructed space is required in front of a lap-belted passenger to avoid upper body and head injuries. Since school bus seats are closely spaced, the lap-belted child's throat or head will most likely strike the back of the seat ahead during an accident. In such cases, the head or throat will receive all the forces of the impact and could result in severe physical injuries.

Positions

The National Highway Traffic Safety Administration, the National Safety Council, and the National School Transportation Association have stated that current school bus safety standards in force since 1977 provide adequate protection for school bus passengers. The following are the positions of those organizations:

National Highway Traffic Safety Administration

The U.S. Department of Transportation in Issue Paper HS-806-000 dated September, 1981 states:

"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."

National Safety Council

The National Safety Council in its policy statement *Protecting Pupil Passengers in School Buses* dated June 28, 1984, states:

"The Council recommends that until further research and testing demonstrate that pupils will be safer by the installation of seat belts in school buses, the Council believes that passive protection provided by compartmentalization as required by the current (1977) federal standard on school bus seating and crash protection protects seated pupil passengers in school buses with gross vehicle weight ratings (GVWR) greater than 10,000 pounds."

National School Transportation Association

The Board of Directors of the National School Transportation Association (NSTA) in its Spring, 1984 special edition of *National School Bus Report*, states:

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

Canadian Government

School bus tests have shown that in some crashes belted passengers suffer more severe injuries than those not belted. A case in point is the most recent crash tests by the Canadian government.

In 1984 the Canadian government sponsored crash testing to determine the effectiveness of seat belts in three sizes of school buses. Results of the crash testing were summarized in the December 19, 1984 issue of the *Bulletin*, published by the Supply and Services Division of the Canadian government, and a February 1985 technical memorandum on automotive safety entitled *School Bus Collision Tests*, published by Transport Canada of the Canadian government. These publications state:

"Transport Canada has reaffirmed that the safety features Canada (same as U.S. Federal Motor Vehicle Safety Standards) has incorporated into its school buses—well-padded, high-backed, energy-absorbing seats, spaced at controlled intervals—provide a safe environment without seat belts."

"The use of lap seat belts in any of the 3 sizes of recent model school buses which were tested may result in more severe head and neck injuries for a belted occupant than for an unbelted one in a severe frontal collision."

State of Arkansas

On March 25, 1983 a school bus accident in Jonesboro, Arkansas, killed nine persons including four students. The tragedy heightened concern for school bus safety among parents, interested citizens, school officials and legislators. Because of the accident, the Arkansas Legislature studied whether to install seat belts on school buses. In its September 20, 1984 report entitled *Feasibility of Requiring School Districts to Install Seat Belts on School Buses* the Arkansas Legislative Council concluded:

"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, and the outstanding safety records 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."

State of New Jersey

Independent groups in New Jersey have thoroughly studied over the last 15 years the subject of seat belts on school buses. The groups have not recommended installation of belts. A March 1, 1983 letter written by the New Jersey Department of Education regarding the research states:

"In any decision-making process involving the safety and well being of transported students, the bus internal and external safety environment must be carefully analyzed. Such questions as, 'Is what we are proposing more safe, less safe or as safe as what we already have?' (should be raised). It is apparent that there still are too many safety trade offs that, under highly critical questioning, prohibit mandated seat belts at this time."

State of Minnesota

In 1984 the Minnesota Legislature created a task force to answer concerns about school bus safety after fatal school bus accidents. The task force recommended against mandating seat belts in school buses.

State of Maryland

The Maryland Department of Education has concluded that seat belts would not improve the safety of pupils on school buses and may even present hazards to their safety. In the publication *Concerns about Seat Belts on School Buses* dated January, 1985, the department made these findings:

- If the bus rolls over on its side or roof during an accident, passengers may suffer serious injuries when releasing their seat belts because the bus roof would be three to four feet from their heads. Also, young children may find it difficult to unfasten a seat belt because of their suspended weight.
- If the school bus catches fire, particularly with unconscious children aboard, rescuers may not have enough time to release seat belts for as many as 60 children.

State of Alaska

The Department of Education in 1983 appointed a committee of school bus company representatives and school transportation officers to study school bus safety issues. In February 1985 the committee issued a resolution that since has been endorsed by the Alaska School Transportation Association and the Alaska Association for Pupil Transportation. The resolution states:

"The Alaska School Bus Safety Committee is agreed in its opinion that no legislative or regulatory action be taken in the State of Alaska to require seat belts on school buses until an authoritative body of test data has been produced showing conclusively that the overall safety of the ridership on pupil transportation buses is significantly enhanced."

The real danger

According to the National Safety Council, in 1983 55 pupils were killed in school bus accidents nationwide. Ten were school bus passengers and 45 were pedestrians approaching or leaving a loading zone.

Evidence does not show that fatalities inside the bus could have been prevented by seat belts. Most school bus accidents resulting in fatalities inside the bus involve another large vehicle such as a tractor-trailer combination or a railroad train. A section of the bus is usually torn away, intruded into or crushed. In these types of accidents it is sometimes evident that students would have suffered more severe injuries or even suffered a greater number of fatalities if they had been belted in some seat locations.

According to the National Safety Council, the greatest danger area for children is outside the school bus in an area known as "the loading zone." The loading zone is the area where pupils wait for the bus in the morning and get off the bus in the afternoon. Of the 45 fatalities in this area during 1983, more than half were killed when hit by the bus they regularly rode. The others were killed by motorists who failed to stop for school buses loading and unloading passengers.

The Alaska School Bus Safety Committee recommends that efforts be increased to lower loading zone fatalities. The committee's resolution:

"Alaska pupil transportation professionals should continue their ongoing efforts to reduce the incidence of external loading zone fatalities which exceed internal crash fatalities by a ratio of approximately 3 to 1 through state regulation of roadworthiness, in-depth school bus driver safety training, and preventative maintenance program for buses and that these same pupil transportation professionals should work diligently to develop a comprehensive program to promote loading and unloading zone safety awareness in the students' minds through classroom curriculum, in the motoring publics' mind through the public media, and in the parents' minds through use of parent-teacher associations and other concerned citizen groups."

Conclusion

The Department of Education has carefully reviewed available information about using seat belts in school buses. In light of the evidence, the department has concluded that it cannot support seat belt use in school buses until further testing shows that it is safer than compartmentalization.

Until such time, the department supports the position favoring compartmentalization of the National Highway Traffic Safety Administration, the National Safety Council and the National School Transportation Association.

The department also supports the Alaska School Bus Safety Committee's resolution that encourages greater efforts to reduce external loading zone fatalities. The department also encourages all concerned Alaskans to work with the Alaska School Bus Safety Committee in promoting programs on safety awareness in the loading and unloading zone area.

KENAI PENINSULA BOROUGH SCHOOL DISTRICT

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

March 7, 1986

Penny Little/Tom Overman

Telephone conversation with Brian Reihl, Pupil Transportation Supervisor for the Province of Manatoba, Canada

Reihl: There was a question on what position a board would find themselves in if there was an accident and a board had not installed seat belts in the school buses. Essentially the liability for design of minimum safety standards and certainly for the standards for crash protection right now belongs to the National Highway Traffic Safety Administration. So that in the event of a liability, if the school board was criticized or found themselves in court facing a lawsuit for not installing seat belts, the National Highway Traffic Safety Administration would have to bear the responsibility for that design as the local school board does not have that as a responsibility. If a school board, on the other hand, makes a decision to install seat belts, in view of the evidence that in a crash situation a seat belt causes injuries, an important question to look at would be "Who will be with the school board on that decision?" I don't believe they would have the National Coalition there defending along with the board that particular decision. That decision would really fall completely on the local board. I think this is one of the most important considerations in this issue. That's one of the reasons why it's not adequate for the National Highway Traffic Association to say local school boards can put seat belts in if they like. Well, that's true. What they don't say is that, because that's a change in design, the liability belongs to the local board.

Little: The reason I called was to find out what your government's position is on seat belts, since the crash tests .....

Reihl: My office has the responsibility for controlling any modifications to school buses after they have been manufactured. ..... We would not approve the installation of the lap belt in the current school bus design because of the liability attached to the risk of injury in the event of a frontal collision.

Overman: What if one of your districts within the Province decided to order school buses and have the seat belts manufacturer installed?

Reihl: In Manatoba that would not be permitted. If we put a seat belt in a bus it would be to accommodate a handicapped child only.....

Little: One of things a representative from the National Coalition stated during her presentation to our Board was that the only life-threatening HIC levels that were inflicted on a dummy during those Canadian Crash Tests were inflicted on an unbelted dummy at the chest level. Is this true?

Reihl: No, it's not true.....The evidence was exactly the opposite.....All dummies would likely have survived the crash in the large bus, however the belted dummies would have been more severely injured.....

Reihl: A board would be well advised to take a very cautious approach to redesigning the bus and to make certain that the decisions are based on fact and not feelings. It's easy to develop a feeling in a particular area and make a judgement on how you feel about something, but I think in this area concerning safety, you need to emphasize the decision has to be based on fact because of the ramifications, the results of what can happen if you change the design, which has already proven effective.

News Briefs continued . . .

Driver Rescues Child Trapped by Seat Belt in Burning Bus

A 22-year-old Navajo Headstart bus driver who returned to a burning bus to rescue a child who had been left behind "went beyond the call of duty," according to the Crownpoint (N.M.) Navajo Police investigator who was at the scene of the fire. Willie Castillo, the bus driver, said he "just had to return to the bus" even though he thought all of the ten children in his care had been taken away from it. He said he had not been sure, however, because there was no time to count them.

When Castillo returned to the bus, however, he found another child, three-year-old Nathaniel Sandoval, sitting at the rear of the bus, unable to unfasten his seat belt.

Aware that the gas tank was about to explode, Castillo quickly freed the child and threw him from the bus. He then made one last check for children on the bus. Finding none, he jumped from the bus and ran a few hundred feet before the gas tank exploded enveloping the vehicle in fire.

An investigation by the Navajo Fire Department and Crownpoint NPD revealed the probable cause of the fire, which began while the bus was stuck in mud. It apparently began when heat produced by either the spinning tires or by the exhaust pipe ignited gas fumes or gas leading from the gas tank.

No one was injured in the incident. The Headstart director for Crownpoint credited the driver and staff who had prepared the children for the emergency by conducting regular fire drills.

Defect Investigations Being Conducted on Three School Bus Models

Defect investigations are now being conducted by the NHTSA Office of Defects Investigation on the following school bus models. Problems with any of these should be reported to Dick Boyd, (202) 426-2847.

- 1985 Ford school bus – brake hose problems
- 1983 IHC school bus – driveshaft failure
- 1980-81 Ford B Series and F Cowl Chassis – problems with electrical connection between engine and cab.

Marijuana High Impairs Driving for 4 to 8 Hours, Study Finds

One marijuana cigarette can impair driving performance – enough to cause a serious accident – for four to eight hours after the high has worn off, scientists from Minnesota, California and Maryland have found. University of Minnesota psychologist Travis Thompson, one of the scientists in the pioneering research project, said the findings could lead to a roadside test for marijuana intoxication. He said the study is the first to show that blood levels of THC, the active ingredient in marijuana, correlates "at least as well as alcohol does" with the degree of driver impairment.

The findings are based on extensive THC blood level and performance studies on eight San Francisco men (ages 22 to 33) and weighing 150 to 160 pounds. They were described as social drinkers who normally smoke marijuana no more than three times a week. The tests examined how well the men responded to simulated driving emergencies while drug free, after smoking fake marijuana cigarettes, and after smoking real marijuana.

They were able to perform non-emergency driving reasonably well once they were past the initial 60 to 90 minutes when they said they "felt high," their eyes were red and their heart rates were accelerated, Thompson said. Not so with their reactions to emergencies. Those tests showed that the effects of marijuana were much more long-lasting. The men did not return to normal for an average of five hours.

In those tests, they were required to react to simulations in which a vehicle was pulling into the driver's lane some distance ahead and the driver's car began to skid. Some overreacted, slamming on the brakes far too early and far too hard, while others reacted so late they could take no evasive action, Thompson said. He said the inability of the men to respond properly corresponded with the level of THC in their blood. The researchers took blood tests for nearly 23 hours after the participants smoked marijuana and detected some levels of THC even at the end of the testing period.

The study was financed by the National Institute on Drug Abuse and was the first ever performed on the issue of the effects of marijuana smoking on driving and about the possibility of relating the blood level of THC to the degree of impairment of performance. The next step will be to do a similar study in which volunteers are placed in real driving situations so there can be a better legal basis for keeping marijuana smokers off the highway long after symptomatic effects (such as red eyes) are gone.

The research findings appear in the current edition of the *Psychopharmacology Journal.*

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continued from page 5

Committees in Action

John J. Callahan, III, Marietta City Schools, P.O. Box 1265, Marietta, GA 30061.

William Simpson, Dekalb County School System, 1780 Montreal Road, Tucker, GA 30084.

Merlin B. Roosen, Richland County School Dist. I, 927 Whaley Street, Columbia, SC 29201.

Byron C. Watkins, Hopkins County Schools, 537 W. Arch, Madisonville, KY 42431.

Bob Larson, Robbinsdale Area School Dist., 3313 Major Ave N., Robbinsdale, MN 55422.

Rande Downer, Kern County Schools, 5801 Dunsale Avenue, Bakersfield, CA 93309.

Charles J. Devlin, Los Angeles County Schools, 9525 Imperial Highway, Downey, CA 90242.

Danny Baker, Prescott Unified School District #1, P.O. Box 1231, Prescott, AZ 86302.

Larry J. Gilles, Bendix HVSD, 901 Cleveland Street, Elyria, OH 44036.

Melvin J. Thompson, Pupil Transportation Consultant, 24 King, Toms River, NJ 08753.

Nov. 1985

State of New Hampshire

RICHARD M FLYNN
COMMISSIONER OF SAFETY

DEPARTMENT OF SAFETY
DIVISION OF MOTOR VEHICLES
JAMES H. HAYES SAFETY BUILDING
HAZEN DRIVE, CONCORD, N.H. 03305

THOMAS A POWER
DIRECTOR OF MOTOR VEHICLES
271-2484

Mrs. Romayne A. Kareen
Pupil Transportation Officer
State of Alaska
Department of Education
Pouch F
Juneau, Alaska 99811

Dear Romayne:

This letter is a follow-up to a discussion we had concerning seat belts in school buses.

Two years ago a small school district, (Bow, NH) purchased two new buses, (1984 models). The buses came equipped with seat belts on the aisle seats. (The district did not order the buses with seat belts, but decided to keep them since they were not charged for them).

The principal of the school sent notices home to those parents whose children were scheduled to ride the new buses and advised them that they were equipped with seat belts. He also asked for voluntary compliance since the state does not have a seat belt law in school buses.

Most of the elementary students buckled up and at first, most of the junior high students also complied. As time went on, especially with the junior high students, there was less and less compliane. It appeared that peer pressure was probably the most significant factor. It wasn't "cool" for junior high kids to buckle up in a school bus.

Although there were no acts of vandalism, some students buckled the belts across the aisle.

The second situation was a little different. A school district which runs approximately 24 buses wished to require seat belts in replacement buses it was purchasing. In addition, they attempted to formulate a policy that would require students to buckle up when they were riding buses. Buses were equipped with three belts per seat for 65 students.

The school board intended to require mandatory usage or have students face disciplanary action. However, this never came about. Students tied the belts in knots and stuffed them behind the seat cushions. Usage dropped very dramtically.

None of the belts had retractors, and as a result, belts were tangled and also dragged on the floor. Students who wanted to use them didn't because they were dirty! I don't believe there is any formal policy at this time, although the school board has requested voluntary compliance. (This situation occurred last fall).

This past spring, the New Hampshire legislature defeated two seat belt bills. One bill required the mandatory installation of seat belts on school buses manufactured after January 1, 1986. The bill insinuated that if the belts were installed, then there would be usage; but nothing actually requiring mandatory usage. School districts were expected to enforce usage. A second bill was introduced to require seat belts in all commercial vehicles, but was defeated in committee.

As I mentioned to you last week, the school districts with seat belts did no formal "evaluation " of seat belts. Most of these observations were made by drivers and other district personnel, which was eventually passed on to me.

I hope that this information will be helpful to you. Good luck at your meeting next week.

Sincerely,

Mike Colter