

NASDPTS' Survey on Real-World Experiences with Safety Harnesses

NASDPTS recently sent you a copy of its paper, "Safety Harnesses and School Buses," which was developed in an effort to inform the pupil transportation industry of the current facts about safety harnesses/vests and Federal Motor Vehicle Safety Standard 213, "Child Restraint System." The paper is also on the association's web site – www.nasdpts.org – under the Focus Topics section.

As noted in that paper, the federal government may consider amending FMVSS No. 213 if it has sufficient information to justify such an action. The purpose of this survey is to gather real-world information on safety harnesses/vests used in school transportation.

We realize that it may take extra effort to obtain the requested information, however, with your cooperation it may be possible to collect sufficient information that would allow the federal government to reconsider how and when safety vests may be safely used in school buses. Without your assistance, it is unlikely anything will change.

Thank you in advance for your cooperation and efforts in responding to this survey. We recognize that you may need time to consult local school bus operators in order to be able to answer some of these questions. Your response is requested as soon as possible, but not later than Friday, February 1, 2002. **Please respond to Charlie Gauthier at jollydolly@aol.com or fax to 703-734-1868.**

State: _____ Person Responding: _____

1. Are safety harnesses/vests used in your state? _____
2. If so, how many safety harnesses/vests are in use? _____
[An educated estimate is acceptable.]
3. When (year) were safety harnesses/vests first used? _____
4. Which types of students use safety harnesses/vests? Check all that apply:
____ Pre-school age students with disabilities
____ K-12 students with disabilities
____ Other pre-school age students
____ Others (please specify: _____)
5. Are the safety harnesses/vests only used on school buses with lap belts or lap belt-ready seats? _____
6. How many, or what percentage, of the safety harnesses/vests are attached to the seat back through the use of a cam-wrap device? _____
[An educated estimate is acceptable.]

7. How many, or what percentage, of the safety harnesses/vests utilize a tether? ____
[An educated estimate is acceptable.]
8. In those instances where a tether is used with the safety harness/vest, to what is the tether attached? _____
9. Are you aware of any incidents where a student utilizing a safety harness/vest in a school bus was involved in a crash? _____
10. If yes, can you provide any information about the crash?
Date?
Location?
Injuries?
Statements by safety or medical professionals about the performance of the safety harness/vest?
10. What percentage of safety vest use is for (may add to more than 100% if multiple reasons):
____ Student behavior control (i.e., to keep student in seat for safety reasons)?
____ Student posture control or trunk support (medical reasons or injury prevention during normal transportation)?
____ Perceived improved passenger crash protection (i.e., to augment compartmentalization)?
____ Other reasons (please specify: _____

11. What do you believe are the advantages/benefits of utilizing a safety harness/vest rather than a child safety seat? _____
12. Additional comments: _____

Summary of Comments to NASDPTS' Survey on Real-World Experiences with Safety Harnesses

State	Used in State	How Many ?	Year First Used	Types of Students Using Safety Harness/Vest			Used with lap belt-ready seats?	% used with cam wrap	% used with tether	Tether attached to:		Incidents or Crashes	Purpose of Safety Harness (%) – [may add to more than 100%]			
				Pre-school with Disabilities	K-12 with Disabilities	Other Pre-school age pupils				Seat or seat back	Floor or seat track		Student Behavior Control	Student Posture Control	Perceived Improved Crash Protection	Other Reasons
Ariz	Yes	302 (a)	~1985	X	X	X	Yes	66%	22%		X	No	60%	33%	45%	
Calif	Yes	35 (b)	1990	X	X	X	Yes	100%				Yes (c)	29%	11%	60%	60%
Calif	Yes	~300 (d)		X	X		Yes	100%				No	X	X		
Fla	Yes	7,502 (e)	1975	X	X	X	Yes & No	65%	10%	X	X	Yes (f)	53%	35%	10%	21%
Hawi	Yes	40	1988	X	X		Yes	100%				No	90%	10%		
Ill	Yes	?	~1972	X	X	X	Yes & No	75%	0-50%		X	Yes (g)	15-50%	50-90%		
Ind	Yes	~290 (h)	1978	X	X		Yes	90%	10%	X		Yes (i)	100%	50-100%		
Iowa	Yes	~1,000 (j)	~1980	X	X	X	No	98-99%				No	40%	60%		
Kan	Yes			X	X	X	Yes & No					No				
Ky	Yes	~50-100	2002	X	X	X	No	100%				No	X	X	X	

Me	Yes	~50	1981	X	X	X	No	75%	10%	X		No	80%	20%	1%	
Md	Yes	1,045	~1980	X	X	X	Yes & No	80%	10%	X		No	45%	50%	20%	10%
Mass	Yes	~200	2000	X		X										
Miss	Yes	~300	~1985	X	X	X	Yes	95%	0%			No	20%	10%	70%	
Mo	Yes	~700	1973	X	X	X	No	96%	4%	X	X	Yes (k)	80%	55%	68%	83%
N.Y.	Yes	97 (l)	1978	X	X		Yes & No	100%				No	50%	50%		
Ohio	Yes	2,000+	~1975	X	X	X	No	100%				No	75%	25%		
N.C.	Yes	1,750	~1995	X	X	X	No	90%	10%	X	X	Yes (m)	33%	33%	33%	
S.C.	Yes	~100	~1978	X	X		Yes	90%	10%	X (n)		No	20%	80%		
Texas	Yes	2,980	1983	X	X	X	No	100%				No	90%	50%		
Utah	Yes	~100	1999	X		X	No	50%				No		25%	75%	

NOTES:

- a. Arizona – Based on 9 school districts.
- b. California – Palmdale School District.
- c. Palmdale School District reported 4 incidents (crashes) with no injuries. 10/14/94, 9/24/97, 5/1/98, 1/23/02.
- d. California – AVSTA

- e. Florida – Estimates extrapolated to state level based on reports from 20 school districts.
- f. Florida – 2 crashes reported with no injuries.
- g. Illinois – About 20 years ago in O’Fallon & Mascoutah, Illinois – one bus in a ditch, one broadsided. No injuries in either.
- h. Indiana – Based on 13 schools, of which 9 use a vest and 4 do not.
- i. Indiana – Bus was “T-boned” and the students were hanging from their seats, but no injuries due to the vests.
- j. Iowa – This is an estimate of vest use by public and private schools. It does not include hundreds of child care, Head Start and transit programs.
- k. Missouri – Accident on January 1, 1999 in Dexter R-XI School District. No reported injuries.
- l. New York – Response based on information from 13 out of 700+ carriers.
- m. North Carolina – Reported a couple of crashes, but no information on them.
- n. South Carolina – For those vests that are tethered, the tether is hooked to the lap belt on the seat immediately behind.

Summary & Weighted Averages:

Twenty states responded to the survey, and all reported that safety harnesses/vests were in use in their state. These states reported about 20,000 vests are currently in use. Some states recently started using the vests, while other states have been using them for more than 20 years.

The following summarizes the responses to the various survey questions:

1. What types of students use the safety harness/vest?

- All states use them for pre-school children with disabilities
- Most states use them for K-12 children with disabilities
- Many states use them for other pre-school-aged children

2. Are the safety harnesses/vests used with a lap belt-ready seat?

- About half of the states reported that they used lap belt-ready seats, but the other half did not.

3. Is the safety harness/vest used with a cam wrap device?

- About 80 percent reported using a cam wrap device with the safety harnesses/vests.
- Only about 5 percent reported using a tether with the safety harness/vest.

4. What is the perceived purpose of using a safety harness/vest? (multiple responses were given)

- Slightly more than half responded that the harness/vest was used for student behavior control.
- About 40 percent reported the harness/vest was used for student posture control.
- About 40 percent reported using the harness/vest as a means of improving crash protection.

A total of 12 real-world crashes/incidents were reported where a child was restrained with a safety harness/vest. While few details were given with respect to the severity of the crash/incident, no injuries were reported.

Question 11. What do you believe are the advantages/benefits of utilizing a safety harness/vest rather than a child safety seat?

Arizona

- Can be used for multiple ages of children
- Can be used for children who could unfasten a seat belt
- Quicker to evacuate
- Easier to sanitize
- Cannot be stolen

California

- Can be used for children upwards of 100 pounds
- Take up less room on the seat and for storage
- Can travel with the child to school, home and from bus to bus
- Can be used as a behavior modifying equipment
- Do not need lap/shoulder belt for proper use (school buses do not have L/S belts)
- Allow training and transitioning into a “regular” seat more easily
- Child Safety Seats do not always “fit” into a school bus seat
- Vests are easily adjusted for growth and bulky clothing
- Vests can accommodate many children with orthopedic challenges (including casts, braces and even children in a prone position)
- More mobility and less restrictive environment

Florida

- Versatility and mobility (can be used on different buses)
- Takes less room than a child safety seat
- Can be used for larger students
- No belts required
- Can be used on any bus
- Better for children over 40 pounds
- More difficult to get out of
- Can reduce driver/aide injuries
- Better student control
- More comfortable

Hawaii

- Addresses children with physical disabilities and orthopedic aids
- Good for students that are too large to comfortably occupy a child safety seat
- Allows transportation of a greater number of students
- Behavior training and discipline

Illinois

- Vests accommodate greater age and sizes of children
- Student unable to unhook themselves
- More space and comfort
- Easier to remove in an emergency
- Cam wrap is easier to move than a tether and takes up less space

Indiana

- The advantage is safety – safety for the student in the harness, the other students on the bus, the bus driver and any aides
- Child safety seats do not accommodate all children. A safety harness will accommodate the needs of children of various heights, weights and special needs
- There are no weight restrictions
- Children are more secure in the seat with a harness
- Keeps children from moving out of their seats and can control discipline
- Allows the driver to focus on driving

Iowa

- Provides acceptable postural positioning for students too large for a child safety seat
- Provides flexibility in that the harness can be used on any school bus
- Many children with special needs change schools frequently and need transportation right away. A safety harness provides the flexibility to meet those needs
- Vests can be modified to accommodate physical growth, positioning and securement needs, where a child safety seat can not (replace with new CSRS)
- Reasonably priced, compared with integrated school bus seating systems
- Has provided safe and suitable transportation for many years with a demonstrated real-world safety problem. If these devices were not available, these children likely would have been transported in other, less-safe forms of transportation (cars and vans)

Kansas

- Less storage room
- Fewer breakable parts
- Fits children better
- Less worry about not installing it properly
- Less or easier training required on how to properly use

Maine

- Lower cost
- Easier to move from bus to bus
- Vest has a better range of size adjustment and use

Maryland

- Vests can be used to accommodate each student's height, weight and age
- Vests allow for more seat availability during months of unpredictable weather and bulky clothing
- Students appear more securely fastened in vests
- Provides the posture control and support needed by the more medically fragile students
- For behavior use
- Take up less space
- Take less time to attach to seat
- Easier to maintain
- More cost efficient
- Less time to secure child
- More flexibility and freedom for student
- Eliminates having to physically lift child

Mississippi

- No advantage of a vest over a child safety seat, unless the child's feet make contact with the seat in front of them

Missouri

- Students are more secure in the bus seat
- Vests accommodate larger/older children
- Less expensive
- Utilizes existing seating compartment
- Students can not get out of a vest as easily
- Ease of moving equipment from bus to bus
- Faster evacuations and medical assistance, if needed
- Easier to install
- Does not require a belt system in the school bus
- Less restrictive, yet maintains control
- Safety of child is higher

New York

- Keep students in the seat better and are better for student management
- More comfortable for children – legs are not cramped as in a child safety seat
- Harness can be left in place on the seat with less loss of seating space
- Harnesses fit children that can not sit in a child safety seat
- More cost effective
- Harness is less restrictive, and many children with special needs feel restricted by a child safety seat with its sides that come close to the child's face
- Storage and cleaning issues are easier
- Capacity improvement (2 per seat with child safety seat – 3 per seat with vests)
- Harness is easier to check for stress and durability
- Most school bus operators try to standardize equipment – child safety seats are all different, where vests can be adjusted for all sizes of children
- Safety harnesses last longer

Ohio

- Good for behavioral management – students without skills to remain seated quietly or who cannot refrain from interacting inappropriately with others
- Provide proper seating position for children without sufficient motor skills
- Holds small students to their seat

North Carolina

- Better/easier storage
- Fits larger children
- Can be left on the school bus seat when not in use (child safety seat takes up space)

South Carolina

- Can be used for children that are too large for a child safety seat
- Can be used for children with a medical disability that will not permit a child safety seat to be used

Texas

- Versatility of sizes of children that can be accommodated
- The zipper can be placed in the back to prevent child from unhooking the restraint
- Better posture and added body control
- Easier installation/less time

Utah

- Safety vests offer more room for the child's legs [the seat spacing is such that a child's legs often hit the seat back when they are in a child safety seat

Question 12. Additional Comments

Mississippi

- The Mississippi Department of Education received a \$40,000 Grant from NHTSA – “Occupant Protection for Pre-K Children on School Buses.” The funds were used for the purchase of child safety seats and safety vests. The specifications for the safety vests was based on information contained in the NHTSA brochure, “Proper Use of Child Safety Restraint Systems.” These vests were purchased and distributed during the 2000-2001 school year, and utilize the cam wrap system.

California

- I am very satisfied with the safety vests on our school buses. Our job is to provide a safe ride to and from school. I feel the vest is the best possible answer. Some of our special needs students are not capable of understanding the need for keeping lap belts secured. They can also slide under a lap belt causing serious injury to a child. This did happen on one of my buses. The student was placed in a safety vest and now rides secure and safe daily.

Illinois

- Some parents do not like to hear the term “harness.” It sounds cruel.

Indiana

- Why would a safety vest load a seat frame any more than a seat belt?

Iowa

- It would seem that without real-world data showing that safety harnesses have been the cause of, or have resulted in, the injury to students secured by safety harnesses, that their use should be allowed under federal standards/guidelines. We are aware of absolutely no reported, negative accident history that would support banning the cam-wrap vest system. We highly recommend that FMVSS No. 213 be amended to accept the continued use of cam-wrap vest systems, unless a significant real-world safety risk to students can be documented.

Maine

- In conjunction with compartmentalization, the vest system with the cam-wrap is sufficient and more affordable than other alternatives.
- Compartmentalization is working and in our opinion, is working for the younger students as well.

Maryland

- Does a tether provide a risk to the student sitting behind the seat with a tether?
- Due to unresolved issues about crotch straps on vests, we have not used them. Who fastens them and how tight should they be?
- The NASDPTS paper was helpful and eye opening.
- The current design of school bus seats does not support larger car seats or tethering.
- Safety harnesses with cam-wraps have supplied systems with the necessary protection and security assurance at an affordable cost and flexibility.

Missouri

- There are 523 school districts in Missouri. Forty percent (40%) of them responded to the survey (292). Of those 292 school districts, 53% of them do not use vests at all.

New York

- Vests can not be used for medically fragile kids, but neither can child safety seats.
- Parents may be concerned about the ease of exit for children wearing a harness.
- If the vest opens in the front, the child can easily get out. If the vest opens from the back, then it will be difficult to get the child out, especially if the driver or aide is injured in the crash.
- Some are concerned that the top tether of the harness will increase the forces on the child, while the cam-wrap will give with the seat.
- Tethering to a seat behind eliminates that seat for use. Three (3) seats are lost in order to transport one (1) child.

Ohio

- In all cases, safety harnesses are being used to keep the student on the seat and within the confines of the compartment, so as to keep them protected by compartmentalization.
- In some cases, safety harnesses also are being used to manage negative student behaviors which impact on the safety of the other students and driver.
- With larger students, a child safety seat is not an option due to the size of the child. For those students, some type of mobility restraint is needed and the use of a child safety seat is not appropriate.