COMMERCIAL BUS CRASHES IN NORTH CAROLINA 1995-1999

Prepared for:
CMV Enforcement Section
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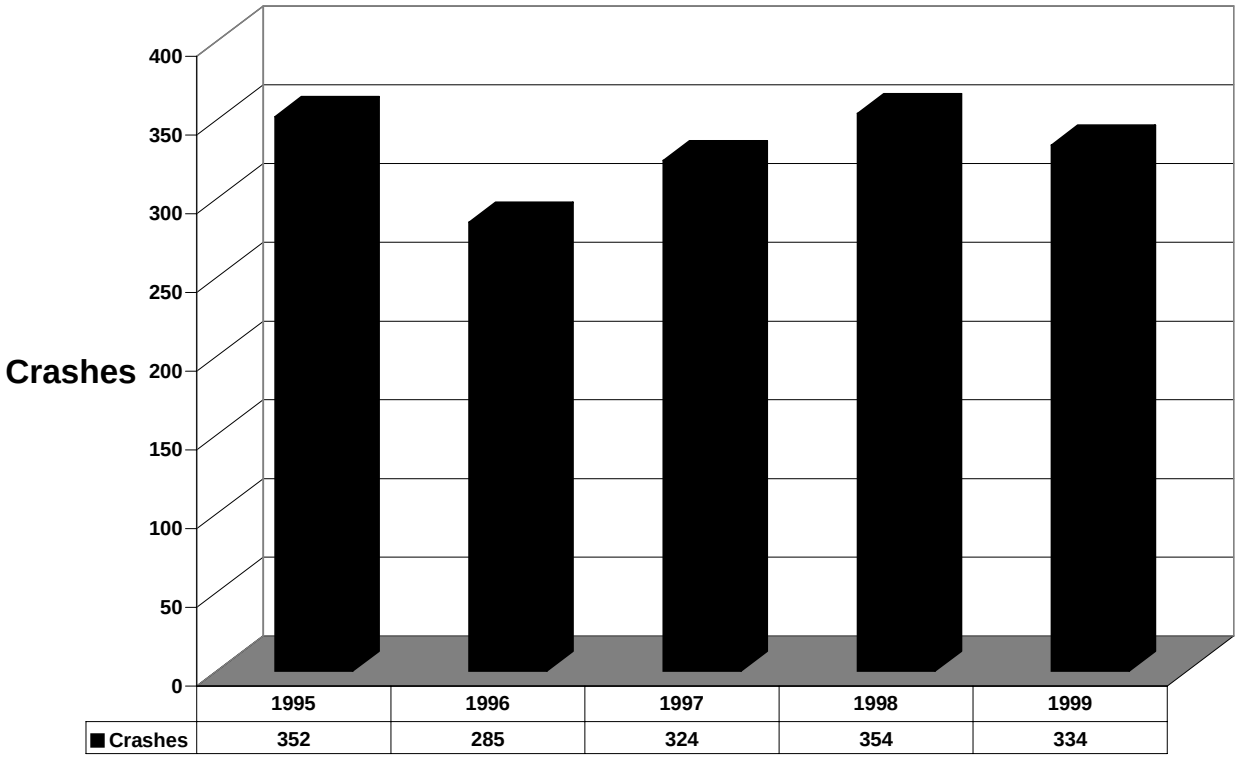
CRASH FREQUENCY

Figure 1 shows the frequency of commercial bus crashes in North Carolina during the period 1995-1999. These data do not include activity buses or school buses. Commercial bus crashes ranged from a low of 285 in 1996 to a high of 354 for 1998. Total crashes for the five-year period was 1649.

Figure 1
Commercial Bus Crashes in North Carolina 1995-1999



	1995	1996	1997	1998	1999
Crashes	352	285	324	354	334

CRASHES BY COUNTY

Table 1 lists the number of commercial bus crashes, by North Carolina county, for the period 1995-1999. The data are *commercial bus crashes only* and do not include counts of activity or school bus crashes. The five counties with the highest number of commercial bus crashes during this period were: Mecklenburg (573), Wake (199), Guilford (127), Durham (122), and Forsyth (116).

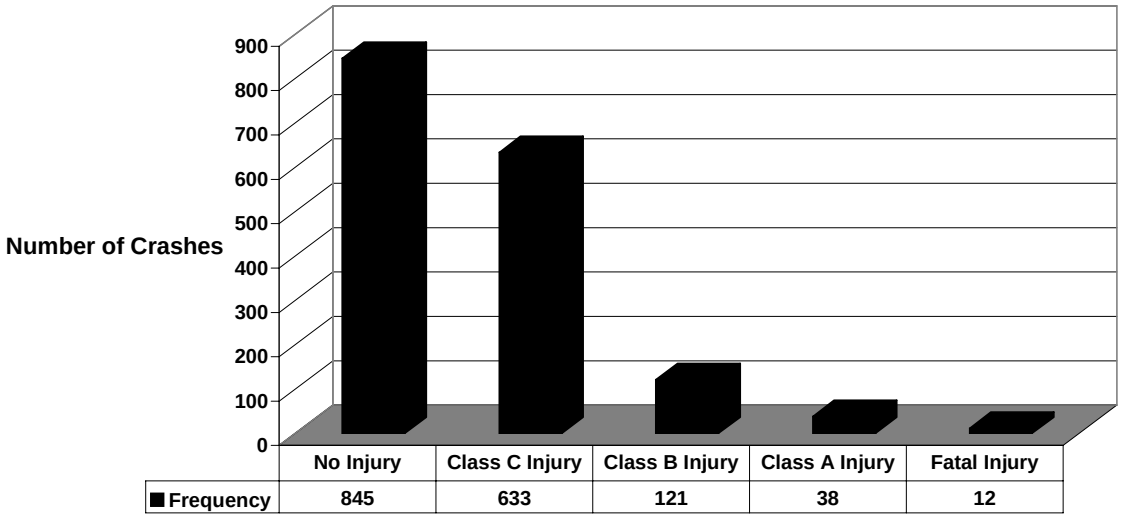
Table 1
Commercial Bus Crashes in North Carolina, By County, for the Period 1995-1999

COUNTY	FREQUENCY		COUNTY	FREQUENCY
Mecklenburg	573		Moore	3
Wake	199		Randolph	3
Guilford	127		Wilkes	3
Durham	122		Anson	2
Forsyth	116		Bertie	2
Cumberland	67		Cleveland	2
Orange	67		Harnett	2
Buncombe	52		Henderson	2
New Hanover	43		Hertford	2
Pitt	22		Hoke	2
Gaston	21		Lincoln	2
Catawba	16		Northhampton	2
Rowan	16		Pasquotank	2
Edggecome	15		Polk	2
Nash	12		Richmond	2
Wilson	12		Stanly	2
Cabarrus	9		Vance	2
Onslow	8		Yadkin	2
Watauga	8		Ashe	1
Davidson	7		Avery	1
Johnston	7		Beaufort	1
Robeson	7		Brunswick	1
Halifax	6		Carteret	1
Iredell	6		Caswell	1
Lenoir	5		Chatham	1
Scotland	5		Columbus	1
Wayne	5		Duplin	1
Burke	4		Franklin	1
Chowan	4		Macon	1
Rockingham	4		Madison	1
Surry	4		McDowell	1
Union	4		Pamlico	1
Alamance	3		Pender	1
Craven	3		Person	1
Dare	3		Rutherford	1
Granville	3		Sampson	1
Haywood	3		Washington	1
Lee	3			

ACCIDENT SEVERITY

In 845 (51%) of the commercial bus crashes, no injuries were recorded. Class C injuries totaled 633 (38%); Class B totaled 121 (9%); Class A totaled 38 (2%); and fatal injuries totaled 12 (less than 1 percent).

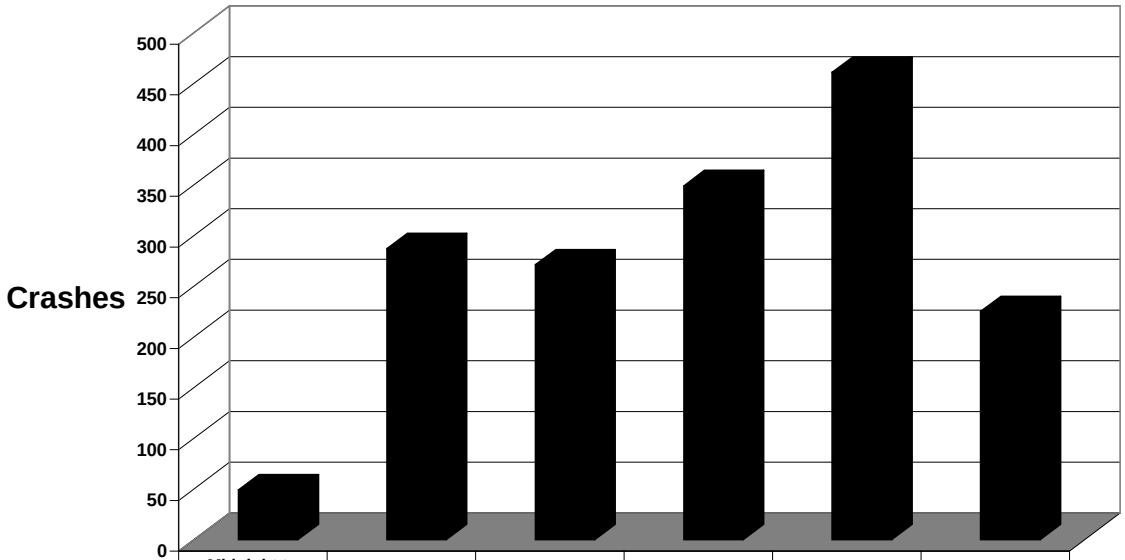
Figure 2
Accident Severity for Crashes Involving a Commercial Bus in North Carolina
1995-1999



TIME OF DAY

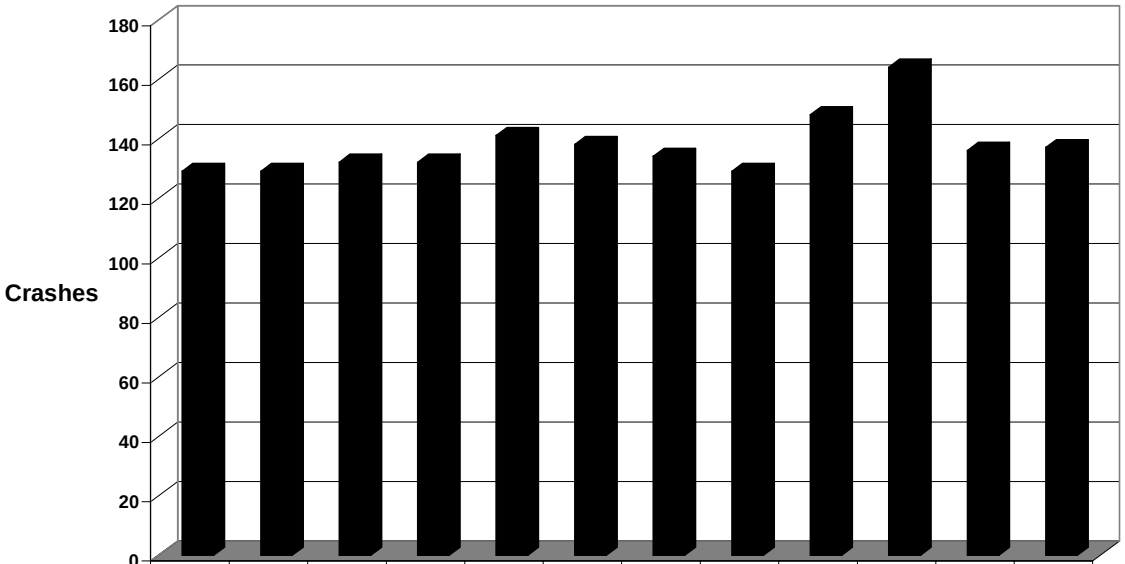
Commercial bus crashes generally increased throughout the day from 6am until 6pm with the highest number of crashes occurring during the period between 3pm and 6pm (see Figure 3).

Figure 3
Commercial Bus Crashes in North Carolina and Time of Day 1995-1999



	Midnight to 5:59am	6:00 to 8:59am	9:00 to 11:59am	Noon to 2:59pm	3:00 to 5:59pm	6:00 to 11:59pm
Series1	49	287	271	349	461	225

Figure 4
Commercial Bus Crashes in North Carolina by Month of the Year 1995-1999



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Series1	129	129	132	132	141	138	134	129	148	164	136	137

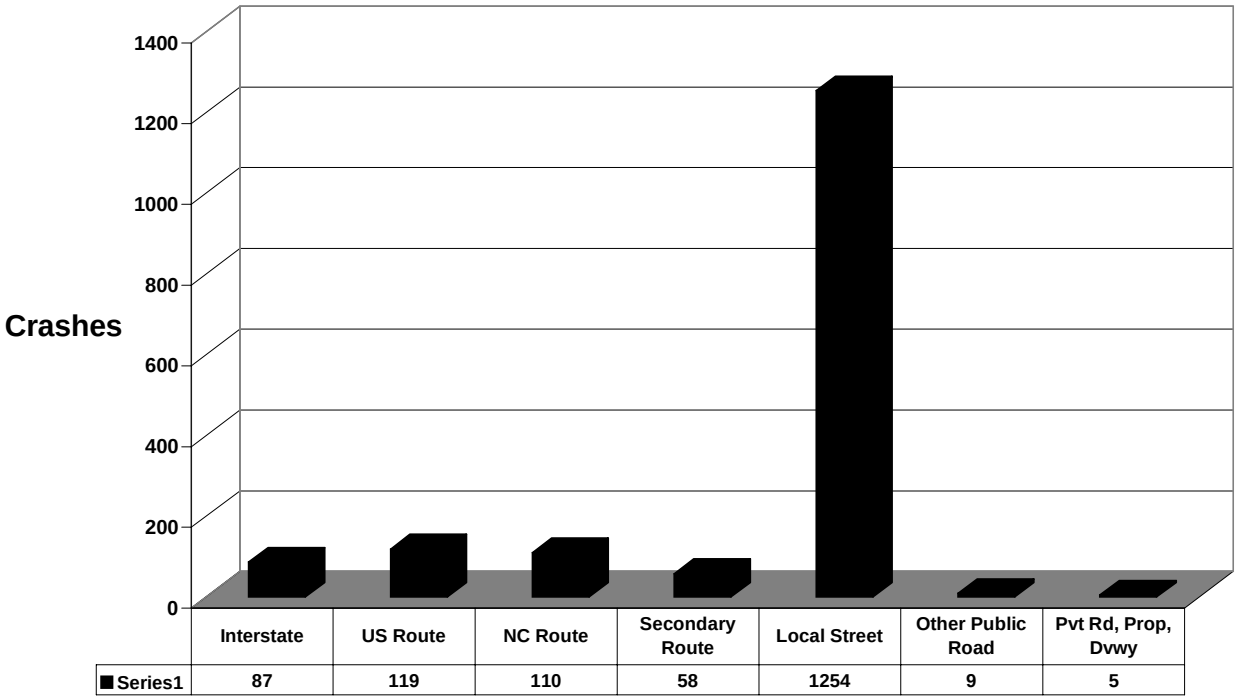
MONTH OF THE YEAR

No marked trend is apparent in terms of the month in which crashes occurred (Figure 4), other than to point to August and September as being the two adjacent months with the highest average totals during this period.

CLASS OF ROADWAY

Figure 5 shows that the vast majority (76%) of commercial bus crashes in North Carolina during the period 1995-1999 occurred on 'local streets' as opposed to NC and/or US-numbered routes or Interstates.

Figure 5
Commercial Bus Crashes and Class of Road North Carolina 1995-1999



ROAD CONDITION

Figure 6 shows the condition of the roadway associated commercial bus crashes in North Carolina from 1995-1999. The data show that 80 percent of all commercial bus crashes in NC during this period occurred on dry roads; 18 percent on wet roads; approximately 1 percent on icy roads; and less than 1 percent on snow covered roads. With respect to reported vision obstructions for the commercial bus driver, the data indicated that in 95 percent of crashes there was no reported source of visual interference or obstacle.

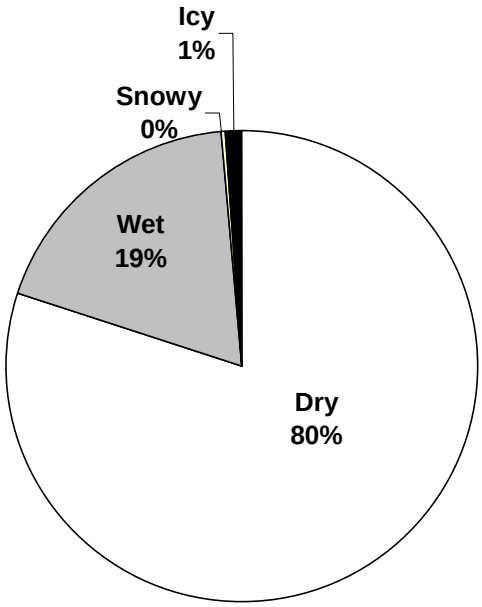


Figure 6
Road Conditions Associated With Commercial Bus Crashes in North Carolina 1995-1999

DRIVER AGE AND SEVERITY OF INJURY TO DRIVER

The following data address the age of the driver, either the commercial bus driver or the driver of the 'other' vehicle and the level of injury incurred by the driver. The data in Table 2 show the age and level of driver injury for the driver of the commercial bus. The data in Table 3 show the age and level of driver injury for the driver of the 'other' vehicle. Table 4 compares the relative likelihood of the commercial bus driver and driver of the 'other' vehicle incurring a class B,A, or fatal injury. In general, the data show the following:

- whereas 11 percent of commercial bus crashes involved injury to the driver, 26 percent of bus-involved crashes resulted in injury or death to the driver of the other vehicle

- for bus-involved crashes between 1995 and 1999, one (1) bus driver was killed compared to 11 drivers of the 'other' vehicles, and as Table 3 shows

- the likelihood of serious driver injury (Class B,C, or Fatal) in the 31-60 yr old age group of 'other' vehicle drivers was 8 times that for bus drivers of the same age.

Table 2
Commercial Bus Driver Age and Driver Injury

	No Injury	Class C	Class B	Class A	Fatal
15-to-20	6	0	0	0	0
21-to-30	155	20	4	0	0
31-to-60	1156	136	8	3	0
61 and over	115	4	2	2	1

Table 3
'Other' Vehicle Driver Age and Injury

	No Injury	Class C	Class B	Class A	Fatal
15-to-20	140	33	10	5	0
21-to-30	360	83	21	4	1
31-to-60	596	168	47	15	6
61 and over	160	19	12	4	4

Table 4
Percent of Drivers (Either Bus or Other Vehicle) Incurring Class B,C, or Fatal Injuries

	Bus Driver	Other Vehicle Driver
15-to-20	0%	0%
21-to-30	2%	5%
31-to-60	1%	8%
61 and over	4%	10%

TYPE OF OTHER VEHICLE INVOLVED IN CRASH

Table 5 provides a list of the types of vehicles involved in bus-related crashes, listed from most to least frequent. The data reiterate the finding that drivers involved in bus-related crashes were most likely in the 31-60 year old age range and most likely to be driving a 2 or 4 door sedan.

Table 5
Vehicle Type and Driver Age In Bus-Involved Crashes

	10-to-14	15-to-20	21-to-30	31-to-60	61 and above	Total Crashes
2,4 Door Sedan	0	145	349	508	166	1168
Pickup Truck	0	11	32	78	24	145
SW Passenger	0	11	17	74	11	113
Van	0	5	21	62	12	100
Truck, 2 Axles	0	8	22	54	8	92
Trk, Tractor Trailer	0	0	11	31	1	43
Pedestrian	1	4	9	18	4	36
SW Truck	0	4	9	18	1	32
Taxi	0	0	3	12	2	17
School bus	0	1	4	2	0	7
Bicycle	1	1	1	4	0	7
Truck, 3 Axles	0	0	1	3	2	6
Trk, Tractor Only	0	0	0	4	0	4
Motorcycle	0	1	2	0	0	3
Activity Bus	0	0	0	2	0	2
Ambulance	0	0	1	1	0	2
Self-Contained RV	0	0	1	1	0	2
Farm Tractor	0	0	0	1	0	1
Moped	0	0	0	1	0	1
Other Motor Vehicle	0	0	0	1	0	1

TRAFFIC VIOLATIONS ASSOCIATED WITH CRASHES

Table 6 lists the frequency of traffic violations for the commercial bus driver and for the driver of the ‘other’ vehicle. In 33 percent of crashes, the commercial bus driver was cited; in 61 percent of the crashes the driver of the ‘other’ vehicle was cited. The most frequent violation for both classes of drivers was ‘safe movement violation.’ The driver of the commercial bus was cited for ‘safe maneuver violation’ seven percent of the time whereas the driver of the ‘other’ vehicle was cited for ‘safe movement violation’ 16 percent of the time. With respect to the involvement of speed (i.e., violations cited for either failure to reduce speed, exceeding posted speed, or exceeding safe speed), commercial bus operators were cited for speed related violations 7 percent of the time whereas the driver of the ‘other’ vehicle was cited for a speed related violation 16 percent of the time. To the extent that

violations can be used as an indicator of who was 'at fault,' the data suggest that the 'other driver' was almost twice as likely to be at fault in a bus-involved crash as the driver of the bus itself. The approximate 2:1 ratio is upheld across measures of (a) percent of crashes involving a violation, (b) relative likelihood of a safe movement violation, and (c) involvement of speed.

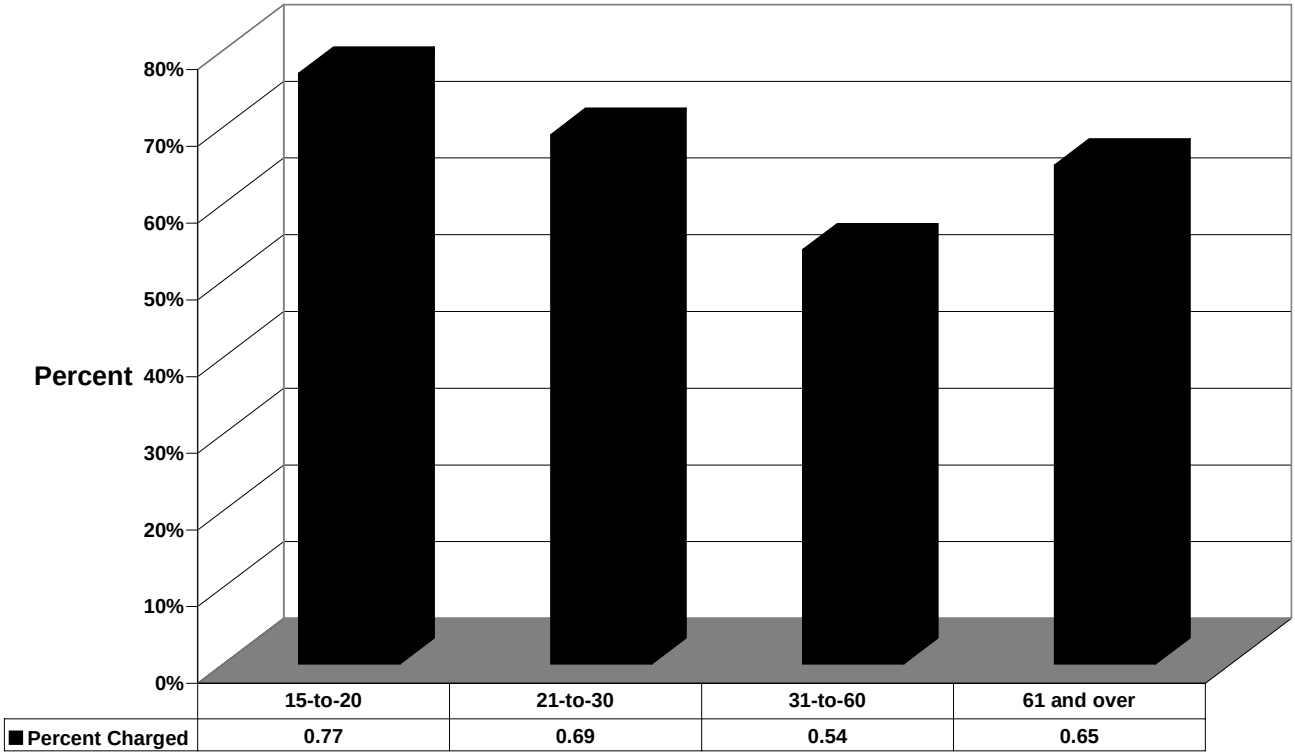
Table 6
Frequency of Traffic Violations for Driver of Bus And Driver of 'Other' Vehicle (1995-1999)

Bus Driver Violation			Other Driver Violation	
Violation	**Frequency**		**Violation**	**Frequency**
No Violation	1035		No Violation	660
Safe Movement Viol	180		Safe Movement Viol	277
Fail to Reduce Speed	91		Fail to Reduce Speed	223
Improper Turn	52		Traffic Signal	77
Yield	33		Improper Lane Change	74
Traffic Signal	22		Yield	62
Improper Lane Change	22		Improper Turn	45
Improper Veh Equip	18		Other Impr Passing	39
Exceed Safe Speed	17		Following Too Close	39
Improper Backing	16		Exceed Safe Speed	31
Other Improper Passing	10		Stop Sign	28
Following Too Close	9		Improper Backing	20
Improper Lane	8		DWI-Alcohol	19
Other	8		Improper Parking	17
Left of Center	6		Impr Veh Equipment	16
Stop Sign	5		Exceed Posted Speed	14
Exceed Speed Limit	5		Other	13
Improper Parking	3		Improper Lane	12
DWI-Alcohol	1		Left of Center	6
Rt Turn on Red	1		DWI-Drugs	2
			Pass Stopped Sch Bus	1
			Pass on Hill	1
			Pass on Curve	1
			Imp-No Signal	1

AGE AND THE LIKELIHOOD OF 'OTHER DRIVER' VIOLATIONS IN BUS-INVOLVED CRASHES

Figure 7 shows that the likelihood of the driver of the 'other' vehicle being cited for a violation was inversely related to driver age over the range of drivers from 15 to 60 years of age. This trend did not hold for drivers 61 years of age and older. In the group of oldest drivers (61 and above), there was a reversal in this trend. This 'reversal' was most prevalent in the case of violations for: safe movement violations, improper lane change, improper turn, and yield violations.

Figure 7
Percent of Crashes Associated With Violation by 'Other' Driver: The Involvement of Age



	15-to-20	21-to-30	31-to-60	61 and over
Percent Charged	0.77	0.69	0.54	0.65

SUMMARY

- During the period 1995-1999 there were 1649 commercial bus-involved crashes in North Carolina.

- 76 percent of all bus-involved crashes occurred on 'local streets' as opposed to state and federal highways and/or interstates.

- Injuries were reported in 49 percent of the crashes. One percent of reported injury crashes involved a fatality.

- The driver of the bus was injured in 11 percent of the reported crashes; the driver of the other vehicle was injured in 26 percent of the reported crashes.

- The driver of the 'other' vehicle was 11 times more likely to be killed in the crash than the driver of the bus.

- Over half of all bus-involved crashes occurred in three counties: Mecklenburg, Wake, and Guilford.

- Bus-involved crashes most often involved 2,4 door sedans and pickup trucks.

- Bus-involved crashes during this period were most frequent from 3pm to 6pm.

- Bus-involved crashes had a higher likelihood of occurrence under wet, snowy, or icy road conditions than other vehicles. Approximately 20 percent of bus-involved crashes occurred under these conditions.

- In 33 percent of bus-involved crashes, the driver of the bus was cited for a traffic violation, most often for an unsafe movement (7 percent of total violations). The driver of the 'other' vehicle, on the other hand, was cited for a violation 61 percent of the time (also most likely for unsafe maneuver, but at a rate (16%) roughly twice that of the commercial bus operator).

- In approximately 7 percent of crashes, the driver of the bus was cited for a speed-related violation; in 16 percent of crashes, the driver of the 'other' vehicle was cited for a speed-related violation.

- Generally, the likelihood of the 'other driver' being cited for a traffic violation was inversely related to the age of the driver (for drivers between 15 and 50 years of age). In other words, the younger the driver, the more likely the driver was cited for a traffic violation in conjunction with the crash.

- The exception to this relationship was for drivers over the age of 60. Drivers age 61 and above had higher than expected frequencies of violations for improper lane change violations, unsafe vehicle movements, improper turns, and yield violations.