

**Survival Group Chairman
Factual Report**

(Number of pages excluding this cover sheet – 30)



**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY : WASHINGTON, D.C. 20594**

**SURVIVAL FACTORS GROUP
FACTUAL REPORT OF INVESTIGATION**

A. ACCIDENT

Operator 1: Kinnicutt Bus Company
Vehicle 1: 1997 International AmTran 66 Passenger School Bus
Operator 2: MVF Construction Company
Vehicle 2: 1987 Mack Tandem Axle dump truck, 1988 Interstate Utility Trailer
Location: Intersection of SR 30A and SR 7; Schoharie County, Central Bridge, NY
Date: October 21, 1999
Time: 10:30 a.m. Local Time
Accident: School Bus Collision with Dump Truck/Utility Trailer
NTSB #: HWY-00-FH-001

B. SURVIVAL FACTORS GROUP

Henry F. Hughes, NTSB 490 L'Enfant Plaza East, S.W.,	<i>Senior Investigator</i> Washington, D.C. 20594	Group Chairman
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C. ACCIDENT SUMMARY

On Thursday, October 21, 1999, at about 10:30 a.m. EDT a 1997 International AmTran school bus, operated by Kinnicutt Bus Company, was northbound on State Route 30A (SR-30A/Zicha Road). The bus, occupied by the driver, 44 students (ages 5 to 9), and eight adults, was en-route to an Albany City School field activity. The bus drove past the flashing red lights and stop sign at the intersection of SR-30A and State Route 7 (SR-7) into the path of an oncoming westbound 1987 Mack dump truck towing a utility trailer, operated by MVF Construction Company. Five students and two adults were seriously injured, about 30 students, one adult, and both drivers sustained minor injuries, and nine students and three adults were uninjured.

Figure 1 shows a picture of the final rest positions of the school bus and the dump truck. The exterior damage to the bus and the location of the major impact forces can be seen in Figure 2.

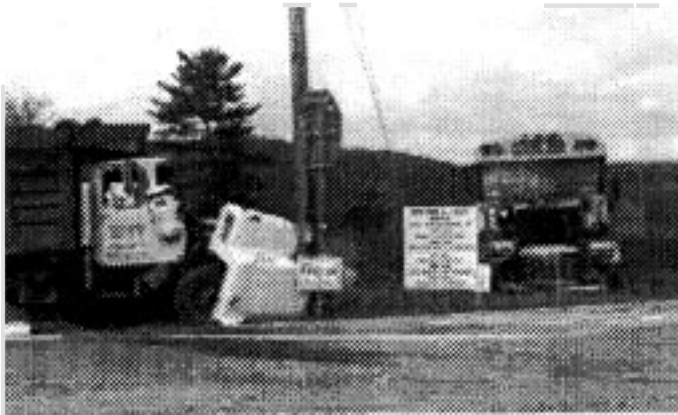


Figure 1: The final rest locations of the school bus and dump truck



Figure 2: The exterior damage to the school bus

D. DETAILS OF THE INVESTIGATION

The motor vehicle interior configuration, accident damage documentation, medical information, passenger interviews and questionnaire responses, emergency response and local disaster planning were examined.

1. MOTOR VEHICLE DOCUMENTATION

1.1 GENERAL INFORMATION

On October 22 and 23, 1999, Safety Board Investigators from the Survival Factors Group conducted an examination of the school bus. The accident bus was a 1997 International, 11 row, AmTran, 66 passenger, Conventional school bus assembled in Conway, Arkansas. The nomenclature specified the bus to be a Model CS3102-66, Serial Number 80720, Navistar VIN 1HVBBABN7VH514240. The manufacture date was 6/3/97. The capacity of the school bus was printed along the outside of the bus and stated "66C - 44A Stands 13". This printing indicated that the bus capacity was 66 children (3 per seat), or 44 adults (2 per seat) and 13 standing passengers.

The interior dimensions of the bus were documented. The floor to ceiling height was 77 inches at the center of the bus. At the windows, the floor to ceiling height was 68 inches. The interior width of the bus was 91 inches. The aisle width was approximately 12 inches. Four steps were between the outside of the bus and the inner floor. The first step (from the ground up) was 35.75 inches wide and 12.25 inches high. The second step was the same width as the first and 8.5 inches high. The third step was the same width as the first and 8.5 inches high. The fourth step (up to the inner floor) was the same width as the first and 9 inches high. The horizontal distance from the front-most point on the stair to the center of the first axle was approximately 38 inches. The spacing from the rear-most point of the stair to the front-most point on the modesty panel was 4.75 inches.

There were 8 emergency exits on the school bus: 1 side door emergency exit on the driver's side, 2 window exits on the driver's side, 2 window exits on the passenger side, 2 roof hatch emergency exits, and 1 rear door emergency exit. Rescue workers cut the two emergency exit windows on the passenger side. The location and dimensions of each exit are listed in Table 1 below.

Table 1: Location and dimensions of the seven emergency exits within the school bus. (DS = driver's side, PS = passenger's side).

Exit	Description	Location Row (side)	Opening Size (Height x Width)
1	Side door exit	5 (DS)	49.5" x 24.5"
2	Window exit	3 (DS)	22" x 21.75"
3	Window exit	8 (DS)	21.75" x 21.75"
4	Window exit	4 (PS)	24" x 21.75"
5	Window exit	8 (PS)	24" x 21.75"
6	Roof hatch exit	4 (center)	23" x 23"
7	Roof hatch exit	8 (center)	23" x 23"
8	Rear door exit	11 (center)	52.5" x 35.5"

The height of the lower portion and upper portion of the glass in the emergency exit windows was 10.25 inches and 11.5 inches, respectively. The window sash was 0.75 inches high. Additional measurements made on the emergency exit doors are shown on the drawings in Figure 3 and Figure 4. The horizontal distance between the opening of the side emergency exit door and the seat back in front was 16 inches. The aisle width, with the flip seat in the up position, to the side emergency exit door was 18 inches. Figure 5 is a picture of the side emergency exit door detailing the aisle width (18 inches) with the flip seat in the up position. In addition, the emergency exit handle, the latch mechanism and the location of the seat in front of the side emergency exit door can be more clearly distinguished in Figure 5.

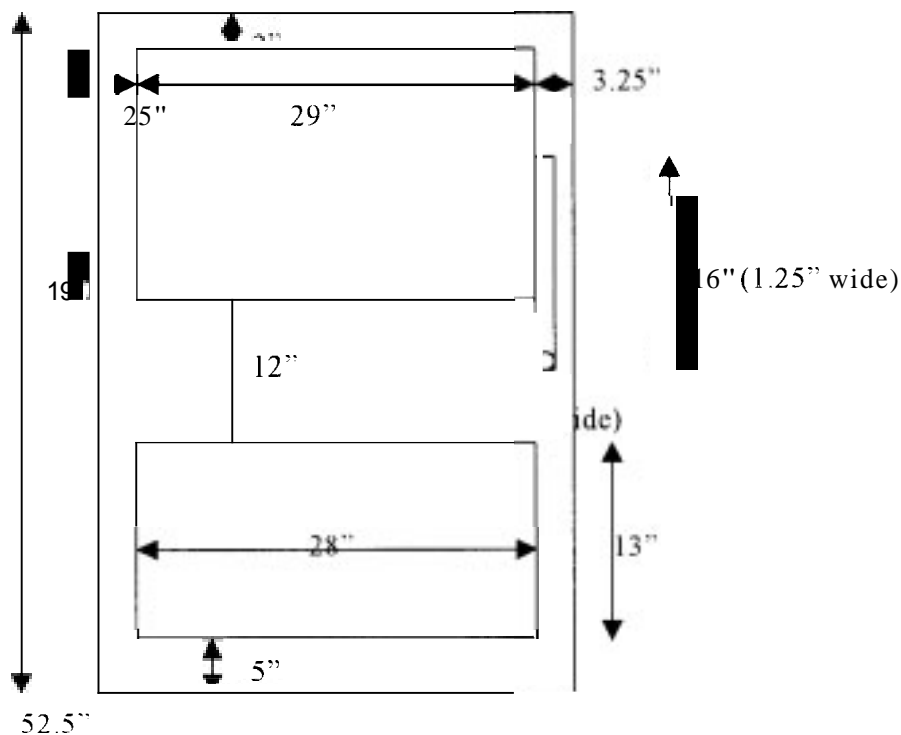


Figure 3: Measurements of the rear emergency exit door. (Not drawn to scale.)

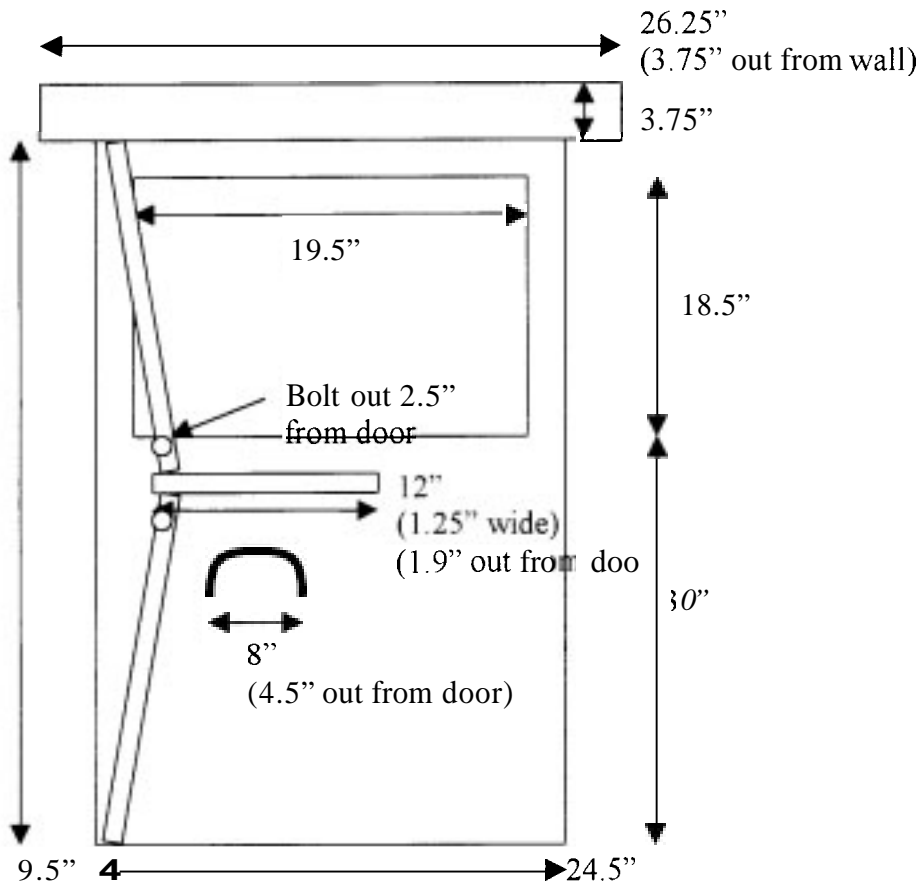


Figure 4: Measurements of the side emergency exit door. (Not drawn to scale.)



Figure 5: A photograph of the side emergency exit door with the flip seat in the up position

There were 22 seats on the bus including the flip seat located at the side emergency exit door on the driver's side. The seats were labeled inside the accident bus as documented in Figure 6. The seat adjacent to the side emergency exit door, the flip seat, was not labeled with a number inside the accident bus. Therefore, to avoid confusion, the seats were labeled based on the row number and the seat position as documented in Figure 7. All future labels referring to the seats and windows are based on the numbering in Figure 7

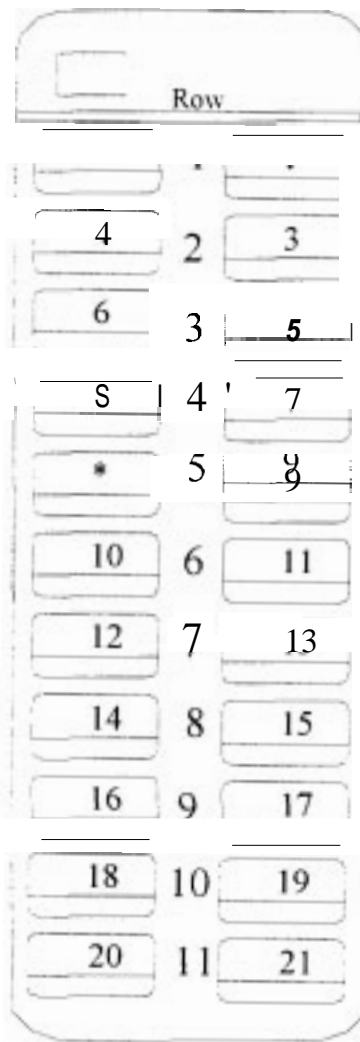


Figure 6: Seat numbers labeled on accident bus. (* indicates the flip seat in front of the emergency exit on the driver's side of the bus. This seat was not labeled with a number.).

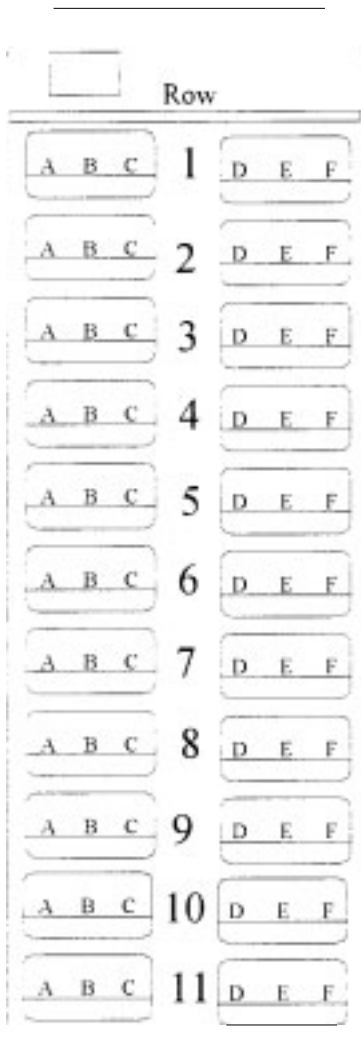


Figure 7: Seat labeling based on row and seat position. This labeling will be used during this documentation.

The seat cushions were 39 inches long and 15.5 inches wide. The seat backs were 28.5 inches high with a reclining angle of approximately 12 degrees from the vertical. The seat back thickness was 3.5 inches and the seat cushion thickness was 4 inches. The seats were constructed with two legs on the aisle side that were bolted to the floor with two bolts each. In addition, the seats were bolted to the side-wall with one bolt in front of the seat cushion and two bolts behind the seat cushion. The measurement from the floor to the top of the seat cushion at the front of the cushion was 15.75 inches and was 14.75 inches at the base of the seat cushion. The horizontal spacing of the seats from seat back to seat back was approximately 27 inches and there was approximately 8 inches clearance between the front of one seat cushion to the back of the seat back in front. (The spacing from the seat back in row 4, driver's side to the seat back in row 5, driver's side was 26.25 inches. The seat in row 5, driver's side was the flip seat along side the emergency exit door.) The horizontal distance

from the back of the last seat to the rear wall was 11.5 inches and 10.25 inches on the driver's and passenger's sides of the bus, respectively.

A modesty panel was located in front of the first row of seats on both sides of the bus. This modesty panel measured 42.25 inches from the floor to the top of the panel and had a reclining angle similar to the reclining angle of the seat backs. The horizontal spacing from the seat back to the modesty panel was approximately 28 inches. The modesty panel was 38 inches wide at the base and 33 inches wide at the top. The thickness of the modesty panel was 3.5 inches.

The seats on either side of the aisle were slightly offset with the seat on the driver's side consistently in front of the seat on the passenger side for a given row (see Figure 7). Table 2 documents the approximate offset distance between the seats. The offset is listed by the row and the measurement indicates how far the seat on the driver's side was in front of the seat on the passenger's side of the bus.

Table 2: The offset between seats on either side of the aisle. The offset measurement corresponds to the amount that the driver's side seat was in front of the passenger's side seat.

Row	Offset (inches)
	1
2	2
3	2.25
4	2.25
5	1
6	1
	1
8	1.75
9	1
10	1
11	1

Each passenger seat was equipped with three lap belts. The window side belt webbing was maroon in color. The center belt webbing was navy and the aisle side belt webbing was tan. The belts were attached to the seat frame near the junction of the seat cushion and the seat back. The attachment points were 10.5 inches above the floor. The buckle was located along both the window and the aisle sides of the seat. The spacing between the buckle attachment and the tongue (clasp) attachment for the aisle and window positions was 9 inches while the spacing for the center position was 9.5 inches. There was a 2.5 inch spacing between the side belts and the center belt and there was a 3 inch spacing between the wall and the first attachment point and also between the aisle and the last attachment point.

The length of the webbing on the buckle side of the belt was 12 inches (11 inches for the replaced belt, discussed in more detail below) and the buckle was 2 inches long. The length of the webbing on the tongue (clasp) side of the belt was 41 inches (37 inches for the replaced belt) at the maximum length. The length of the clasp was 2.9 inches with the tongue portion accounting for 1.6 inches of the length. The buckle was manufactured by I.M.M. Inc. with patent number 4,128,924 (A30023). A tag was found on the webbing, except at seat location 8C, indicating compliance with FMVSS 209 and 302.

The windows were aligned with the seats so that there were 11 windows on the passenger's side of the bus and 10 windows (one was in the emergency exit door) on the driver's side. Two additional windows were located on either side of the rear emergency exit door and two windows were in the rear emergency exit door. The vertical measurement from the floor to the base of the glass was 32 inches (33.5 inches for the emergency exit windows). The height of the lower and upper portions of the window glass in the windows was 12.25 inches for each. The height of the sash between the upper and lower portions was 0.75 inches. The horizontal positioning of the windows on both the driver's side and the passenger's side of the bus are shown in Table 3 and Table 4, respectively. For each case, the zero point is the base of the modesty panel.

Table 3: Horizontal location of windows and window separations starting from the base of the modesty panel on the driver's side of the bus. (+ emergency exit door, * emergency exit window).

Row	Description	Location (inches)	
		Start Point	End Point
1	Separation	0	1.5
	Glass	1.5	34
	Separation	34	37.5
2	Glass	37.5	61
	Separation	61	65.25
3*	Glass	65.25	87.25
	Separation	87.25	89.5
4-5+	Wall	89.5	104.5
	Emergency door	104.5	129
	Wall	129	144

6	Separation Glass Separation	144 145.5 169	145.5 169 172.5
7	Glass Separation	172.5 196	196 200.25
8*	Glass Separation	200.25 222	222 226
9	Glass Separation	226 250	250 253.5
10	Glass Separation	253.5 277	277 280.5
11	Glass Separation	280.5 313	313 314.5

Table 4: Horizontal location of windows and window separations starting from the base of the modesty panel on the passenger's side of the bus. (* emergency exit window).

Row	Description	Location (inches)	
		Start Point	End Point
1	Separation Glass Separation	0 1.5 34	1.5 34 37.5
2	Glass Separation	37.5 61	61 64
3	Glass Separation	64 88	88 91.25
4*	Glass Separation	91.25 115.25	115.25 119.5
5	Glass Separation	119.5 142	142 145.5
6	Glass Separation	145.5 169	169 172.5
7	Glass Separation	172.5 196	196 199.25
8*	Glass Separation	199.25 223.25	223.25 226.5
9	Glass Separation	226.5 250	250 253.5
10	Glass Separation	253.5 277.25	277.25 280.5
11	Glass Separation	280.5 313.25	313.25 316

Measurements were also made for the driver's area. The diameter of the steering wheel was 18 inches. The seat cushion was 23 inches wide at the front of the seat and 16.5

inches wide at the base of the seat where the seat back joined with the seat cushion. The seat cushion was approximately 18 inches long. The seat cushion was 5 inches thick. The distance from the floor to the top of the driver's seat cushion at the front of the cushion and the base of the cushion was 18 inches and 17.5 inches, respectively. The seat back height was 18.5 inches and 18 inches wide at the widest portion. The top of the driver's seat back was 2.5 inches in front of the modesty panel behind. The top of the seat back was 26.5 inches (horizontally) from the wall at the center of the seat back. The horizontal measurement from the base of the seat cushion to the front edge of the steering wheel was 19 inches. The horizontal measurement from the base of the seat cushion to the farthest edge of the steering wheel was 33 inches. The driver's seat was also equipped with a lap belt manufactured by I.M.M. Inc.

1.2 ACCIDENT DAMAGE DOCUMENTATION

The following is a description of the accident school bus subsequent to examination by Safety Board investigators on October 22 and 23, 1999.

Table 5: Documentation of the deformation and forensic evidence found for each seat and the surrounding area. (PS = passenger side, DS = driver's side, all directions are made assuming a vantagepoint above the bus and looking forward toward the front of the bus).

Row	Side	Documentation
1	PS	Seat not properly latched to frame' (See Figure 9)
	DS	Seat not properly latched to frame
2	PS	
	DS	Seat not properly latched to frame
3	PS	Seat not properly latched to frame
	DS	-
4	PS	Seat not properly latched to frame
	DS	-
5	PS	Seat not properly latched to frame
	DS	Seat needs to be manually lifted ² . (Seat found folded up)
6	PS	-
	DS	Seat frame laterally shifted to the right
7	PS	Seat not properly latched to frame. Seat cushion laterally shifted to the left. Beginning of wall deformation
	DS	Seat not properly latched to frame
8	PS	Seat not properly latched to frame, retaining clip loose Minor lateral shift towards the left

¹ The seat cushions were attached to the frame with a hinge at the front and two retaining clips at the base of the seat cushion. Some of these retaining clips were found unlatched or loosely screwed in so that the seat cushion was not fixed to the frame at the base of the cushion.

² According to 49 CFR 571.217 S5.4.2.1, a seat can be positioned in front of an emergency exit "if the seat bottom pivots and automatically assumes and retains a vertical position when not in use".

		Slight deformation of seat frame legs but not measurable Small amounts of blood identified on seat cushion Blood splattered in aisle beside this seat Possible dripping of blood on aisle side of seat frame towards the floor
	DS	Seat not properly latched to frame Small amounts of blood identified on seat cushion Corner of vinyl on seat cushion damaged and repaired
9	PS	Seat not properly latched to frame Seat cushion laterally shifted to the left Deformation of rear attachment to side wall Deformation of the attachment points to the floor Deformation of seat frame legs causing a bend of approximately 18 degrees from vertical in the direction of the aisle (see Figure 8) Front retaining clip on seat cushion bent and not functioning Scratch marks on the vinyl located across back of seat back
	DS	Seat cushion laterally shifted to the right by approximately 1 inch
10	PS	Seat not properly latched to frame Maximum intrusion occurred at this seat location Seat cushion and seat back laterally shifted to the left Significant wall and floor deformation in this area Deformation of seat frame legs causing a bend of approximately 29 degrees from vertical in the direction of the aisle (See Figure 8) Seat back displaced laterally to the left by 2.5 inches from the wall, measured at the base of the window frame
	DS	Seat cushion laterally shifted to the right by approximately 5 inches (measured from wall to edge of seat cushion) Scratch marks on seat frame from retaining clip underneath measure approximately 7 inches Seat cushion bent downwards in the aisle Seat cushion feels less dense to the touch than other cushions (This cushion was removed for further inspection)
11	PS	Significant wall and floor deformation in this area Seat cushion not laterally shifted to the left but ripple marks are apparent in seat cushion along wall where seat was deformed
	DS	Seat not properly latched to frame Front retaining clip inboard on seat cushion bent and not functioning

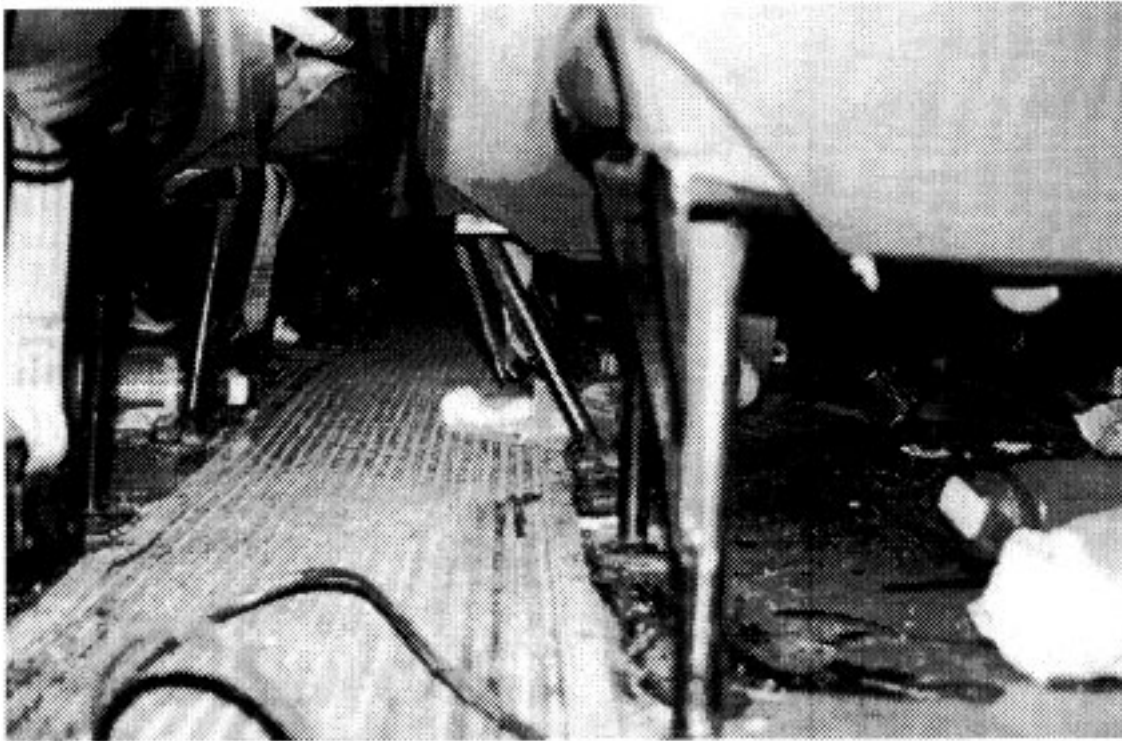


Figure 8: A photograph showing the deformation of the seat frame legs on the passenger side of the bus.

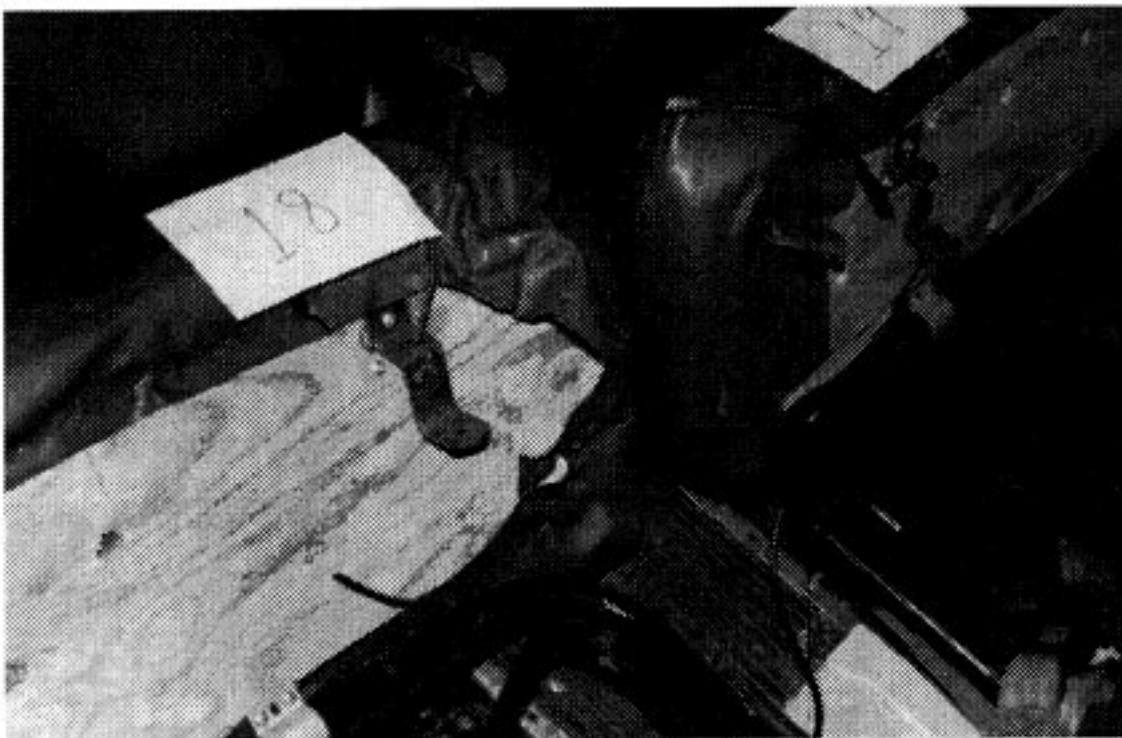


Figure 9: A photograph showing the retaining clips used to fix the seat cushion to the frame at the base of the cushion. This photograph shows the seats in row 10 of the school bus.

Table 6 documents the appearance of the lap belts found on the school bus. If a belt position is not listed then nothing abnormal was noted for that position. Belt function was also tested with no failures documented.

Table 6: Documentation of the lap belts.

Row	Belt Location	Seat Belt Documentation
	F	Buckle and tongue found in the connected position Belt was extended to the longest length
4	A	Buckle side of belt found hanging under the seat
5	A	Buckle side of belt found hanging under the seat
5	B	Buckle side of belt found hanging under the seat
6	C	Buckle and tongue found in the connected position
6	E	Buckle and tongue found in the connected position Belt was extended to the longest length
7	A	Buckle side of belt found hanging under the seat
8	A	Buckle side of belt found hanging under the seat Tongue (clasp) side of belt found hanging under the seat
8	B	Buckle side of belt found hanging under the seat
8	C	Replacement belt (no FMVSS tag located) Belt webbing was black Buckle was missing, stitching was broken, belt fraying at end Tongue (clasp) side of belt found with fraying webbing and loose stitching (See Figure 10)
9	E	Buckle side of belt found hanging under the seat
9	F	Buckle side of belt found hanging under the seat
11	A	Buckle found wedged between seat back and wall Tongue (clasp) side of belt found hanging under the seat
11	B	Buckle side of belt found under seat cushion along the seat frame (not visible from underneath the seat) Tongue (clasp) side of belt found hanging under the seat and then between seat cushion and frame out into the aisle



Figure 10: A photograph of the replaced belt in row 8 on the driver's side of the bus. Note the black webbing, the missing tongue portion, and the fraying of the webbing.

Damage to the windows was documented and is listed below. (If a window is not listed, then damage was not found.).

Row 4, Passenger's side window:

Emergency exit window cut by rescue workers.

Row 5, Passenger's side window:

Circular impact pattern located in front portion of lower window glass.

Row 6, Passenger's side window:

Circular impact pattern located in front portion of lower window glass. The break has a smaller diameter than the break in the row 5 window (approximately 4 inches in diameter).

Row 7, Passenger's side window:

Window fracture in front portion of upper window glass, extending towards the front of the lower window glass.

Row 8, Passenger's side window:

Emergency exit window cut by rescue workers.

Row 9, Passenger's side window:

Severe damage to both the upper and lower portions of the window glass. A large piece of triangular shaped glass was protruding out from the window toward the outside of the bus. A blackish-gray substance was noted in the fractured glass on the lower portion of the window glass toward the rear of the window.

Row 10, Passenger's side window:

Severe damage to both the upper and lower portions of the window glass. The base of the window frame was pinching the seat back of the seat in row 9 on the passenger side. The window frame was separating from the bus body at the lower portion of the frame. A small tear in the bus body was noted at the junction between the window frame and the bus body. Severe damage was noted at the rear portion of the window.

Row 11, Passenger's side window:

Severe damage to the upper portion of the window glass. The lower portion of the glass was missing.

Rear bus window, Passenger's side:

Window displaced laterally to the right. Window glass fractured.

Rear bus window, Driver's side:

Window displaced laterally to the right. Window glass fractured.

Rear emergency exit door:

Glass missing from upper window.

2. MEDICAL INFORMATION

Table 7 Injuries ³

INJURIES	BUS DRIVER	BUS PASSENGERS	TRUCK DRIVER	TOTAL
FATAL	0	0	0	0
SERIOUS	0	7	0	7
MINOR	0	28	1	29
NONE	1	13	0	14
TOTAL	1	52	1	54

- Medical records for all of the passengers have been subpoenaed; however, four individuals' medical records have not been received at the time this report was issued. This information will be added to the investigative file as it becomes available.

2.1 SURVIVOR INJURIES

After the accident, fifty-two bus passengers, one bus driver, and the dump truck driver were transported to four area hospitals. The following is a description of the injuries. Figure 11 details the seating locations for each of the following individuals based on passenger and witness interviews.

2.1.1 ALBANY MEDICAL CENTER

1. A 7-year-old female sustained right frontal and right cerebella contusions, a C-7 transverse spinous process fracture, right clavicular lateral fracture, and a small non-displaced right pubic rami fracture. SERIOUS Admitted 10/21-11/08/99
2. A 7-year-old female sustained an open right tibia/fibula fracture, left closed tibia/fibula fracture, small liver laceration, forehead abrasion, back abrasion, and front tooth injury. SERIOUS Admitted 10/21-10/25/99
3. A 7-year-old male sustained a basilar skull fracture, small splenic laceration. left ear and right eyebrow laceration and ecchymosis. SERIOUS Admitted 10/21- 10/25/99
4. A 7-year-old female sustained a right clavicular closed fracture. left forehead laceration. and abrasions and contusions. SERIOUS Admitted 10/21-10/23/99
5. A 7-year-old male sustained a liver laceration, displaced sternal fracture, right forehead abrasion and contusion and scalp laceration. SERIOUS Admitted 10/21-10/26/99

³ 49 CFR 830.2 defines a fatal injury as: any injury which results in death within 30 days of the accident. A serious injury as: an injury which requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; results in a fracture of any bone (except simple fractures of the fingers, toes, or nose); causes severe hemorrhages, nerve, muscle, or tendon damage; involves any internal organ; or involves second or third degree burns, or any burns affecting more than 5 percent of the body surface.

6. A 33-year-old female sustained a small superior splenic laceration. small adrenal hemorrhage, two small posterior liver lacerations, sternal injury, and extremity lacerations and abrasions. SERIOUS Admitted 10/21/99 - 10/ UNKNOWN
7. A 7-year-old female sustained a right cheek laceration. MINOR Admitted 10/21-10/22/99
8. A 7-year-old female sustained a head injury and a right thigh abrasion MINOR Admitted 10/21-10/22/99
9. An 8-year-old male sustained a closed head injury, small left forehead ecchymosis. and left lower extremity abrasions. MINOR Treated and Released (T/R)
10. A 7-year-old female sustained a tongue laceration, chin laceration, and neck strain. MINOR T/R

2.1.2 *BASSETT HOSPITAL OF SCHOHARIE*

11. The 79-year-old male bus driver received a routine exam, diagnosed as no injury. NONE
12. A 25-year-old female received a routine exam, diagnosed as sustained no injury. NONE
13. A 44-year-old female received a routine exam, diagnosed as sustained no injury. NONE
14. An 8-year-old male received a routine exam, diagnosed as sustained no injury. NONE
15. A 7-year-old male received a routine exam, diagnosed as sustained no injury. NONE
16. A 7-year-old male received a routine exam, diagnosed as sustained no injury. NONE
17. A 7-year-old male received a routine exam, diagnosed as sustained no injury. NONE
18. A 7-year-old male received a routine exam, diagnosed as sustained no injury. NONE
19. A 7-year-old male received a routine exam, diagnosed as sustained no injury. NONE
20. A 7-year-old female received a routine exam, diagnosed as sustained no injury. NONE
21. A 7-year-old female received a routine exam, diagnosed as sustained no injury. NONE
22. A 7-year-old female received a routine exam, diagnosed as sustained no injury. NONE
23. A 7-year-old female received a routine exam, diagnosed as sustained no injury. NONE
24. A 7-year-old female received a routine exam, diagnosed as sustained no injury. NONE

- 25. A 7-year-old female sustained a rib contusion. T/R MINOR
- 26. A 7-year old male sustained a left cheek abrasion. T/R MINOR
- 27. A 7-year old male sustained a right shin abrasion. T/R MINOR
- 28. A 6-year old female sustained a right upper thigh abrasion. T/R MINOR
- 29. A 7-year-old female sustained a left posterior knee contusion. T/R MINOR
- 30. A 7-year-old female sustained a right anterior tibia contusion. T/R MINOR
- 31. A 7-year-old female sustained a posterior scalp contusion. T/R MINOR

2.1.2 BASSETT HOSPITAL OF SCHOHARIE, CONTINUED.

- 32. A 7-year-old male sustained right knee pain. T/R MINOR
- 33. An 8-year old male sustained a left hip abrasion. T/R MINOR
- 34. An 8-year old male sustained a right shin abrasion. T/R MINOR
- 35. An 8-year-old male sustained abdominal pain. T/R MINOR
- 36. An 18-year-old female sustained a left wrist sprain and thumb fracture. T/R MINOR
- 37. A 7-year-old male sustained a right forehead laceration. T/R MINOR
- 38. A 7-year-old male sustained a lumbar soft tissue contusion. T/R MINOR
- 39. An 8-year-old female sustained a forehead and tibia contusion. T/R MINOR
- 40. A 7-year-old male sustained a right eyebrow laceration and concussion. T/R MINOR
- 41. A 30-year-old male sustained a right eyebrow laceration and facial abrasions. T/R MINOR
- 42. A 6-year old male sustained a right eye abrasion and facial contusions. T/R MINOR
- 43. The 52-year-old male dump truck driver sustained a left ear laceration. T/R MINOR
- 44. A 7-year-old female sustained a right temporal contusion and concussion. T/R MINOR
- 45. A 7-year-old female sustained a chin and left tibia contusion and lip abrasion. T/R MINOR
- 46. A 44-year-old female sustained left shoulder strain and a chin contusion. T/R MINOR
- 47. A 7-year-old female sustained a right hip contusion and left facial abrasion. T/R MINOR

48. A 7-year-old female sustained lower bilateral leg abrasions and contusions. T/R MINOR

49. A 6-year-old female sustained a left eyebrow laceration and right forehead abrasion.
T/R MINOR

50. An 8-year-old male sustained a right fibula fracture and forehead contusion.
T/R SERIOUS

2.1.3 *ELLIS HOSPITAL*

51. A 7-year-old female sustained a sprained ankle. T/R MINOR

52. A 7-year-old male sustained a lip laceration. T/R MINOR

2.1.4 *ST. PETERS HOSPITAL*

53. A 35-year-old male sustained a head injury and scalp laceration. T/R MINOR

54. A 37-year-old female sustained a head injury. MINOR Admitted 10/21-10/ /99

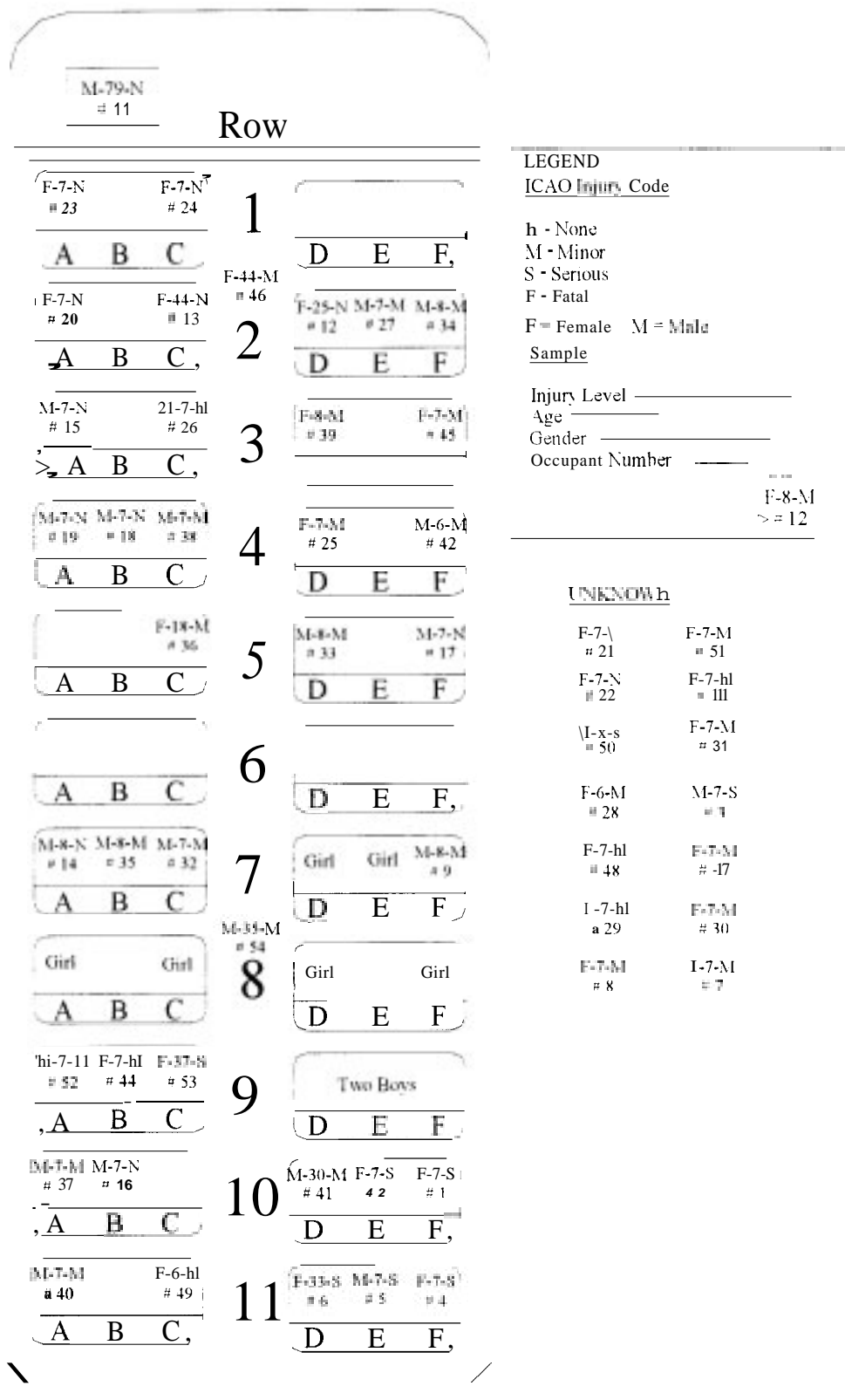


Figure 11: The passenger seating chart with gender, age, injury level, and occupant number listed.

3. PASSENGER INFORMATION

3.1 PASSENGER INTERVIEWS

3.1.1 *BUS PASSENGER # 1*

This summarized interview was conducted by Safety Board investigators on October 26, 1999 at the Albany Elementary School #18. The passenger, a 44-year-old second grade school teacher, was a passenger on board the bus at the time of the accident. The entire interview transcript is located in Attachment 1.

The teacher stated that she had her students enter the bus and sit in the front section, and she and the other chaperones buckled them into their lap belts. The chaperones were seated mixed in with the students. The teacher then sat two seats behind the driver with the special education teacher sitting across the aisle from her. After the students were seated and buckled the driver asked the teachers for a map, he seemed confused on how to get to the pumpkin patch. Once out of the city and onto the highway, the driver had to pull off the highway at one point because he was not sure which exit to take. Once another chaperone gave him directions he continued down the highway and exited at the proper ramp. At that time, she recalled that the driver stated that he did know the remainder of the directions to their destination.

As the driver approached a red light, he slowed down a bit but “just kept right on going through it”. This teacher had been seated and facing toward the right of the bus and she recalled observing the driver go through the light and the truck approaching. After the bus came to rest she and the other teachers and chaperones unbuckled the student’s seatbelts and evacuated the bus. The students walked off the bus through the front and then this teacher returned to the bus for the first aid kit and gave medical attention to the students. Once the emergency responders arrived, they loaded the minor injured onto another bus and transported them to a local hospital.

3.1.2 *BUS PASSENGER # 2*

This summarized interview was conducted by Safety Board investigators on October 26, 1999 at the Albany Elementary School #18. The passenger, a 25-year-old special education teacher, was a passenger on board the bus at the time of the accident. The entire interview transcript is located in Attachment 1.

The teacher/chaperone stated that they loaded the two classes of students onto the bus and made sure that the students were wearing their lap safety belts. Although she did state that one of the middle row aisle seat belt buckles did not operate properly and she had to move the student to another seat. The teachers were not wearing lap belts in order to be able to move around the bus during the trip. Once on the highway, it appeared that the driver was not sure of which exit ramp to take, and so a chaperone, the grandmother of one of students, was standing in the aisle and gave the driver directions. This passenger stated that as the bus driver departed the highway exit ramp, the children observed the signs for the pumpkin patch and

started getting excited about having arrived. The grandmother chaperone made a comment to this passenger that she felt the bus driver was not going to stop. The bus driver then drove through the stop sign and the bus was struck by the dump truck. This passenger is unsure of whether the chaperone standing in the aisle was able to sit down prior to the accident or not.

She stated that she struck her face during the accident, she believes on the seat in front of her. She sustained pain in her extremities and back. She does believe that some of the students may have removed their belts just as they observed the pumpkin patch sign before the accident occurred. She stated that after unbuckling the kids, most of those seated in the front were able to walk off the bus and that everyone evacuated through the front loading door.

After the bus came to rest facing opposite the direction in which they had been traveling, the teachers and chaperones had the children evacuate the bus. The teachers did have a nurse kit on the bus and they gave first aid to the injured student passengers while they waited for the emergency responders, who arrived shortly after. She stated that the emergency responders “responded quickly” and were “just amazing”.

3.1.3 *BUS PASSENGER # 3*

This is a summary of a telephone interview conducted by a Safety Board investigator on October 27, 1999 of one of the adult male chaperones on board the bus at the time of the accident. This passenger, a 30-year-old male, stated that at the time of the accident he was seated in the right side second to last seat, aisle position. He stated that he was sitting next to a young female student who was in the middle of this seat and there was a young female student seated next to the window.

During the ride, this chaperone was not belted, and was partially seated also on the aisle section of the second to last seat on the left side of the bus. In the middle of the left side seat was a young male student and next to the window was this chaperone’s step-son. This passenger recalled that seated behind him was an adult female chaperone on the right side last seat. Next to her in the middle of the seat was a young male student and next to the window was a young female student. On the left side of the bus in the rear seat was a young male student next to the window and a young female student was seated in the aisle seat.

According to this passenger, at the beginning of the trip, the chaperones and teachers belted every child into the available lap belts. For the three last sets of seats on both the left and right side of the bus, (so six total seats) the aisle seat belts were tied around the outside leg of the seat. The middle and window seat belts were knotted and therefore when the chaperones attempted to tighten the belts on the children, they were not completely snug. but were slightly loose due to the knot in the belt that prevented tightening. In addition, he stated that some of the belts had to be pulled from either behind the seats or from within the seat cushions. They appeared to not have been used in the past. This passenger has been a chaperone previously on school field trips in which a Kinnicutt school bus was used, and he related that this was not a situation he had encountered on that previous trip.

Prior to departing for the field trip, this chaperone stated that he observed the bus driver as being somewhat quiet and irritated, not in a cheerful disposition. Just prior to

leaving for the field trip, he assisted the bus driver in placing the food containers and coolers into the rear area behind the seats with the bus driver, who had opened the rear emergency door in order to load these items. He also observed that the driver did not put on his glasses to read a map, but then removed his glasses and tucked them into his shirt pocket. After the accident, this passenger and another adult male chaperone observed the bus driver replace his glasses onto his face.

As the bus had departed the highway exit ramp, the passenger observed the driver not stopping for the flashing red lights at the intersection with SR 7. He said something to the other adult male chaperone about the driver not stopping, and then he observed the dump truck at about 20 feet from the rear of the bus where he was seated. He felt the bus driver slow down prior to the intersection, but only briefly. He then stated that he felt the driver tried to speed up slightly through the intersection, and he believes this was due to the driver observing the on-coming dump truck. He tried to move the two female students seated next to him away from the side wall of the bus, but then upon impact he was thrown forward and to the right and struck the seat in front of him. He sustained a facial/eyebrow laceration that required stitches, a head laceration, several bruised ribs, a sprained ankle and sprained foot. During the accident, he also stated that he was aware that the female adult chaperone had also struck the seat in front of her on the right side behind where the two little girls had been seated, which was the seat he had been sitting in.

After the bus was struck by the dump truck, rotated and came to a stop, he attempted to open the rear emergency door. He could not move the door, and had to kick it several times before he could open it. At this time, he assisted the adult female chaperone, seated in the rear right seat, out the door and observed her exit the bus and walk around the left side of the bus and he did not observe her after this time. He then assessed the injured seated in this area of the bus. He observed the two female students seated in the second to last row had fallen off the seat, their knees were almost touching the floor of the bus, while their backs were lying on the seat cushion, even though they were still in their lap belts. He observed bones protruding from the lower extremities of the young female who had been seated next to him on the right side of the bus, and he left her in this position while he checked on the female who had been seated next to her at the window. He moved the young female from next to the window to the seat across from where he had been sitting and laid her across the seat with a shirt under her head. He noted that the young male students who had been seated in the middle of this seat stated his back hurt severely, and he left this student in the rear seat. He assisted other students off the bus, then remained on the bus with these three injured students until the emergency responders arrived.

This passenger stated several concerns he had regarding the accident. He felt that the lap belts were not able to be securely fastened around the small student passengers, because they did not restrain their upper bodies and that the belts had knots in them. He noted that one female student seated in approximately four rows up from the rear on the right side sustained a seatbelt abrasion mark on her upper abdomen, indicating that it had not stayed in the appropriate location to prevent injury. He also felt that shoulder harness belts would have probably been better. He also felt that the driver was at an age in which he should not have been a school bus driver.

3.2.4 *BUS PASSENGER # 4*

This summarized telephone interview was conducted by a Safety Board investigator on October 27, 1999 of one of the adult male chaperones on board the bus at the time of the accident. The passenger, a 35-year-old male, would only give general information at this time. An investigator with a law firm representing the passenger advised that the Safety Board could send a questionnaire that would be reviewed by the firm prior to being completed and returned.

According to this passenger, he recalled that he was not seated in one particular location, he had been moving about prior to the accident in order to check on the students. He believes that at the time of the accident, he had been in the vicinity of seat row four from the rear of the bus. He recalled that on the left side of the bus at this location were two female students. On the right side of the bus were also two female students. In front of his seat, in row five from the rear on the right, was a young male student at the window, with two female students seated next to him. On the left side of the bus at row five was a young male student in the middle, a male student at the window, and he is unsure of what student was seated at the aisle position. Behind this chaperone, on the left side of the bus about three rows from the rear, was his wife, a female teacher, seated in the aisle position.

The passenger recalled that prior to the trip, his wife had asked him to go outside and inform the bus driver that the class would be late leaving for the field trip, and that they should be ready to go at 9:30 a.m. He stated that at this time, the driver then asked him for directions, and he replied to the driver that he would have thought the driver would have known. The driver answered that he knew "vaguely" the general area of where he was going, but not specifically. This passenger then went back into the school and was able to get a map and directions from another teacher for the driver.

At just prior to the impact, this passenger recalled seeing the dump truck before it hit. He believes he may have passed out because he awoke and observed the other male chaperone holding a young female student in his arms. He then began to help out the injured children. He sustained a laceration to his right shin that required four stitches, and badly bruised left chest area and general pain.

3.1.5 *BUS PASSENGER #5*

This summarized telephone interview was conducted by a Safety Board investigator on October 27, 1999 of the only teenage chaperone on board the bus at the time of the accident. This passenger, an 18-year-old female, stated that she had been seated in the emergency door exit row, behind the driver at the outboard aisle seat location. She recalled that an adult female chaperone, the grandmother of one of the students, had been seated with her, but had gotten up to give the driver directions and had then sat down in another seat. She stated that when the accident occurred, she went forward and struck the seatback in front of her and then fell toward the emergency door. She sustained a broken thumb and sprained wrist. She stated that some of the seatbelts did have knots in them, and that she had to undo the knots in order to tighten the belts on the students. She also stated that some of the belts had been tucked into

or behind the seats and had to be pulled out before the students could be belted. She stated that she was wearing her belt at the time of the accident. She recalled that there were two boys seated in the seat across from hers. She stated that she had not been on a field trip with Public School #18 before, had not ridden on a Kinnicutt bus before, and had not taken any bus trips with this driver before. She stated that she did see the driver with glasses before the trip, but he was not wearing his glasses when he was driving.

3.2 ADDITIONAL PASSENGER INTERVIEWS

The following interviews were conducted soon after the accident by the Cobleskill Police Department and were provided to the Safety Board in support of the investigation.

3.2.1 *DUMP TRUCK PASSENGER*

This is a summary of a written statement provided to the New York State Police by a 39-year-old male passenger of the dump truck that struck the school bus. This passenger stated that at approximately 1030 hours, he was a passenger in a dump truck headed west on State Route 7 and approximately 100 yards from the intersection with State Route 7 and Zicha Road when the driver of the dump truck stated that “that bus isn’t stopping”. At that time, this passenger stated that the dump truck was travelling approximately 30-40 miles per hour, entered the intersection, the driver swerved the dump truck to the left and they struck the rear section of the bus on the right side. The dump truck driver then made a cellular phone call to 911 and informed them of the accident.

3.2.2 *SCHOOL BUS PASSENGER # 1*

This is a summary of a written statement provided by this passenger to the Cobleskill Police Department after the accident. This passenger, a 44-year-old female, stated that she was a chaperone on the school bus at the time of the accident. She recalled that when leaving the elementary school, she felt the school bus driver did not seem to take the shortest route to the highway and asked if he knew where he was going. Once on the highway, the driver pulled off the interstate onto an exit ramp. This passenger was concerned because the driver had pulled over onto the left side of the exit ramp and seemed confused about which exit to take to get to their destination. She informed him that it was the next exit, and he pulled back out onto the highway and continued to the next off ramp. He then exited the interstate at the correct exit, and the students began to yell about seeing the pumpkin patch. This chaperone was standing in the aisle talking to one of the teachers and noticed that the driver was not stopping at the stop sign controlled intersection. She observed the dump truck headed toward the bus and the driver continued without braking through the intersection and the bus was struck in the rear section by the dump truck and rotated around and over to the other side of the intersection.

4. EMERGENCY RESPONSE

Initial notification of the school bus accident was received at 1032 by the Schoharie County Emergency Operations (communications) Center. Preliminary information provided by a citizen, who telephoned the Schoharie County Emergency Operations Center, indicated that the accident had occurred at the intersection of State Route 7 and Zicha Road.

The Schoharie-Wright Ambulance Company initially dispatched an ambulance and the Central Bridge Fire Department dispatched a pumper at 1036, both of which arrived onscene at 1038. Upon arrival the first EMS and fire Fighters assessed the scene and requested additional assistance. Ambulances from 10 other surrounding area Emergency Medical Service (ambulance) companies responded to the scene to assist in treating the injured students. At 1041 a triage area adjacent to the school bus was established by the Cobleskill Volunteer Ambulance Company. The Cobleskill volunteer triage supervisor, a physician, supervised the injury evaluation, treatment and transport of the students.

The two most seriously injured students and one adult passenger were transported to Saint Peters Hospital and the Albany Medical Center respectively in Albany, NY by a New York State Police helicopter and a Med-Flight Air Ambulance helicopter. The helicopters were requested by the on-scene EMS coordinator at 1041. The helicopters, stationed in Albany, arrived on scene about 1106 and arrived at Saint Peters Hospital Trauma Unit at 1149. In addition, 28 students and 3 adults were treated on scene and transported to one of three area hospitals with minor injuries. The last patients transported by ambulance arrived at 1146.

A total of 54 persons were transported to area medical facilities for precautionary examination and treatment. Fire and rescue personnel remained on-scene for several hours while the Schoharie County Sheriff's Department and New York State Police conducted a preliminary investigation into the accident. According to the Schoharie Fire Department Chief, the emergency responders removed the two right side emergency exit windows for the purpose of handing medical equipment into the bus and for possible use as an extrication point. However, the Chief stated that the remaining injured passengers were removed from the bus via the left side emergency door. The scene was clear at 1621.

Schoharie County public safety agencies' are made up of a combination of the New York State Police, the Schoharie County Sheriffs Department, the Schoharie County Emergency Operations Center (EOC), 17 Volunteer Fire Departments and 13 Emergency Medical Service Departments. At the time of the accident the county had a mutual aid agreement which had been in effect since May of 1992. All public safety communications are channeled through the county EOC which maintains radio frequencies for police, fire, and EMS departments. Subsequent to the accident an after action meeting was held to discuss the response and rescue operation and ideas for improvement. Overall, the consensus on the response was determined to be timely and the resources brought to bare appropriate.

During an interview with Safety Board investigators the director of the EOC stated that the county had conducted an emergency drill in or about June, 1999. wherein they used an overturned school bus accident as the training accident. He stated the training had better prepared the area public safety agencies and medical facilities to cope with a real life situation.

EMERGENCY RESPONDER INTERVIEW # 1

This summarized interview of the Deputy Fire Coordinator for Schoharie County was conducted on October 22, 1999 by a Safety Board investigator. This emergency responder, a 41-year-old male, was working at the Holiday Inn Express at 1-88 and Route 30A when the accident occurred. At that time, the weather was clear and dry with good visibility. When he arrived on scene to coordinate the fire department activities as the Fire Department Incident Commander. he assessed the scene with the Assistant Chief from the Central Bridge Fire Department, the primary responding fire department, located 2-3 miles from the accident site.

After the deputy fire coordinator assessed the accident scene, he entered the bus and observed where the seats had been damaged in the rear of the bus, were some of the injured children and adults were, while the other remaining children were outside the bus. He stated that he then left the bus and set up the command post in his pick-up truck where his radio and other equipment was located, on the west side of Route 7.

EMERGENCY RESPONDER INTERVIEW # 2

This summarized interview of the Schoharie County Emergency Medical Services Coordinator was conducted on October 22, 1999 by a Safety Board investigator. This emergency responder, a 49-year-old male, stated that he was monitoring the radio and heard the call for a school bus vs. dump truck accident and started heading in that direction. He arrived on-scene within ten minutes from the original dispatch and at that time the first responders on-scene consisted of personnel from Central Bridge Fire Department and Scho-Wright ambulance who were already attending to the passengers.

He was approached by the assistant chief from Central Bridge Fire Department who briefed him on the medical situation. This responder asked the assistant chief who was EMS commander, and the asst. chief stated that no one had been assigned, so this responder **took** over as EMS incident commander. The deputy EMS coordinator was informed that triage was initiated by several first arriving responders consisting of: a volunteer for the Cobleskill Ambulance Company, who served as Triage Chief and is a resident physician at Albany Medical Center; a volunteer with the Scho-Wright Ambulance Company who was one of the first EMS on-scene; and a fire fighter from the Schoharie Fire Department.

At this time, he did a quick overview of the scene and climbed into the bus. He observed that there weren't any passengers in the front or middle area of the bus, but there were a few injured passengers remaining in the rear area. He got mixed reports on whether all the passengers had been belted because several kids reported to the EMS personnel that they were belted while others said that they were not. He assigned triage to two other EMTs who

arrived on-scene. He then inquired of the crew chief what resources were needed and then coordinated the mutual aid emergency medical service personnel who responded to the accident.

As incident commander, this responder was not immediately involved in treating the passengers. There were twelve ambulance companies that responded and two med-evac helicopters that responded to the accident, which according to this responder was probably the largest response they have had in this county. He believed that the mutual aid response went well. All ambulances had been dispatched out of Schoharie's Sheriff's department. with the exception of Rural Metro, which is a commercial service (private) ambulance company. they dispatch their own. Rural Metro had three of their ambulances there. which were requested via radio from the Incident Commander. A school bus was requested from Schoharie Central Schools to come to the scene to transport the walking wounded to Bassett Hospital of Schoharie at Cobleskill. According to this responder, there were a total of 54 patients transported to four area hospitals. One adult and two children were transported via medical helicopter, 31 patients (28 children and 3 adults) were transported via school bus to Bassett Hospital, while the remainder were transported via ground ambulance service.

5. DISASTER PREPAREDNESS

6.1 SCHOHARIE COUNTY


According to the document titled *Schoharie County Comprehensive Emergency Management Plan*:

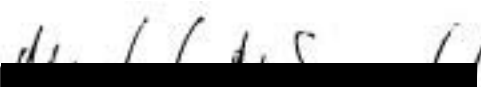
“The plan resulted from the recognition on the part of local government and state officials that a comprehensive plan was needed to enhance the county's ability to manage an emergency and disaster situation in peacetime or under wartime conditions. The product was prepared by county officials working cooperatively with their state agency counterparts in a planning effort coordinated by the New York State Emergency Management Office. This plan constitutes an integral part of a statewide emergency management program and contributes to its effectiveness.”


For the purposes of emergency response and this accident, the plan covered the following areas: standard operating procedures in the event of an emergency; critical stress debriefing contact names and addresses; fire department emergency numbers, addresses, and fire chief contacts; ambulance squad emergency numbers, addresses and captain contact information; rescue squad emergency numbers, addresses, and captain contact information.

Included in the county emergency management plan was an annex titled *Schoharie County **Emergency Mutual Aid Plan***. This stated objective of the annex was to provide an organized and coordinated method in which the personnel and equipment of the participating fire departments and ambulance corps would assist each other during emergency in which the services of the members of the participating fire departments or ambulance corps were required. The administration and execution of the mutual aid plan was the responsibility of the Schoharie County Fire Coordinator. The Schoharie County Emergency Medical Service Coordinator was responsible for the supervision of emergency medical service in mass casualty situations, providing specialized emergency medical service, and administration of the EMS radio system. The plan covered areas such as: participation requirements, authority of officials, status of participating organizations, and coordination with other agencies.

According to the Schoharie County Emergency Medical Services Coordinator, the mutual aid plan and county emergency management plan were included in a mass casualty drill conducted about three or four months prior to this accident. The drill simulated an overturned school bus accident about three miles from the Central Bridge accident site. This particular drill was a cooperative effort, the host was Schoharie Fire Department and Scho-Wright Ambulance Company and the coordinator stated that it was successful.

 4/18/00
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