



SCHOOL BUS COLLISIONS 1995-2004

SUMMARY

School buses continue to be one of the safest methods of travel for children and youth. Only 0.3 percent of all collisions resulting in personal injury or death involved school buses. Yet, over the last 10 years, children have travelled by bus as many as 6 billion times, an estimated 600 million pupil-trips per year and 3,400,000 pupil-trips each day. Over the 10-year period, 142 people died in collisions involving school buses; and only five of these fatalities were bus passengers.

This report provides a statistical summary of collisions involving school buses over the 10-year period from 1995 through 2004. It reviews the number of collisions involving at least one school bus, the number of school buses involved in collisions, and the resulting deaths and personal injuries, both inside and outside the school bus.

The report also highlights: the ages of victims; type of road users involved in the incident, such as drivers, passengers, pedestrians and bicyclists; time of day of collision; number of incidents by year; and vehicle manoeuvre of the striking vehicle.

QUICK FACTS ABOUT COLLISIONS INVOLVING SCHOOL BUSES

Over the 10-year period, 1995 to 2004:

Deaths	Injuries
o 142 deaths – average 14/year	o 9,405 injuries – average 941 per year
o 5 school bus passengers	o 3,427 school bus passengers
o 3 school bus drivers	o 980 school bus drivers
o 90 occupants of other vehicles	o 4,348 occupants of other vehicles
o 38 pedestrians	o 485 pedestrians
o 6 bicyclists	o 165 bicyclists

Collisions	School Buses Involved
o 25,252 collisions	o 25,521 school buses involved
o 129 fatal collisions	o 130 in fatal collisions
o 4,872 personal injury collisions	o 4,954 in personal injury collisions
o 20,251 property damage only (PDO) collisions	o 20,437 in PDO collisions

BACKGROUND

Since 1995, many improvements have been made to school buses including:

- the structural integrity of the roof and joints in school buses;
- the structure and design of the seats and seat backs to absorb the energy of a collision and keep the passenger contained;
- windows designed to prevent the passenger from being ejected;
- additional mirrors for greater visibility in and around the bus; and
- improved swing arms and stop warning lamps to protect children when getting on or off the bus.

ESTIMATE OF EXPOSURE

In order to calculate the exposure on a national basis, the estimate assumes that the other provinces transport a similar proportion of children by school bus as Ontario. Based on the assumption that 28.4%¹ of Ontario's population aged 4 to 18 years travelled by school bus daily during the 2004 school year, the national total of pupils travelling by school bus was estimated at 1,700,000 students in the morning and again in the afternoon, or 3,400,000 pupil trips each school day. The additional assumption, that students attend school for about 180 days in a school year, yields an estimate of 612 million pupil-trips per school year.

CASUALTIES

Transporting children by school bus remains one of the safest methods of transportation. During the past 10 years, five school bus passengers (three of them less than 19 years of age) and 137 others died in collisions involving school buses. To give some perspective, among young people 18 years of age and under involved in collisions involving automobiles, light trucks and vans, 3,554 fatalities occurred over the 10-year period. Of these 3,554 fatalities, there were 959 drivers, 2,014 passengers, 34 bicyclists, and 547 pedestrians, all less than 19 years of age.

From 1995 to 2004, total injuries in collisions involving a school bus were 9,405; including 4,407 occupants of school buses, 4,348 occupants of other vehicles, 485 pedestrians and 165 bicyclists. Over the 10-year period, 339,285 young people (less than 19 years of age) were injured in motor vehicle crashes involving automobiles, light trucks and vans. These young victims were comprised of 86,544 drivers, 211,083 passengers, 3,425 bicyclists, and 38,233 pedestrians.

It is important to note that the comparison between the two groups of victims, young passengers of smaller vehicles and the passengers of school buses, is very difficult. There are always a far greater number of smaller vehicles on the road at any given time than the number of school buses.

¹ The Ontario Road Safety Annual Report for 2004 contains a section on school vehicles showing 685,325 pupils were transported daily in 2003/2004 school year. The number of pupils as a percentage of Ontario's population of 4-18 year olds in 2004 equals 28.4 percent. This percentage was used to estimate the pupils transported daily on a national basis and multiplied by two for pupil-trips daily. The number of school days (180) in a given year was based on the current schedule of the Ottawa-Carleton School Board. The Ontario Ministry of Transport web site is http://www.mto.gov.on.ca/english/safety/orsar/orsar04/chp6_04.htm#ref_6b.

However, when a school bus is transporting students, there are usually a far greater number of occupants on a school bus.

DETAILED FINDINGS

Casualties

In the 129 fatal collisions involving 130 school buses, there were 142 fatalities. Of the 142 fatalities, 8 (6 percent) were school bus occupants (5 passengers and 3 drivers); 38 (27 percent) were pedestrians; 6 (4 percent) were bicyclists; and the majority – 90 (63 percent) – were occupants of other vehicles involved in collisions with school buses. Of the 90 occupants of other vehicles fatally injured, 68 (76 percent) were drivers and 22 (24 percent) were passengers.

Over the 10-year period, 4,954 school buses were involved in 4,872 personal-injury collisions, resulting in 9,405 personal injuries. (Two or more buses were involved in a number of collisions.) Of the 9,405 injuries, 4,407 (47 percent) were school bus occupants; 485 (5 percent) were pedestrians; 165 (2 percent) were bicyclists; and 4,348 (46 percent) were occupants of other vehicles. Personal injuries² varied from minimal, where no treatment was required for minor abrasions and bruises, to serious injuries, where the victim was admitted to hospital for treatment or observation. Of the 3,427 school bus passengers injured, 108 (3 percent) were seriously injured, while 3,319 (97 percent) suffered minor injuries.

All casualties of school bus collisions are presented in Table 1, with a breakdown by occupants of school buses (drivers and passengers), occupants of other vehicles, pedestrians and bicyclists. Table 1 is the only table in this report to include the occupants of other vehicles involved in collisions with school buses.

Table 1. All Casualties in School Bus Collisions, 1995-2004

Year	Occupants of School Buses						Occupants of Other Vehicles		Pedestrians		Bicyclists		Total Casualties	
	Driver		Passenger		Total									
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
1995	0	108	0	384	0	492	10	472	2	69	1	18	13	1,051
1996	0	95	0	310	0	405	6	401	7	41	0	19	13	866
1997	0	87	0	299	0	386	8	450	2	44	1	22	11	902
1998	1	80	0	262	1	342	6	361	3	53	1	25	11	781
1999	0	89	1	297	1	386	7	390	5	55	0	13	13	844
2000	0	107	2	381	2	488	8	480	5	43	1	14	16	1,025
2001	0	102	1	351	1	453	10	367	3	43	0	15	14	878
2002	1	117	0	458	1	575	6	504	5	49	0	9	12	1,137
2003	0	99	0	358	0	457	14	471	4	58	2	12	20	998
2004	1	96	1	327	2	423	15	452	2	30	0	18	19	923
Total	3	980	5	3,427	8	4,407	90	4,348	38	485	6	165	142	9,405

² Prior to 2004, not all provinces and territories reported a breakdown of the data element “Injury Severity of Person”. British Columbia began reporting serious injuries in March of 2004.

Table 2 presents 10-year totals of school bus occupant, pedestrian and bicyclist fatalities and injuries by age. Two of the school-age bus occupant fatalities were 11 years of age, while the majority of occupants injured were between 5 and 17 years of age.

Table 2. School Bus Occupant, Pedestrian and Bicyclist Casualties by Age, 1995-2004

Age	School Bus Occupants		Pedestrians		Bicyclists		Total	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
1	0	4	0	0	0	0	0	4
2	0	3	0	4	0	0	0	7
3	0	12	2	5	0	0	2	17
4	0	36	2	8	0	1	2	45
5	0	84	7	17	0	2	7	103
6	0	127	4	19	1	4	5	150
7	0	175	4	26	0	3	4	204
8	0	182	1	23	0	4	1	209
9	0	217	2	17	0	5	2	239
10	0	250	0	19	0	7	0	276
11	2	300	0	15	0	4	2	319
12	0	297	0	23	0	8	0	328
13	0	285	1	23	0	10	1	318
14	0	213	0	21	0	9	0	243
15	0	234	0	23	0	6	0	263
16	0	220	1	8	0	4	1	232
17	0	144	1	14	0	4	1	162
18	1	55	0	7	1	5	2	67
19+	5	1,569	13	213	4	89	22	1,871
Total	8	4,407	38	485	6	165	52	5,057

School-Age Casualties

School-age casualties can be determined from the above table; however, Table 3 and Table 6 are the only tables in this report that focus solely on school-age casualties (less than 19 years of age). The other tables include casualties of all ages.

Over the 10-year period, three school bus occupants less than 19 years old were fatally injured – an average of 0.3 school bus occupant fatalities per year. Of the school-age occupant fatalities, one was fatally injured in 1999, and two in 2000.

From 1995 to 2004, 25 school-age pedestrians died in school bus collisions and 272 were injured. Sixty percent (15) of all school-age pedestrian fatalities in school bus collisions were between the ages of 5 and 7. Of the 272 school-age pedestrians injured, approximately 83 percent were between the ages of 5 and 15.

Table 3 presents the number of school-age (less than 19 years old) occupant, pedestrian, and bicyclist fatalities and injuries by time of day. An average of three school-age children died in school bus collisions each year and 319 were injured. Of the 30 fatalities over the 10-year period, three were school bus occupants, 25 were pedestrians, and two were bicyclists. Of the school-age injuries, averages of 284 were school bus occupants, 27 were pedestrians, and 8 were bicyclists.

More school-age pedestrian fatalities and injuries occurred in the afternoon than in the morning, with 16 (64 percent) fatalities and 132 (49 percent) injuries occurring in collisions between 3:00 p.m. and 5:00 p.m. Two of the three school-age occupant fatalities occurred between 7:00 a.m. and 8:00 a.m. on the journey to school. Almost 43 percent (1,218) of school-age occupant injuries occurred between 7:00 a.m. and 9:00 a.m. followed by 35 percent (987) of occupant injuries occurring between 3:00 p.m. and 5:00 p.m. About 54 percent (41) of school-age bicyclist injuries occurred between 2:00 p.m. and 5:00 p.m., while about 26 percent (20) of these injuries occurred on the journey to school between 7:00 a.m. and 9:00 a.m.

Table 3.
School-Age Casualties (Less Than 19 Years Old) by Time of Day,
1995-2004

Time of Day	School Bus Occupants		Pedestrians		Bicyclists		Total	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
12:00 - 6:59 a.m.	0	18	0	6	0	2	0	26
7:00 - 7:59 a.m.	2	272	3	17	0	3	5	292
8:00 - 8:59 a.m.	0	946	2	47	1	17	3	1,010
9:00 - 9:59 a.m.	0	79	0	9	0	1	0	89
10:00 - 10:59 a.m.	0	19	0	1	0	0	0	20
11:00 - 11:59 a.m.	0	98	2	15	0	1	2	114
12:00 - 12:59 p.m.	0	101	1	12	0	7	1	120
1:00 - 1:59 p.m.	0	32	0	5	0	2	0	39
2:00 - 2:59 p.m.	1	150	1	16	0	9	2	175
3:00 - 3:59 p.m.	0	622	13	91	1	20	14	733
4:00 - 4:59 p.m.	0	365	3	41	0	12	3	418
5:00 - 11:59 p.m.	0	104	0	11	0	0	0	115
Unknown	0	32	0	1	0	2	0	35
Total	3	2,838	25	272	2	76	30	3,186

School Bus Occupant Casualties

Table 4 shows the number of school buses involved in crashes where at least one occupant casualty occurred, by single and multi-vehicle collisions and year.

Table 4. School Bus Occupant Casualties by Year and Number of Buses Involved, 1995-2004

Year	Type of Collision								
	Single-Vehicle			Multi-Vehicle			Total		
	# of Buses	Fatalities	Injuries	# of Buses	Fatalities	Injuries	# of Buses	Fatalities	Injuries
1995	45	0	154	148	0	338	193	0	492
1996	31	0	65	138	0	340	169	0	405
1997	22	0	64	139	0	322	161	0	386
1998	26	0	57	121	1	285	147	1	342
1999	25	0	82	135	1	304	160	1	386
2000	26	0	62	168	2	426	194	2	488
2001	29	1	81	140	0	372	169	1	453
2002	43	0	108	183	1	467	226	1	575
2003	28	0	75	151	0	382	179	0	457
2004	35	2	87	148	0	336	183	2	423
Total	310	3	835	1,471	5	3,572	1,781	8	4,407

Pedestrian Casualties

Table 5 shows the number of pedestrians killed or injured in crashes involving school buses by the vehicle manoeuvre of the striking vehicle. Over the 10-year period, an average of three pedestrians were fatally injured and 36 were injured each year when struck by school buses. An average of one fatality and 12 injuries occurred when pedestrians were struck by another vehicle in a collision involving a school bus, or where the striking vehicle was not recorded on the crash report form.

In collisions involving school buses, 76 percent (29) of the fatally injured pedestrians were struck by school buses and 16 percent (6) were struck by another vehicle. The striking vehicle was not identified on the traffic collision report form for the remaining eight percent (3) of the pedestrian fatalities.

In crashes where a school bus was the striking vehicle, this table also shows that victims were killed or injured most often when the school bus was going straight ahead, turning left, turning right or starting in traffic.

Table 5.
Pedestrian Casualties by Vehicle Manoeuvre of Striking Vehicle
in Collisions Involving School Buses, 1995-2004

Vehicle Manoeuvre	Striking Vehicle							
	School Bus		Other Vehicle		Unknown Vehicle		Total	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
Going Straight	6	128	5	40	1	15	12	183
Turning Left	3	98	0	0	0	0	3	98
Turning Right	8	58	0	0	0	0	8	58
Changing Lanes	0	1	0	0	0	0	0	1
Merging or Overtaking	0	2	0	6	0	1	0	9
Making U-Turn	0	1	0	0	0	0	0	1
Reversing	2	10	0	3	0	1	2	14
Slowing or Stopping	0	19	1	4	1	2	2	25
Stopped or Parked	0	0	0	1	0	3	0	4
Starting in Traffic	8	26	0	0	0	0	8	26
Stopped in Traffic	0	1	0	0	0	4	0	5
Starting from Parked Position	2	8	0	0	0	1	2	9
Entering Parked Position	0	2	0	0	0	0	0	2
Swerving to Avoid Object	0	0	0	0	0	0	0	0
Unknown	0	9	0	1	1	40	1	50
Total	29	363	6	55	3	67	38	485

School-Age Pedestrian Casualties

Table 6 data is a subset of the data presented in Table 3 and shows school-age pedestrians killed and injured *by a school bus* during the most dangerous time periods; 7:00 to 9:00 a.m. and 3:00 to 5:00 p.m. This table shows that 6.5 times more pedestrian fatalities occurred during the afternoon period than during the morning period and roughly twice as many injuries occurred in the afternoon than in the morning.

While the focus has always been and will continue to be on improving occupant protection, Transport Canada and its partners are also developing strategies to offer more protection to the pedestrians in the vicinity of school buses.

Table 6. School-Age Pedestrian Casualties during the most Dangerous Time Periods by Vehicle Manoeuvre of the School Bus

Time Period	Vehicle Manoeuvre	Fatalities	Injuries
7:00 - 9:00 a.m.	Going Straight Ahead	1	20
	Turning Left	0	4
	Turning Right	0	6
	Slowing or Stopping	0	7
	Starting In Traffic	1	3
	Starting from Parked Position	0	1
	Changing Lanes	0	1
	Total	2	42
3:00 - 5:00 p.m.	Going Straight Ahead	2	41
	Turning Left	1	8
	Turning Right	3	13
	Reversing	1	2
	Slowing or Stopping	0	3
	Starting in Traffic	4	9
	Starting from Parked Position	2	0
	Entering Parked Position	0	2
	Unknown	0	2
	Total	13	80

Source: Transport Canada, Road Safety and Motor Vehicle Regulation Directorate, TRaffic Accident Information Database (TRAID)

To find out more about national road safety programs and initiatives, call Transport Canada at **1 800 333-0371** or **(613) 998-8616** in the Ottawa area, or e-mail us at: roadsafetywebmail@tc.gc.ca. You can also write to us at: Road Safety and Motor Vehicle Regulation Directorate, Transport Canada, ASF, Ottawa, ON, K1A 0N5.

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