ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 8672

3808 HTRA HB 684

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We, the undersigned qualified (registered) voters, living within the Kenai Peninsula Borough, do hereby petition the Assembly of the Kenai Peninsula Borough to place the following question on the Oct. 1, 1985, ballot:

"Shall the Kenai Peninsula Borough School District be required to equip new school buses with seatbelts?"

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	SIGNATURE OF VOTER	PRINTED NAME	DATE	ACTUAL RESIDENT ADDRESS	PRECINCT
1	Jacqueline R Barden	Jacqueline R Barden	8/1/85	280 Corral Ave.	Soldotna 2
2	David R Barden	DAVID R BARDEN	8/1/85	280 W CORRAL AVE	SOLDOTNA #2
3	Alice M Rumley	ALICE M RUMLEY	8/2/85	mail 78 Sterling Hwy.	Sterling
4	Allen M. Gillilland	Allen M. Gilliland	8/3/85	266 W. Corral St	Sold #2
5	Mike Pappin	Mike Pappin	8/3/85	279 W Corral St	Sold 2
6	Janette Pappin	Janette Pappin	8/3/85	279 W. Corral St	Sold #2
7	Tom Van Vleet	TOM VAN VLEET	8/3/85	286 CORRAL ST.	SOLD #2
8	Skyla Van Vleet	Skyla Van Vleet	8/3/85	286 Corral St	Sold #2
9	Barbara Nagengast	Barbara Nagengast	8/5/85	159 Box 1345 Hille Ave	Soldotna #2
10	Billy W. Harris	BILLY W. HARRIS	8/6/85	P.O Box 732	Sterling Alt 1
11	Catherine R Harris	Catherine R. Harris	8/6/85	P.O. BOX 732 mail 9982 Sterling Hwy	Sterling
12	Paul Rumley	PAUL RUMLEY	8/7/85	VALLEY VIEW Rd.	Sterling
13	Dana M Rumley	Dana M Rumley	8/7/85	39585 Valley View Rd	Sterling
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FFIDAVIT:
tate of Alaska)
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_____ My commission expires _____.
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.11 the Seatbelts Are For Everyone (SAFE) Committee at 235-7240 for more information or tition pick up, or mail petition to P.O. Box 3331, Homer, Alaska 99603.

Old (13)

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	SIGNATURE OF VOTER	PRINTED NAME	DATE	ACTUAL RESIDENT ADDRESS	PRECINCT
1	Lydia Tousley	Lydia Tousley	8/7/85	Spruce Drive	Forth Clk.
2	Trina Fellows	Trina Fellow	8/6/85	Bayview - Kachemak	
3	Sandra L Early	Sandra Early	8-7-85	1851 Sterling Hwy	High School
4	Tom J. Early	TOM J. EARLY	8/7/85	1851 Sterling Hwy	High Sch
5	John L. Martin	John L. Martin	8/7/85	Box 3253	Kachemak
6	Elizabeth R Rogers	Elizabeth R Rogers	8/11/85	PO Box 1539	"
7	Eugene S. Rogers	Eugene S. Rogers	8-11-85	P.O. Box 1537	" "
8	Lynne. A. Sinnhuber	Lynne A. Sinnhuber		Ptarmigan Heights	Kachemak City
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AFFIDAVIT:
State of Alaska)
Third Judicial District)
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	SIGNATURE OF VOTER	PRINTED NAME	DATE	ACTUAL RESIDENT ADDRESS	PRECINCT
1	Jill Blackwell	Jill Blackwell	7/31/85	5 Mile East End	Homer
2	Gisela Agdamag	Gisela AGDAMAG	7/31/85	Kittiwake Ct Kachemak City	
3	Donna S. Martin	Donna S. Martin	7/31	Diamond Hts. Kachemak City	
4	Jan E Baird	JAN E. BAIRD	7/31	2310 Augustine Dr. Homer AK	
5	Marianne D Sheridan	MARIANNE D SHERIDAN	7/31	POBox Homer AK	99603
6	Jodi L. Riley	Jodi L Riley	8/1/85	Box 782 Homer	99603
7	Jan VanDerSandon	Jan VanDerSandon	8/1/85	628 Rangeview	Homer 99603
8	Diana J. LeBrun	DIANA J. LEBRUN	08/01/85	4029 MAIN	HOMER 99603
9	T H Keffer	T H. KEFFER	8/1/85	152 Cityview	Homer Homer
10	Kenneth M Hoyt	Kenneth M Hoyt	8-1-85	Box 2337	Homer
11	Robert R Hobson	ROBERT R HOBSON	8-1-85	Box 2805	Homer Homer
12	Robert L Ditton	ROBERT L. DITTON	8-1-85	Box 1001	HOMER HOMER
13	Ruth Plumire	RUTH PLUMIRE		POx 1833	HOMER
14	Carol A. Humbyrd	CAROL A. HUMBYRD	8/2/85	Box 1103	Homer Homer
15	Susan T Seaford	SUSAN T SEAFORD	8/6/85	Hmr 12-14	HOMER AK Homer
16	Terry L Warrington	Terry L. Warrington	8/6/85	Box 824	Homer AK Homer
17	Elsie Albertson	Elsie Albertson	8/6/85	Box 422	Homer AK Kachemak
18	Ruth Elaine McCullough	Ruth Elaine McCullough	8/7/85	301 Bayview	Homer AK
19	Traci Newark	TRACI NEWARK	8/9/85	4.5 mile Foster	HOMER City
20	Ken Landstrom Jr	Ken Landstrom Jr	8-13-85	Mile 16 Kenai Spur Hwy	Soldotna, Alaska
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AFFIDAVIT:
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Signature: _____
Sworn and Subscribed to before me this _____ day of _____, 1985.

_____ My commission expires _____.
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	SIGNATURE OF VOTER	PRINTED NAME	DATE	ACTUAL RESIDENT ADDRESS	PRECINCT
1	[illegible]	[illegible]	[illegible]	[illegible]	Homer
2	[illegible]	[illegible]	8/7/85	[illegible]	Homer
3	[illegible]	[illegible]	[illegible]	[illegible]	Homer
4	[illegible]	Cindy Ellis	8/7/85	Greer Road	Homer
5	[illegible]	Carla Long	8/7/85	39605 FRENMARK	HOMER
6	[illegible]	[illegible]	8/7/85	3141 ASPEN LANE	HOMER
7	[illegible]	Shirley Sanders	8/7/85	1151 NELSON AVE	HOMER
8	[illegible]	CORY BRACHT	8-7-85	Box 3742	HOMER
9	[illegible]	Lisa Bracht	8-7-85	Box 492	Homer
10	[illegible]	Annette Valaer	8-7-85	Box 3207	Homer
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	SIGNATURE OF VOTER	PRINTED NAME	DATE	ACTUAL RESIDENT ADDRESS	PRECINCT
1	Deborah Lunsford	Deborah Lunsford	8/4		1
2	Carolina M. [illegible]	Carolina M. Willi	8-5	[illegible] Jeanine Way - Nikiski	#2
3	Dorothy T Muir	Dorothy T. Muir	8/6/85	53835 Kittiwake Dr. R.R. Box 1790-7	" "
4	Audrey Hodgins	Audrey Hodgins	8/6/85	mi 18½ N Spur Road, Nikiski	
5	[illegible]	JANICE KING	8/6/85	BOSTON COVE NIKISKI	NIKISKI 2
6	[illegible]	JANICE NIGHTINGALE	8/6/85	OTTER CT. Nikiski	Nikiski 2
7	[illegible]	CAROL SAARI	8-6-85	Ainsworth Nikiski	#2
8	Bonita Miller	Bonita J Miller	8-6-85	Cisburne St Nikiski	2
9	Jean Turner	Jean Turner	8-6-85	Chugach Estates - Nikiski	2
10	Barbara Haness	Barbara Haness	8-6-85	Lake St - Nikiski	2
11	Sharon M. Brawer	Sharon M. Brawler	8-6-85	Earl Ave - Halbouty Rd	Nik
12	Bev Bardahl	Beverly Bardahl		Mile 23½ N Road Kenai	#2
13	Emma Brucks	Emma Brucks	8-6-85	50805 Middleton Nikiski	#2 Nikiski
14	J. Carolyn Hawkins	J. Carolyn Hawkins	8-6-85	Rt 1-Box 353-2 Kenai	#1
15	Denise M Taylor	Denise M Taylor	8-6-85	P.O. Box 7324 Nikiski	#2
16	Stephen P. Taylor	Steve P. Taylor	8-6-85	P.O. Box 7324 Nikiski	#2
17	Gayle Chivers	Gayle Chivers	8-7-85	Montana Ave Nikiski	#1
18	Joseph A. Nightingale	JOSEPH A. NIGHTINGALE	8-12-85	OTTER CT. Nikiski	#2
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1	Molly McCarthy	Molly McCarthy	8-2-85	PO Box 3715, Homer / Mile 9 East End Rd.	
2	Sue Christansen	SUE CHRISTIANSEN	8-2-85	P.O BOX 15093/12 MILE EAST END, FRIT	
3	Gail Thompson	GAIL THOMPSON	8-2-85	P. BOX 2189 / 4MI EAST RD	FRET
4	Kate Amundson	Kate Amundson	8-3-85	PO BOX 1559 Homer.	
5	Catherine Jane Henry	Catherine Jane Henry	8-3-85	450 Rangeview Apt 1 Homer	
6	Catherine R. Stingley	Catherine R. Stingley	8-3-85	HCR 1660 East End Rd. Homer	
7	Dick S. Bower	DICK S BOWER	8-6-85	000 CAROLINE DR	FRITZCK.
8	John T. Cowan	JOHN T. COWAN	8-6-85	HCR 68169 CENTURION AR, HOMER	
9	Frank Palermo	Frank Palermo	8-8-85	64110 Bidarki Dr Homer	Diamond R
10	Ralph Broshes	RALPH BROSHES	8-9-85	Box 1445 Homer AK	Homer
11	Debra Courney	Debra Courney	8-9-85	Box 1832 Homer, Ak.	
12	Robert Paul Purcell	Robert Paul Purcell	8/13/85	Box 2486 Homer, AK	Fritz Creek
13	Linda R Ellsworth	LINDA R ELLSWORTH	8/15/85	4287 Homer Spit Rd Homer AK	
14	Ann S. Bower	Ann S. Bower	8/16/85	Box 1004 Homer AK	Fritz Cr
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	SIGNATURE OF VOTER	PRINTED NAME	DATE	ACTUAL RESIDENT ADDRESS	PRECINCT
1	[illegible]	Cheryl Schoessler	9/17/85	105 W. Kobuk-Soldotna	
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Petition 1

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1	Cheryl Beck	Cheryl Beck	8-16	Mile 136 Sterling	
2	Mary Eek	MARY EEK	8-16	1111 OIL WELL RD	
3	Vicky Cooper	Vicky Cooper	8/16	Hse 134 1/2 Sterling	
4	Lee B. Billington	LEE BILLINGTON	8/16	207 BIRCH KENAI AK 99611	
5	Bruce R Beiker	BRUCE R BEIKER	8/16	312 FOREST DR KENAI, AK 9961	
6	Linda Stroecker	LINDA STROECKER	/	1st house N of Hope School — Hope 9960	
7	Patrick S Clinton	PATRICK S CLINTON	/	Scott AVE SOLDOTNA	
8	Lynne I. Clinton	LYNNE I. CLINTON	/	SCOTT AVE SOLDOTNA	
9	Terri Leman	TERRI LEMAN	/	Mi. 7 NILWELL RD NIKISKI	
10	Delores Howell	Delores Howell	/	310 HIGHBUSH KENAI	
11	Yvonne Long-Bigham	Yvonne Long-Bigham		1077 Walnut Kenai	
12	Rick Shearer	Rick Shearer		Box 1 Sterling	
13	Sharon A. Gerhard	SHARON A GERHARD		1619 TANAGA KENAI AK 99611	
14	Helen Meyer	HELEN MEYER		131 SHAIN LANE - SOLDOTNA	
15	Tami Greenwell	TAMI GREENWELL		5547C TOK ST HOMER - FRITZ	
16	Cindy Hendrickson	Cindy Hendrickson		Box 1704 Homer	
17	Tamra Pruett-Dixon	TAMRA PRUETT-DIXON		BOX 155 Anchor Point	
18	Ward Perdue	Ward Perdue		PO 155 Anchor Point	
19	Robin Jaime	Robin Jaime		PO 469 Anchor Pt	
20	Katharine I. McNiece Duggar	Katharine I. McDuggar		HCR 63 Miller Loop 2 Homer	
21	Ellen Barnett	Box 1772 Soldotna, Alaska			
22	Lucy Mahan	LUCY MAHAN	8-17	FUNNY RIVER RD SOLDOTNA	
23	Isla Ledbetter	Isla E Ledbetter		Box 77 Nikiski	
24	Lois Miller	Lois Miller	8-17	289 Mirydale Ct. Soldotna	
25	Tara Schlinker	TARA SCHLINKER	8-17	RT 2 Box 920 Soldotna, Ak	
26	Robert L Dewees	Robert L Dewees	8-17	37184 Denise Lake Rd Soldotna	
27	Jenny L Dewees	JENNY L. DEWEES	8-17	37184 Denise Lake Rd Soldotna	
28	Douglas W Brown	Douglas W Brown		Box 616 Soldotna AK	
29	Cheryl L Edwards	Cheryl L Edwards		Box 2148 Homer AK	
30	Don B. May	Don B. May		PO Box 427 Anchor Pt (Mile 142 1/8 Sterling Hwy.	

AFFIDAVIT:

State of Alaska)
Third Judicial District)

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1		Ruth McIlvaney	8/3/85	182 Birch Ln	Homer
2		Jesse Romero	8-3-85	3055 Kimberly	#2
3		Patricia Rediske	8-3-85	310 Cindy Circle	#2
4		JANET L JENSEN	8-6-85	426 E BAYVIEW	#2
5		Alyce McClellan	8-6-85	PO Box 572 Homer	
6		Carol Clark	8-7-85	[illegible]	
7		Patricia Niles	8-7-85	Nelnisco Legal Studies	
8		Nancy Young	8-9-85	Caswell Rd.	Soldotna
9		Patricia Haase	8-9-85	3938 Main St	Homer
10		[illegible]	[illegible]	[illegible]	
11		Diane L Reed	8/9/85	Mile [illegible]	Soldotna
12		[illegible]	8-9-85	[illegible]	[illegible]
13		Jim Kimpter	8/9/85	Address	Soldotna
14		[illegible]	8/9/85	Mirwood Dr.	Soldotna
15		Ruth Hinton	8-9-85	Kenai Peninsula Pl	Kenai
16		[illegible]	8-9-85	[illegible]	[illegible]
17		[illegible]	8-9-85	[illegible]	[illegible]
18		[illegible]	[illegible]	[illegible]	[illegible]
19		[illegible]	[illegible]	[illegible]	[illegible]
20		[illegible]	[illegible]	[illegible]	[illegible]
21		[illegible]	8-9-85	[illegible]	[illegible]
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25		[illegible]	[illegible]	[illegible]	[illegible]
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29		[illegible]	[illegible]	[illegible]	[illegible]
30		[illegible]	[illegible]	[illegible]	[illegible]

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	SIGNATURE OF VOTER	PRINTED NAME	DATE	ACTUAL RESIDENT ADDRESS	PRECINCT
1	Lisa C Ellington	Lisa C. Ellington	7/31/85	HCR 64645 Fitzman Ave.	Homer Diamond Ridge
2	W. Lance F Ellington		7/31/85	177 Farnsworth	Soldotna area
3	Meredith H. Hilderbrand	Meredith H. Hilderbrand	7/31/85	Fitzman Avenue	Diamond Ridge
4	DEA L. Heusel	DEA L. HEUSEL	7/31/85	HC64760 FITZMAN AVE	DIAMOND RIDGE
5	Shirley J Heusel	Shirley J Heusel	7/31/85	HCR 64360 Fitzman Ave.	Diamond Ridge
6	Susan F. Loshbaugh	Susan F. Loshbaugh	7/31/85	64770 Pitzman Av	Diamond Ridge
7	David J Ellington	DAVID J. ELLINGTON	7/31/85	64645 Pitzman Av	DIAMOND RIDGE
8	Vickie DeGreffenried	VICKIE DEGREFFENRIED	8/1/85	144 Island View Sub.	FIRE HALL-H
9	Alice M Danby	Alice M Danby	8/4/85	1914 Sterling Hwy	High School
10	Donna Schaefer	DONNA Schaefer	8/4/85	Box 39078 Chamberlain	Ninilchik AK 99639 N. Fork-Johns
11	Bruce Royce	Bruce Royce	8/4	Box 1537	Homer
12	Melody A. Royce	Melody A Royce	8/4	Box 1537	Homer Alaska Diam
13	Donna Peterson	Donna Peterson		Box 573	Homer, AK. 9960
14	Dolores Butler	Dolores Butler		4181 Svedlund Homer	AK 9960
15	Patrick Butler	Patrick Butler		4181 Svedlund Homer	AK 996
16	George C. Danby	GEORGE C. DANBY		Box 582 Homer	Alaska 9960
17	Karen S. DeVaney	Karen S. DeVaney		484 Klondike	Homer, Alaska
18	John Berelc	JOHN BERELC		Box 691	Homer AK
19	Harry Gregoire	HARRY GREGOIRE		Box 241	Homer AK
20	Janet Lighthill-Talbert	Janet Lighthill Talbert		Box 2711	Homer AK
21	Barb Benson	BARB BENSON	8/5	65290 Corbin Rd	Anchor Point, AK 99
22	Marilyn Kirkham	MARILYN KIRKHAM	8/5	Mattox Rd Homer.	Homer
23	Terri C Lark	TERRI C LARK		P Box 3563	HOMER AK 996
24	Carole Short	CAROLE SHORT		Box 1971	HOMER AK 9960
25	Kelley Eastham	Kelley Eastham		Box 1093	Homer AK 99603
26	Jane E Whitman	Jane E. Whitman		HCR 5520 East Rd.	Homer AK 99603
27	Jake Freudiger	JAKE FREUDIGER	8/6/85	11387 Frostage	KENAI 99611
28	[illegible]	RANDY WISNIEWSKI		Box [illegible]	Soldotna 99669
29	Julieann M Amico	Julieann M Amico		Box 2324	Homer, AK 99603 High
30	[illegible]	BARBARA TRASKA		135 E. FIREWEED	HOMER 99603

AFFIDAVIT:

State of Alaska)
Third Judicial District)

The undersigned, being first duly sworn, hereby certify that the parties whose signatures appear above were identified as residents of the Kenai Peninsula Borough, personally signed the petition in his/her presence on the date set out above, and stated that the address given was their present residential address.

Signature: _____

Sworn and Subscribed to before me this _____ day of _____, 1985.

_____ My commission expires _____.

Notary Public in and for Alaska.

Call the Seatbelts Are For Everyone (SAFE) Committee at 235-7240 for more information or petition pick up, or mail petition to P.O. Box 3331, Homer, Alaska 99603.

T M S Transportation & Marketing Systems, Inc.
P.O. Box 770350 • Eagle River, Alaska 99577 • (907) 694-4865

April 3, 1986

The Honorable Bette Cato
Alaska State Legislature
Box V
Juneau, AK 99811

Dear Ms. Cato:

I would like to thank the House Transportation Committee for the opportunity to testify during the teleconference on April 2, 1986. By this letter, I would like to recap my comments during the teleconference as well as other thoughts that I held due to the shortness of time.

First of all, there is a serious question of whether seat belts and compartmentalization are compatible. Of the limited testing that has been done to date, the results have shown more serious complications to potential seat belt occupants versus unbelted occupents. The combination of 24" seat backs, limited seat spacing and belts show the potential for more severe injury in frontal collisions. Again, the concern of retrofitting a bus that wasn't designed with seat belts in mind brings grave doubts as to whether the bus components would be safe with the extra stress of belts.

I would like to urge the legislature to consider two recommendations. The first is to urge the Federal government to immediately implement a comprehensive testing program in two areas: One area would be the retrofitting of existing buses. What are the real safety issues of retrofitting and what would be the safest way of retrofitting an existing bus if a school district so chooses? To what standards should a retrofitting program adhere if a school district so chooses? The second area of testing with a resultant set of standards would be for newly manufactured buses. Again, as in the case of retrofitting, we have no standards established by the federal government for seat belts in large school buses.

I would hope that we would learn a lesson from our current insurance crisis. Before we go charging off and requiring seat belts in buses, let's make sure they are indeed safe and that if they are, we have standards that belts and buses must comply together. Let's not suddenly wake up two years or more down the road and find that we are involved in a crisis situation because we didn't put enough thought into the situation at the time that legislation was enacted.

Another aspect of the school bus seat belt issue is that of priorities. We (Alaska School Transportation Association, Alaska School Bus Safety Commission and other industry professionals) have for the last few years attempted to get a safe minimum standard for school bus driver training. We have also attempted to get funding for a state monitoring and training program for school bus driver training and school bus inspections. We are considering the appropriation and spending of millions of dollars for seat belts, yet we don't have but a minimum effort at best in the areas of school bus driver training and school bus inspections.

In this time of shrinking oil revenues and budgets, we must put items in order of priority. School districts are cutting elementary swim education programs and other type programs. How many children/adults die in Alaska annually because they don't know how to swim? How does that program stand up in comparison to seat belts in school buses? I'm a parent who has a child who came very close to drowning in one of Alaska's rivers. I can state categorically that I feel there is a much greater danger to my child in and around Alaska's waterways than in riding a "compartmentalized bus." My point is that we must take a strong, unemotional, objective look at our priorities and decide where our largest problems are and where our dollars will make the most significant impact.

I would like to make some comments concerning some of the statements made during the teleconference. The one comment concerning the use of seat belts on buses in the East End Road at Homer brought up an interesting problem. If those roads are so treacherous in the spring and the liklihood of rollovers/accidents is great, why are we allowing buses on the road? Don't the residents know the dangers they are exposing their children to? There is no way that a school bus operator can anticipate and prepare a driver or vehicle under those adverse conditions. I would submit that instead of installing seat belts in buses because the road conditions are particularly dangerous, that the buses should not be operating in these conditions, seat belts or not.

Another comment was made speculating that most accidents in Alaska were of the side impact or rollover type. That speaker obviously did not know what he was talking about. Being an operator in the industry for the last nine years, I can tell you that most of our accidents are either rear or front impacts, the highest percentage being rear impact.

One speaker commented about the seat belt movie "Room to Live" and then went further to state the only difference between buses and cars were that buses were yellow. The movie "Room to Live" does a good job of showing how seat belts enhance safety in cars. But there is little if any correlation between cars and buses during impacts. In cars, the mass of the vehicle is small and therefore transmits more of the force in a collision to the passengers. Most passengers are seated at a door and those in front have no padded barricade, just a dash and windshield.

In a bus, the passengers are in a padded seat area with little or no exposure to doors. The windows are designed to stay in place and to keep passengers inside. The center of gravity of the bus is higher than most vehicles which in most cases is a positive factor during collisions. And most importantly, the mass of the bus is much greater than an automobile. The bus is able to absorb more of the force in a collision, there fore passing on less force to its passengers. I could not count the number of times I have responded to an accident involving a school bus where the car hitting the back of the bus has extensive damage or had been totaled, yet the bus has no damage or simply a scraped bumper. There are significant differences between automobiles and school buses in collision situations.

The speaker from Fairbanks who referred to two accidents this year in which seat belts would have made a difference was, at best, misinformed. Transportation and Marketing Systems operates the Fairbanks buses and the accident investigation did not show that seat belts would have been a factor in any of our accidents. Unfortunately, we have had more than two accidents in Fairbanks, so It's hard to know which the speaker was talking about, but the highest incidence of accidents involve our buses being struck in the rear.

The engineer from Fairbanks spoke to the conclusion that the paramenters for the Canadian testing were set up against seat belts. Specifically he stated that the dummys used were the size that would have the greatest liklihood of hitting the seat with their head and the seat belts weren't necessarily tight across the lap. The seat backs weren't high enough nor were they padded sufficiently. All these factors were supposedly loaded against seat belts. Unfortunately, the conditions of the test were real world. The dummys were selected because they were the best representation of the average size of a child. The seat back height was 24", which is the situation you face with virtually every bus in the country if you consider retrofitting and not replacing the seats with 28" backs. The padding on the seats is what we have on virtually every post-1977 bus; that's the federal standard. And as far as the complaint that the belts were not tight, thus enabling the dummys to slide forward, if that was the case, again, welcome to real world situations. How is a bus driver going to insure that every one of his 65 to 71 elementary passengers have their belts snugly around their hips?

In conclusion, there seems to me to be two basic issues. First of all, is there conclusive and comprehensive evidence that seat belts in large buses enhance the total safety environment? If conclusive evidence is presented then what standards are to be used to install belts in used buses and what specifications do manufacturers use to construct new buses?

The second issue is that of priority. Unfortunately, our state and school districts do not have money to satisfy everbody's needs and wants. If we have extra money to spend, our state is in dire need of funds for school bus driver training programs and inspection programs. I also feel that there are other priorities that come far ahead of seat belts on large capacity school buses.

Cordially Yours,

Thomas F. Hyatt
General Manager - TMSI
Member - Alaska School Bus Safety Commission
President - Alaska School Transportation Association

TFH/cp

APR 0 7 1986

April 3, 1986

Dear Rep. Cato and Committee Members

My children have become school age and I want them as protected on the school bus as they are in any other vehicle--buckled-up.

I have done my part, faithfully buckling them up every single time. My children feel "naked" when they have to ride a vehicle without belts i.e. some airport shuttle buses. It is second nature to them to buckle up. It is a non sequitur when they start school for the School District, Borough Government, and State Government to sanction vehicles without seatbelts.

When I asked my principal about this she said it is safer without seatbelts. This does not make sense; it defies reason. In fact, when I studied the information and data, IT IS NOT TRUE. Why are we told this ridiculous answer?

Indeed, the very research which people quote to prove seat-belts are dangerous proves the opposite at best and at the very least it is such a poor study no one should use it to prove anything. The best proof is a bus accident last year in Florida (Beth Lauesen gave this testimony April 2). In the accident in a large school bus severe injuries were sustained by all unbelted persons and only minor or no injuries were sustained by all belted persons including a child in a wheelchair. To those who want more tests--great! However, in the meantime buckle up the children-- not the other way around.

For the first time in my life I have appeared and testified at a school board meeting and now a teleconference because this is important to me. It is important to my friends as well. Rest assure this is hot topic-- one that is discussed at our children's birthday parties. This is a true grass roots issue. I have become active because I would never forgive myself if I had not done all I could to keep my children as safe as possible. I will hold the State responsible if it does not act to insure my child the right to safe school transportation.

On this week's teleconference someone asked me if I'd considered driving my children to school. The answer is definitely YES and I know several who do. In fact, a mother from Healy testified she would do so next year when her children started school-- a 240 miles a week job. Yes, safety is a top priority.

It is imperative that we protect our children to the best of our ability, NOW. The mundane realities of cost also favor

installation. One bad accident will cost more than the seatbelt. The only lawsuits that have been successful are two that found the school districts negligent for NOT providing seatbelt protection.

In conclusion, I'd like to thank the Committee for the eleconference opportunity and urge you to protect our children now before tragedy strikes.

Sincerely,

Laurie Rockstad

Laurie Rockstad
1946 Swallow Dr.
Fairbanks, Alaska 99709

APR 2 2 1986

Box 133
Galena, AK. 99741

April 22, 1986

Representative Bette Cato
Chair, House Transportation Committee
Alaska State Legislature
Juneau, AK. 99801

Dear Representative Cato:

In Alaska, the Governor, the State Legislature, the State School Board and local school boards are all asking questions about the advisability of installing seatbelts in school buses. The Department of Public Safety and the Department of Health and Social Services are agencies whose missions are injury prevention and public safety. However, the Alaska Department of Education has become the most vocal agency in this issue. Their ability to treat the subject fairly is questionable because of their:

1. Failure to Listen to All Interests

While the Department of Education has had information on the positive aspects of seatbelt installation for over a year, they have not mentioned this side of the issue in any of their publications. In their booklet, "School Buses and Seat Belts- A discussion", the Department presents only arguments against seatbelts supplied by the pupil transportation industry. They fail to balance their "discussion" with information on school bus seatbelt successes and nationwide medical support.

2. Failure to Treat the Problem Seriously

The Department of Education, in their brochure, states that the "real danger" is in the loading zones. By shifting emphasis to the loading zones, the Department treats on-board deaths and injuries (5,500 on-board injuries nationwide in 1984) as inconsequential. Only after 5 Alaskan children died in the loading zones was any action taken. Presumably, the Department of Education needs an on-board body count before they will take this problem seriously.

3. Use of Misinformation

In their brochure, the Department of Education states that passengers cannot be ejected from a school bus because they do not sit next to doors. National Transportation Safety Board accident reports clearly document rollover accidents where students were ejected through the windows and crushed as the bus came down on top of them (enclosure 1). The National Highway Traffic Safety Administration in their report "Safety Belts in School Buses", June 1985 stated:

"...ejections, which could be prevented by seatbelts, represent one-fourth of all fatalities."

The Department of Education contends that lap belts are not compatible with the closely spaced seats in today's school buses. In their brochure, DOE refers to a test which showed that at least 40 inches of space are needed in front of a lap-belted passenger. The reference is incorrect. The test was performed by the National Motor Vehicle Research Foundation (not the Southwest Research Institute, as DOE states), involved front seats of cars, and is not applicable to school buses.

Seatbelts and closely spaced seats (27 inches or less) have been required on small and mid-sized buses since 1977. This arrangement has not only proved compatible, but has saved lives and prevented injuries, according to The National Transportation Safety Board (enclosure 2). The omission of this information in DOE's brochure is significant.

The Department of Education appears to have published information supplied by the pupil transportation industry without verifying their sources. Such irresponsible action on the part of a state agency is inexcusable and casts serious doubt on their ability to be objective about seatbelts on school buses.

4. Conflict of Interests

Information on seatbelts in school buses which has been provided by the Alaska Department of Education is seriously biased towards pupil transportation interests. It is ultimately DOE who will pay for seatbelts should House Bill 684 become law. Additional buses may have to be purchased by the state as this law ensures that every student must be provided with a seat and seatbelt. Students, who currently stand in the aisles, illegal under state law but allowed in some districts, will finally have a place to sit. The Department of Education may have to make some financial sacrifices for the sake of child safety.

5. Failure in Safety Education

Seatbelts have been required in all school vans and mid-sized school buses since 1977. The Department of Education, whose mission is to educate children, has had nine years to develop a curriculum to encourage seatbelt use in smaller buses, but has failed to do so.

A seatbelt education program should already be in place in those school districts which operate small and mid-sized buses. Districts have had nine years to acquaint themselves, their drivers and their students with the safety restraints which the Federal Goverment has made mandatory. There should be no problem adapting their program to new large buses entering the system.

Conclusion

Other state agencies have more expertise, knowledge and commitment in the area of child safety and passenger restraint than the Department of Education. The Highway Safety Planning Agency of the Department of Public Safety has supplied grant support for 'The Real Connection', an excellent seatbelt education curriculum which was adapted for this state by the Alaska Council on Prevention of Alcohol and Drug Abuse, Inc.

The Emergency Medical Services Section of the Department of Health and Social Services is concerned with injury prevention and realizes the value of occupant restraints in school buses.

I would urge decision-makers who are asking questions concerning the advisability of installing seatbelts in school buses to look at all sides of the issue. This can best be done by consulting the Department of Health and Social Services and the Department of Public Safety, as well as the Department of Education.

Sincerely yours,

Laurel Osborne

Laurel Osborne
Chairman, Galena PTSA Safety Committee
Regional Coordinator, National Coalition
For Seatbelts on School Buses

Seatbelts on School Buses" Enclosure #1

nformation on Resolution #7

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

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

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

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

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

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

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

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

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

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

Kinematics of Occupants:

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

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

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

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

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

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

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

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

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

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

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

-Restraints would have prevented the ejections in this accident.

-Restraints would have prevented the postimpact kinematics to the passengers. This is especially true of the rear section that came to rest on its top."

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Newsletter Excerpts:

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

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

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

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

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

Conclusions: "NHTSA should be urged to amend standard #222 to require high-backed seats and seatbelts or, at the very least, seatbelt ANCHORAGES to make it possible to install belts in the course of the 14-year lifespan of a bus ... Ultimately, it is public concern that is the key to action. Buses may be relatively safe, but they are not safe enough."

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

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

Enclosure #2

8/25/82

AUG 27 1982

Safety Information

We would like you to have this information

Bob Evans

FOR IMMEDIATE RELEASE: Monday,

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

NATIONAL TRANSPORTATION SAFETY BOARD
Washington, D.C. 20594

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

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

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

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

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

- more -

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

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

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

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

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

--oOo--

Press Contact: Brad Dunbar
(202) 382-6605

APR 0 7 1986

Box 225
Galena, AK.
99741

April 3, 1986

Representative Bette Cato
Chairman, House Transportation Committee
Alaska State Legislature
P.O. Box V
Juneau, Alaska 99811

Dear Representative Cato:

After I mailed my testimony from Wednesday's teleconference to you I realized that I:

1. Had left out a page on the Federal Standards.
2. Had given you a poor page 6 of the Sherman and Howard letter.

Please accept my apologies. I was rushing and trying to get the information to you before your Tuesday meeting.

Again, if I can be of assistance, just let me know.

Sincerely yours,

Laurel Osborne

Laurel Osborne

Standard No. 124 - Accelerator Control Systems

This standard establishes requirements for the return of a vehicle's throttle to the idle position when the driver removes the actuating force from the accelerator control, or in the event of a breakage or disconnection in the accelerator control system.

Standard No. 205 - Glazing Materials

This standard specifies requirements for all glazing materials used in windshields, windows, and interior partitions of motor vehicles. Its purpose is to reduce the likelihood of lacerations to the face, scalp, and neck, and to minimize the possibility of occupants penetrating the windshield in collisions. It requires, among other things, that windshields be of a type that tend to cushion those that impact them, rather than allowing head penetration and even decapitation - a problem with older windshields. An amendment to this standard added two new categories of glazing materials, amended the certification requirements, and made minor changes to the chemical resistance tests.

Standard No. 207 - Seating Systems

This standard establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibility of failure as a result of forces acting on the seat on vehicle impact. This standard was amended, effective January 1, 1972, to extend applicability to the driver's seat of buses.

* Standard No. 208 - Occupant Crash Protection

This standard amends Standard No. 208, Seat Belt Installations, by specifying requirements for both active and passive occupant crash protection systems for passenger cars, multipurpose passenger vehicles, trucks and buses. Effective January 1, 1972, passenger cars were required to have improved safety belt systems which incorporate automatic adjuster, single point release and a belt use warning system. Effective August 15, 1973, passenger cars were required to provide occupant crash protection for front seating positions by passive means that require no action by vehicle occupants or to provide belt starter interlock systems. Light trucks and multipurpose passenger vehicles were required to have one of these systems after August 15, 1975. An amendment disallowed the starter interlock systems and established requirements for a visual signal, a "Fasten Seat Belt," sign and an audible signal that operates for a 4- to 8 second period after the ignition is operated, effective February 25, 1975, for passenger cars and January 1, 1976 for multipurpose passenger vehicles and light trucks. A recent amendment continues present options for occupant protection in passenger cars until August 31, 1976.

Standard No. 209 - Seat Belt Assemblies

The National Bureau of Standards, Standards for Seat Belts for Use in Motor Vehicles, was originally incorporated only by reference to this standard. On December 24, 1968, the specifications were made a part of this standard. In order to mitigate the results of an accident to a person in a motor vehicle, the standard specifies requirements for seat belt assemblies. The requirements apply to straps, webbing, or similar devices as well as all necessary buckles and other fasteners, and all hardware designed for installing the assembly in a motor vehicle. This standard was amended to upgrade webbing abrasion, buckle crush and emergency locking requirements. It was further amended to reduce the minimum retraction force required of emergency-locking retractor force.

Standard No. 210 - Seat Belt Assembly Anchorages

This standard specifies the requirements for seat belt assembly anchorages to insure effective occupant restraint and to reduce the likelihood of failure in collisions. Included is a requirement for anchorages for lap and upper torso restraint belts in all forward facing outboard seats (four in standard sedans). This standard was amended extending the requirements to driver's seats in buses and upgrading the test requirements effective January 1, 1972.

Standard No. 217 - Bus Window Retention and Release

This standard establishes minimum requirements for bus window retention and release to reduce the likelihood of passenger ejection in accidents and enhance passenger exit in emergencies. The effective date is September 1, 1973. The standard was amended to exempt certain buses manufactured for the purpose of transporting persons under physical restraint and to clarify marking requirements. It was amended further to require that each school bus have an interlock system which will prevent the engine from starting if an emergency door is locked and an audible warning system which will sound an alarm if an emergency door release mechanism is not closed while the engine is running, effective October 26, 1976.

Standard No. 219 - Windshield Zone Intrusion - Rule (PC (9/1/76), MPV & TR, B of 10,000 lbs. or less GVWR - 9/1/77

The purpose of this standard is to reduce crash injuries and fatalities that result from occupants contacting vehicle components displaced near or through the windshield. The standard regulates the intrusion of vehicle parts from outside the occupant compartment into a defined zone in front of the windshield during a frontal barrier crash test. An amendment changed effective dates as noted above, substituted the term "daylight opening" for "windshield opening."

Standard No. 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 vehicle's unloaded weight, the vehicle roof shall not crush more than 5 1/8 inches, and the emergency exits shall be capable of being opened, with the weight applied and after its release.

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.

Standard No. 222 - School Bus Passenger Seating & Crash Protection

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

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.

Standard No. 302 - Flammability of Interior Materials

Specifies burn requirements for materials used in the compartments of motor vehicles. An amendment, effective October 1, 1975, modifies the test procedures and specimen preparation requirements.

the central issue in the case. In any event, wheelchairs are plainly a special case. Colorado requires tie-down mechanisms in vehicles intended to carry disabled students. 1 C.C.R. § 301-25(96).

6 Annotation, Tort Liability, supra note 4 at 1230-36. See also Annotation Personal Liability of Public School Executive or Administrative Officer in Negligence Action for Personal Injury or Death of Student. 35 A.L.R. 4th 272 (1985 & Supp.).

7 Annotation, Liability of Owner or Operator of Motor Vehicle or Aircraft for Injury or Death Allegedly Resulting From Failure to Furnish or Require Use of Seat Belt. 49 A.L.R. 3d 295, 302-04 (1973 & 1985 Supp.).

8 McNeil v. Yellow Cab Co., 147 Cal. Rptr. 733 (Cal. Ct. App. 1978). See also Twohig v. Briner, 214 Cal. Rptr. 729 (Cal. Ct. App. 1985) (jury issue of negligence when private vehicle owner removed seat belts from her car).

9 Greyhound Lines, Inc. v. Superior Court, 83 Cal. Rptr. 343 (Cal. Ct. App. 1970) (passengers in a bus crash); Tiemeyer v. McIntosh, 176 N.W. 2d 819 (Iowa 1970) (failure to install seat belts in a taxi cab is not negligence as a matter of law, but presents an issue for the finder-of-fact; here, the trial judge's finding that the defendant was not negligent as a matter of fact was upheld); Benson v. Penn Central Transp. Co., 342 A.2d 393 (Pa. 1975) (it was a question of fact for the jury whether a taxi cab company retained by a railroad to transport railroad employees was negligent in not installing seat belts).

10 Supra note 4.

11 For example, a California appellate court found there to be a question of fact for the jury as to whether an employer--who is not held to the same high standards as a common carrier--should have recognized the inadequacy of the then prevale practice of not providing seat belts and should have supplied them for its employees. Mortenson v. S. Pac. Co., 53 Cal. Rptr. 851 (Cal. Dist. Ct. App. 1966) (case decided under Federal Employers' Liability Act, 45 U.S.C.A. § 51).

Colorado school districts are already required to instruct students in safe behavior on buses and to ensure proper deportment. 1 C.C.R. § 301-26 (4204-R-216.00) (emer-

APR 1 6 1986

Box [illegible]
Galena, Alaska
[illegible]

April [illegible], 1986

Representative Bette Cato
Chair, House Transportation Committee
Alaska State Legislature
P.O. Box V
Juneau, Alaska
99811

Dear Representative Cato:

I hope that you received the information which I sent to you last week. I realize that the issue of seatbelts on school buses may appear confusing, especially when opponents and proponents quote the same tests to support their arguments.

I would like to try and clarify the controversy concerning "The Canadian Tests". It is essential that you have a copy of the original report "School Bus Safety Study, Volume 1, Report" by G.H. Farr--the entire 123 page report or at least through page 71. Do not accept any summaries or conclusions by other parties. The Department of Education should be able to supply you with the complete report.

The following is provided as a guide to some of the problems found with the Canadian Report.

Page:

5- For the large bus tested "...all dummies exhibited HIC values which were less than 1000. The value of 1000 is the generally accepted threshold, above which serious injury or death is likely to occur." Typically a belted dummy receives a higher head and lower chest injury than its unbelted counterpart. Belted dummies received acceptable readings in this test.

13- "Six instrumented but uncertified 5th percentile adult female anthropomorphic test devices were installed in each bus..." Six instrumented dummies, particularly placed in a 66 passenger large bus is not a statistically valid sample. The dummies were not certified for compliance testing.

48-49- In the Blue Bird bus "If a rollover had occurred, a significant leakage of fuel would probably have occured." On the Thomas Minotour Bus "If even a partial rollover had occured, a major fuel spill would have happened." In the van conversion "two of the three left side windows shattered early in the event. This resulted in a tremendous number of small shards of glass being hurled about the interior of the bus." These buses were all 1984 models and should have met Federal standards.

62- It is worth noting that the ATD neck is exceptionally stiff, much more so than that of a human.

63- An uncelted dummy, in the large Blue Bird bus "experienced a resultant chest acceleration of 60.4g which is marginally above the limit of 60g." In my opinion if 60g is dead, 60.4g is just as dead.

63- In the large bus a belted dummy slid approximately 254 mm along the seat cushion before being pivoted about the lap belt." In order for a dummy to slide 10 inches on the seat before contacting the belt, the belt has to be at full extension. Apparently the seatbelts were never tightened on the belted dummies. I have to seriously question the motives behind the non-adjustment of belts in this test.

54- In the large bus an unrestrained dummy "...ended up laying in the aisle." Compartmentalization failed to contain this dummy.

57- In the large bus "The hood of the vehicle penetrated the windshield. With the windshield encroaching from the front and the body sliding forward, the driver's compartment was severely crushed. It is doubtful if the driver would have survived this collision." It is worth noting that the "body slide", where the bus body slides forward on the chassis, is a feature that was deliberately built into compartmentalized buses, so that the front of the bus would take the brunt of the impact, and the forces to the passengers would be lessened. One would have thought that if adequate crash testing had occurred in 1970's, the problem with the obliteration of driver space and driver would have been realized.

59- In the van conversion an unrestrained "... dummy then rotated to an upside down position and ended up resting on the door operating mechanism."

61- In the van conversion an unrestrained "...dummy was rotated to the right and rebounded into the centre aisle."

63- In the Thomas Minotour "...the dummy ended up laying partially in the aisle." Some summaries of the report state that compartmentalization functioned as expected in these tests. Was the expectation that dummies would be thrown in the aisles and on door opening mechanisms?

65- In the Thomas Minotour "This dummy slid approximately 250 mm along the seat before pivoting about the lap belt." Again, this dummy's seatbelt was not tightened.

I hope that this attempt at documentation of problems with the Canadian Tests have proved informative to you and should help explain some of the statements which I made in testimony to your Committee.

I have enclosed a number of papers and letters which address the Canadian studies. Please let me know if I can be of further help.

Sincerely yours,

David Osborne

65

A FRESH LOOK AT THE ARVIN/CALSPAN CRASH TEST RESULTS

(The Canadian Report)

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

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

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

A FRESH LOOK AT THE ARVIN/CALSPAN CRASH TEST RESULTS

(The Canadian Report)

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

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

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

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

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

A. Blue Bird Bus -- Type A

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

B. Thomas Mid-Size Bus

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

C. Campwagon Bus

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

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

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

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

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

Nancy Bogel
Angela Eidelman, DESIGN ENGINEER *
Eileen Mendelsohn
Allan Mendelsohn

* Box 72
N. SALEM, NY 10560

The University of Michigan

COLLEGE OF ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING
AND APPLIED MECHANICS

321 W. E. LAY AUTOMOTIVE LAB. N.C.
ANN ARBOR, MICHIGAN 48109-2121

DATE January 23, 1986

TO Colleagues concerned about Child Passenger Safety

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

John W. Melvin
Kathleen Weber

RE Transport Canada School Bus Safety Study

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

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

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

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

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

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

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

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

ROCHESTER GENERAL HOSPITAL
UNIVERSITY OF ROCHESTER
SCHOOL OF MEDICINE AND DENTISTRY

JOHN D. STATES, M.D.
CHAIRMAN AND PROFESSOR
DEPARTMENT OF ORTHOPAEDICS

DOCTOR'S OFFICE BUILDING
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December 23, 1985

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

Dear Senator Levy:

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

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

1. Anthropomorphic dummies as specified in Part 572 of the United States Department of Transportation Federal Motor Vehicle Safety Standards were used. These dummies do not accurately model the flexibility of the human spine, and particularly the spine of a child. The stiffness of the dummy spine induces excess velocity in the head by the time the head contacts the seat in front of a belted dummy. The additional stiffness also prevents contact of the chest, shoulders and upper extremities with the seat in front. This contact would share loading and reduce the head accelerations and the Head Injury Criterion (HIC). The Part 572 dummy was recognized in the FMVSS in 1972 and has not been upgraded inspite of the availabilty of much more representative dummies: ie; the Hybrid 3 dummy.

2. Adult injury criteria were used. The HIC of 1000 is almost certainly not applicable to children. Experimental studies have demonstrated that arterial vessel walls in the brain of children are significantly more resistent to tearing than similar adult tissues. The skulls of children are more flexible and elastic and better able to tolerate impact trauma than the adults. No consensus exists concerning a child's HIC but it is my personal impression that it is greater than 1500 and possibly 2000 rather than the 1000 used for adult.

3. Children are more resistent than adults to impact injury in all parts of their body. Experimental and accident investigation studies reveal that the bones of children have greater tensile strength and are more resistent to fractures, that ligaments, muscles, and blood vessels of the peripheri have greater tensile strength. Field accident experience bears this out. Spinal cord injury is virtually unknown in children under age 1..

4. Seat backs used in New York State school buses are 28 inches high, 4 inches higher than seat back required under Federal Motor Vehicle Safety Standard 222. The additional height insures that the 5th Percentile dummies used in the Canadian tests will impact the vertical surface on the back of the seat rather than the top of the seat back as occurred in the Canadian tests. The top of the seat backs of the Thomas buses used in the test are particularly stiff because of the presence of a pipe placed crosswise in the seat. This was mentioned by Mr. Gardner of Transports Canada at the 12/16/85 hearing.

5. The Canadian tests ignored the spectrum of accident configurations experienced by school buses in the real world. While completely reliable accident statistics do not exist for school buses because of the infrequency of school bus accidents, it is reasonable to conclude that approximately half of injury producing school buses are head on impacts, another third are rollovers and side impacts, and the remainder rear end impacts. Safety belts will give excellent protection to occupants in rollovers and side impact accidents. The belts will hold the occupant in place and prevent them from striking the roof or opposite side of the bus. In addition, safety belts will provide protection in head on impacts when pitch occurs. In the real world, occupants are frequently pitched upward as well as forward and thrown from their seats. This happened in the recent fatal accident which occurred Mahopac, New York on 10/15/85 when Paul Goodrow, Jr., was killed. This was an accident of minor impact severity and he was the only occupant to sustain significant injury. If he had been wearing a belt, he would have been held in place and not thrown out of his seat.

In conclusion, I believe that the installation of lap belts in New York State school buses will not increase the risk of injury for school children using the lap belts, but will actually reduce the risk. The educational benefits to the school children are the principal reason for the installation of seat belts in school buses. It is essential that children learn this habit, which in the future will almost certainly protect them from a disabling injury and, possibly, save their lives. Children are now entering school having worn child restraints while traveling in their parents cars. It is essential that they can continue this habit while riding in our school buses.

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

Sincerely,

JDS/rmk

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

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

Dear Mrs. Kleinfeldt,
I'm very pleased that you presented on 4-16-84 a well done safety belts in school buses. Thanks for your diligent effort.
John D. States, M.D.

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BRIEF CURRICULUM VITAE - JOHN D. STATES, M.D.

EDUCATION

Premedical	University of Rochester	B.A. 1946
Medical	Harvard Medical School	M.D. 1949
Internship	Rochester General Hospital, Rochester, NY	1950-1951
Residency	Children's Hospital & Massachusetts General Hospital, Boston, MA	1954-1956

MILITARY SERVICE

United States Air Force (Capt. MC) 1951-1953

PRINCIPLE RESEARCH

Traffic accident investigation to determine injury mechanisms and effectiveness of occupant protection systems and designs.
Injury severity scaling - Co-developer of Abbreviated Injury Scale.
Chairman of Committee on Injury Scaling of the American Association for Automotive Medicine 1971-1982.

RESEARCH ACTIVITIES

Accident Investigation Research since 1959.
Contract Funding U.S. Department of Transportation 1969-1973.
New York State Department of Motor Vehicles 1973 - to date.
Consultant on Biomechanics for General Motors 1976 - to date.
Consultant on Accident Investigation and Biomechanics for Volkswagen 1976 - to date.
Past Member of National Motor Vehicle Safety Advisory Council, 1969-1976.
Chairman of Crashworthiness Committee of U.S.D.O.T.

HOSPITAL APPOINTMENTS

Chairman, Department of Orthopaedics, Rochester General Hospital 1976.
Chief of Service Rochester General Hospital since 1969.
Clinical Appointment, 1956.
Strong Memorial Hospital, Attending 1958.
Consultant in Orthopaedics - Genesee Hospital, Highland Hospital, ParkRidge Hospital (Rochester, NY), Myers Community Hospital, (Sodus, NY), Soldiers and Sailors Hospital (Penn Yan, NY).

TEACHING APPOINTMENTS

Professor of Orthopaedic Surgery- University of Rochester - 1976.
Associate Clinical Professor of Orthopaedic Surgery -1970.
Clinical Instructor Orthopaedic Surgery - 1960.

National Coalition for Seatbelts on School Buses

THE CANADIAN TESTS

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

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

Test Results

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

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

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

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

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

Not unexpectedly, HIC levels in the mid size and van were

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

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

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

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

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

Arthur L. Yeager DDS
Chairman
May 1985

Canadian School Bus Safety Tests
April 1985

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

1. that passengers restrained by lap belts in a school bus did remain within their compartment,

2. that restrained passengers and their seats did withstand the force of the collision, and

3. that all belted dummies received HIC (a generally accepted injury level) levels lower than 1000.

As expected, the unrestrained dummies received lower HIC levels than the belted ones in the severe front-end collision, but this study also showed the unbelted dummy in the center of the bus (ATD#4) did not remain within the compartment and actually landed in the aisle of the bus. Another unrestrained dummy (ATD#1) received a slightly higher than allowable chest acceleration.

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

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

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

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

Bridget A. Ernst
Regional CoCoordinator
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Seatbelts on School Buses

Attachments

NHTSA Completes Its Crash Testing Program Of 1984 Car Models

The National Highway Traffic Safety Administration (NHTSA) has completed its 1984 new car assessment program with the release of 15 additional motor vehicle crash tests.

Of the new group, six fared reasonably well: a Toyota van wagon, a 4-door Mercedes-Benz 300 SD equipped with a driver air bag, a 4-door Mercury Grand Marquis, a 2-door Honda Prelude, a 4-door Renault Alliance (though some of the results were unavailable), and a 4-door Toyota Tercel hatchback.

The tests, conducted at 35 mph, exceed the government's safety requirements by 5 mph.

All of the above cars listed except the Mercury produced head injury results during the test that were below the 1,000 limit NHTSA has considered the threshhold for serious injury. The Mercury Marquis produced results that were slightly in excess of 1,000. However, the chest injury measurement produced by the driver side dummy in the Mercedes test was 63g, slightly in excess of the 60g NHTSA considers to be the desirable upper limit.

Mercedes officials did not disagree with the test results, saying their own tests had produced similar readings, but they argued that the test itself, which was developed for seat belts, isn't appropriate. The dummy does not measure how the crash forces are spread across the chest and the company has asked NHTSA to adopt a different standard for air bags.

The Toyota van also had some difficulty managing the crash forces exerted on both dummies' legs. The forces generated in the crash produced measurements in excess of the levels NHTSA says are likely to produce serious injuries.

The other vehicles tested produced head injury measurements that substantially exceeded the 1,000 limit though none exceeded the limits for chest and leg injury. See listing for details. (For earlier crash test results, see *Status Reports* Vol. 19, Nos. 4 and 9, March 3 and May 26, 1984.)

Update

Louisiana and Texas have become the 48th and 49th states to enact child restraint use legislation. Only Wyoming's legislature has not adopted a restraint requirement for young children.

NHTSA New Car Assessment Program — 1984 Models 35 mph Frontal Crash Test Results

Cars	Head Injury Criterion* Driver	Passenger
Buick Park Avenue 4-Door (1985 model)	1,550	662
Datsun 200SX 2-door hardtop	1,992	582
Ford Mustang 2-door convertible	894	1,112
Honda Prelude 2-door coupe	659	475
Isuzu Impulse 2-door hatchback	1,769	2,454
Mercedes-Benz 300SD 4-door sedan (equipped with supplemental driver air bag and belt tensioning device)	890	734
Mercury Grand Marquis 4-door	1,094	1,019
Mitsubishi Tredia 4-door	1,314	1,521
Renault Alliance 4-door	940	**
Renault Sportwagon 4-door station wagon	2,053	2,721
Toyota Tercel 4-door hatchback	658	492
Utility Vehicles		
AMC Jeep Cherokee 2-door MPV (4x4)	850	1,548
Dodge Caravan	973	1,200
Toyota Van Wagon MPV	984	748
Pickup Trucks		
Ford F-150	1,362	1,443

*The lower the HIC value, the less the risk of head injury.

**Data not available.

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December 27, 1984

The Editor
School Transportation Director
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To The Editor:

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

1. Part 572 dummies were used. It is well known that the neck and spines of these dummies are very stiff and do not model the performance of the human spine at all well. The shortcomings were well recognized by 1972 and an improved version with a more supple, although still quite stiff spine was introduced by Highway Safety Research Institute of the University of Michigan. The stiffness of the neck and spine of the Part 572 dummy will exaggerate head loading because it delays or prevents shoulder and chest contact with the seat back. Shoulder and chest contact should occur in this accident configuration and reduce head loads but can occur only if the spine is sufficiently flexible to permit extension.

2. The particular seats used in the experiment were particularly stiff according to one of the investigators with whom I spoke. These seats should be carefully examined to identify any structure which might increase head loading if the force is delivered from a non-horizontal direction.

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

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

Sincerely,

John D. States, M.D.

JDS/rmk

John D. States, M.D.*

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

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June 25, 1985

M E M O R A N D U M

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

FROM: Dr. Russ Fine
Professor and Co-Director

RE: Canadian School Bus Safety Study

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

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

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

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

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

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

crashes by type) should not and cannot be legitimately generalized to the spectrum of collision types in which any vehicle can be involved.

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

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

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

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

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

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

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

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

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

Good Luck ... you'll need it.