A Review of Information on Fatal Traffic Crashes in the United States in 1989

A DECADE OF PROGRE

U.S. Department of Transportation
National Highway Traffic Safety Administration

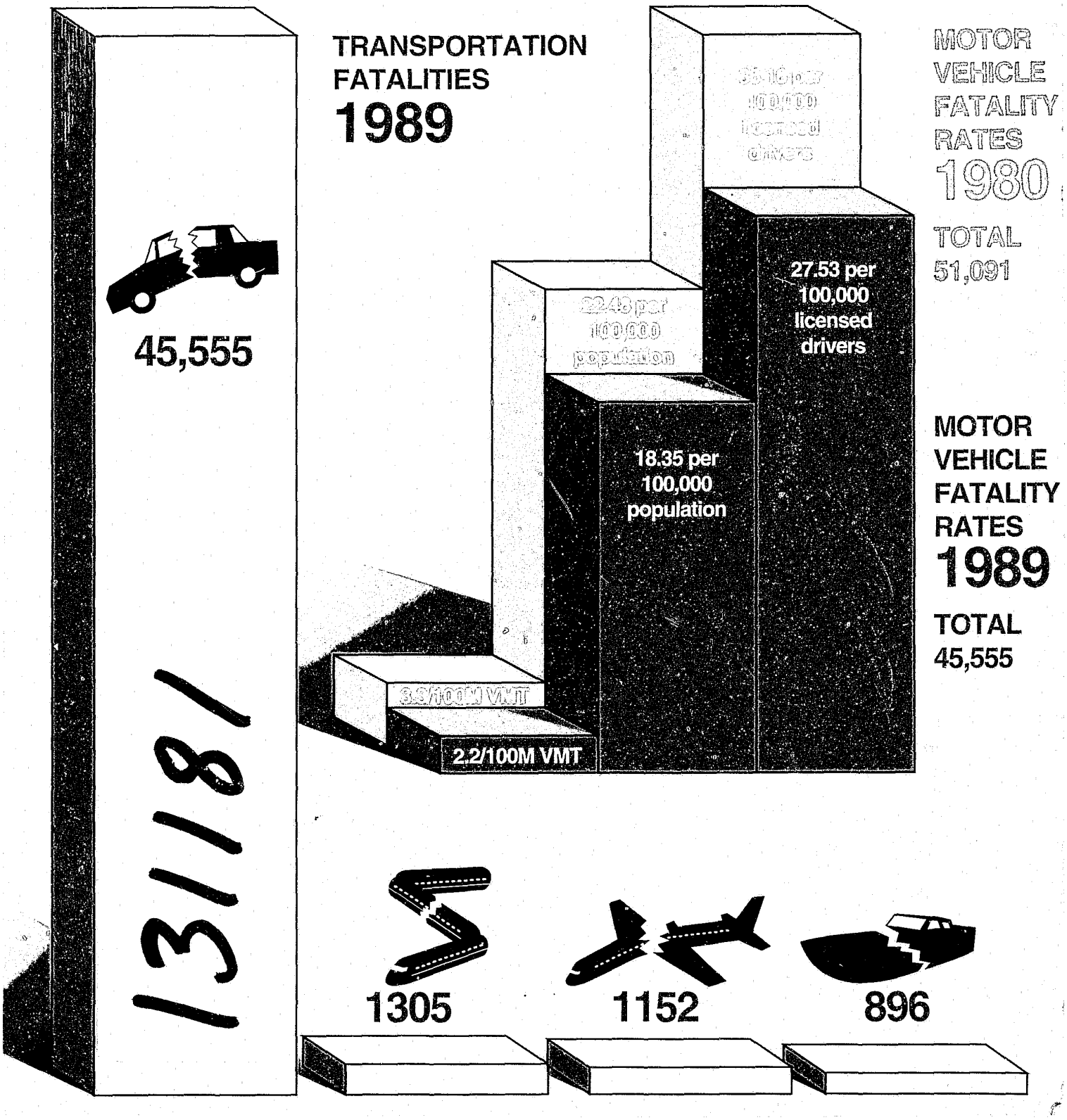

Table 1
1989 National Statistics

Fatal Crashes	
One Vehicle Involved	23,732
Two or More Motor Vehicles Involved	16,986
Total	40,718
Types of Vehicles Involved in Fatal Crashes	
Passenger Cars	35,384
Motorcycles	3,081
Other Motorized Cycles	113
Multipurpose Vehicles	1,890
Light Trucks	13,801
Medium Trucks	672
Heavy Trucks	4,310
Buses	311
Other Vehicles	447
Unknown	825
Total	60,834
Persons Killed in Fatal Crashes	
Occupants	
Drivers	26,379
Passengers	11,611
Other	75
Nonoccupants	7,490
Total	45,555
Persons Involved in Fatal Crashes	
Occupants	
Drivers	60,398
Passengers	40,792
Other	152
Nonoccupants	8,457
Total	109,799
Other National Statistics	
Population	248,239,000
Registered Vehicles	191,694,462
Licensed Drivers	165,555,295
Vehicle Miles Traveled	2,107,040,000,000
National Rates	
Fatalities per 100 Million VMT	2.2
Licensed Driver per Person	0.67
VMT per Registered Vehicles	10,992
Fatal Crashes per 100 Million VMT	1.9
Involved Vehicles per Fatal Crash	1.49
Fatalities per Fatal Crash	1.12
Average Number of Occupants per Fatal Crash	2.7
Fatalities per 100,000 Population	18.35

Sources: Fatalities - National Highway Traffic Safety Administration
Population - U.S. Bureau of the Census
Registered Vehicles, Licensed Drivers, and Vehicle Miles Traveled - Federal Highway Administration

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National Highway Traffic Safety Administration

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How to Use the FARS Annual Report

This publication presents information on fatal traffic crashes and fatalities in the United States based on the Fatal Accident Reporting System (FARS) data file for 1989. Similar information, from 1982 through 1988, is included for comparison purposes where appropriate. Data for 1988 has been updated and may not agree exactly with the data that appeared in the earlier version of the FARS Annual Report.

The **Foreword** explains the FARS operations.

The **Glossary** defines the terms used in this report.

The **Table of Contents** describes the material in each Chapter. The color key on the outside back cover will help to locate Chapters. Tables are labeled on the top of each table and figures are labeled on the bottom.

National Statistics and Rates for 1989 appear in Table 1 (inside front cover).

A Fatality Overview is presented in Chapter 1, including sections on **Trends** and **Demographics.**

The **Summary Statistics on Fatal Crashes in 1989** covers important aspects of the entire report.

About the Contents

Percentages shown, for the most part, have been rounded to the nearest 1/10 of 1 percent. As a result, they may not total exactly 100%. In figures and tables that show percentages, the base number upon which these percentages are computed is either explained on the figure or indicated by "100%" adjacent to the base number in the tables.

The state records from which FARS data are collected vary in content and level of detail from state to state and jurisdiction. Because of this, it is not always possible for a state analyst to uniquely identify an attribute of a data element. In this event, the analyst uses the code "unknown" for the particular data element. "Unknown" data are included in this report to provide complete and unbiased information.

Most of the information in this report comes directly from the FARS files. Detailed exposure information - vehicle miles traveled (VMT) under particular circumstances or numbers of licensed drivers and registered vehicles - is only included in some of the tables in Chapters 1 and 4. Thus, there is little rate information such as the rate of crash involvement for different classes of vehicles. The significance of some of the data presented in this report may not be obvious until such exposure-based rates are calculated.

Sources:

Fatalities--**National Highway Traffic Safety Administration** (Fars89 File Version 210, June 6, 1990 was used to generate statistics).

Vehicle Miles Traveled, Registered Vehicles, and Licensed Drivers--**Federal Highway Administration.**

Population Data--**U.S. Bureau of the Census.**

US Department
of Transportation

**National Highway
Traffic Safety
Administration**

1989 Traffic Fatality Facts

NATIONAL CENTER FOR STATISTICS AND ANALYSIS

FATAL TRAFFIC CRASHES IN 1989

The following is a summary of important statistics on fatal motor vehicle crashes and fatalities which occurred in 1989 in the United States. This information is from the National Highway Traffic Safety Administration's Fatal Accident Reporting System (FARS).

FATALITIES AND FATAL CRASHES

- In 1989, there were 45,555 fatalities in 40,718 fatal crashes. This is a decrease from 1988 in both the number of fatalities (3.3%) and fatal crashes (3.4%).
- The total of fatalities divided by an estimate of vehicle miles traveled (VMT), yields a fatality rate of 2.2 per 100 million VMT. This is the lowest fatality rate per 100 million VMT in history.

ALCOHOL

The National Highway Traffic Safety Administration (NHTSA) defines a fatal traffic crash as being alcohol related if either a driver or nonoccupant (e.g. pedestrian) had a blood alcohol concentration (BAC) of .01% or greater in a police reported traffic crash. Persons involved in fatal crashes with a BAC of .10% or greater are considered to be intoxicated. This is the legal limit of intoxication in most states.

- In 1989, an estimated 49.2% of all traffic fatalities were alcohol related (BAC of .01 or greater), compared to 57.2% in 1982 and 50.2% in 1988. For persons 15 years of age and older, the age group with the lowest proportion of alcohol related fatalities was age 65 and older (20.4%) followed by 15-19 year olds (45.2%). The highest proportion was in the 25-29 year old age group (67.7%).

In 1989, 45,555 individuals lost their lives in traffic crashes. Of these, about 17,850 or 39.2% were killed in crashes in which at least one driver or nonoccupant was intoxicated. The table below presents the distribution of these 17,850 fatalities by their alcohol level.

ALCOHOL LEVEL OF FATALLY INJURED PERSONS IN CRASHES IN WHICH AT LEAST ONE DRIVER OR NONOCCUPANT WAS INTOXICATED

	No.	%
Drivers Who were Intoxicated and Were Killed	9,820	55
Nonintoxicated Drivers Who Were Killed	1,220	7
Passengers Who Were Killed	3,760	21
Nonoccupants (Pedestrians & Pedalcyclists) Who Were Intoxicated and Killed	2,200	12
Nonoccupants Who Were Not Intoxicated and Were Killed	850	5
Total	17,850	100

- Of the 17,850 individuals killed in the above crashes, 67% were themselves intoxicated. The remaining 33% were passengers or nonintoxicated drivers or nonintoxicated nonoccupants.

- The proportion of fatalities in crashes in which at least one driver or nonoccupant had blood alcohol concentration (BAC) of .10% or greater decreased from 46.3% in 1982, to 39.2% in 1989 (Figure 1). The reduction in that proportion from 1982 to 1989 is 15.3%.

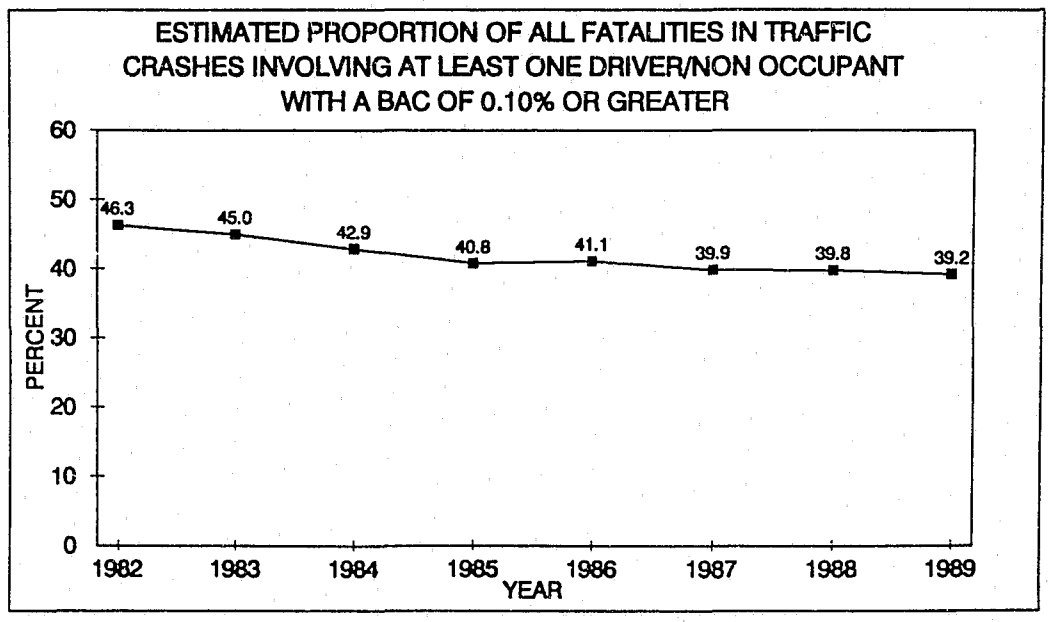

Figure 1

- Since 1982, alcohol use by drivers in fatal crashes has steadily decreased. The proportion of all drivers who were estimated to have been legally intoxicated (BAC of .10% or greater) dropped from 30.0% in 1982 to 24.2% in 1989 (Figure 2). The reduction from 1982–1989 is 19.3%.

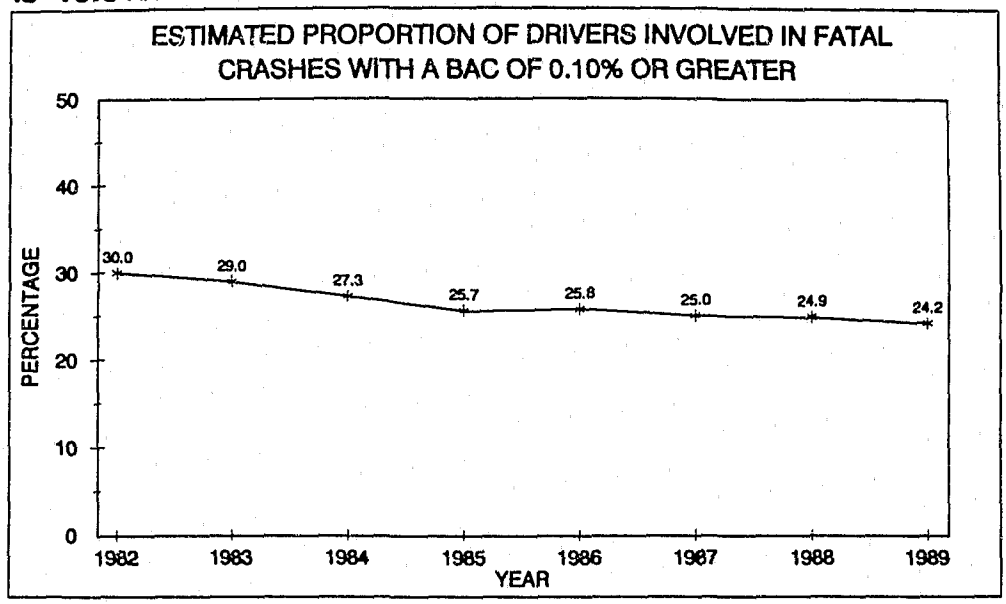

Figure 2

- The proportion of fatally injured drivers who were legally intoxicated dropped from 43.8% in 1982 to 37.2% in 1989 -- a 15.1% decrease.

- During the past seven years, the proportion of drivers involved in fatal crashes who were intoxicated decreased in all age groups. The most significant drop continues to be the 15 to 19 year old age group. In 1982, NHTSA estimated that 28.4% of these teenaged drivers in fatal crashes were intoxicated, compared with 17.1% in 1989 (Figure 3).

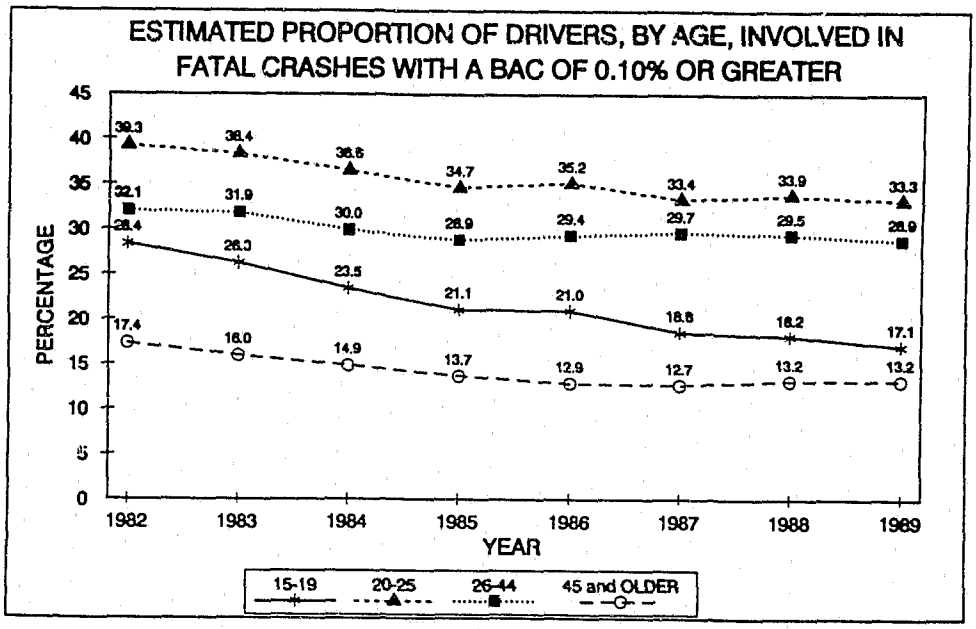

Figure 3

- When drivers of various types of vehicles involved in fatal crashes are compared, there is a decline in the percentage of drivers who were intoxicated from 1982 to 1989 for all vehicle groups. The decrease for drivers of passenger cars was 22%, while the decrease among drivers of light trucks, vans and multipurpose vehicles was 18%. The proportion of motorcycle drivers involved in fatal crashes who were legally intoxicated has remained relatively constant at about 40% over the last 8 years.

- The proportion of fatally injured adult pedestrians and bicyclists (14 and older) who were legally intoxicated decreased 8% between 1982 and 1989 as a group. During this same time period, there was a substantial decrease in the proportion of fatally injured pedestrians and bicyclists in the 14 to 19 and 65 and older age groups who were legally intoxicated -- 28% and 32% respectively.

- The proportion of male drivers in fatal crashes who were intoxicated was 27.0% in 1989 compared to 14.4% of the female drivers.

- Based on data from states with at least 80% BAC testing, 16.6% of fatally injured drivers who were highly intoxicated --- BAC equal to or greater than .20 -- had at least one prior DWI conviction, compared to only 1.9% of fatally injured drivers who were sober.

Percent of Fatally Injured Drivers with:	BAC of Fatally Injured Drivers .00	.01-.09	.10-.19	.20+
Prior DWI Conviction	1.9%	6.9%	9.4%	16.6%
Prior Accident	17.1%	18.4%	21.2%	20.9%
Prior Revocation/Suspension	8.2%	14.7%	22.9%	24.6%
Prior Moving Violation	31.7%	44.4%	45.5%	39.8%

LIVES SAVED BY MINIMUM DRINKING AGE LAWS

- Minimum Drinking Age Laws are estimated to reduce traffic fatalities involving drivers in affected age groups by 13%. NHTSA estimates these laws saved 1,093 lives in 1989 (Figure 4).

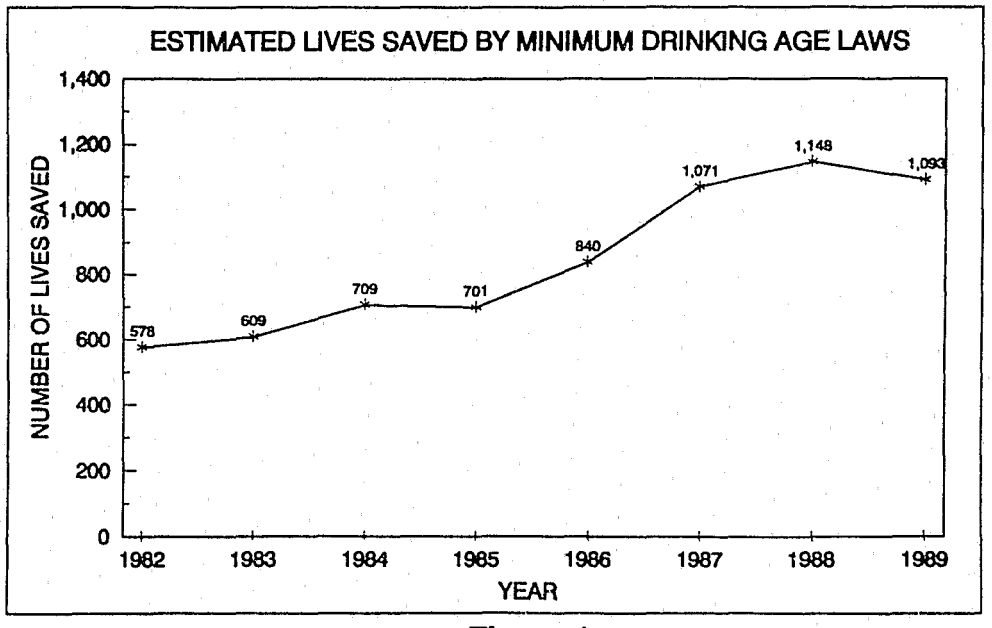

Figure 4

- Since 1975, Minimum Drinking Age Laws have saved almost 10,400 lives. Figure 5 presents the cumulative lives saved by Minimum Drinking Age Laws since 1975, from 1982 through 1989.

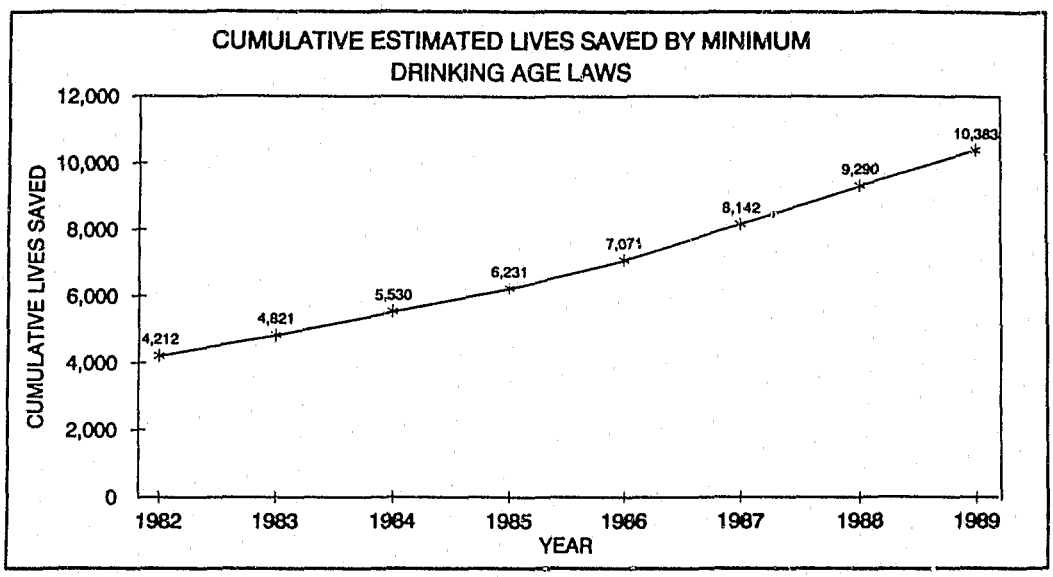

Figure 5

SAFETY BELTS AND CHILD SAFETY SEATS

- The reported use of safety belts continued to rise dramatically in 1989. Reported driver safety belt usage in fatal crashes in 1989 was 35.0%, up from 28.6% in 1987 and 33.2% in 1988. Reported safety belt use by all passenger car occupants in fatal crashes increased from 36.3% in 1988 to 38.0% in 1989. It is impossible to determine whether these increases in restraint usage are real, or are due to the increased belt use reported to police, especially in states with mandatory safety belt use laws.

- Of the passenger car occupants in fatal crashes who were reported as restrained, 26.9% (5,537) were fatally injured. Of the occupants who were reported as unrestrained, 50.1% (16,759) were fatally injured.

- While 28.8% of the restrained occupants in passenger cars involved in fatal crashes suffered no reported injuries, only 9.0% of the unrestrained occupants were not injured.

- Less than 1 percent of the passenger car occupants reported as restrained were totally ejected, while 17.3% of the unrestrained occupants were totally ejected. Almost three quarters (72.4%) of the occupants who were totally ejected were killed.

- All 50 states and the District of Columbia have child restraint use laws in effect. The estimated usage rate in 1989, according to NHTSA's 19 cities survey, is 85%, and approximately 238 lives (age 4 and under) were saved in 1989 as a result of child restraint use. In 1989, 336 unrestrained children under the age of 5 died in passenger cars.

SAFETY BELT USE LAWS

- Numerous research studies indicate that, when used, lap and shoulder safety belts, reduce the risk of fatal or serious injury to front seat occupants by between 40 and 55 percent.

- The implementation of belt use laws has been estimated to reduce fatalities by seven percent.

- Among front seat passenger vehicle occupants over four years old, safety belts saved about 4,575 lives in 1989 - 3,656 associated with belt use laws.

- From 1983 through 1989, an estimated 20,086 lives were saved by safety belts -- 14,191 of which were associated with belt use laws. (Figure 6).

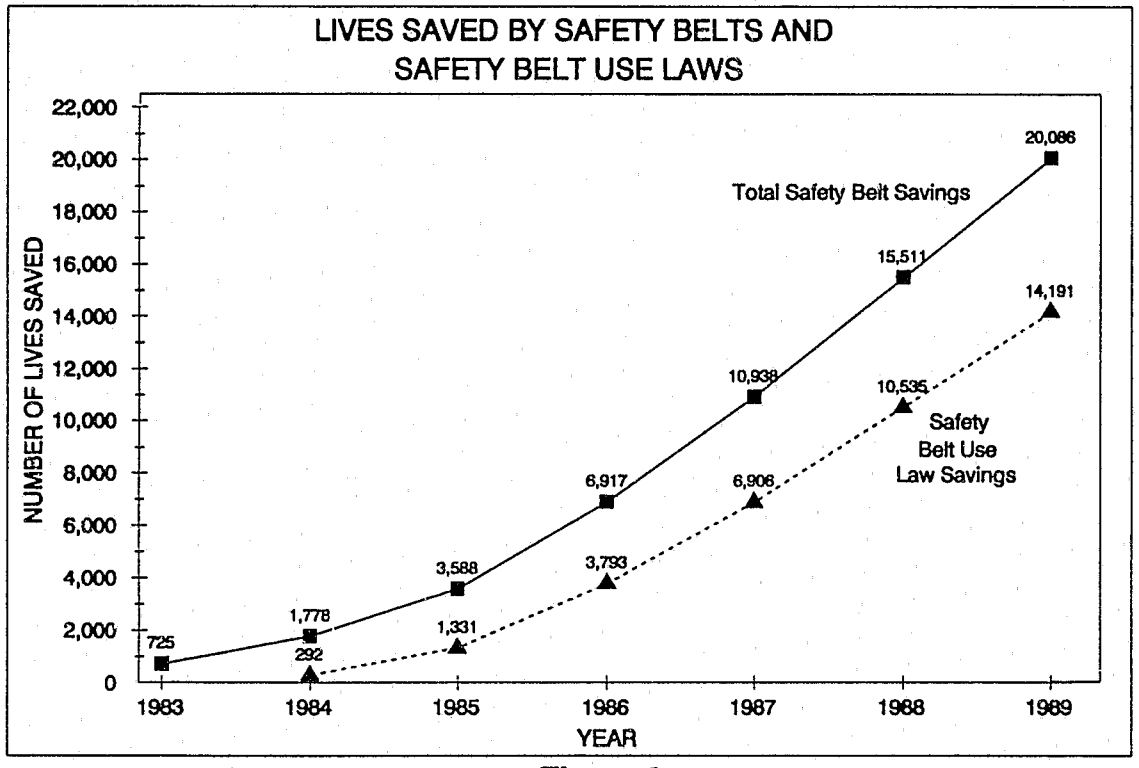

Figure 6

- At the current use level in belt law States (52%) belts would have saved 5,540 lives nationally if all states had belt use laws in 1989.

STATE STATISTICS

- California had the greatest number of fatalities, 5,412 in 1989. New Mexico had the greatest number of fatalities per 100,000 population (35.21) and the greatest number of fatalities per 100 million vehicle miles of travel (3.4). Information on fatalities, by state, is presented in Table 2 (page11).

- About a quarter of all fatal crashes nationwide occurred on principal arterial roads other than interstates, freeways, or expressways. One fifth occurred on minor arterials.

OCCUPANTS/VEHICLES

- Passenger car occupant deaths decreased from 25,808 in 1988 to 25,046 in 1989, a 3.0% decrease. These fatalities are about one half of all occupant fatalities (55%).

- Light truck, van and multipurpose vehicle occupant fatalities increased 2.9%, from 8,306 in 1988 to 8,545 in 1989. Rollover remains the crash mode in which most occupant fatalities in these vehicles occur, accounting for 46.6% of all fatalities in these types of vehicles.

- Light truck, van and multipurpose vehicle occupants were 22.4% of total occupant fatalities in 1989. About 69% of these occupant fatalities were in pickups.

- There was a decrease of 7.3% in fatally injured occupants of heavy trucks, and a 2.3% decrease in the number of occupants in other vehicles who were killed in crashes involving heavy trucks.

- More than half of all fatal crashes involved only one vehicle.

- Angle impacts were the most frequent type of fatal multivehicle crash, followed by head-on collisions.

- Motorcycle fatalities decreased 14.2% in 1989, down from 3,662 in 1988 to 3,143.

- Two out of every 5 motorcycle riders in fatal crashes wore helmets in 1989, a statistic that has remained essentially constant since 1980. Motorcycle operators were more likely to wear helmets than their passengers.

NONOCCUPANTS

- There were 7,490 nonoccupant fatalities in 1989. Most were either pedestrians, 6,552 (87%) or were pedalcyclists, 831 (11%).
- Within pedestrian fatalities, male fatalities outnumber female fatalities in each age group, accounting for an average of 70% of all pedestrian fatalities since 1977.
- As in past years, most pedestrian and pedalcyclist fatalities occurred in urban areas away from intersections.

FATALITIES IN CRASHES INVOLVING VEHICLES DESIGNED AS SCHOOL BUSES

- In 1989, 2 school bus drivers and 31 school bus passengers were killed in crashes. Twenty-one of these occupant fatalities were the result of a single crash. An average of 15 occupants a year were killed between 1977 and 1987.
- Most of the people killed in school bus crashes were either occupants of other vehicles (81), or pedestrians (28). The pedestrian fatalities were mostly students going to or recently alighting from the school bus.

FATALITIES IN CRASHES INVOLVING VEHICLE USED AS A SCHOOL BUS FOR SCHOOL RELATED ACTIVITIES

- In 1989, there were 141 fatalities involving vehicles used for school related activities. Of this number, 36 fatalities were occupants of the vehicle being used as a school bus, e.g. school buses, transit type buses, or other multipassenger vehicle. Seventy-two were occupants of other vehicles involved in the crash, and 33 were nonoccupants (pedestrians or pedalcyclists).

FATALITIES IN CRASHES INVOLVING VEHICLES DESIGNED AS SCHOOL BUSES BUT USED FOR OTHER PURPOSES

- Twenty-four persons died in 1989 in traffic crashes involving school bus type vehicles that were being used for other than school related purposes. Of this number, one was an occupant of the bus, 18 were occupants of the other vehicles involved in the crash, and 5 were nonoccupants.

AGE AND SEX

- Males continue to outnumber females as fatal crash victims by an average of 2 to 1; 3 to 1 in the 18–45 year old age group.

- Since 1982, the proportion of fatally injured drivers who were female has increased 37%. The decrease from 1988 to 1989 for both male and female drivers was 3.2%.

DAY, TIME, AND WEATHER

- Almost half of all fatalities continue to occur on weekends, with more fatalities on Saturdays (midnight Friday to midnight Saturday) than any other day of the week. Almost one-third of all fatalities were on weekend nights.

- On a seasonal basis, fatalities correlate closely with VMT. More fatalities occurred in the summer of 1988 (27.0%), than in the fall (26.3%), winter (22.7%) or spring (24.0%).

- Most deaths (85.9%) resulted from crashes that occurred in dry weather, regardless of lighting conditions. Only 13.5% of daytime fatalities occurred during adverse weather conditions.

ROADWAY CLASSIFICATION

- Of the 40,718 fatal crashes that occurred in 1989, 56.4% occurred on rural roads of all types.

- Of the 45,555 fatalities occurring in 1989, 8,398 (18.4%) occurred on county roads or local streets, and 13,580 (29.8%) on state highways. There were 5,044 fatalities (11.1%) on the nation's Interstate system.

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Foreword

How FARS Operates

The Fatal Accident Reporting System (FARS) gathers data on the most severe traffic crashes that occur each year - those that result in loss of human life. FARS supplies the U.S. Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) with information that is invaluable to its mission of reducing the number of traffic crashes and the losses that result from them. These data are essential to support NHTSA's identification of traffic safety problems, and the evaluation of existing and proposed motor vehicle safety standards and traffic safety programs.

FARS is operated and maintained by NHTSA's National Center for Statistics and Analysis (NCSA). FARS data are gathered on motor vehicle crashes that occurred on a roadway customarily open to the public, result in the death of a person within 30 days of the crash, but were not the result of natural disasters such as earthquakes, floods or torrential rains. DOT adopted the 30-day requirement because studies show that more than 98% of all motor vehicle-related fatalities occur within 30 days of the crash and because this allows expeditious reporting. Most other countries use the 30-day reporting period.

FARS data are collected by FARS analysts who are state employees. NHTSA has contracts with all 50 states, Puerto Rico, and the District of Columbia to provide this information. The contracts are managed by Regional Contracting Officer's Technical Representatives (COTR) in 10 NHTSA regions.

FARS analysts gather, interpret, codify, and transmit data on all fatal crashes to NHTSA. They use some or all of the following: police, hospital, medical examiner/coroner, and Emergency Medical Services (EMS) reports; state vehicle registration, driver licensing, and highway department files; and vital statistics documents and death certificates.

As the state FARS analysts enter data into NHTSA's computerized central data file, the data are automatically checked on-line for range and consistency as part of FARS quality control.

Range checks ensure that the codes submitted are valid. For example, a code of "4" for the element "Sex" would be rejected by the system, since the only valid codes are "1" for "Male", "2" for "Female" and "9" for "Unknown".

Consistency checks ensure that no inconsistent data are entered. For example, if an analyst codes 11:00 a.m. as the time of the crash and "dusk" as the light condition, both values would be rejected because they are inconsistent. Errors are displayed on the analyst's terminal as data are entered, enabling the analyst to make corrections immediately.

FARS data are also checked for timeliness, completeness, and accuracy. Timeliness is monitored by FARS headquarter's staff and by the 10 Regional COTRs. The data submitted by each state is updated and reviewed weekly. Similarly, several programs continually monitor and improve the completeness and accuracy of the data. Periodically a sample of cases are recoded and analyzed to ensure accuracy and consistency in the data.

The system contains descriptions, in a standard format, of each fatal crash reported. The format allows coding of upwards of 90 different data elements to characterize each crash and the vehicles and people involved in it. A few data elements may be added, dropped, or modified each year to reflect changing user needs, vehicle designs, and areas of highway safety emphasis.

Sample forms for reporting FARS data can be found in Appendix B. Data are reported on three forms:

The Accident Level Form — Includes information on the time and location of the crash, the first harmful event, whether it was a "hit and run" crash, whether a school bus was involved, the number of vehicles and people involved, and weather conditions.

The Vehicle/Driver Level Form — Includes data on each vehicle type and its role in the crash, initial and principal impact points, the most harmful event, and the driving record and license status of each driver.

The Person Level Form — Provides details on each person involved in the crash. That includes age and sex; whether the person was a driver, passenger, pedestrian, pedalcyclist or other nonoccupant; alcohol involvement, injury severity, etc.

NHTSA's National Center for Statistics and Analysis (NCSA) each year responds to more than 3,000 requests for FARS information and distributes almost 60 computer tapes of data. Requests for information come from the international and national highway safety communities, including state and local government, the Congress, federal agencies, research organizations, industry, the media, and private citizens. Close to 8,000 copies of this annual report are distributed each year.

FARS data are available in the following ways, for each year since 1975, when FARS began operation.

- Computer tapes can be purchased and processed on the user's own computer system. The cost is $150. A sample order blank is in Appendix C.
- Modest requests for specific data will be answered by NCSA at no charge. Response usually requires about two weeks, depending on the nature and complexity of the data requested.

FARS fully conforms with the requirements of the Privacy Act by omitting all personal identifying information such as names, addresses, or social security numbers.

While this report presents a wide spectrum of information in many different combinations, it contains only a small fraction of the potential uses of the data and only suggests the scope of analyses that can be performed using them. This report is not intended to be a comprehensive presentation. Statements about the data in this text are mainly based on cross tabulations and descriptive statistics.

These data concern only fatal crashes. NHTSA's National Accident Sampling System (NASS) is the complementary data based on all police reported crashes, including those which resulted in non-fatal injury and/or property damage. Data on non-fatal crashes are an important element in crash analysis programs.

To improve the usefulness of NASS as a source of information on vehicle crashworthiness and occupant injury, NCSA undertook a complete reassessment in 1985. The result was a complete redesign that built on the strengths of the system. NASS was divided into two parts to satisfy the different needs identified for NHTSA:

- A Crashworthiness Data System (CDS) collects detailed information on approximately 7,000 crashes involving light passenger vehicles. CDS data support research into the crash safety of light passenger vehicles and the biomechanics of trauma; the development of test equipment, procedures, and criteria; and the development and support of motor vehicle safety standards for occupant protection, and consumer information programs.

- The General Estimates System (GES), collects less detailed information from police crash reports (PARs) on a sample of about 45,000 police reported traffic crashes of all types. Unlike CDS, GES does not investigate crashes. GES will provide the data needed to assess the state of and trends in traffic safety.

These new systems began full operation on January 1, 1988, with 36 primary sampling units for CDS and 60 for GES.

To conform with other national data gathering systems, fatal crashes that occurred in Puerto Rico are not included in U.S. totals. Data from Puerto Rico are reported separately in Chapter 4.

For additional information concerning the 1989 FARS Report, contact the National Center for Statistics and Analysis, National Highway Traffic Safety Administration, NRD-30, 400 Seventh Street, SW, Washington, DC 20590.

Chapter 1
1989 Fatality Overview

In 1989 there were 45,555 traffic fatalities in 40,718 fatal crashes. This is a 10% decrease from the 50,894 fatalities reported in 1966, the year the National Traffic and Motor Vehicle Safety Act of 1966 was enacted.

Vehicle Miles of Travel increased by 128% during this time period (926 billion miles in 1966, 2,107 billion miles in 1989).

These 1989 figures have produced a fatality rate of 2.2 fatalities per 100 million vehicle miles traveled - the lowest rate in U.S. history. This fatality rate of 2.2 shows a decrease of 60% from the 5.5 rate of 1966. If the 1966 fatality rate had been experienced in 1989 more than 115,000 persons would have lost their lives in traffic crashes.

Other fatality rates have also shown a decline.

	1966	1989	% Change
Fatality rate per 100,000 population	26.02	18.35	-29.5
Fatality rate per 100,000 licensed drivers	50.39	27.52	-45.4
Fatality rate per 100,000 registered vehicles	53.18	23.76	-55.3

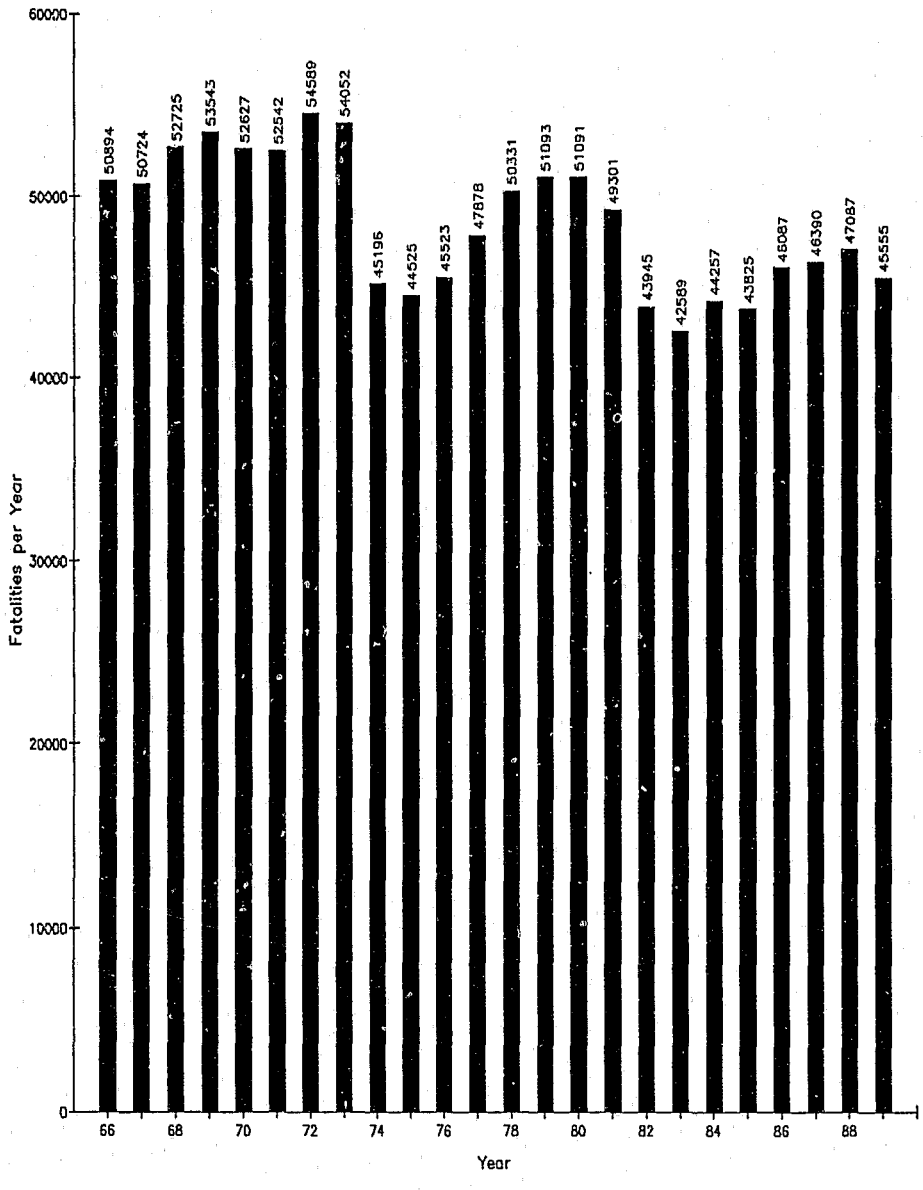

Figure 1-1
U.S. Traffic Fatalities by Year
1966-1989

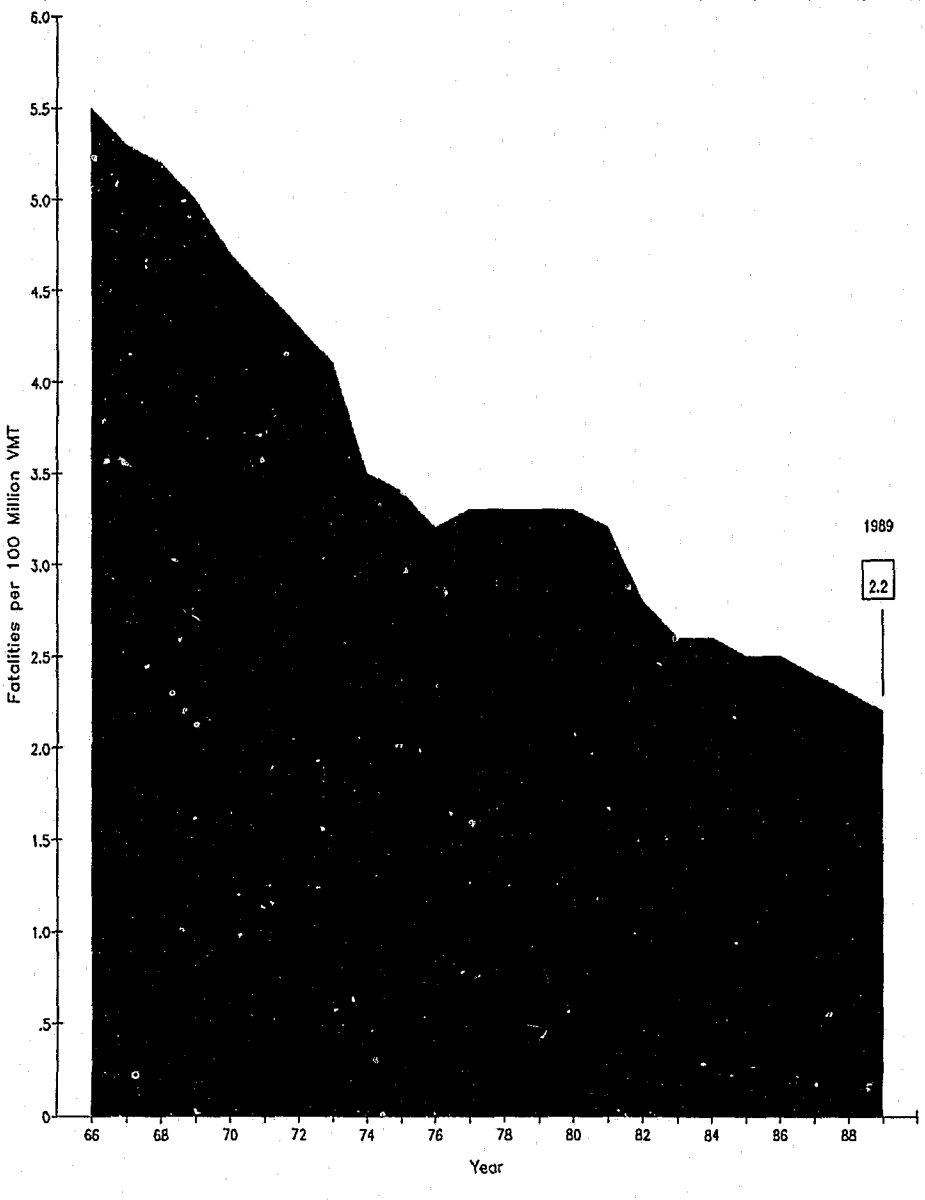

Figure 1-2
U.S. Traffic Fatality Rate per 100 Million Vehicle Miles Traveled (VMT) 1966-1989

Table 1-1
United States Motor Vehicle Traffic Crashes
1966-1989

Year	Fatalities	Resident Population (thousands)	Fatality Rate per 100,000 Population	Licensed Drivers (thousands)	Fatality Rate per 100,000 Licensed Drivers	Registered Motor Vehicles (thousands)	Fatality Rate per 100,000 Registered Vehicles	Vehicle Miles Traveled (billions)	Fatality Rate per 100 Million Vehicle Miles Traveled
1966	50,894	195,576	26.02	100,998	50.39	95,703	53.18	926	5.5
1967	50,724	197,457	25.69	103,172	49.16	98,859	51.31	964	5.3
1968	52,725	199,399	26.44	105,410	50.02	102,987	51.20	1,016	5.2
1969	53,543	201,385	26.59	108,306	49.44	107,412	49.85	1,062	5.0
1970	52,627	203,984	25.80	111,543	47.18	111,242	47.31	1,110	4.7
1971	52,542	206,827	25.40	114,426	45.92	116,330	45.17	1,179	4.5
1972	54,589	209,284	26.08	118,414	46.10	122,557	44.54	1,260	4.3
1973	54,052	211,357	25.57	121,546	44.47	130,025	41.57	1,313	4.1
1974	45,196	213,342	21.18	125,427	36.03	134,900	33.50	1,281	3.5
1975	44,525	215,465	20.66	129,791	34.31	137,913	32.28	1,328	3.4
1976	45,523	217,561	20.92	134,036	33.96	143,476	31.73	1,402	3.2
1977	47,878	219,758	21.79	138,121	34.66	147,026	32.56	1,467	3.3
1978	50,331	222,093	22.66	140,844	35.74	153,282	32.84	1,545	3.3
1979	51,093	224,569	22.75	143,284	35.66	157,291	32.48	1,529	3.3
1980	51,091	227,255	22.48	145,295	35.16	161,490	31.64	1,527	3.3
1981	49,301	229,637	21.47	147,075	33.52	164,118	30.04	1,553	3.2
1982	43,945	231,996	18.94	150,234	29.25	165,397	26.57	1,595	2.8
1983	42,589	234,284	18.18	154,389	27.59	169,334	25.15	1,653	2.6
1984	44,257	236,477	18.72	155,424	28.48	171,729	25.77	1,720	2.6
1985	43,825	238,741	18.36	156,868	27.94	177,098	24.75	1,774	2.5
1986	46,087	241,078	19.12	159,487	28.90	181,357	25.41	1,835	2.5
1987	46,390	243,400	19.06	161,818	28.67	183,930	25.22	1,921	2.4
1988	47,087	245,785	19.16	162,853	28.91	188,981	24.92	2,026	2.3
1989	45,555	248,239	18.35	165,555	27.52	191,694	23.76	2,107	2.2

Source: Vehicle Miles of Travel, Registered Vehicles and Licensed Drivers - Federal Highway Administration.
Population - U.S. Bureau of the Census (July 1 Estimate).
Traffic Deaths - 1966-1974, National Center for Health Statistics, H.H.S. and State Accident Summaries - Adjusted to 30-day Traffic Deaths.
Traffic Deaths - 1975-1989 - Fatal Accident Reporting System (FARS), NHTSA, 30-day Traffic Deaths

Figure 1-3 depicts changes in traffic fatalities, population, and fatalities per 100,000 population by age group from 1975 to 1989. There were decreases in fatalities per 100,000 population among all age groups.

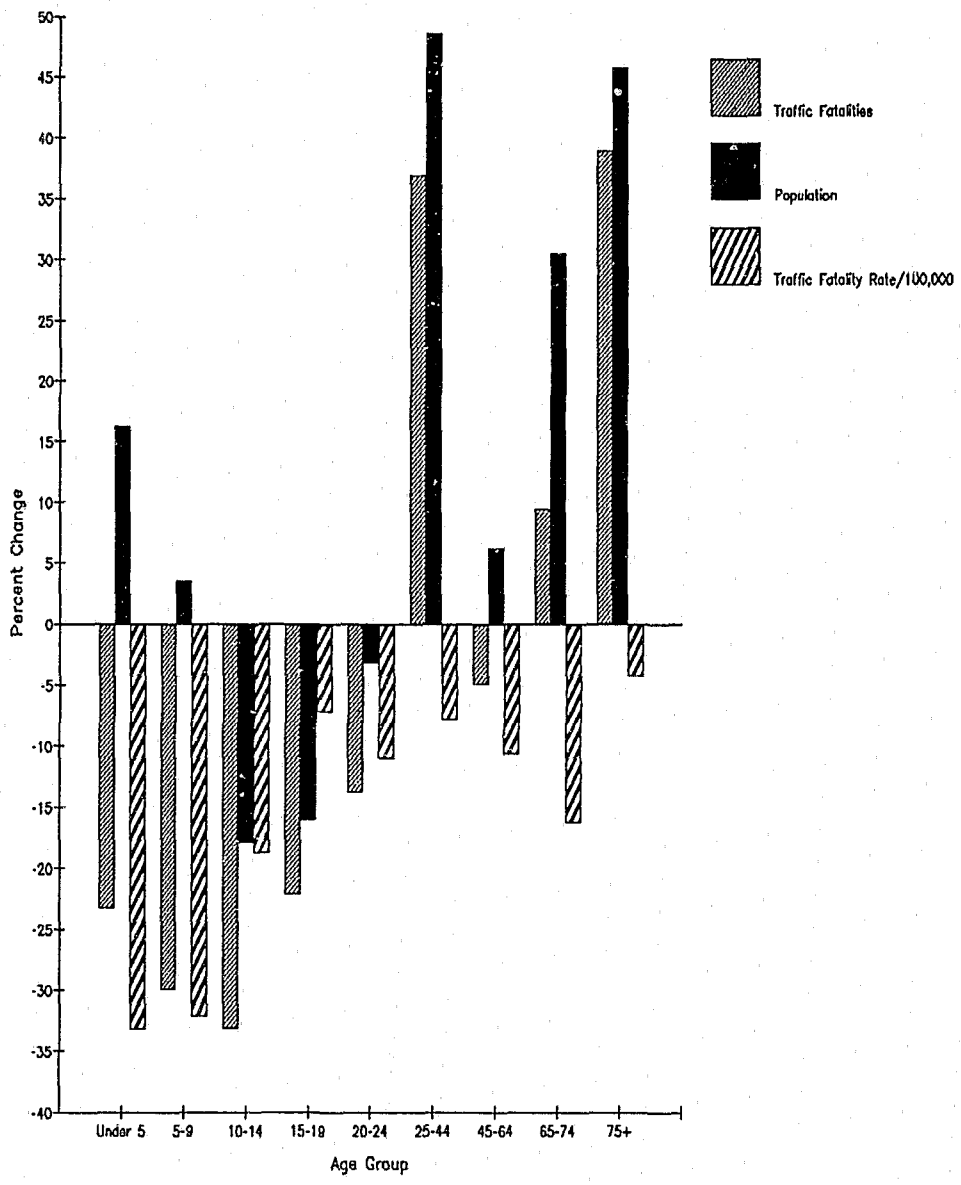

Figure 1-3
Percent Change in Traffic Fatalities, Population, and Fatality Rate per 100,000 Population by Age Group Between 1975 and 1989

Table 1-2
Motor Vehicle Traffic Fatalities
1975-1989

Occupant Fatalities	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Passenger Cars	25,928	26,166	26,782	28,153	27,808	27,455	26,650	23,330	22,981	23,621	23,214	24,944	25,132	25,808	25,046
Light Trucks, Vans Multipurpose Veh.	4,856	5,438	5,976	6,745	7,178	7,486	7,081	6,359	6,202	6,496	6,689	7,317	8,058	8,306	8,545
Med/Hvy Trucks	961	1,132	1,287	1,395	1,432	1,262	1,133	944	982	1,074	977	926	852	911	857
Motorcycles	3,189	3,312	4,103	4,577	4,894	5,144	4,906	4,453	4,265	4,608	4,564	4,566	4,036	3,662	3,143
Buses	53	73	42	41	39	46	56	35	51	45	55	39	51	54	50
Other/Unknown Vehicles	938	981	959	622	579	534	598	525	362	440	544	442	436	429	424
Subtotal	35,925	37,102	39,149	41,533	41,930	41,927	40,424	35,646	34,843	36,284	36,043	38,234	38,565	39,170	38,065
Nonoccupant Fatalities															
Pedestrian	7,516	7,427	7,732	7,795	8,096	8,070	7,837	7,331	6,826	7,025	6,808	6,779	6,745	6,870	6,552
Pedalcyclist	1,003	914	922	892	932	965	936	883	839	849	890	941	948	911	831
Other/Nonoccupant	81	80	74	111	135	129	104	85	81	99	84	133	132	136	107
Subtotal	8,600	8,421	8,728	8,798	9,163	9,164	8,877	8,299	7,746	7,973	7,782	7,853	7,825	7,917	7,490
Total	44,525	45,523	47,877	50,331	51,093	51,091	49,301	43,945	42,589	44,257	43,825	46,087	46,390	47,087	45,555

Approximately 95% of all occupant fatalities occur in three vehicles: passenger cars, light trucks, and motorcycles.

The following show comparisons for these vehicles between 1989 and 1975, the year the Fatal Accident Reporting System (FARS) became operational.

Light trucks showed the most dramatic changes of the three vehicles. In 1975 light trucks accounted for 14% of all occupant fatalities. In 1989, light truck occupant fatalities accounted for almost one-fourth of the fatalities (22%). Light truck occupant fatalities increased by 76%, registered light trucks by 85%, and vehicle miles of travel for light trucks rose by 128%. However, the fatality rate per 100 million vehicle miles of travel has dropped from 2.4 to 1.9 for light trucks during that time period. This is a decline in fatality rate of 21%.

Table 1-2A
Light Truck Occupant Fatalities, Registered Vehicles, Vehicle Miles of Travel and Fatality Rates
1975 - 1989

(Light Trucks Including Multipurpose Vehicles)

Year	Light Truck Occupant Fatalities	Registered Light Trucks	Vehicle Miles of Travel (millions)	Fatality Rate per 100,000 Registered Light Trucks	Fatality Rate per 100 million VMT
1975	4,856	20,418,250	200,700	23.78	2.4
1976	5,438	22,300,740	225,834	24.38	2.4
1977	5,976	23,624,382	250,591	25.30	2.4
1978	6,745	25,476,057	279,414	26.48	2.4
1979	7,178	27,022,233	291,905	26.56	2.5
1980	7,486	27,875,934	290,935	26.85	2.6
1981	7,081	28,927,832	296,343	24.48	2.4
1982	6,359	29,791,960	306,141	21.34	2.1
1983	6,202	31,214,223	327,643	19.87	1.9
1984	6,496	32,106,388	357,999	20.23	1.8
1985	6,689	33,865,483	373,072	19.75	1.8
1986	7,318	34,820,377	389,047	21.02	1.9
1987	8,058	35,841,360	415,449	22.48	1.9
1988	8,306	37,095,808	439,496	22.39	1.9
1989	8,545	37,861,916	456,699	22.57	1.9

Source: Registered Vehicles and Vehicle Miles of Travel - Federal Highway Administration

The percentage of total occupant fatalities for passenger cars has decreased from 72% in 1975 to 66% in 1989. Passenger car occupant fatalities are practically the same for both years (1975=25,928 and 1989=25,046), but they rose to a high of 28,153 in 1978, and dropped to a low of 22,980 in 1983. Passenger car registrations have increased by 34% and vehicle miles of travel are up by 44%. The fatality rates per VMT for passenger cars and light trucks show a similar pattern during the 15 years, with the passenger car fatality rate showing a 32% decrease from 1975.

Table 1-2B
Passenger Car Occupant Fatalities, Registered Vehicles, Vehicle Miles of Travel, and Fatality Rates
1975 - 1989

Year	Passenger Car Occupant Fatalities	Registered Passenger Cars	Vehicle Miles of Travel (millions)	Fatality Rate per 100,000 Registered Passenger Cars	Fatality Rate per 100 million VMT
1975	25,928	106,705,950	1,033,950	24.30	2.5
1976	26,166	110,188,640	1,078,215	23.75	2.4
1977	26,782	112,287,522	1,109,243	23.85	2.4
1978	28,153	116,573,394	1,146,508	24.15	2.5
1979	27,808	118,428,730	1,113,640	23.48	2.5
1980	27,455	121,600,343	1,111,596	22.58	2.5
1981	26,650	123,098,411	1,130,827	21.65	2.4
1982	23,330	123,701,665	1,166,256	18.86	2.0
1983	22,980	126,443,732	1,198,023	18.17	1.9
1984	23,621	128,157,682	1,224,919	18.43	1.9
1985	23,214	131,864,029	1,260,565	17.60	1.8
1986	24,947	135,431,112	1,301,214	18.42	1.9
1987	25,132	137,208,290	1,355,330	18.32	1.9
1988	25,808	141,251,695	1,429,579	18.27	1.8
1989	25,046	143,081,443	1,485,474	17.50	1.7

Source: Registered Vehicles and Vehicle Miles of Travel - Federal Highway Administration

Motorcycle fatalities and the fatality rate per vehicle mile traveled are the lowest since the Fatal Accident Reporting System (FARS) data collection began. While the 1975 and 1989 fatalities are about the same, the 1989 total is 39% below the 1980 figure of 5,144, the highest number reported. Motorcycle registrations have declined by 11% and vehicle miles of travel have increased by 85% since 1975. The 1989 fatality rate of 30.1 motorcycle fatalities per vehicle mile of travel has decreased by almost 50% since 1975, but is still 18 times higher than the passenger car fatality rate of 1.7.

Table 1-2C
Motorcycle Fatalities, Registered Vehicles, Vehicle Miles of Travel, and Fatality Rates
1975 - 1989

Year	Motorcycle Fatalities	Registered Motorcycles	Vehicle Miles of Travel (millions)	Fatality Rate per 100,000 Registered Motorcycles	Fatality Rate per 100 million VMT
1975	3,189	4,964,070	5,629	64.24	56.7
1976	3,312	4,933,332	6,003	67.14	55.2
1977	4,104	4,933,256	6,349	83.19	64.6
1978	4,577	4,867,864	7,158	94.02	63.9
1979	4,893	5,422,132	8,637	90.24	56.7
1980	5,144	5,693,940	10,214	90.34	50.4
1981	4,906	5,831,132	10,690	84.13	45.9
1982	4,453	5,753,858	9,910	77.39	44.9
1983	4,265	5,585,112	8,760	76.36	48.7
1984	4,608	5,479,822	8,784	84.09	52.5
1985	4,564	5,444,404	9,086	83.83	50.2
1986	4,566	5,262,322	9,397	86.77	48.6
1987	4,036	4,917,131	9,506	82.08	42.5
1988	3,662	4,584,284	10,024	79.88	36.5
1989	3,143	4,433,915	10,425	70.89	30.1

Source: Registered Vehicles and Vehicle Miles of Travel - Federal Highway Administration

Table 1-3
Fatalities in Crashes Involving a Medium/Heavy Truck (10,000 lbs or greater)

Year	Fatal Crashes	Vehicle Miles of Travel (Millions)	Fatal Crash Rate per 100 Million VMT	Fatalities			
				Total	Truck Occupant	Occupants of Other Vehicles	Nonoccupant
1977	4,843	95,021	5.1	5,723	1,287	3,925	511
1978	5,405	105,739	5.1	6,356	1,395	4,354	607
1979	5,684	109,004	5.2	6,702	1,432	4,615	655
1980	5,042	108,491	4.6	5,971	1,262	4,084	625
1981	4,928	108,702	4.5	5,806	1,133	4,126	547
1982	4,396	106,880	4.1	5,229	944	3,790	495
1983	4,615	113,163	4.1	5,491	982	3,941	568
1984	4,831	123,927	3.9	5,640	1,074	4,036	530
1985	4,841	126,580	3.8	5,734	977	4,227	530
1986	4,785	130,141	3.7	5,579	926	4,088	565
1987	4,813	135,601	3.5	5,598	852	4,194	552
1988	4,885	141,397	3.5	5,679	911	4,250	518
1989	4,672	148,757	3.1	5,488	857	4,141	490

Source: Vehicle Miles of Travel - Federal Highway Administration

Table 1-3A
Years of Potential Life Lost Before Age 65
From Motor Vehicle Fatalities

1975	1,420,546
1976	1,453,912
1977	1,417,288
1978	1,629,707
1979	1,653,175
1980	1,644,669
1981	1,553,752
1982	1,386,127
1983	1,328,562
1984	1,365,945
1985	1,342,245
1986	1,425,517
1987	1,416,806
1988	1,421,685
1989	1,347,147

Note: Defined as years lost up to age 65 (e.g., if a traffic fatality was 21 years of age, years of potential life lost by age 65 is equal to 65-21=44) cumulated for all fatalities up to age 64.

The years of potential life lost before age of 65 due to motor vehicle traffic crashes decreased 5.2% in 1989 from 1988.

Table 1-4
Motor Vehicle Traffic Fatalities 1988-1989 and Percent Change

Occupant Fatalities:		Driver	Passenger	Unknown	Total
Passenger Car	1988	17,220	8,515	73	25,808
	1989	16,700	8,305	41	25,046
	% Change	-3.0	-2.5	-43.8	-3.0
Light Truck	1988	5,002	2,239	25	7,266
	1989	5,120	2,270	22	7,412
	% Change	2.4	1.4	-12.0	2.0
Multipurpose Vehicles	1988	677	360	3	1,040
	1989	731	397	5	1,133
	% Change	8.0	10.3	66.7	8.9
Motorcycles	1988	3,282	374	6	3,662
	1989	2,787	352	4	3,143
	% Change	-15.1	-5.9	-33.3	-14.2
Heavy Trucks	1988	676	108	2	786
	1989	608	119	2	729
	% Change	-10.1	10.2	0.0	-7.3
Buses	1988	10	44	0	54
	1989	2	48	0	50
	% Change	-80.0	9.1	0.0	-7.4
*Other	1988	308	125	2	435
	1989	335	65	1	401
	% Change	8.8	-48.0	-50.0	-7.8
Unknown	1988	78	40	1	119
	1989	96	55	0	151
	% Change	23.1	37.5	-100.0	26.9
Subtotal	1988	27,253	11,805	112	39,170
	1989	26,379	11,611	75	38,065
	% Change	-3.2	-1.6	-33.0	-2.8
Nonoccupant Fatalities					
Pedestrian	1988				6,870
	1989				6,552
	% Change				-4.6
Pedalcyclist	1988				911
	1989				831
	% Change				-8.8
**Other	1988				136
	1989				107
	% Change				-21.3
Subtotal	1988				7,917
	1989				7,490
	% Change				-5.4
Total	1988				47,087
	1989				45,555
	% Change				-3.3

* Includes snow mobiles, trucks not specified, farm equipment other than trucks, construction equipment, ambulances, self propelled campers or motor homes, fire trucks, other special vehicles.
** Includes persons riding in animal-drawn conveyance, on an animal, skateboard riders.

Fatal traffic crashes are compared by type in Table 1-5. There was a 3.4% decrease in the number of single vehicle crashes and a 5.3% decrease in nonoccupant crashes in 1989. The number of multi-vehicle crashes decreased by 2.4%.

Table 1-5
Fatal Traffic Crashes by Type

Crash Type	1988	1989	% Change
Nonoccupant	7,806	7,392	-5.3
Single Vehicle	17,517	16,918	-3.4
Multi-Vehicle	16,807	16,408	-2.4
Total	42,130	40,718	-3.4

Table 1-6 illustrates traffic fatalities by person type. In 1989, 2.8% fewer occupants were killed in traffic crashes than in 1988, and the number of nonoccupant fatalities decreased 5.4%.

Table 1-6
Traffic Fatalities by Person Role

Person Role	1988	1989	% Change
Occupant	39,170	38,065	-2.8
Nonoccupant	7,917	7,490	-5.4
Total	47,087	45,555	-3.3

Demographics

Table 1-7 compares traffic fatalities by age group and person type. The most dramatic decrease occurred in the 21-24 age group. This group had significant decrease in all person roles compared to 1988.

Fatalities among other occupants increased in 5 out of the 9 groupings, with the 45-54 year olds incurring the largest increase of 8.6%.

Table 1-7
Traffic Fatalities by Age Group and Person Role

Person Role	Under 15	15-17	18-20	21-24	25-34	35-44	45-54	55-64	65+	Unknown	Total
Drivers											
1988	126	1,440	3,179	3,903	6,981	4,064	2,356	1,954	3,238	12	27,253
1989	119	1,285	2,932	3,460	6,787	4,102	2,420	1,934	3,317	23	26,379
% Change	-5.6	-10.8	-7.8	-11.4	-2.8	0.9	2.7	-1.0	2.4	91.7	-3.2
Other Occupants											
1988	1,746	1,328	1,678	1,429	1,862	932	596	659	1,657	30	11,917
1989	1,803	1,259	1,453	1,278	1,898	951	647	652	1,703	42	11,686
% Change	3.3	-5.2	-13.4	-10.6	1.9	2.0	8.6	-1.1	2.8	40.0	-1.9
Nonoccupants											
1988	1,424	314	343	534	1,269	951	664	655	1,657	106	7,917
1989	1,259	248	313	445	1,294	989	643	675	1,531	93	7,490
% Change	-11.6	-21.0	-8.7	-16.7	2.0	4.0	-3.2	3.1	-7.6	-12.3	-5.4
Total											
1988	3,261	3,013	4,975	5,715	10,148	5,966	3,667	3,261	6,598	148	47,087
1989	3,181	2,792	4,698	5,183	9,979	6,042	3,710	3,261	6,551	158	45,555
% Change	-2.5	-7.3	-5.6	-9.3	-1.7	1.3	1.2	0.0	-0.7	6.8	-3.3

Both the male and female populations increased in 1989 (Table 1-8). Female fatalities increased 0.7% while the male fatalities declined by 4.9%. The largest reduction occurred in the 20-24 age group for both male and female: 13.5% decrease in males and 11.0% decrease for females (Table 1-9).

Table 1-8
Estimates of Population by Age Group and Sex
(in thousands)

	Under 15	15 to 17	18 to 20	21 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
Male										
1988	27,183	5,502	5,628	7,765	21,849	17,395	11,751	10,292	12,355	119,720
1989	27,608	5,214	5,756	7,491	21,943	18,025	12,110	10,200	12,636	120,983
% Change	1.6	-5.2	2.3	-3.5	0.4	3.6	3.1	-0.9	2.3	1.1
Female										
1988	25,904	5,232	5,511	7,756	21,819	17,869	12,413	11,540	18,018	126,062
1989	26,306	4,955	5,621	7,479	21,892	18,478	12,786	11,393	18,348	127,258
% Change	1.6	-5.3	2.0	-3.6	0.3	3.4	3.0	-1.3	1.8	0.9
Total										
1988	53,087	10,734	11,139	15,521	43,668	35,264	24,164	21,832	30,373	245,782
1989	53,914	10,169	11,377	14,970	43,835	36,503	24,896	21,593	30,984	248,241
% Change	1.6	-5.3	2.1	-3.6	0.4	3.5	3.0	-1.1	2.0	1.0

Source: U.S. Bureau of the Census

Table 1-9
Traffic Fatalities by Age Group and Sex

Person Type	Under 5	5-9	10-14	15-19	20-24	25-44	45-64	65-74	75+	Unknown	Total
Male											
1988	559	689	736	4,662	5,812	12,003	4,607	1,880	1,886	113	32,947
1989	560	641	691	4,191	5,025	11,768	4,668	1,768	1,885	126	31,323
% Change	0.2	-7.0	-6.1	-10.1	-13.5	-2.0	1.3	-6.0	-0.1	11.5	-4.9
Female											
1988	441	426	441	1,984	1,686	4,053	2,277	1,302	1,482	31	14,123
1989	446	430	411	1,954	1,500	4,248	2,301	1,395	1,502	32	14,219
% Change	1.1	0.9	-6.8	-1.5	-11.0	4.8	1.1	7.1	1.3	3.2	0.7
Unknown											
1988	2	1	1	1	3	3	0	1	1	4	17
1989	1	0	1	2	1	5	2	1	0	0	13
Total											
1988	1,002	1,116	1,178	6,647	7,501	16,059	6,884	3,183	3,369	148	47,087
1989	1,007	1,071	1,103	6,147	6,526	16,021	6,971	3,164	3,387	158	45,555
% Change	0.5	-4.0	-6.4	-7.5	-13.0	-0.2	1.3	-0.6	0.5	6.8	-3.3

The only increase in male drivers involved in fatal crashes occurred in the 45-54 age group (3.6%). Among female drivers involved in fatal crashes, the largest increase (8.4%) also occurred in the 45-54 age group (Table 1-10).

Table 1-10
Involved Drivers by Age Group and Sex

Person Type	Under 15	15-17	18-20	21-24	25-34	35-44	45-54	55-64	65+	Unknown	Total
Male											
1988	163	2,512	5,424	6,809	12,935	7,807	4,464	3,236	3,830	222	47,402
1989	135	2,212	5,022	6,154	12,413	7,683	4,625	3,193	3,777	206	45,420
% Change	-17.2	-11.9	-7.4	-9.6	-4.0	-1.6	3.6	-1.3	-1.4	-7.2	-4.2
Female											
1988	41	960	1,519	1,746	3,461	2,269	1,297	1,083	1,546	29	13,951
1989	37	920	1,507	1,563	3,505	2,416	1,406	1,007	1,649	34	14,044
% Change	-9.8	-4.2	-0.8	-10.5	1.3	6.5	8.4	-7.0	6.7	17.2	0.7
Unknown											
1988	0	0	0	0	2	1	0	1	0	896	900
1989	0	0	0	0	1	1	0	0	0	932	934
Total											
1988	204	3,472	6,943	8,555	16,398	10,077	5,761	4,320	5,376	1,147	62,253
1989	172	3,132	6,529	7,717	15,919	10,100	6,031	4,200	5,426	1,172	60,398
% Change	-15.7	-9.8	-6.0	-9.8	-2.9	0.2	4.7	-2.8	0.9	2.2	-3.0

Vehicle Type

From 1988 to 1989, vehicle registration increased by 1.4%, and vehicle occupant fatalities decreased by 2.8% (Table 1-11). Table 1-12 shows that among passenger cars involved in fatal crashes, compact cars experienced the only increase (5.3%). The greatest decrease of 15.2% occurred among the largest sized passenger cars.

Table 1-12 further indicates that increases were reported for light trucks (1.4%), buses (8.4%), and multipurpose vehicles (12.4%), while motorcycles decreased by 14.0%.

Table 1-11
Occupant Fatalities, Vehicles Involved in Fatal Crashes and Registered Vehicles by Vehicle Type

	Vehicle Type				
Vehicle	Passenger Cars	Motorcycles	Trucks & Buses	Other & Unknown	Total
Vehicle Occupant Fatalities					
1988	25,808	3,662	9,271	429	39,170
1989	25,046	3,143	9,452	424	38,065
% Change	-3.0	-14.2	2.0	-1.2	-2.8
Vehicles Involved					
1988	36,977	3,715	20,814	1,197	62,703
1989	35,384	3,194	20,984	1,272	60,834
% Change	-4.3	-14.0	0.8	6.3	-3.0
Registered Vehicles (thousands)					
1988	141,252	4,584	43,145	0	188,981
1989	143,081	4,434	44,179	0	191,694
% Change	1.3	-3.3	2.4	--	1.4

Table 1-12
Vehicles Involved in Fatal Crashes by Vehicle Type

	1988	1989	% Change
Passenger cars	36,977	35,384	-4.3
Mini Subcompact	4,544	4,145	-8.8
Subcompact	6,393	6,144	-3.9
Compact	6,413	6,751	5.3
Intermediate	7,302	7,037	-3.6
Full Size	4,621	4,024	-12.9
Largest Size	5,276	4,476	-15.2
Unknown	2,428	2,807	15.6
Motorcycles	3,715	3,194	-14.0
Light Trucks	13,604	13,801	1.4
Medium Trucks	691	672	-2.7
Heavy Trucks	4,550	4,310	-5.3
Buses	287	311	8.4
Multipurpose Vehicles	1,682	1,890	12.4
Other Vehicles	453	447	-1.3
Unknown	744	825	10.9
Total	62,703	60,834	-3.0

Wheelbase Size
Mini Subcompact = Under 95 inches
Subcompact = 95-99 inches
Compact = 100-104 inches
Intermediate = 105-109 inches
Full Size = 110-114 inches
Largest Size = 114+ inches

Table 1-13 reveals that the largest increase in occupant fatalities occurred in compact cars, 4.7%, and multipurpose vehicles (8.9%). Among truck occupant fatalities, light trucks experienced an increase of 2.0%, medium trucks increased 2.4%, while heavy trucks decreased by 7.3%.

Table 1-13
Vehicle Occupants Killed in Crashes
by Vehicle Type

	1988	1989	% Change
Passenger cars	25,808	25,046	-3.0
Mini Subcompact	3,794	3,481	-8.2
Subcompact	4,975	4,785	-3.8
Compact	4,764	4,987	4.7
Intermediate	5,016	4,943	-1.5
Full Size	2,840	2,569	-9.5
Largest Size	2,904	2,534	-12.7
Unknown	1,515	1,747	15.3
Motorcycles	3,662	3,143	-14.2
Light Trucks	7,266	7,412	2.0
Medium Trucks	125	128	2.4
Heavy Trucks	786	729	-7.3
Buses	54	50	-7.4
Multipurpose Vehicles	1,040	1,133	8.9
Other Vehicles	310	273	-11.9
Unknown	119	151	26.9
Total	39,170	38,065	-2.8

Wheelbase Size
Mini Subcompact = Under 95 inches
Subcompact = 95-99 inches
Compact = 100-104 inches
Intermediate = 105-109 inches
Full Size = 110-114 inches
Largest Size = 114+ inches

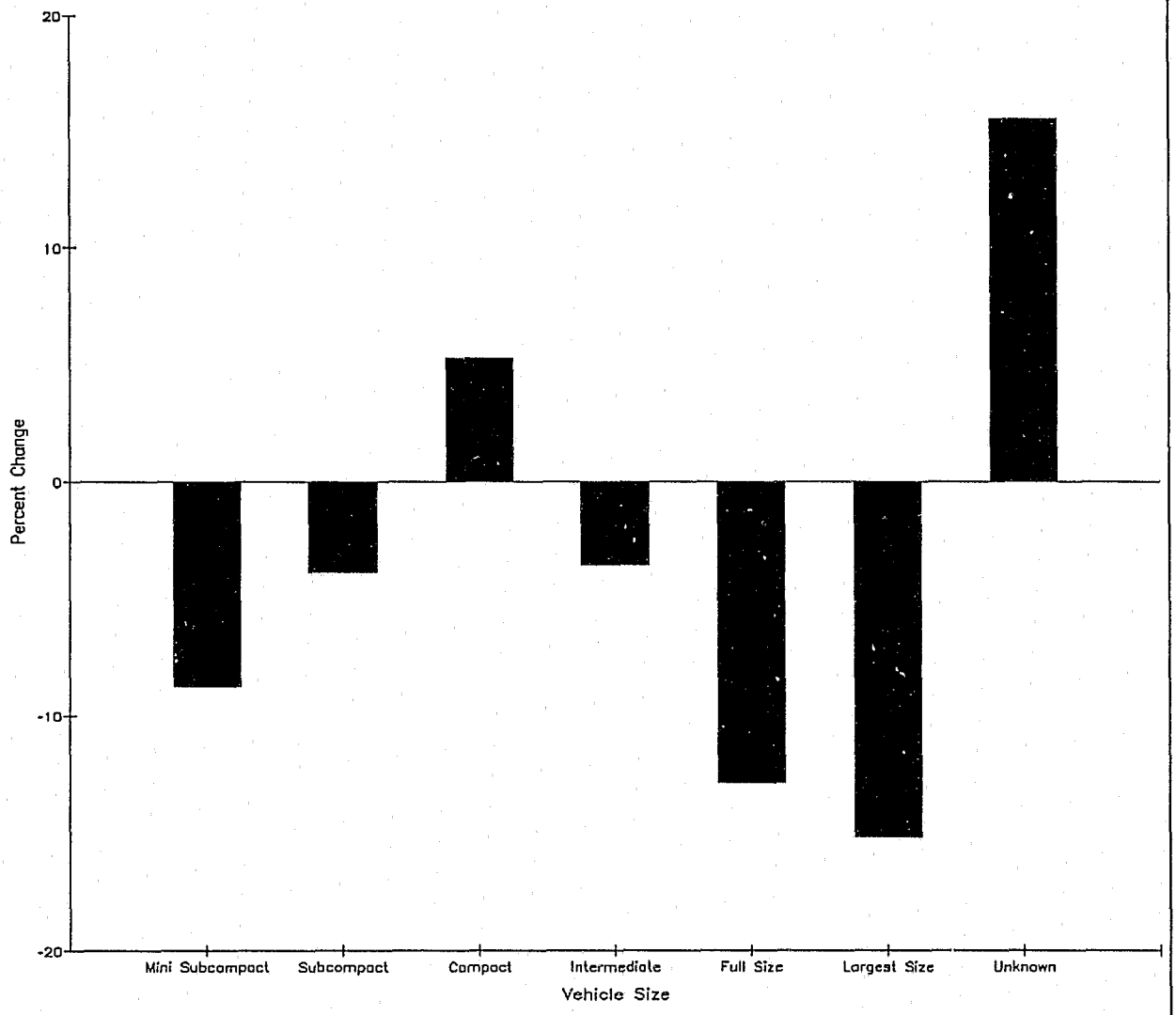

Figure 1-4
Percent Change Between 1988 and 1989 in
Passenger Cars Involved in Fatal Crashes by Vehicle Size

Heavy truck occupant fatalities in single vehicle crashes declined 3.5%, while truck occupant fatalities in multi-vehicle crashes declined 13.6%. There was a 6.4% decrease in nonoccupant fatalities involving heavy trucks. Other vehicle occupant fatalities decreased 2.3% (Table 1-14).

Table 1-14
Traffic Fatalities in Crashes Involving a Heavy Truck

	Truck Occupant Fatalities		Other Vehicle	Nonoccupant	
	Single Vehicle	Multi-Vehicle	Occupant Fatalities	Fatalities	Total
1988	491	295	3,734	437	4,957
1989	474	255	3,649	409	4,787
% Change	-3.5	-13.6	-2.3	-6.4	-3.4

Table 1-15
Fatalities by Road Type

	Urban	Rural	Unknown	Total
Interstate				
1988	2,294	2,848	0	5,142
1989	2,191	2,775	0	4,966
% Change	-4.5	-2.6	--	-3.4
Fed-aid Primary				
1988	4,295	10,887	3	15,185
1989	4,516	10,195	0	14,711
% Change	5.1	-6.4	--	-3.1
Fed-aid Secondary				
1988	0	6,916	3	6,919
1989	0	6,759	0	6,759
% Change	0.0	-2.3	--	-2.3
Fed-aid Urban				
1988	8,534	0	0	8,534
1989	8,368	0	0	8,368
% Change	-1.9	-	--	-1.9
Non Fed-aid				
1988	4,066	6,776	2	10,844
1989	4,024	6,531	0	10,555
% Change	-1.0	-3.6	--	-2.7
Unknown				
1988	62	368	33	463
1989	17	101	78	196
% Change	-72.6	-72.6	--	-57.7
Total				
1988	19,251	27,795	41	47,087
1989	19,116	26,361	78	45,555
% Change	-0.7	-5.2	--	-3.3

Location

Table 1-16
Occupants Killed in Multi-Vehicle Crashes by Road Type and Land Use

	Urban	Rural	Unknown	Total
Interstate				
1988	905	1,058	0	1,963
1989	839	935	0	1,774
% Change	-7.3	-11.6	0.0	-9.6
Fed-aid Primary				
1988	2,229	6,375	0	8,604
1989	2,288	6,105	0	8,393
% Change	2.6	-4.2	0.0	-2.5
Fed-aid Secondary				
1988	0	2915	1	2916
1989	0	2949	0	2949
% Change	0.0	1.2	0.0	1.1
Fed-aid Urban				
1988	3,658	0	0	3,658
1989	3,601	0	0	3,601
% Change	-1.6	0.0	0.0	-1.6
Non Fed-aid				
1988	1,648	1,206	0	2,854
1989	1116	1,775	0	2,891
% Change	7.7	47.2	0.0	1.3
Unknown				
1988	148	23	14	185
1989	4	29	31	64
% Change	-97.3	26.1	--	-65.4
Total				
1988	8,588	11,577	15	20,180
1989	7,848	11,793	31	19,672
% Change	-8.6	1.9	--	-2.5

Table 1-17
Occupants Killed in Single Vehicle Crashes by Road Type and Land Use

	Urban	Rural	Unknown	Total
Interstate				
1988	885	1,520	0	2,405
1989	893	1,581	0	2,474
% Change	0.9	4.0	0.0	2.9
Fed-aid Primary				
1988	1,052	3,453	2	4,507
1989	1,136	3,235	0	4,371
% Change	8.0	-6.3	--	-3.0
Fed-aid Secondary				
1988	0	3,403	2	3,405
1989	0	3,271	0	3,271
% Change	0.0	-3.9	--	-3.9
Fed-aid Urban				
1988	2,333	0	0	2,333
1989	2,350	0	0	2,350
% Change	0.7	0.0	--	0.7
Non Fed-aid				
1988	1,667	4,456	2	6,125
1989	1,697	4,140	0	5,837
% Change	1.8	-7.1	--	-4.7
Unknown				
1988	20	181	14	215
1989	6	58	26	90
% Change	-70.0	-68.0	--	-58.1
Total				
1988	5,957	13,013	20	18,990
1989	6,082	12,285	26	18,393
% Change	2.1	-5.6	--	-3.1

Table 1-18
Nonoccupants Killed in Crashes by Road Type and Land Use

	Urban	Rural	Unknown	Total
Interstate				
1988	504	270	0	774
1989	459	259	0	718
% Change	-8.9	-4.1	0.0	-7.2
Fed-aid Primary				
1988	1,014	1,059	1	2,074
1989	1,092	855	0	1,947
% Change	7.7	-19.3	0.0	-6.1
Fed-aid Secondary				
1988	0	598	0	598
1989	0	539	0	539
% Change	0.0	-9.9	0.0	-9.9
Fed-aid Urban				
1988	2,543	0	0	2,543
1989	2,417	0	0	2,417
% Change	-5.0	0.0	0.0	-5.0
Non Fed-aid				
1988	1,193	672	0	1,865
1989	1,211	616	0	1,827
% Change	1.5	-8.3	0.0	-2.0
Unknown				
1988	19	39	5	63
1989	7	14	21	42
% Change	-63.2	-64.1	--	-33.3
Total				
1988	5,273	2,638	6	7,917
1989	5,186	2,283	21	7,490
% Change	-1.6	-13.5	--	-5.4

Fatalities by person role and road type for 1988 and 1989 are compared in Table 1-19. Fatalities among occupants of single vehicle crashes decreased on all road types except for the Interstate and Federal-aid urban roads. Multi-vehicle crashes increased on Federal-aid secondary roads and non Federal-aid roads. Overall all occupant and nonoccupant fatalities decreased 3.3% from 1988.

Table 1-19
Fatalities by Road Type and Crash Type

		Occupants		
	Nonoccupant	Single Vehicle	Multi Vehicle	Total
Interstate				
1988	774	2,405	1,963	5,142
1989	718	2,474	1,774	4,966
% Change	-7.2	2.9	-9.6	-3.4
Fed-aid Primary				
1988	2,074	4,507	8,604	15,185
1989	1,947	4,371	8,393	14,711
% Change	-6.1	-3.0	-2.5	-3.1
Fed-aid Secondary				
1988	598	3,405	2,916	6,919
1989	539	3,271	2,949	6,759
% Change	-9.9	-3.9	1.1	-2.3
Fed-aid Urban				
1988	2,543	2,333	3,658	8,534
1989	2,417	2,350	3,601	8,368
% Change	-5.0	0.7	-1.6	-1.9
Non Fed-aid				
1988	1,865	6,125	2,854	10,844
1989	1,827	5,837	2,891	10,555
% Change	-2.0	-4.7	1.3	-2.7
Unknown				
1988	63	215	185	463
1989	42	90	64	196
% Change	-33.3	-58.1	-65.4	-57.7
Total				
1988	7,917	18,990	20,180	47,087
1989	7,490	18,393	19,672	45,555
% Change	-5.4	-3.1	-2.5	-3.3

Care should be taken when reviewing Table 1-20 relative to posted speed limits of 55 mph or greater. Congress in 1987 decided to permit the states to raise the speed limit on rural interstate highways to 65 mph from the 55 mph limit set in the mid-1970's as an energy conservation measure. Since 1987, 40 states have increased rural interstate speed limits to 65 mph.

Assessment of the effects of the higher speed limits may be found in NHTSA's Reports to the Congress for 1987, 1988 and 1989.

Table 1-20
Fatal Crashes by Crash Type and Posted Speed Limit

No Limit	5-15	20-25	30-35	40-45	50-55	60-65	Unknown	Total
Nonoccupant								
1988	30	869	2,643	1,494	2,430	220	239	7,943
1989	29	775	2,522	1,462	2,232	229	263	7,538
% Change	-3.3	-10.8	-4.6	-2.1	-8.1	4.1	10.0	-5.1
Single Vehicle								
1988	34	881	2,954	2,290	9,523	1,181	459	17,394
1989	36	883	2,782	2,325	8,914	1,258	502	16,791
% Change	5.9	0.2	-5.8	1.5	-6.4	6.5	9.4	-3.5
Rear-end								
1988	0	33	217	300	1,015	277	25	1,868
1989	1	25	172	289	1,071	228	20	1,807
% Change	0.0	-24.2	-20.7	-3.7	5.5	-17.7	-20.0	-3.3
Head-on								
1988	2	92	707	1,066	3,906	176	94	6,047
1989	3	70	691	1,033	3,817	157	113	5,892
% Change	50.0	-23.9	-2.3	-3.1	-2.3	-10.8	20.2	-2.6
Angle								
1988	11	346	1,716	1,757	3,379	93	132	7,438
1989	11	318	1,589	1,762	3,396	108	150	7,340
% Change	0.0	-8.1	-7.4	0.3	0.5	16.1	13.6	-1.3
Other & Unknown								
1988	2	37	192	239	839	114	15	1,440
1989	2	43	189	206	767	117	25	1,350
% Change	0.0	16.2	-1.6	-13.8	-8.6	2.6	66.7	-6.3
Total								
1988	79	2,258	8,429	7,146	21,092	2,061	964	42,130
1989	82	2,114	7,945	7,077	20,197	2,097	1,073	40,718
% Change	3.8	-6.4	-5.7	-1.0	-4.2	1.7	11.3	-3.4

Day and Time

All days experienced less fatal crashes in 1989 than in 1988. The greatest decrease was on Monday with a 6.1% decline, followed by Saturday with a 5.3% decrease (Table 1-21).

Table 1-21
Fatal Crashes by Day of Week and Hour of Day

Day	10pm-2am	2am-6am	6am-10am	10am-2pm	2pm-6pm	6pm-10pm	Unknown	Total
Sunday								
1988	1,563	1,279	500	659	1,160	1,335	68	6,564
1989	1,522	1,253	466	654	1,150	1,323	75	6,443
% Change	-2.6	-2.0	-6.8	-0.8	-0.9	-0.9	10.3	-1.8
Monday								
1988	797	467	739	762	1,184	1,059	35	5,043
1989	782	409	704	715	1,094	1,000	29	4,733
% Change	-1.9	-12.4	-4.7	-6.2	-7.6	-5.6	-17.1	-6.1
Tuesday								
1988	746	368	665	757	1,101	1,017	35	4,689
1989	742	349	682	738	1,097	982	35	4,625
% Change	-0.5	-5.2	2.6	-2.5	-0.4	-3.4	0.0	-1.4
Wednesday								
1988	849	406	680	736	1,125	1,098	26	4,920
1989	845	424	658	746	1,132	1,027	30	4,862
% Change	-0.5	4.4	-3.2	1.4	0.6	-6.5	15.4	-1.2
Thursday								
1988	1,000	534	733	759	1,135	1,147	41	5,349
1989	999	470	701	811	1,148	1,130	28	5,287
% Change	-0.1	-12.0	-4.4	6.9	1.1	-1.5	-31.7	-1.2
Friday								
1988	1,628	701	687	878	1,430	1,717	48	7,089
1989	1,561	586	721	858	1,366	1,616	38	6,746
% Change	-4.1	-16.4	4.9	-2.3	-4.5	-5.9	-20.8	-4.8
Saturday								
1988	2,273	1,497	696	876	1,309	1,742	74	8,467
1989	2,018	1,500	618	899	1,288	1,623	71	8,017
% Change	-11.2	0.2	-11.2	2.6	-1.6	-6.8	-4.1	-5.3
Unknown								
1988	0	0	0	0	0	0	9	9
1989	0	0	0	0	0	0	5	5
% Change	0.0	0.0	0.0	0.0	0.0	0.0	-44.4	-44.4
Total								
1988	8,856	5,252	4,700	5,427	8,444	9,115	336	42,130
1989	8,469	4,991	4,550	5,421	8,275	8,701	311	40,718
% Change	-4.4	-5.0	-3.2	-0.1	-2.0	-4.5	-7.4	-3.4

Table 1-22 also shows that by 4 hour increments, fatalities increased the most on Fridays between 6 a.m. and 10 a.m. (9.1%) and the greatest decline also occurred on Friday between 2 a.m. and 6 a.m. (18.7%).

Table 1-22
Fatalities by Day of Week and Hour of Day

Day	10pm-2am	2am-6am	6am-10am	10am-2pm	2pm-6pm	6pm-10pm	Unknown	Total
Sunday								
1988	1,744	1,436	546	750	1,371	1,492	74	7,413
1989	1,729	1,403	533	767	1344	1,498	82	7,356
% Change	-0.9	-2.3	-2.4	2.3	-2.0	0.4	10.8	-0.8
Monday								
1988	897	508	815	842	1,323	1,170	41	5,596
1989	871	463	776	790	1,217	1,105	31	5,253
% Change	-2.9	-8.9	-4.8	-6.2	-8.0	-5.6	-24.4	-6.1
Tuesday								
1988	811	396	741	848	1,223	1,120	38	5,177
1989	815	375	754	812	1,219	1,087	37	5,099
% Change	0.5	-5.3	1.8	-4.2	-0.3	-2.9	-2.6	-1.5
Wednesday								
1988	928	443	740	830	1,216	1,196	29	5,382
1989	930	470	724	833	1,244	1,164	32	5,397
% Change	0.2	6.1	-2.2	0.4	2.3	-2.7	10.3	0.3
Thursday								
1988	1,102	579	817	854	1,249	1,283	42	5,926
1989	1,095	505	775	884	1,296	1,240	29	5,824
% Change	-0.6	-12.8	-5.1	3.5	3.8	-3.4	-31.0	-1.7
Friday								
1988	1,844	785	739	1,019	1,599	1,915	51	7,952
1989	1,766	638	806	969	1,544	1,786	40	7,549
% Change	-4.2	-18.7	9.1	-4.9	-3.4	-6.7	-21.6	-5.1
Saturday								
1988	2,623	1,692	783	1,004	1,474	1,978	78	9,632
1989	2,315	1,650	716	1,011	1,475	1,824	81	9,072
% Change	-11.7	-2.5	-8.6	0.7	0.1	-7.8	3.8	-5.8
Unknown								
1988	0	0	0	0	0	0	9	9
1989	0	0	0	0	0	0	5	5
% Change	0.0	0.0	0.0	0.0	0.0	0.0	-44.4	-44.4
Total								
1988	9,949	5,839	5,181	6,147	9,455	10,154	362	47,087
1989	9,521	5,504	5,084	6,066	9,339	9,704	337	45,555
% Change	-4.3	-5.7	-1.9	-1.3	-1.2	-4.4	-6.9	-3.3

Chapter 2
Alcohol and Safety Belts

Information on Alcohol in Fatal Crashes

Reporting on blood alcohol levels of drivers and pedestrians in fatal crashes is incomplete. Fifteen states have provided blood alcohol concentration (BAC) data on more than 75% of all fatally injured drivers within those states since at least 1980. Prior to the 1985 editions of this report, that data was used to estimate alcohol use by all fatally injured drivers. In 1984, a new methodology was developed that uses information on all cases for which BAC data was available as a basis for making national estimates for BAC for all drivers in fatal crashes (whether killed or not) and on all pedestrian fatalities. This year, this methodology is again being used to provide information on alcohol in fatal crashes.

Although information from this methodology is generally consistent with information from the original 15 state sample, it provides more detail and more accurate information on all cases.

Trends: 1982-1989

Alcohol use by drivers involved in fatal crashes has decreased steadily over the past 8 years. The proportion of all drivers who were estimated to be legally intoxicated (with BACs of 0.10% or greater) has dropped from 30.0% in 1982 to 24.2% in 1989, and the proportion of fatally injured drivers who were legally intoxicated has dropped from 43.8% in 1982 to 37.2% in 1989.

Alcohol involvement trends over the past 8 years are shown in Tables 2-1 through 2-9. From 1982 to 1989, the number of drivers involved in fatal crashes increased by 7.8%. The estimated proportion with any alcohol involvement (BAC of 0.01% or above) decreased over the same time period by 18.5%, and the proportion legally intoxicated decreased by 19%. During the same time, the number of drivers killed increased by 6.8% while the proportion of legally intoxicated drivers killed decreased by 15%.

Table 2-1
Blood Alcohol Concentration (BAC) for All Drivers Involved in Fatal Crashes

	Year								
BAC	1982	1983	1984	1985	1986	1987	1988	1989	1982-1989 % Change*
0.00%	61.1 %	62.4 %	64.0 %	66.2 %	65.7 %	66.8 %	67.2 %	68.2 %	
0.01-0.09%	8.9 %	8.6 %	8.6 %	8.1 %	8.5 %	8.2 %	8.0 %	7.5 %	
0.10%+	30.0 %	29.0 %	27.4 %	25.7 %	25.8 %	25.0 %	24.9 %	24.2 %	-19
Total	56,029	54,656	57,512	57,883	60,335	61,442	62,253	60,398	

*1982-1989 percent change is difference in proportion of drivers with BAC ≥ 0.10%.

Table 2-2
Blood Alcohol Concentration (BAC) for All Driver Fatalities and for All Surviving Drivers Involved in Fatal Crashes

	Fatally-Injured Drivers								
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	46.9 %	48.6 %	50.6 %	52.2 %	51.8 %	53.4 %	53.2 %	54.4 %	
0.01-0.09%	9.3 %	9.0 %	9.2 %	9.1 %	9.4 %	8.9 %	8.8 %	8.4 %	
0.10%+	43.8 %	42.4 %	40.2 %	38.7 %	38.8 %	37.7 %	38.0 %	37.2 %	-15
Total	24,690	24,138	25,589	25,337	26,630	26,833	27,253	26,379	
	Surviving Drivers								
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	72.4 %	73.5 %	74.8 %	77.2 %	76.7 %	77.2 %	78.0 %	79.0 %	
0.01-0.09%	8.6 %	8.2 %	8.1 %	7.2 %	7.8 %	7.7 %	7.3 %	6.8 %	
0.10%+	19.0 %	18.3 %	17.1 %	15.6 %	15.5 %	15.1 %	14.7 %	14.2 %	-25
Total	31,339	30,518	31,923	32,546	33,705	34,609	35,000	34,019	

Table 2-3 indicates the number of traffic fatalities that resulted in crashes when a driver, pedestrian, or bicyclist had been drinking. In 1982, it was estimated that 25,165 fatalities were alcohol-related. In 1989 that had dropped to 22,415, a 10.9% decrease. There was also a 2.7% decrease in the proportion of alcohol-related fatalities occurring in 1989 from 1988.

Table 2-3
Traffic Fatalities by Highest Blood Alcohol Concentration (BAC) of Active Participant (Driver, Pedestrian, or Pedalcyclist)

Year	Total Fatalities	No Alcohol BAC = 00%	Alcohol Related BAC = 0.01-0.09%	Alcohol Related BAC 0.10%+	Total Fatalities in Alcohol Related Crashes BAC ≥ 0.01%
1982	43,945	18,780 (42.7 %)	4,809 (10.9 %)	20,356 (46.3 %)	25,165 (57.3 %)
1983	42,589	18,943 (44.5 %)	4,472 (10.5 %)	19,174 (45.0 %)	23,646 (55.5 %)
1984	44,257	20,499 (46.3 %)	4,766 (10.8 %)	18,992 (42.9 %)	23,758 (53.7 %)
1985	43,825	21,109 (48.2 %)	4,604 (10.5 %)	18,112 (41.3 %)	22,716 (51.8 %)
1986	46,087	22,042 (47.8 %)	5,109 (11.1 %)	18,936 (41.1 %)	24,045 (52.2 %)
1987	46,390	22,749 (49.0 %)	5,112 (11.0 %)	18,529 (39.9 %)	23,641 (50.9 %)
1988	47,087	23,461 (49.8 %)	4,895 (10.4 %)	18,731 (39.8 %)	23,626 (50.2 %)
1989	45,555	23,140 (50.8 %)	4,566 (10.0 %)	17,849 (39.2 %)	22,415 (49.2 %)

Table 2-4 shows the remarkable downward trend in proportion of drivers intoxicated by driver age groups. Drivers aged 18-20 showed a substantial decrease in the proportion intoxicated between 1982 and 1989, a decrease of 33%. In 1982, 35.1% of these drivers involved in fatal crashes were intoxicated and an additional 13.1% had been drinking. In 1989, 23.6% were intoxicated and 11.2% had been drinking. As the table shows, the proportion of drivers intoxicated decreased among all driver age groups, but was largest for drivers under 18 years of age (down 47%) and for both senior citizens age 65 and over and adults aged 18 to 20 (down 33%).

The type of vehicle driven in a fatal crash is associated with the proportion of drivers considered intoxicated. As Table 2-5 indicates, the drivers of motorcycles in fatal crashes were most often drunk (39.6% in 1989), while the proportion of heavy truck drivers who were drunk was only 2.4%. Decreases in the proportion of drivers intoxicated can be seen across all vehicle types from 1982 to 1989.

Table 2-4
Blood Alcohol Concentration for Drivers Involved in Fatal Crashes by Age Group

Age Group Under 18									1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	70.0 %	72.3 %	74.4 %	77.1 %	75.4 %	77.0 %	78.6 %	81.7 %	
0.01-0.09%	11.4 %	10.4 %	10.7 %	9.4 %	11.1 %	10.5 %	9.4 %	8.4 %	
0.10%+	18.6 %	17.3 %	14.9 %	13.5 %	13.5 %	12.5 %	12.0 %	9.9 %	-47
Total	3,082	3,043	3,193	3,269	3,780	3,792	3,676	3,304	

Age Group 18-20									1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	51.8 %	53.2 %	55.7 %	59.8 %	58.6 %	61.9 %	63.1 %	65.2 %	
0.01-0.09%	13.1 %	12.9 %	13.6 %	12.3 %	13.3 %	13.1 %	12.6 %	11.2 %	
0.10%+	35.1 %	33.9 %	30.7 %	27.9 %	28.1 %	25.0 %	24.3 %	23.6 %	-33
Total	7,188	6,707	7,057	6,596	6,887	6,587	6,943	6,529	

Age Group 21-24									1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	48.5 %	49.3 %	51.0 %	54.1 %	52.8 %	54.5 %	54.0 %	55.0 %	
0.01-0.09%	11.5 %	11.6 %	11.7 %	10.6 %	11.2 %	11.4 %	10.9 %	10.5 %	
0.10%+	40.0 %	39.1 %	37.3 %	35.3 %	36.0 %	34.1 %	35.2 %	34.5 %	-14
Total	9,018	8,432	8,963	9,046	9,129	8,808	8,555	7,717	

Age Group 25-34									1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	56.1 %	56.4 %	58.3 %	59.0 %	58.5 %	58.4 %	58.9 %	59.9 %	
0.01-0.09%	8.8 %	8.8 %	8.7 %	8.6 %	8.5 %	8.7 %	8.4 %	8.2 %	
0.10%+	35.1 %	34.8 %	33.0 %	32.4 %	33.0 %	32.9 %	32.7 %	31.9 %	-9
Total	14,787	14,470	15,233	15,257	16,179	16,562	16,398	15,919	

Age Group 35-54									1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	67.3 %	68.7 %	70.4 %	71.9 %	71.8 %	71.8 %	71.6 %	71.5 %	
0.01-0.09%	6.6 %	6.1 %	6.0 %	5.8 %	5.9 %	5.6 %	5.6 %	5.6 %	
0.10%+	26.1 %	25.2 %	23.6 %	22.3 %	22.3 %	22.6 %	22.8 %	22.8 %	-13
Total	12,964	13,060	13,647	14,041	14,317	15,248	15,838	16,131	

Age Group 55-64									1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	77.2 %	78.2 %	79.9 %	81.5 %	81.4 %	81.9 %	81.6 %	82.0 %	
0.01-0.09%	5.4 %	5.0 %	4.8 %	4.7 %	4.9 %	4.3 %	4.4 %	4.3 %	
0.10%+	17.4 %	16.8 %	15.3 %	13.8 %	13.7 %	13.8 %	14.1 %	13.7 %	-21
Total	3,941	3,862	4,059	4,112	4,019	4,223	4,320	4,200	

Age Group 65+									1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	86.3 %	88.0 %	87.5 %	89.0 %	89.5 %	90.0 %	89.1 %	90.0 %	
0.01-0.09%	3.8 %	3.5 %	3.7 %	3.4 %	3.7 %	3.4 %	3.9 %	3.4 %	
0.10%+	9.9 %	8.6 %	8.8 %	7.6 %	6.8 %	6.6 %	7.0 %	6.6 %	-33
Total	3,894	4,026	4,316	4,479	4,881	5,078	5,376	5,426	

Note: * 1982-1989 percent change is difference in proportion of drivers with BAC $\geq$ 0.10%.

Table 2-5
Blood Alcohol Concentration (BAC) for Drivers of Different Types of Vehicles Involved in Fatal Crashes

	Drivers of Passenger Cars Involved in Fatal Crashes								1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	60.1 %	61.4 %	63.5 %	65.5 %	65.3 %	66.3 %	66.7 %	68.2 %	
0.01-0.09%	9.3 %	8.9 %	8.9 %	8.4 %	8.9 %	8.6 %	8.3 %	7.8 %	
0.10%+	30.6 %	29.7 %	27.6 %	26.1 %	25.8 %	25.1 %	25.0 %	24.0 %	-22
Total	34,121	33,069	34,395	34,071	35,959	36,371	36,769	35,178	

	Drivers of Light Trucks Involved in Fatal Crashes								1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	55.9 %	57.7 %	59.9 %	62.7 %	61.4 %	61.4 %	60.3 %	61.7 %	
0.01-0.09%	8.7 %	8.3 %	8.6 %	7.6 %	8.0 %	8.1 %	8.0 %	7.3 %	
0.10%+	35.5 %	34.0 %	31.5 %	29.7 %	30.6 %	30.5 %	31.6 %	31.0 %	-13
Total	8,468	8,366	9,097	9,304	9,914	10,590	11,083	11,145	

	Drivers of Vans Involved in Fatal Crashes								1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	65.9 %	68.0 %	70.0 %	73.9 %	73.8 %	74.1 %	76.9 %	77.4 %	
0.01-0.09%	7.9 %	6.5 %	7.6 %	6.4 %	6.1 %	6.6 %	5.2 %	5.4 %	
0.10%+	26.2 %	25.5 %	22.4 %	19.7 %	20.1 %	19.3 %	17.9 %	17.1 %	-35
Total	1,720	1,614	1,733	1,824	1,963	2,274	2,409	2,541	

	Drivers of Motorcycles Involved in Fatal Crashes								1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	46.5 %	45.7 %	46.4 %	47.2 %	45.6 %	48.7 %	50.1 %	47.3 %	
0.01-0.09%	13.0 %	13.5 %	13.4 %	13.5 %	13.5 %	13.1 %	13.6 %	13.0 %	
0.10%+	40.5 %	40.8 %	40.2 %	39.3 %	40.9 %	38.2 %	36.3 %	39.6 %	-2
Total	4,490	4,288	4,650	4,598	4,558	4,061	3,704	3,184	

	Drivers of Multi-Purpose Vehicles Involved in Fatal Crashes								1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	47.3 %	50.2 %	52.4 %	56.5 %	57.6 %	59.4 %	60.2 %	64.4 %	
0.01-0.09%	10.4 %	10.6 %	11.1 %	8.9 %	8.5 %	9.8 %	8.6 %	8.7 %	
0.10%+	42.3 %	39.2 %	36.5 %	34.6 %	33.9 %	30.8 %	31.2 %	26.9 %	-36
Total	1,011	1,037	1,036	1,244	1,331	1,543	1,675	1,883	

	Drivers of Medium Trucks Involved in Fatal Crashes								1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	90.9 %	89.1 %	90.5 %	91.1 %	91.8 %	94.0 %	93.3 %	92.7 %	
0.01-0.09%	3.7 %	3.3 %	3.0 %	2.6 %	3.1 %	2.0 %	2.7 %	3.3 %	
0.10%+	5.4 %	7.6 %	6.5 %	6.3 %	5.1 %	4.0 %	4.0 %	4.0 %	-26
Total	659	652	673	643	651	703	663	654	

	Drivers of Heavy Trucks Involved in Fatal Crashes								1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	92.2 %	92.7 %	92.7 %	94.3 %	95.0 %	95.8 %	95.5 %	94.9 %	
0.01-0.09%	3.7 %	3.3 %	3.4 %	2.5 %	2.4 %	1.7 %	1.8 %	2.6 %	
0.10%+	4.2 %	4.0 %	3.9 %	3.2 %	2.6 %	2.5 %	2.7 %	2.4 %	-43
Total	3,923	4,138	4,383	4,448	4,364	4,343	4,478	4,247	

*1982-1989 percent change is difference in proportion of drivers with BAC $\geq$ 0.10%.

Table 2-6
Blood Alcohol Concentration (BAC) for Drivers Involved in Fatal Crashes by Sex

				Male Drivers					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	58.2 %	59.5 %	61.2 %	64.0 %	62.4 %	63.6 %	63.8 %	64.9 %	
0.01-0.09%	9.4 %	9.1 %	9.2 %	8.2 %	9.1 %	8.8 %	8.5 %	8.1 %	
0.10%+	32.4 %	31.4 %	29.6 %	27.8 %	28.5 %	27.6 %	27.7 %	27.0 %	-17
Total	44,370	42.812	44,723	44,821	46,653	46,884	47,402	45,420	
				Female Drivers					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	74.3 %	75.2 %	76.4 %	78.8 %	79.1 %	79.0 %	79.7 %	80.2 %	
0.01-0.09%	6.8 %	6.3 %	6.5 %	6.0 %	6.1 %	6.0 %	5.7 %	5.5 %	
0.10%+	18.9 %	18.5 %	17.1 %	15.2 %	14.8 %	15.0 %	14.6 %	14.4 %	-24
Total	10,675	10,958	11,907	12,132	12,744	13,614	13,951	14,044	

*1982-1989 percent change is difference in proportion of drivers with BAC ≥ 0.10%.

The proportion of male drivers who were intoxicated decreased 17% from 1982, while the comparable proportion of female drivers decreased 24% from 1982 (Table 2-6).

The proportion of drivers who were drunk in weekday crashes decreased by 24% from 1982, while the proportion of drivers drunk in weekend crashes decreased 13% during the eight year period (Table 2-7).

Table 2-7
Blood Alcohol Concentration (BAC) for Drivers Involved in Fatal Crashes

				Weekend (6:00 P.M. Friday - 5:59 A.M. Monday)					
BAC	1982	1983	1984	1985	1986	1987	1988	1989	1982-1989 % Change*
0.00%	50.5 %	50.9 %	52.6 %	54.3 %	54.7 %	55.7 %	56.2 %	56.6 %	
0.01-0.09%	11.0 %	11.0 %	11.0 %	10.7 %	11.0 %	10.7 %	10.5 %	10.0 %	
0.10%+	38.5 %	38 1 %	36.4 %	35.0 %	34.3 %	33.6 %	33.3 %	33.4 %	-13
Total	24,993	23,682	25,094	24,171	25,727	26,163	26,315	25,308	
				Weekday (6:00 A.M. Monday - 5:59 P.M. Friday)					
BAC	1982	1983	1984	1985	1986	1987	1988	1989	1982-1989 % Change*
0.00%	69.7 %	71.3 %	72.9 %	74.7 %	73.8 %	75.1 %	75.9 %	76.6 %	
0.01-0.09%	7.2 %	6.7 %	6.8 %	6.2 %	6.7 %	6.4 %	6.0 %	5.7 %	
0.10%+	23.1 %	22.0 %	20.3 %	19.1 %	19.5 %	18.5 %	18.1 %	17.6 %	-24
Total	31,006	30,942	32,384	33,671	34,575	35,227	35,913	35,085	

*1982-1989 percent change is difference in proportion of drivers with BAC ≥ 0.10%.

As Table 2-8 shows, the proportion of drivers who were drunk varied by the time of the crash, but each time-group shows decreases from 1982. There was a 23% decrease in the proportion of drivers drunk in crashes occurring between 6 am and noon, while there was only a 7% decrease in crashes from midnight to 6 am.

Table 2-8
Blood Alcohol Concentration (BAC) for Drivers Involved in Fatal Crashes by Time of Day

				Midnight - 6 A.M.					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	33.4 %	32.9 %	34.0 %	35.3 %	36.0 %	36.3 %	37.0 %	37.5 %	
0.01-0.09%	13.0 %	12.6 %	13.0 %	12.7 %	13.2 %	13.3 %	13.0 %	12.5 %	
0.10%+	53.5 %	54.5 %	53.0 %	52.0 %	50.8 %	50.4 %	50.0 %	50.1 %	-7
Total	13,273	12,126	12,127	11,518	12,227	12,095	12,330	11,544	
				6 A.M. - Noon					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	88.0 %	88.7 %	89.5 %	89.8 %	89.4 %	89.9 %	89.9 %	90.6 %	
0.01-0.09%	3.9 %	3.6 %	3.6 %	3.5 %	3.8 %	3.5 %	3.4 %	3.3 %	
0.10%+	8.1 %	7.7 %	6.9 %	6.7 %	6.8 %	6.6 %	6.7 %	6.2 %	-23
Total	8,681	9,010	9,968	10,279	10,525	11,061	11,627	11,469	
				Noon - 6 P.M.					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	79.4 %	80.1 %	81.1 %	82.5 %	82.6 %	82.8 %	83.3 %	83.7 %	
0.01-0.09%	6.1 %	5.8 %	5.9 %	5.4 %	5.4 %	5.2 %	5.2 %	5.0 %	
0.10%+	14.5 %	14.1 %	13.0 %	12.1 %	12.0 %	12.0 %	11.4 %	11.3 %	-22
Total	15,044	15,371	16,447	17,299	17,902	18,166	18,569	18,455	
				6 P.M. - Midnight					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change*
0.00%	53.9 %	54.6 %	55.4 %	57.5 %	56.4 %	58.4 %	57.8 %	58.8 %	
0.01-0.09%	10.6 %	10.6 %	10.9 %	10.2 %	11.0 %	10.5 %	10.0 %	9.5 %	
0.10%+	35.5 %	34.8 %	33.7 %	32.3 %	32.6 %	31.1 %	32.1 %	31.7 %	-11
Total	18,812	17,911	18,648	18,490	19,311	19,759	19,385	18,618	

*1982-1989 percent change is difference in proportion of drivers with BAC ≥ 0.10 %.

In contrast, the proportion of adult pedestrians and bicyclists who were intoxicated decreased only slightly from 1982 to 1989. Intoxicated teenaged pedestrians and bicyclists in fatal crashes decreased from 32.8% in 1982 to 23.6% in 1989 (a 28% decrease), and the 65 and older age group showed a 32.0% decrease from 1982. Other pedestrian and bicyclist age groups decreased only slightly in the proportion considered drunk (Table 2-9).

Table 2-9
Blood Alcohol Concentration (BAC) for Adult Pedestrians and Bicyclists Involved in Fatal Crashes

				Age Group 14-19					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change *
0.00%	57.6 %	60.5 %	65.9 %	66.7 %	68.6 %	71.4 %	67.9 %	69.2 %	
0.01-0.09%	9.6 %	9.4 %	7.9 %	8.9 %	9.1 %	8.5 %	8.1 %	7.2 %	
0.10%+	32.8 %	30.1 %	26.2 %	24.4 %	22.3 %	20.1 %	23.9 %	23.6 %	-28
Total	1,093	937	918	839	875	795	705	623	
				Age Group 20-29					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change *
0.00%	42.1 %	40.9 %	42.9 %	42.2 %	42.0 %	45.3 %	44.7 %	42.2 %	
0.01-0.09%	9.0 %	9.2 %	9.2 %	10.5 %	10.4 %	9.6 %	8.6 %	9.8 %	
0.10%+	48.9 %	49.9 %	47.9 %	47.3 %	47.6 %	45.1 %	46.6 %	48.0 %	-2
Total	1,752	1,624	1,631	1,500	1,607	1,484	1,452	1,331	
				Age Group 30-39					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change *
0.00%	45.4 %	43.7 %	43.7 %	43.2 %	46.2 %	43.2 %	45.4 %	44.4 %	
0.01-0.09%	8.3 %	7.0 %	8.7 %	8.9 %	7.7 %	7.8 %	8.3 %	7.7 %	
0.10%+	46.3 %	49.3 %	47.6 %	47.9 %	46.1 %	49.0 %	46.2 %	47.9 %	3
Total	1,123	968	1,043	1,043	1,092	1,125	1,219	1,280	
				Age Group 40-64					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change *
0.00%	52.7 %	52.2 %	51.8 %	52.0 %	54.3 %	53.8 %	56.1 %	54.4 %	
0.01-0.09%	7.3 %	8.1 %	6.2 %	7.6 %	7.2 %	8.5 %	6.7 %	7.9 %	
0.10%+	40.0 %	39.7 %	42.0 %	40.4 %	38.5 %	37.7 %	37.2 %	37.7 %	-6
Total	1,778	1,717	1,858	1,785	1,721	1,866	1,862	1,839	
				Age Group 65 +					1982-1989
BAC	1982	1983	1984	1985	1986	1987	1988	1989	% Change *
0.00%	81.2 %	80.9 %	83.5 %	83.8 %	83.4 %	83.0 %	85.6 %	85.0 %	
0.01-0.09%	5.4 %	5.9 %	5.1 %	5.8 %	6.0 %	6.3 %	5.4 %	5.9 %	
0.10%+	13.4 %	13.2 %	11.4 %	10.4 %	10.6 %	10.7 %	9.0 %	9.1 %	-32
Total	1,546	1,473	1,574	1,539	1,526	1,566	1,699	1,560	

*1982-1989 percent change is difference in proportion of driver with BAC ≥ 0.10%.

Alcohol in 1989
Crash Type

Single vehicle fatal crashes more frequently involve alcohol than do other types. Figure 2-1 depicts alcohol involvement in 1989 by crash type: single vehicle, multi-vehicle, and nonoccupant (pedestrian and bicycle) crash. About one half or 48.8% of all fatalities in single vehicle crashes involved a driver who was legally intoxicated. In 40.9% of all fatalities in nonoccupant crashes, either a driver or a nonoccupant victim was legally intoxicated, while about one-third (29.5%) of all fatalities in multi-vehicle crashes involved a legally intoxicated driver.

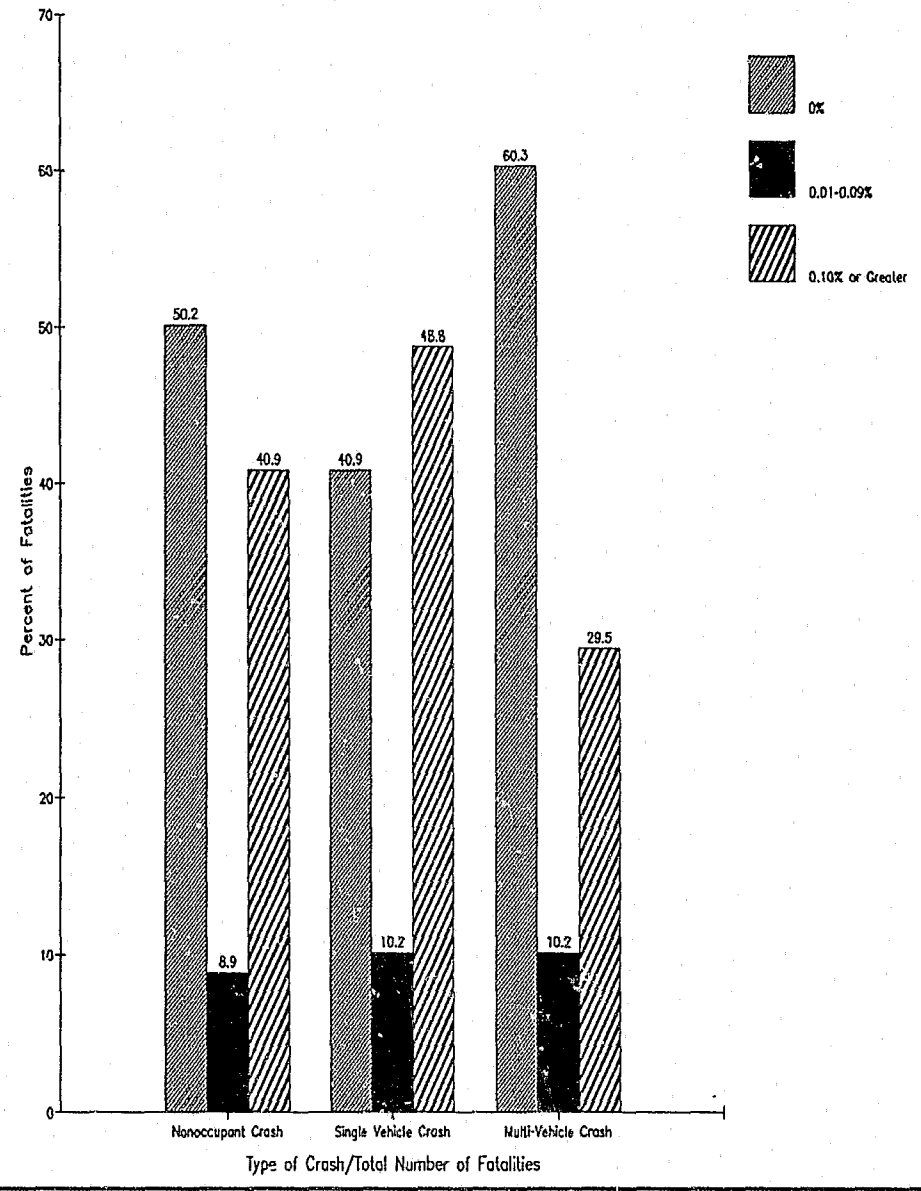

Figure 2-1
Fatalities by Type of Accident and by Estimated Blood Alcohol Concentration (BAC) of Active Participants in 1989

The number and percent of alcohol related fatalities by age group is presented in Table 2-10. Almost half of all fatalities (22,415 or 49.2%) were alcohol related. This is most significant in the 20 to 24 year old age group where 64.6% of the fatalities were in alcohol related crashes.

Table 2-10
Alcohol-Related Fatalities by Age Group and Highest Blood Alcohol Concentration (BAC) of Active Participant (Driver, Pedestrian, or Pedalcyclist)

Age Group of Fatality	Total Number of Fatalities	BAC= .00%	0.01-0.09%	≥ 0.10%	In Alcohol Related Crashes
0-14	3,181	75.1 %	7.9 %	17.0 %	793
15-19	6,147	54.8 %	13.8 %	31.4 %	2,775
20-24	6,526	35.4 %	12.9 %	51.7 %	4,215
25-64	22,992	42.6 %	9.4 %	48.0 %	13,200
65 +	6,551	79.5 %	6.7 %	13.8 %	1,345
Unknown	158	44.4 %	9.5 %	46.2 %	88
Total	45,555	50.8 %	10.0 %	39.2 %	22,415

The number and percent of alcohol involvement in fatal pedestrian crashes is presented in Table 2-11. In about one half (48.6%) of the fatal pedestrian crashes neither the driver nor the pedestrian had been drinking. Almost one-third (32.7%) of the crashes involved pedestrians who were legally intoxicated and 13.6% involved crashes in which both drivers and pedestrians had been drinking.

Table 2-11
Fatal Pedestrian Accidents
BAC Levels for Drivers and Pedestrians

	No Driver Alcohol Involvement		Driver Alcohol Involvement 0.01-0.09%		Driver Alcohol Involvement 0.10%		Total	
	Number	%	Number	%	Number	%	Number	%
No Pedestrian Alcohol Involvement	3,164	48.6	233	3.6	522	8.0	3,919	60.2
Pedestrian Alcohol Involvement 0.01-0.09%	302	4.6	54	0.8	108	1.7	464	7.1
Pedestrian Alcohol Involvement 0.10%+	1,403	21.6	214	3.3	510	7.8	2,127	32.7
Total	4,869	74.8	501	7.7	1,140	17.5	6,510	100.0

Day and Time

Alcohol continues to be far more prevalent in nighttime fatal crashes than daytime. Figure 2-2 shows that 50.1% of the drivers involved in fatal crashes between midnight and 6 am were estimated to be intoxicated. Only 6.2% of the drivers in fatal crashes occurring between 6 am and noon, on the other hand, were intoxicated.

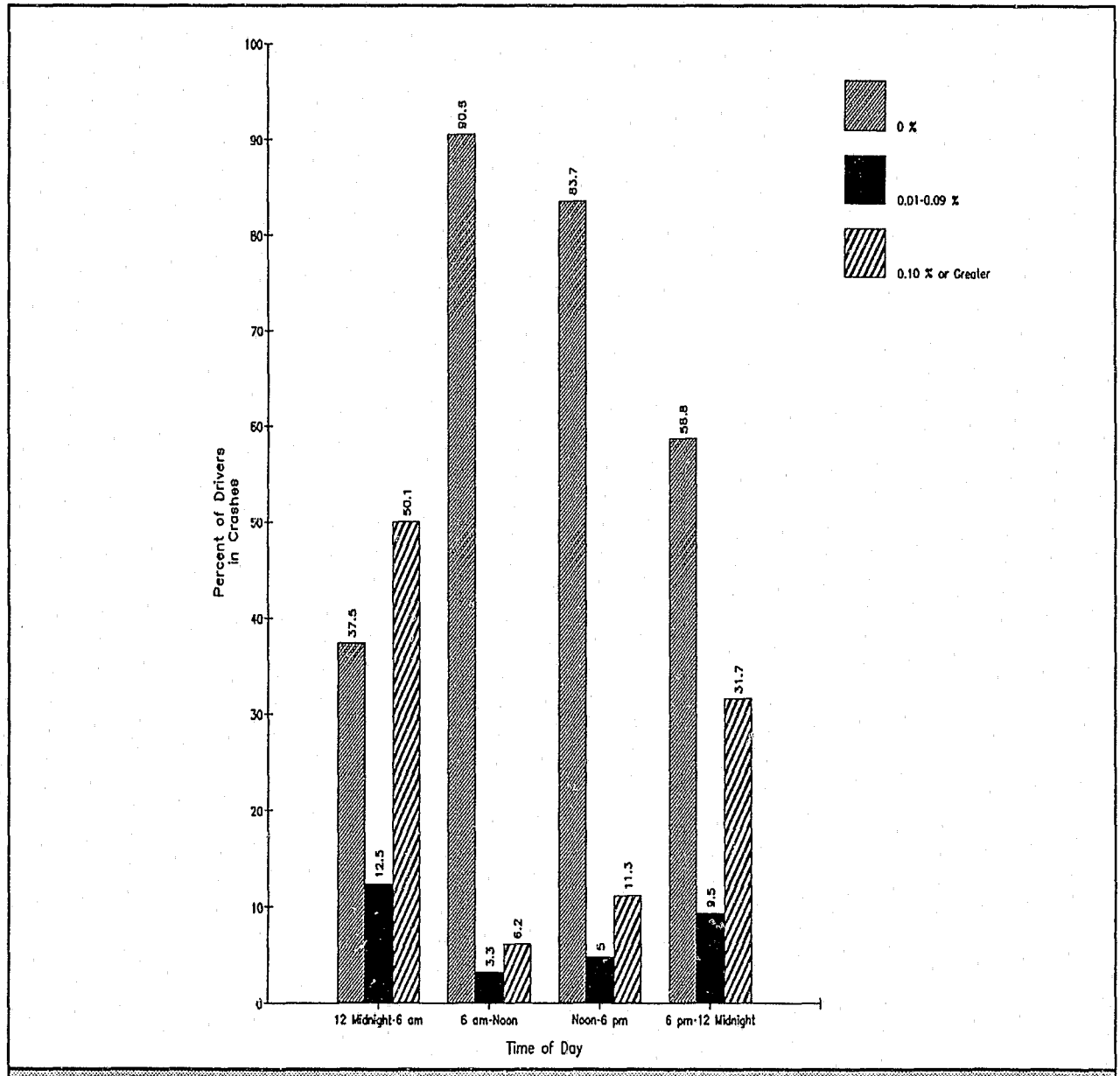

Figure 2-2
Drivers Involved in Fatal Crashes by Time of Day and Estimated Blood Alcohol Concentration in 1989

Alcohol is also more prevalent on the weekends than during the week: 33.4% of the drivers involved in weekend fatal crashes were intoxicated, while 17.6% of the drivers in weekday crashes were intoxicated (Figure 2-3).

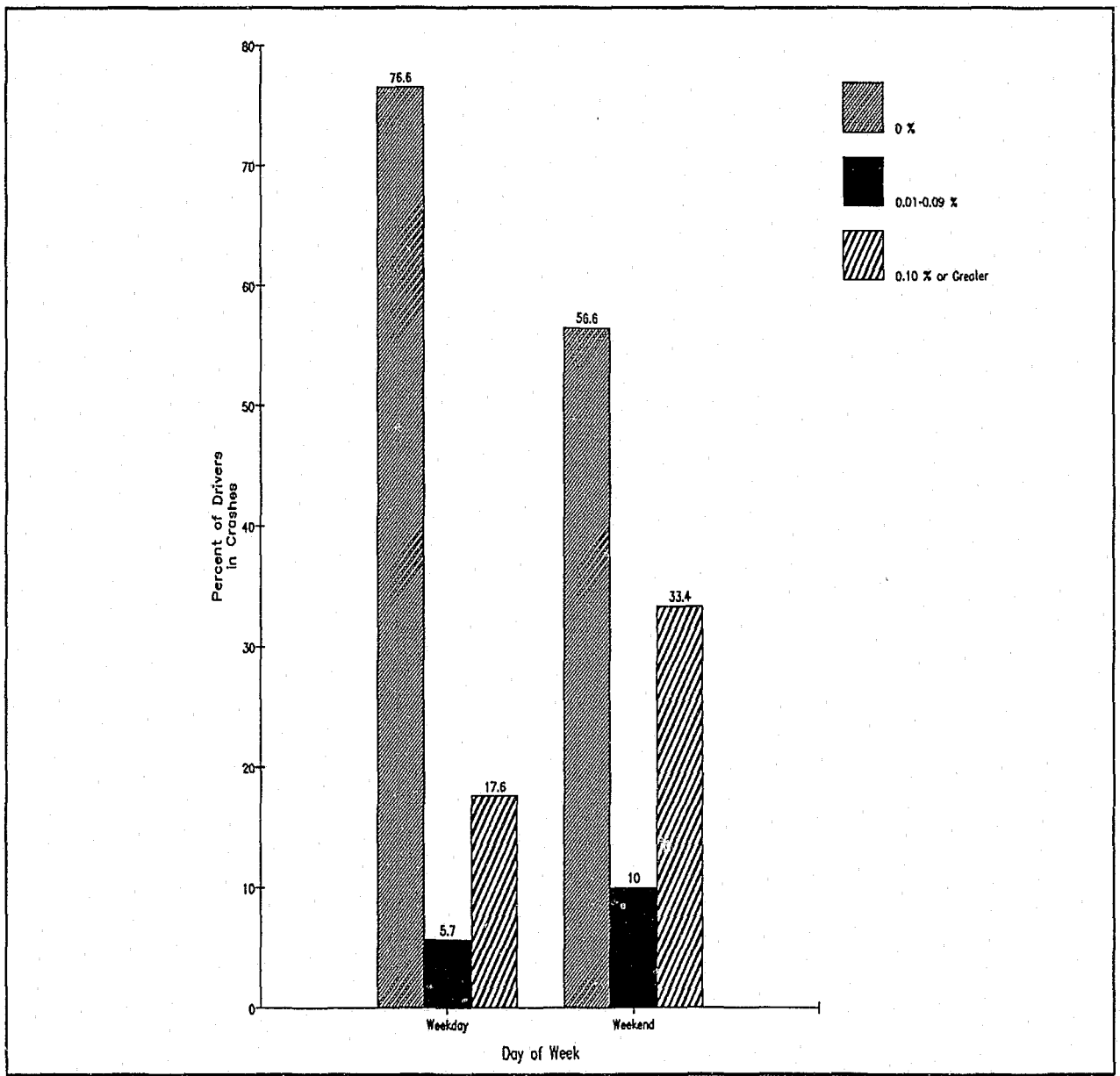

Figure 2-3
Drivers Involved in Fatal Crashes by Day of Week and Estimated Blood Alcohol Concentration in 1989

Age-Group and Sex

Female drivers involved in fatal crashes are less frequently drunk than males. The percentage of female drivers who were legally intoxicated was 14.4%, compared to 27.0% of the male drivers (Figure 2-4).

Driver alcohol involvement varies considerably with age. For drivers involved in fatal crashes in 1989, Table 2-4 shows how the proportion of legally intoxicated individuals vary from 6.6% for drivers aged 65 or older to 34.5% for drivers aged 21-24.

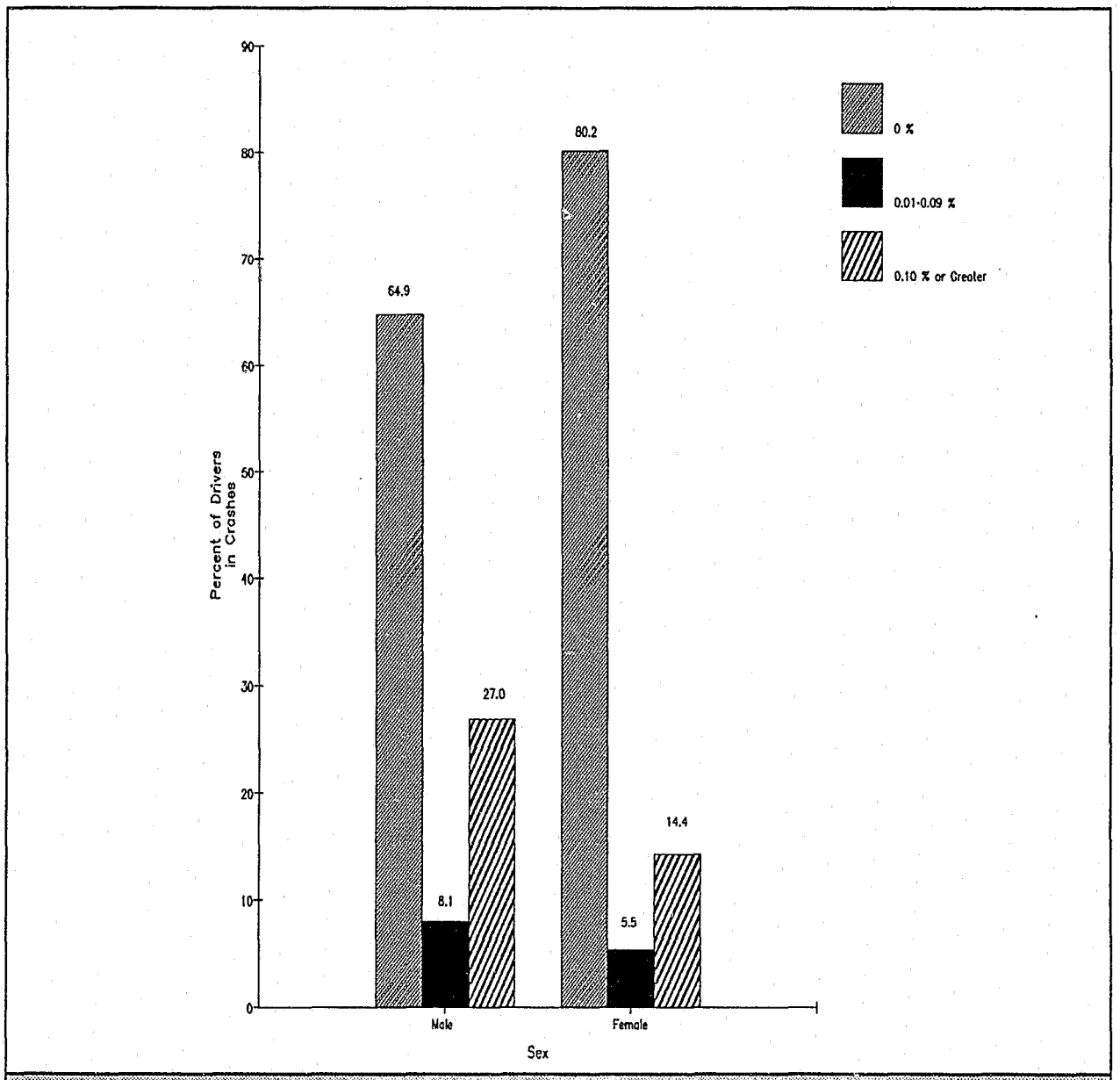

Figure 2-4
Drivers Involved in Fatal Crashes by Sex

The number and percent of fatalities in alcohol related crashes are presented in Table 2-10 by the various age groups of the victims. Approximately 793 children and an additional 2,775 teenagers (aged 15-19) died in alcohol related crashes in 1989.

In 1989, 45.1% of all teenaged fatalities (aged 15-19) were in alcohol related crashes compared to 61.6% in 1982 (Figure 2-5). Of the 7,654 teenaged drivers involved in fatal crashes, almost one-third (27.3%) had been drinking and 17.1% were considered drunk. These levels of alcohol involvement are considerably lower than those experienced in 1982 (Figure 2-7).

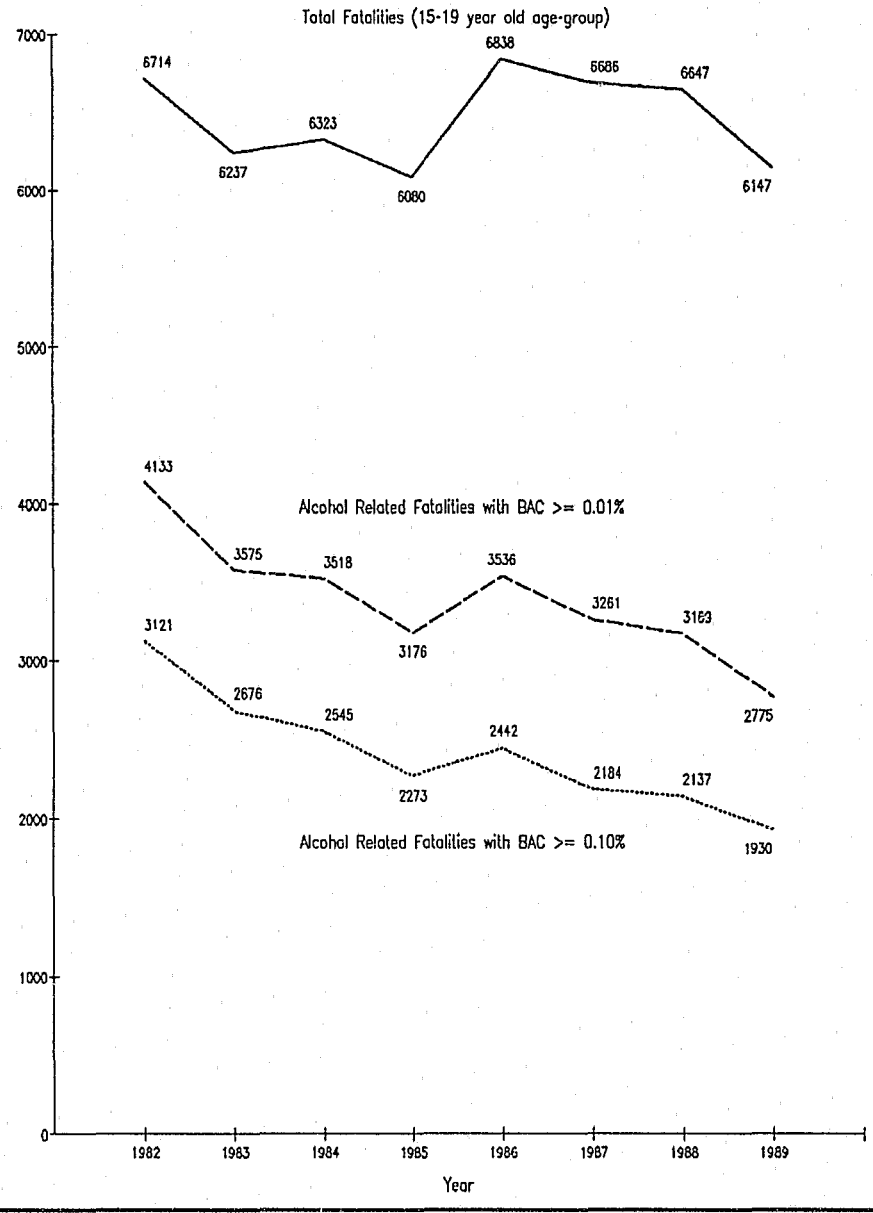

Figure 2-5
Teenaged Motor Vehicle Fatalities for 1982 to 1989

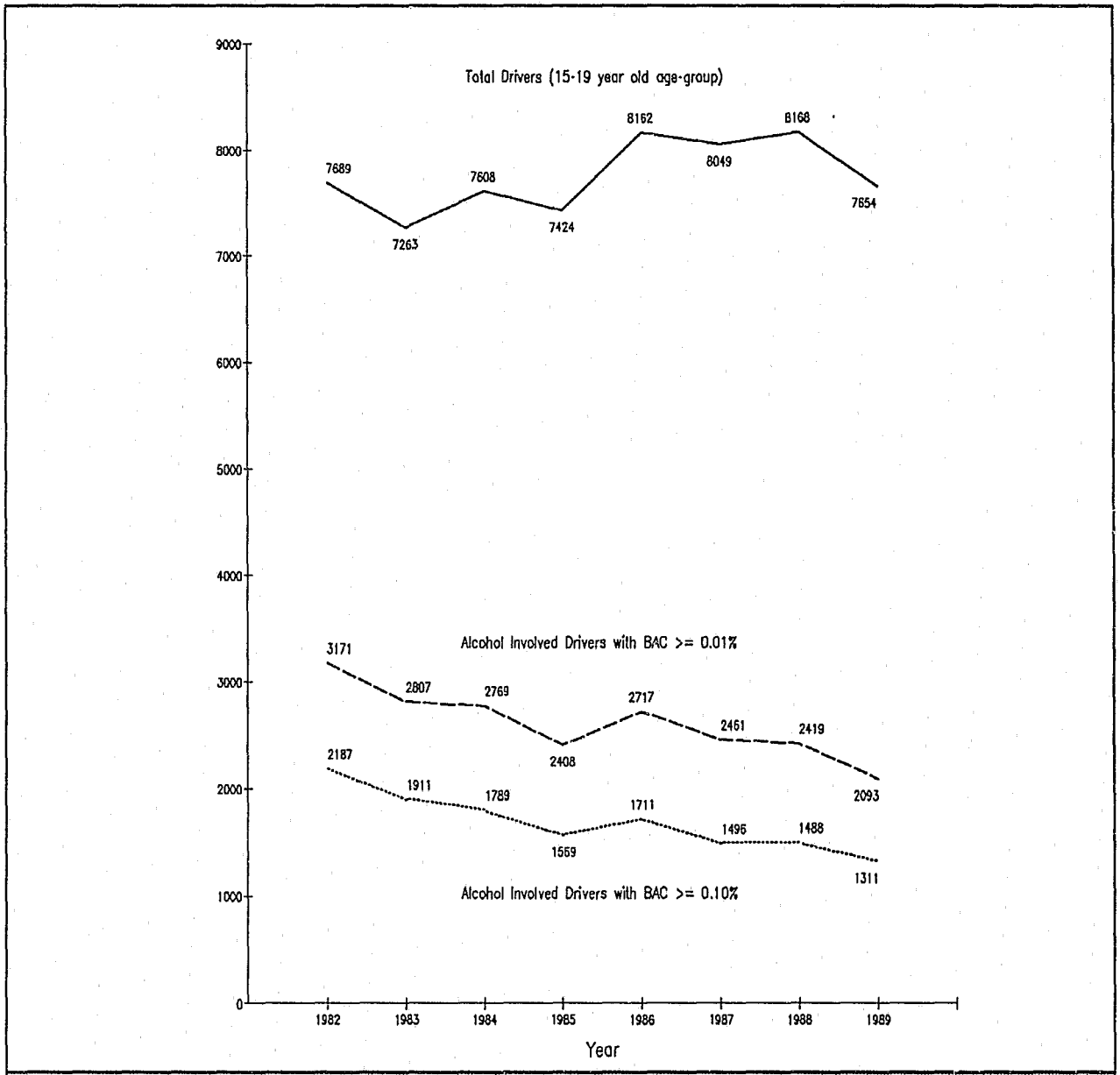

Figure 2-6
Teenaged Drivers in Fatal Crashes for 1982 to 1989

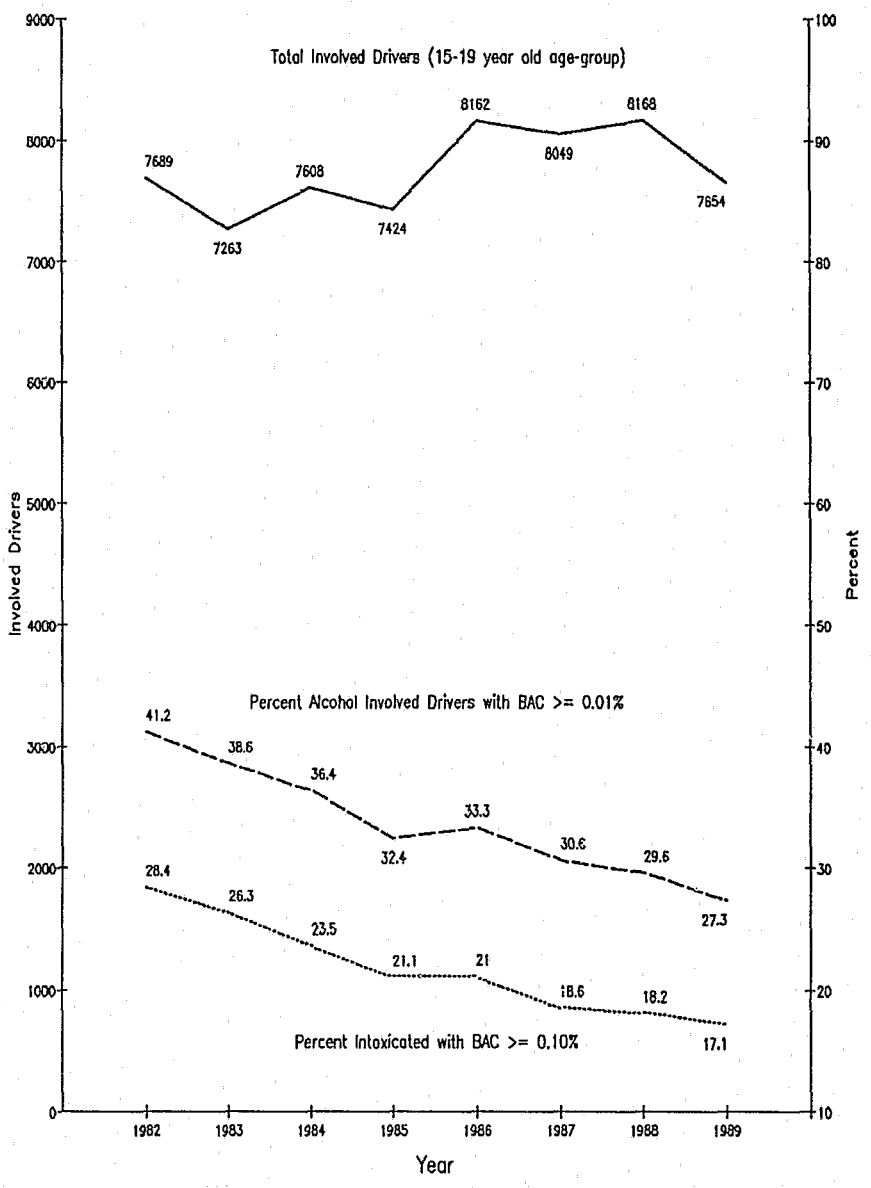

Figure 2-7
Percent of Teenaged Drivers by Alcohol Involvement for 1982 to 1989

Safety Belts

At the end of 1989, safety belt use laws were in effect in 33 states and the District of Columbia. These include a number of the largest states: California, New York, Texas, and Illinois. Two new laws took effect during 1989. Table 2-12 shows the status of belt use laws in 1989.

Table 2-12
States with Safety Belt Use Laws

States	Effective Date
New York	12/1/84
New Jersey	3/1/85
Illinois	7/1/85
Michigan	7/1/85
Texas	9/1/85
Missouri	9/28/85
North Carolina	10/1/85
District of Columbia	12/12/85
Hawaii	12/16/85
California	1/1/86
Connecticut	1/1/86
New Mexico	1/1/86
Tennessee	4/21/86
Utah	4/28/86
Ohio	5/6/86
Washington	6/11/86
Florida	7/1/86
Idaho	7/1/86
Iowa	7/1/86
Kansas	7/1/86
Louisiana	7/1/86
Maryland	7/1/86
Minnesota	8/1/86
Indiana	2/1/87
Oklahoma	2/1/87
Nevada	7/1/87
Colorado	7/7/87
Montana	10/1/87
Pennsylvania	11/23/87
Wisconsin	12/1/87
Virginia	1/1/88
Georgia	9/1/88
Wyoming	6/8/89
South Carolina	7/1/89

The use of safety belts and child restraints was observed in NHTSA's ongoing observations of safety belt use in 19 U.S. cities. Observations of driver safety belt use indicated an overall use rate of 46.3%.

With child restraint use required in all states, 80.6% of all infants and toddlers were observed to be restrained in child safety seats in 1989.

Increased restraint use was reported in FARS for 1989. For all passenger car occupants in fatal crashes, reported restraint use rose from 36.4% in 1988 to 38.2% in 1989 of those whose restraint use was known.

Occupant restraint information in FARS comes directly from police crash reports. Some police reports are based on direct observations of belt use. More commonly, the police obtain this information by interviewing the people involved or by inference from other evidence. Since failing to use occupant restraints is a traffic offense in some cases, it is likely that some people involved in crashes would claim they were wearing a seat belt even if this were untrue. As a consequence, belt use information in FARS may not be completely reliable.

Table 2-13 provides data on restraint use by passenger car occupants involved in fatal crashes, and Table 2-14 provides information on fatally injured passenger car occupants. Only 25% of the drivers and passengers killed in traffic crashes were reported to have been wearing seat belts when usage was known. The severity of injuries to all passenger car occupants in fatal crashes is depicted as a function of restraint use in Figure 2-8 and Table 2-17.

Table 2-13
Restraint Usage of Passenger Car Occupants Involved in Fatal Crashes by Person Role

Restraint Usage	Driver		Passenger		Unknown		Total	
	Number	%	Number	%	Number	%	Number	%
Restraint Used	12,612	35.9	8,022	30.3	7	8.3	20,641	33.4
Shoulder Belt	30	0.1	10	0.0	0	0.0	40	0.1
Lap Belt	524	1.5	1,527	5.8	2	2.4	2,053	3.3
Lap & Shoulder Belt	8,934	25.4	4,019	15.2	2	2.4	12,955	21.0
Child Safety Seat	0	0.0	610	2.3	0	0.0	610	1.0
Unknown Manual Restraint	3,068	8.7	1,836	6.9	3	3.6	4,907	7.9
Automatic Belt	36	0.1	20	0.1	0	0.0	56	0.1
Airbag Deployed	20	0.1	0	0.0	0	0.0	20	0.0
No Restraint Used	17,924	51.0	15,447	58.3	47	56.0	33,418	54.1
Unknown	4,642	13.2	3,025	11.4	30	35.7	7,697	12.5
Total	35,178	100.0	26,494	100.0	84	100.0	61,756	100.0

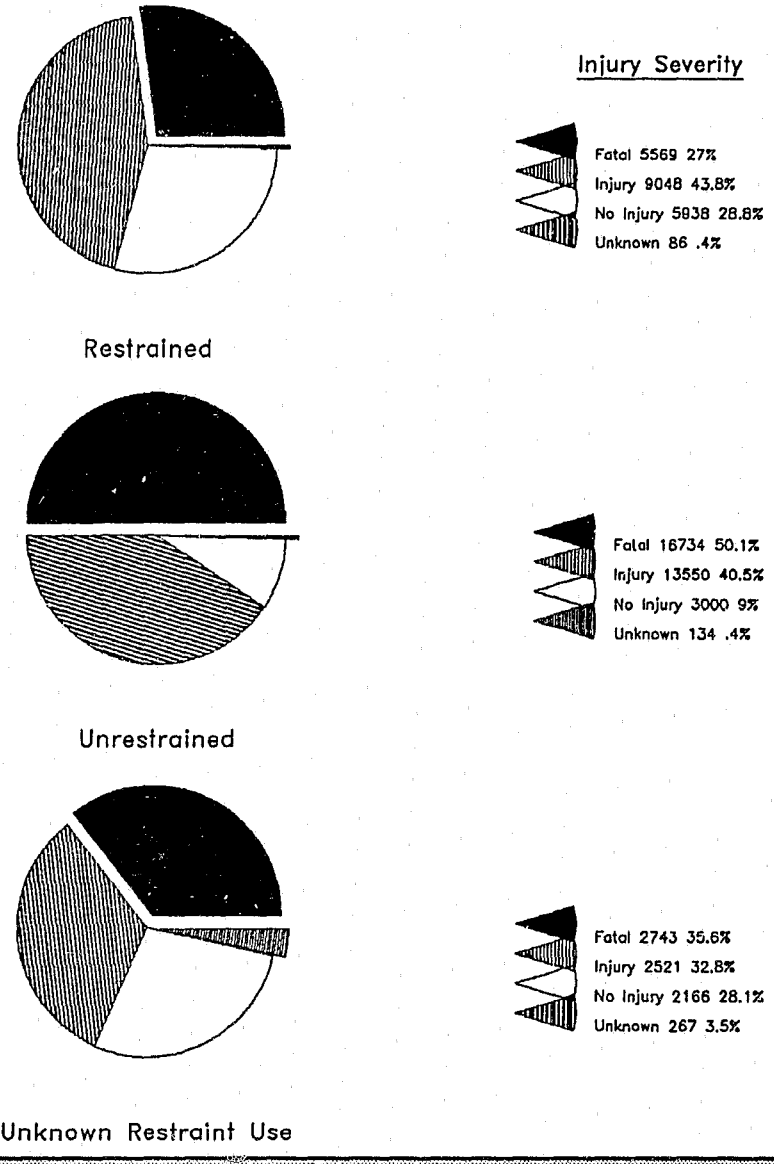

Figure 2-8
Injury Severity and Restraint Usage of Passenger Car Occupants in Fatal Crashes in 1989

Table 2-14
Restraint Usage of Passenger Car Occupants Killed in Fatal Crashes

Restraint Usage	Person Type: Driver Number	%	Passenger Number	%	Unknown Number	%	Total Number	%
Restraint Used	3,652	21.9	1,915	23.1	2	4.9	5,569	22.2
Shoulder Belt	16	0.1	5	0.1	0	0.0	21	0.1
Lap Belt	128	0.8	264	3.2	1	2.4	393	1.6
Lap & Shoulder Belt	2,731	16.4	1,134	13.7	1	2.4	3,866	15.4
Child Safety Seat	0	0.0	104	1.3	0	0.0	104	0.4
Unknown Manual Restraint	748	4.5	405	4.9	0	0.0	1,153	4.6
Automatic Belt	20	0.1	3	0.0	0	0.0	23	0.1
Airbag Deployed	9	0.1	0	0.0	0	0.0	9	0.0
No Restraint Used	11,203	67.1	5,504	66.3	27	65.9	16,734	66.8
Unknown	1,845	11.0	886	10.7	12	29.3	2,743	11.0
Total	16,700	100.0	8,305	100.0	41	100.0	25,046	100.0

Table 2-15
Restraint Usage of Passenger Car Occupants by Injury Severity and Person Role for Fatal Crash

Injury Severity and Person Role	Restraint Used		No Restraint Used		Unknown Restraint Use		Total	
	Restraint Usage							
	Number	%	Number	%	Number	%	Number	%
Fatal Injury								
Driver	3,652	21.9	11,203	67.1	1,845	11.0	16,700	100.0
Passenger	1,915	23.1	5,504	66.3	886	10.7	8,305	100.0
Unknown Occupant	2	4.9	27	65.9	12	29.3	41	100.0
Incapacitating Injury								
Driver	2,052	37.1	2,842	51.4	635	11.5	5,529	100.0
Passenger	1,655	23.3	4,676	65.9	763	10.8	7,094	100.0
Unknown Occupant	2	8.7	15	65.2	6	26.1	23	100.0
Non-Incapacitating Injury								
Driver	1,728	46.0	1,684	44.9	342	9.1	3,754	100.0
Passenger	1,354	30.3	2,706	60.5	412	9.2	4,472	100.0
Unknown Occupant	1	12.5	3	37.5	4	50.0	8	100.0
Possible Injury								
Driver	1,283	63.2	585	28.8	161	7.9	2,029	100.0
Passenger	973	44.0	1,038	47.0	198	9.0	2,209	100.0
Unknown Occupant	0	0.0	1	100.0	0	0.0	1	100.0
No Injury								
Driver	3,854	56.1	1,561	22.7	1,459	21.2	6,874	100.0
Passenger	2,082	49.3	1,438	34.1	701	16.6	4,221	100.0
Unknown Occupant	2	22.2	1	11.1	6	66.7	9	100.0
Unknown								
Driver	43	14.7	49	16.8	200	68.5	292	100.0
Passenger	43	22.3	85	44.0	65	33.7	193	100.0
Unknown Occupant	0	0.0	0	0.0	2	100.0	2	100.0
Total	20,641	33.4	33,418	54.1	7,697	12.5	61,756	100.0

Between 1988 and 1989, reported restraint usage among children under 5 involved in fatal crashes increased by 1.9%. Reported restraint usage among older children (aged 5-14) increased by 6.2% while restraint usage for occupants over 14 years of age increased less than 1%.

Table 2-16
Restraint Usage of Passenger Car Occupants by Age Group and Year

	Age Group				
	Under 5	5 to 14	Over 14	Unknown	Total
Restraint Used					
1988	968	1,047	18,188	218	20,421
1989	986	1,112	18,351	192	20,641
% Change	1.9	6.2	0.9	-11.9	1.1
No Restraint Used					
1988	1,009	2,203	32,093	392	35,697
1989	1,006	2,073	29,989	350	33,418
% Change	-0.3	-5.9	-6.6	-10.7	-6.4
Unknown					
1988	142	361	6,890	898	8,291
1989	146	337	6,381	833	7,697
% Change	2.8	-6.6	-7.4	-7.2	-7.2
Total					
1988	2,119	3,611	57,171	1,508	64,409
1989	2,138	3,522	54,721	1,375	61,756
% Change	0.9	-2.5	-4.3	-8.8	-4.1

Table 2-17
Restraint Usage and Injury Severity for Passenger Car Occupants

	Restraint Used Number	%	No Restraint Used Number	%	Unknown Usage Number	%	Total
Fatal Injury							
1988	5,380	26.3	17,566	49.2	2,862	34.5	25,808
1989	5,569	27.0	16,734	50.1	2,743	35.6	25,046
% Change	3.5		-4.7		-4.2		-3.0
Incapacitating Injury							
1988	3,621	17.7	8,030	22.5	1,483	17.9	13,134
1989	3,709	18.0	7,533	22.5	1,404	18.2	12,646
% Change	2.4		-6.2		-5.3		-3.7
Non-Incapacitating Injury							
1988	2,927	14.3	4,539	12.7	844	10.2	8,310
1989	3,083	14.9	4,393	13.1	758	9.8	8,234
% Change	5.3		-3.2		-10.2		-0.9
Possible Injury							
1988	2,044	10.0	1,632	4.6	374	4.5	4,050
1989	2,256	10.9	1,624	4.9	359	4.7	4,239
% Change	10.4		-0.5		-4.0		4.7
No Injury							
1988	6,245	30.6	3,620	10.1	2,422	29.2	12,287
1989	5,938	28.8	3,000	9.0	2,166	28.1	11,104
% Change	-4.9		-17.1		-10.6		-9.6
Unknown							
1988	204	1.0	310	0.9	306	3.7	820
1989	86	0.4	134	0.4	267	3.5	487
% Change	-57.8		-56.8		-12.7		-40.6
Total							
1988	20,421	100.0	35,697	100.0	8,291	100.0	64,409
1989	20,641	100.0	33,418	100.0	7,697	100.0	61,756
% Change	1.1		-6.4		-7.2		-4.1

Table 2-18
Occupants Involved in Fatal Crashes by Ejection Status and Vehicle Type

Vehicle Type	Ejection Status: Not Ejected Number	%	Totally Ejected Number	%	Partially Ejected Number	%	Unknown Number	%	Total Number	%
Passenger Cars	53,659	86.9	6,361	10.3	1,370	2.2	366	0.6	61,756	100.0
Light Trucks	19,048	80.6	3,701	15.7	649	2.7	244	1.0	23,642	100.0
Medium Trucks	768	91.6	60	7.2	9	1.1	1	0.1	838	100.0
Heavy Trucks	4,588	93.8	215	4.4	68	1.4	19	0.4	4,890	100.0
Buses	1,091	98.6	10	0.9	0	0.0	5	0.5	1,106	100.0
Multipurpose Veh	2,448	69.1	968	27.3	81	2.3	46	1.3	3,543	100.0
Other Vehicles	617	86.7	81	11.4	11	1.5	3	0.4	712	100.0
Unknown	897	89.2	67	6.7	4	0.4	38	3.8	1,006	100.0
Total	83,116	85.3	11,463	11.8	2,192	2.2	722	0.7	97,493	100.0

NOTE: 3,849 motorcycles and other cycle riders are not included.

When passengers are ejected from their vehicles in a crash, their chances of surviving the crash are substantially diminished. Most of the 34,922 occupants killed in crashes were not ejected; (71.4%) however, 7,986 were totally ejected and 1,771 were partially ejected as shown in Table 2-19.

As Table 2-19 further shows, the proportion of passenger car occupant fatalities who were ejected was 22.8%, but was 40.1% for occupant fatalities in light trucks and 59.1% for occupants of multipurpose vehicles.

Table 2-19
Number of Occupant Fatalities by Ejection and Vehicle Type

Vehicle Type	Ejection Status: Not Ejected Number	%	Totally Ejected Number	%	Partially Ejected Number	%	Unknown Number	%	Total Number	%
Passenger Cars	19,185	76.6	4,607	18.4	1,113	4.4	141	0.6	25,046	100.0
Light Trucks	4,388	59.2	2,447	33.0	524	7.1	53	0.7	7,412	100.0
Medium Trucks	76	59.4	45	35.2	7	5.5	0	0.0	128	100.0
Heavy Trucks	492	67.5	177	24.3	55	7.5	5	0.7	729	100.0
Buses	41	82.0	7	14.0	0	0.0	2	4.0	50	100.0
Multipurpose Veh	458	40.4	606	53.5	63	5.6	6	0.5	1,133	100.0
Other Vehicles	214	78.4	51	18.7	6	2.2	2	0.7	273	100.0
Unknown	89	58.9	46	30.5	3	2.0	13	8.6	151	100.0
Total	24,943	71.4	7,986	22.9	1,771	5.1	222	0.6	34,922	100.0

NOTE: 3,143 motorcycles and other motorized cycle fatalities are not included.

Table 2-20
Passenger Car Occupants Involved in Fatal Crashes by Ejection Status, Principal Impact Point and Restraint Usage

Restraint Usage & Impact Point	Ejection Status: Not Ejected Number	%	Totally Ejected Number	%	Partially Ejected Number	%	Unknown Number	%	Total Number	%
Restraint Used										
Non-collision	532	91.9	29	5.0	17	2.9	1	0.2	579	100.0
Frontal	12,088	99.1	48	0.4	55	0.5	10	0.1	12,201	100.0
Side	5,543	97.8	78	1.4	36	0.6	8	0.1	5,665	100.0
Other & Unknown	2,158	98.3	18	0.8	17	0.8	3	0.1	2,196	100.0
Subtotal	20,321	98.4	173	0.8	125	0.6	22	0.1	20,641	100.0
No Restraint Used										
Non-collision	1,148	44.0	1,288	49.3	154	5.9	20	0.8	2,610	100.0
Frontal	15,952	85.3	2,158	11.5	520	2.8	80	0.4	18,710	100.0
Side	7,085	79.8	1,440	16.2	315	3.5	38	0.4	8,878	100.0
Other & Unknown	2,133	66.2	904	28.1	159	4.9	24	0.7	3,220	100.0
Subtotal	26,318	78.8	5,790	17.3	1,148	3.4	162	0.5	33,418	100.0
Unknown										
Non-collision	154	68.1	53	23.5	2	0.9	17	7.5	226	100.0
Frontal	4,136	93.6	145	3.3	45	1.0	91	2.1	4,417	100.0
Side	1,910	89.3	138	6.4	35	1.6	57	2.7	2,140	100.0
Other & Unknown	820	89.7	62	6.8	15	1.6	17	1.9	914	100.0
Subtotal	7,020	91.2	398	5.2	97	1.3	182	2.4	7,697	100.0
Total	53,659	86.9	6,361	10.3	1,370	2.2	366	0.6	61,756	100.0

Occupants using restraints were much less likely to have been thrown from their cars than were those who did not use restraints. Most of the occupants of passenger cars who were restrained and not ejected were wearing both a lap belt and shoulder belts (12,751 of 20,321); 2,022 were wearing lap belts only (Table 2-21).

Table 2-21
Ejection Status by Restraint Type for Restrained Passenger Car Occupants Involved in Fatal Crashes

Restraint Type	Ejection Status: Not Ejected Number	Totally Ejected Number	Partially Ejected Number	Unknown Number	Total
Shoulder Belt	29	9	2	0	40
Lap Belt	2,022	15	13	3	2,053
Lap & Shoulder Belt	12,751	95	97	12	12,955
Child Safety Seat	591	17	0	2	610
Other Manual Restraint	4,860	30	12	5	4,907
Automatic Belt in Use	51	5	0	0	56
Deployed Airbag	17	2	1	0	20
Total	20,321	173	125	22	20,641

Restraint use for non-passenger car occupants involved in fatal crashes is compared in Table 2-22. The data indicate that a greater proportion of heavy truck occupants (47.7%) reportedly used restraints than did light truck occupants (30.7%) when restraint usage was known.

Table 2-22
Restraint Usage by Vehicle Type for Non-Passenger Car Occupants Involved in Fatal Crashes

	Restraint Use							
	Restraint Used		No Restraint Used		Unknown		Total	
Vehicle Type	Number	%	Number	%	Number	%	Number	%
Multipurpose Veh	1,148	32.4	1,998	56.4	397	11.2	3,543	100.0
Light Trucks	6,497	27.5	14,672	62.1	2,473	10.5	23,642	100.0
Medium Trucks	231	27.6	457	54.5	150	17.9	838	100.0
Heavy Trucks	1,973	40.3	2,166	44.3	751	15.4	4,890	100.0
Buses	186	16.8	828	74.9	92	8.3	1,106	100.0
Other Vehicles	85	11.9	501	70.4	126	17.7	712	100.0
Unknown	106	10.5	226	22.5	674	67.0	1,006	100.0
Total	10,226	28.6	20,848	58.3	4,663	13.0	35,737	100.0

Table 2-23
Restraint Usage by Vehicle Type for Non-Passenger Car Occupants Killed in Fatal Crashes

	Restraint Use							
	Restraint Used		No Restraint Used		Unknown		Total	
Vehicle Type	Number	%	Number	%	Number	%	Number	%
Multipurpose Veh	158	13.9	868	76.6	107	9.4	1,133	100.0
Light Trucks	835	11.3	5,975	80.6	602	8.1	7,412	100.0
Medium Trucks	12	9.4	92	71.9	24	18.8	128	100.0
Heavy Trucks	74	10.2	506	69.4	149	20.4	729	100.0
Buses	0	0.0	47	94.0	3	6.0	50	100.0
Other Vehicles	26	9.5	217	79.5	30	11.0	273	100.0
Unknown	23	15.2	102	67.5	26	17.2	151	100.0
Total	1,128	11.4	7,807	79.1	941	9.5	9,876	100.0

Chapter 3
1989 Fatality Profile

1989 Fatality Distributions

In 1989, an average of one person was killed in traffic crashes every 12 minutes - a total of 45,555 lives were claimed. Both the numbers of fatalities and fatal crashes decreased slightly from 1988. The number of fatal crashes decreased by 3.4% and the number of fatalities decreased by 3.3%.

Table 3-1
Vehicles Involved in Fatal Crashes by Vehicle Type and Year

Vehicle Type	1984		1985		1986		1987		1988		1989	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Passenger Cars	34,665	59.8	34,310	58.9	36,219	59.6	36,580	59.2	36,977	59.0	35,384	58.2
Motorcycles	4,483	7.7	4,457	7.6	4,309	7.1	3,864	6.2	3,547	5.7	3,081	5.1
Other Motorized Cycles	176	0.3	151	0.3	261	0.4	203	0.3	168	0.3	113	0.2
Multipurpose	1,043	1.8	1249	2.1	1335	2.2	1,551	2.5	1,682	2.7	1,890	3.1
Light Trucks	10,930	18.9	11,215	19.2	11,992	19.7	12,963	21.0	13,604	21.7	13,801	22.7
Medium Trucks	687	1.2	661	1.1	667	1.1	717	1.2	691	1.1	672	1.1
Heavy Trucks	4,437	7.7	4,492	7.7	4,430	7.3	4,391	7.1	4,550	7.3	4,310	7.1
Buses	303	0.5	304	0.5	262	0.4	353	0.6	287	0.5	311	0.5
Other Vehicles	468	0.8	480	0.8	409	0.7	434	0.7	453	0.7	447	0.7
Unknown	780	1.3	952	1.6	908	1.5	780	1.3	744	1.2	825	1.4
Total	57,972	100.0	58,271	100.0	60,792	100.0	61,836	100.0	62,703	100.0	60,834	100.0

Most of those killed in traffic crashes were occupants of passenger cars (55.0%, Figure 3-1), which were 58.2% of the vehicles involved in fatal crashes. The proportion of passenger car involvements in fatal crashes, as shown in Table 3-1 decreased from 1988 to 1989 (3.0%).

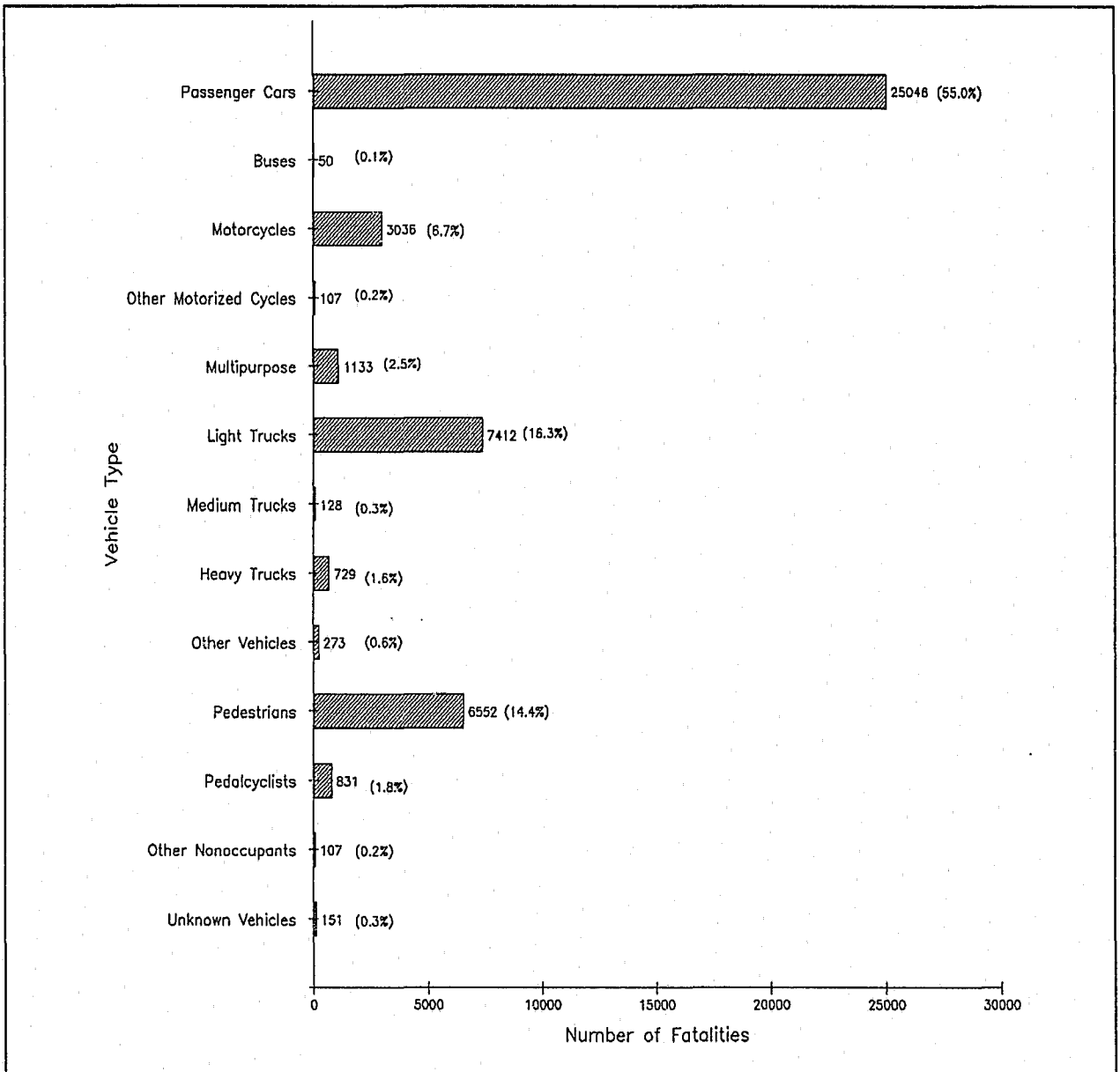

Figure 3-1
Distribution of 1989 Fatalities by Vehicle Type and Nonoccupants

Table 3-2 indicates that the proportion of passenger car occupant fatalities remained about the same, 65.9% in 1988 compared to 65.8% in 1989. By person role, drivers have always represented the largest proportion of those killed in traffic crashes (57.9%, Table 3-3).

Table 3-2
Occupants Killed by Vehicle Type and Year

Vehicle Type	1984		1985		1986		1987		1988		1989	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Passenger Cars	23,621	65.1	23,214	64.4	24,944	65.2	25,132	65.2	25,808	65.9	25,046	65.8
Motorcycles	4,431	12.2	4,417	12.3	4,309	11.3	3,834	9.9	3,492	8.9	3,036	8.0
Other Motorized Cycles	177	0.5	147	0.4	257	0.7	202	0.5	170	0.4	107	0.3
Multipurpose	723	2.0	855	2.4	927	2.4	1,050	2.7	1,040	2.7	1,133	3.0
Light Trucks	5,773	15.9	5,834	16.2	6,390	16.7	7,008	18.2	7,266	18.5	7,412	19.5
Medium Trucks	153	0.4	157	0.4	145	0.4	125	0.3	125	0.3	128	0.3
Heavy Trucks	921	2.5	820	2.3	781	2.0	727	1.9	786	2.0	729	1.9
Buses	45	0.1	55	0.2	39	0.1	51	0.1	54	0.1	50	0.1
Other Vehicles	305	0.8	333	0.9	244	0.6	293	0.8	310	0.8	273	0.7
Unknown	135	0.4	211	0.6	198	0.5	143	0.4	119	0.3	151	0.4
Total	36,284	100.0	36,043	100.0	38,234	100.0	38,565	100.0	39,170	100.0	38,065	100.0

Table 3-3
Distribution of Fatalities by Person Type and Year

	1984		1985		1986		1987		1988		1989	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Drivers	25,589	57.8	25,337	58.0	26,630	57.8	26,833	57.8	27,253	57.9	26,379	57.9
Passengers	10,586	23.9	10,619	24.2	11,498	24.9	11,623	25.1	11,805	25.1	11,611	25.5
Unknown Occupants	109	0.3	84	0.3	133	0.3	109	0.2	112	0.2	75	0.2
Pedestrians	7,025	15.9	6,808	15.5	6,779	14.7	6,745	14.5	6,870	14.6	6,552	14.4
Pedalcylists	849	1.9	890	2.0	941	2.0	948	2.0	911	1.9	831	1.8
Other Nonoccupants	99	0.2	87	0.2	106	0.2	132	0.3	136	0.3	107	0.2
Total	44,257	100.0	43,825	100.0	46,087	100.0	46,390	100.0	47,087	100.0	45,555	100.0

Table 3-4
Distribution of Occupant Fatalities by Age and Person Type

Age	Drivers Number	%	Passengers Number	%	Unknown Number	%	Total Number	%
Under 6	1	0.0	842	7.3	1	1.3	844	2.2
6 to 12	40	0.2	663	5.7	0	0.0	703	1.8
13 to 15	197	0.7	600	5.2	2	2.7	799	2.1
16 to 17	1,166	4.4	949	8.2	5	6.7	2120	5.6
18 to 20	2,932	11.1	1,437	12.4	16	21.3	4385	11.5
21 to 24	3,460	13.1	1,264	10.9	14	18.7	4738	12.4
25 to 34	6,787	25.7	1,875	16.1	23	30.7	8685	22.8
35 to 44	4,102	15.6	941	8.1	10	13.3	5053	13.3
45 to 54	2,420	9.2	644	5.5	3	4.0	3067	8.1
55 to 64	1,934	7.3	651	5.6	1	1.3	2586	6.8
Over 64	3,317	12.6	1,703	14.7	0	0.0	5020	13.2
Unknown	23	0.1	42	0.4	0	0.0	65	0.2
Total	26,379	100.0	11,611	100.0	75	100.0	38,065	100.0

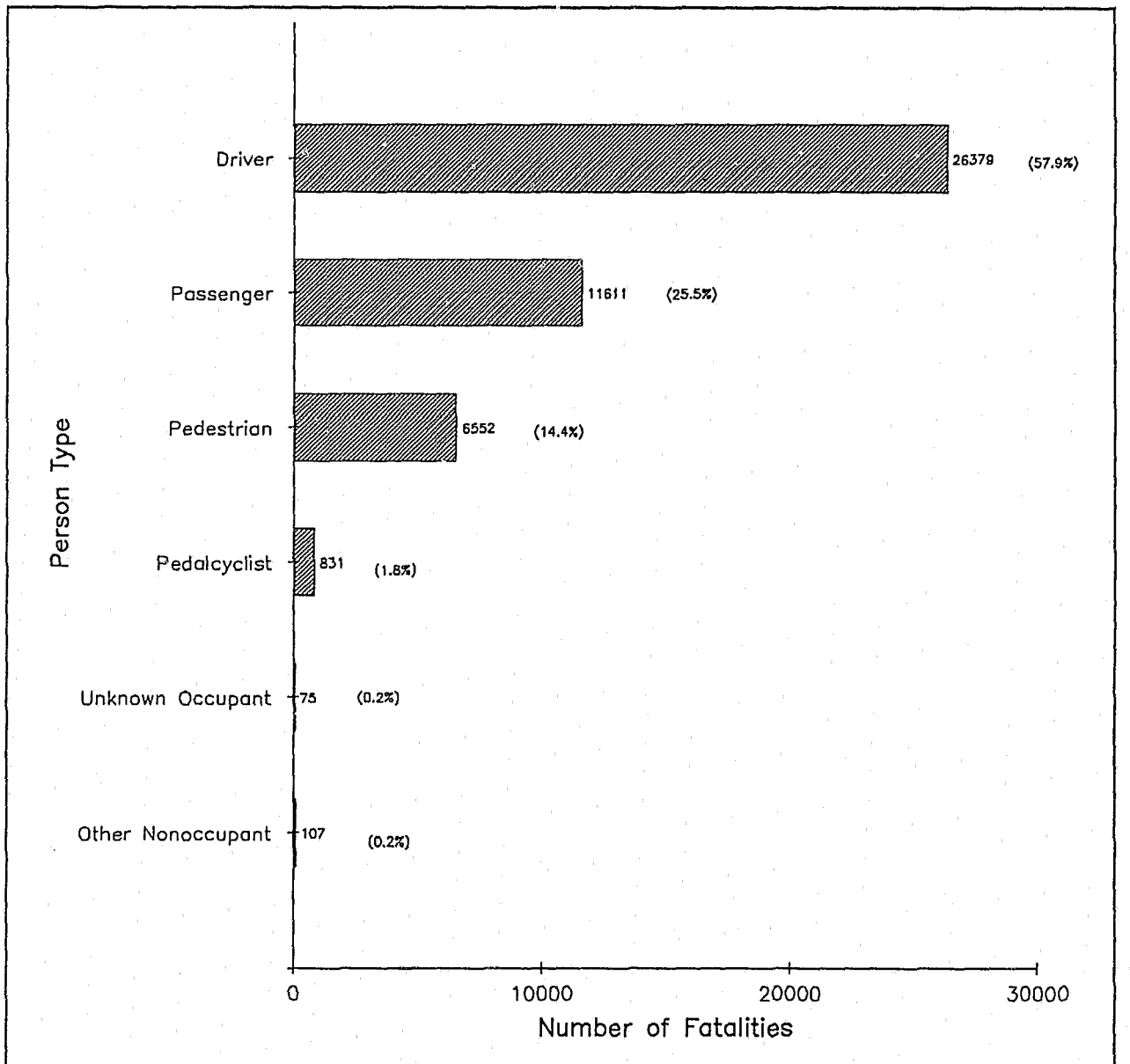

Figure 3-2
Distribution of 1989 Fatalities by Person Type

Figures 3-3 and 3-4 depict the distribution of fatalities by first harmful event in single vehicle crashes and first harmful event and manner of collision for multi-vehicle crashes. Almost half (48.9%) of all single vehicle crashes involved a collision with a fixed object, such as a tree, utility pole, sign, guard rail, stationary structure, or substantial vegetation. Head-on and angle collisions combined accounted for 79.5% of all fatalities in multi-vehicle crashes. Nonoccupants comprised 26.7% of those who died in single vehicle crashes, but only 1.9% of those killed in multi-vehicle crashes.

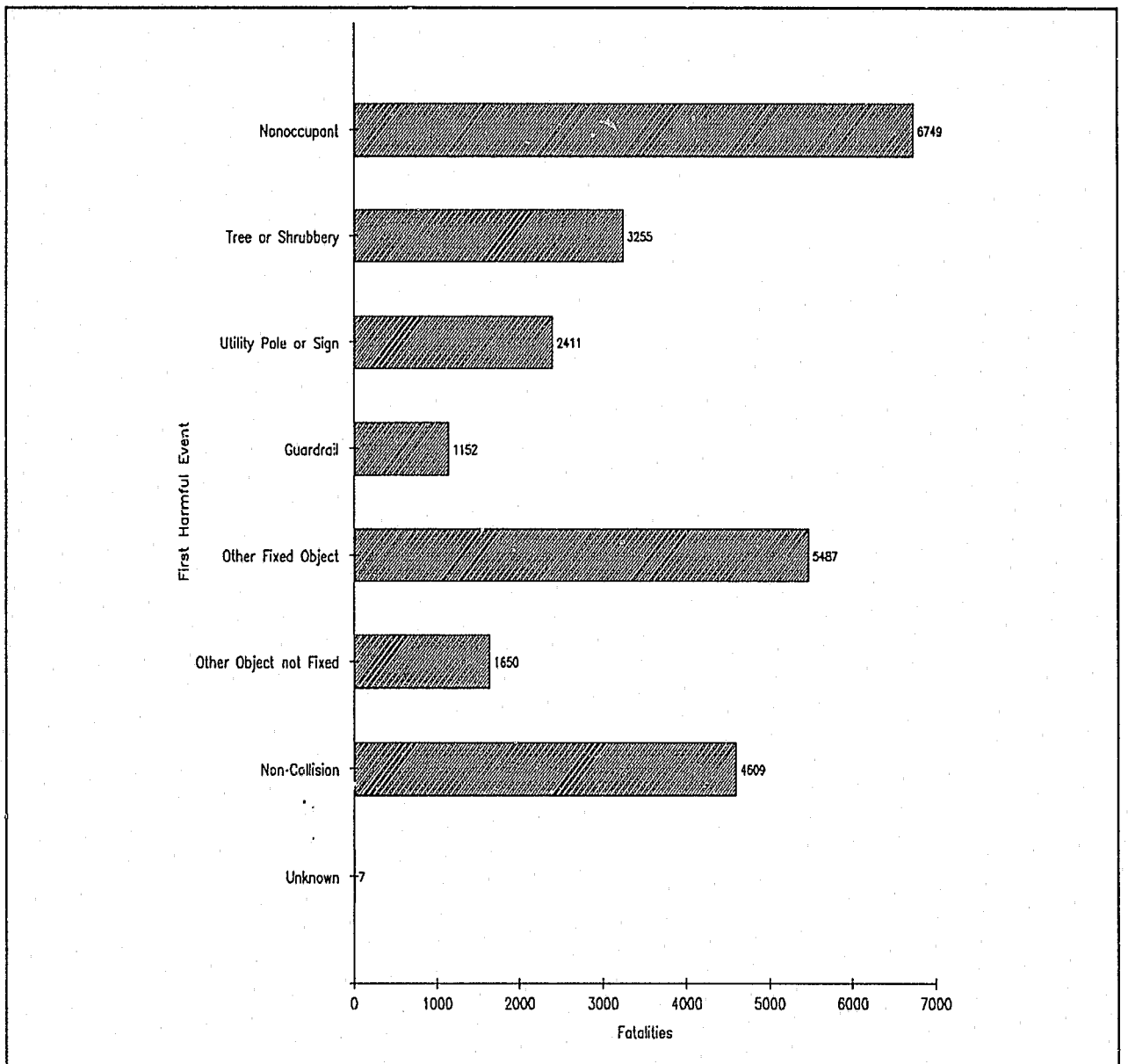

Figure 3-3
Distribution of Fatalities by First Harmful Event
Single Vehicle Accidents (25,320)

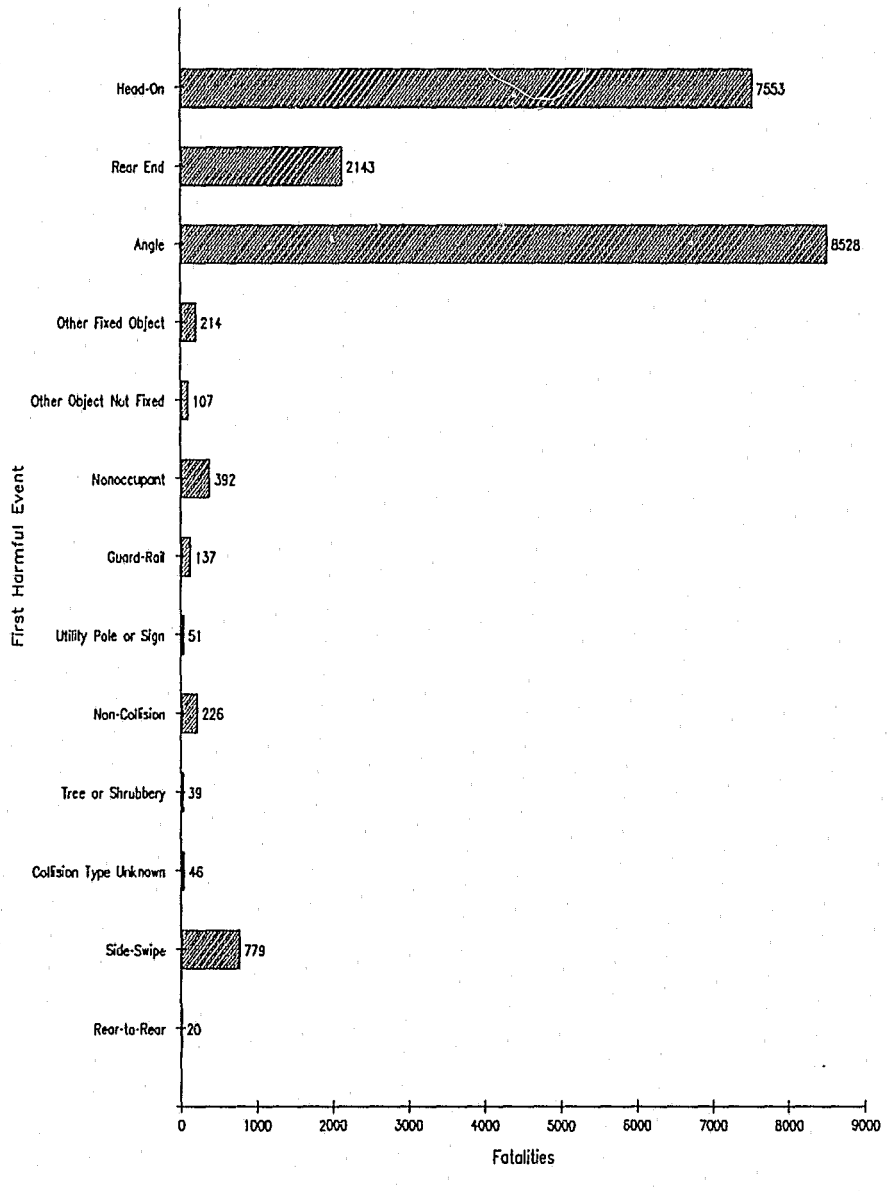

Figure 3-4
Distribution of Fatalities by First Harmful Event and Manner of Collision
Multi-Vehicle Accidents (20,235)

About one half (49.7%) of the passengers who were fatally injured were under 25 years old, and 55.2% of the drivers were under 35 years age (Table 3-4). Young people between the ages of 15 and 24 years of age were overrepresented in occupant fatalities while senior citizens over the age of 64 were overrepresented in nonoccupant fatalities (Figure 3-5).

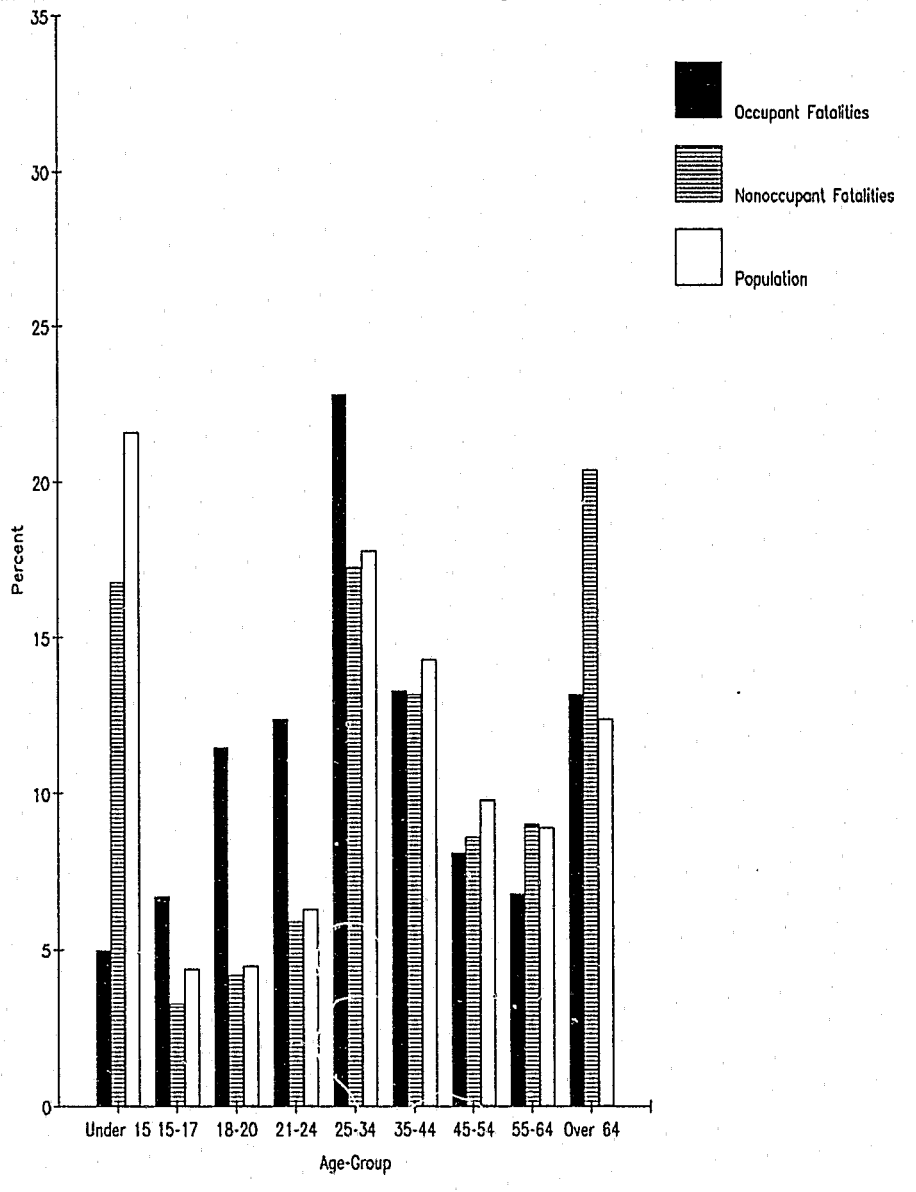

Figure 3-5
Percent Distribution of U.S. Population and Fatalities by Age Group

Fatalities by month and person type are presented in Table 3-5. Seasonal variations are indicated by the distribution of motorcycle fatalities from May through September (61.9%). Nonoccupant fatalities were fairly evenly distributed throughout the year.

Table 3-5
Fatalities by Month and Person Type

Accident Month	Motorcyclists Number	%	Nonoccupant Number	%	All Others Number	%	Total Number	%
January	97	3.1	649	8.7	2,588	7.4	3,334	7.3
February	91	2.9	509	6.8	2,362	6.8	2,962	6.5
March	190	6.1	578	7.7	2,782	8.0	3,550	7.8
April	274	8.7	531	7.1	2,800	8.0	3,605	7.9
May	375	11.9	576	7.7	2,829	8.1	3,780	8.3
June	371	11.8	573	7.7	2,913	8.4	3,857	8.5
July	454	14.4	634	8.5	3,162	9.1	4,250	9.3
August	434	13.8	679	9.1	3,061	8.8	4,174	9.2
September	313	10.0	680	9.1	3,103	8.9	4,096	9.0
October	309	9.8	769	10.3	3,151	9.0	4,229	9.3
November	148	4.7	637	8.5	2,885	8.3	3,670	8.1
December	87	2.8	675	9.0	3,286	9.4	4,048	8.9
Total	3,143	100.0	7,490	100.0	34,922	100.0	45,555	100.0

Table 3-6 illustrates the distribution of occupants by age group and person role. Drivers aged 18 to 44 constituted the largest proportion of drivers (66.7%). More than half (58.5%) of all occupants also fell into this age group. Although senior citizens over the age of 64 comprised only 8.4% of the total occupants, they accounted for 13.2% of all occupant fatalities (Table 3-4).

Table 3-6
Distribution of Occupants by Age Group and Person Type

Age	Drivers Number	%	Passengers Number	%	Unknown Number	%	Total Number	%
Under 6	1	0.0	3,622	8.9	1	0.7	3,624	3.6
6 to 12	44	0.1	3,656	9.0	0	0.0	3,700	3.6
13 to 15	359	0.6	2,658	6.5	3	2.0	3,020	3.0
16 to 17	2,900	4.8	3,498	8.6	10	6.6	6,408	6.3
18 to 20	6,529	10.8	4,996	12.2	25	16.4	11,550	11.4
21 to 24	7,717	12.8	4,394	10.8	33	21.7	12,144	12.0
25 to 34	15,919	26.4	6,320	15.5	45	29.6	22,284	22.0
35 to 44	10,100	16.7	3,213	7.9	15	9.9	13,328	13.1
45 to 54	6,031	10.0	1,942	4.8	3	2.0	7,976	7.9
55 to 64	4,200	7.0	1,639	4.0	1	0.7	5,840	5.8
Over 64	5,426	9.0	3,088	7.6	0	0.0	8,514	8.4
Unknown	1,172	1.9	1,766	4.2	16	10.5	2,954	2.9
Total	60,398	100.0	40,792	100.0	152	100.0	101,342	100.0

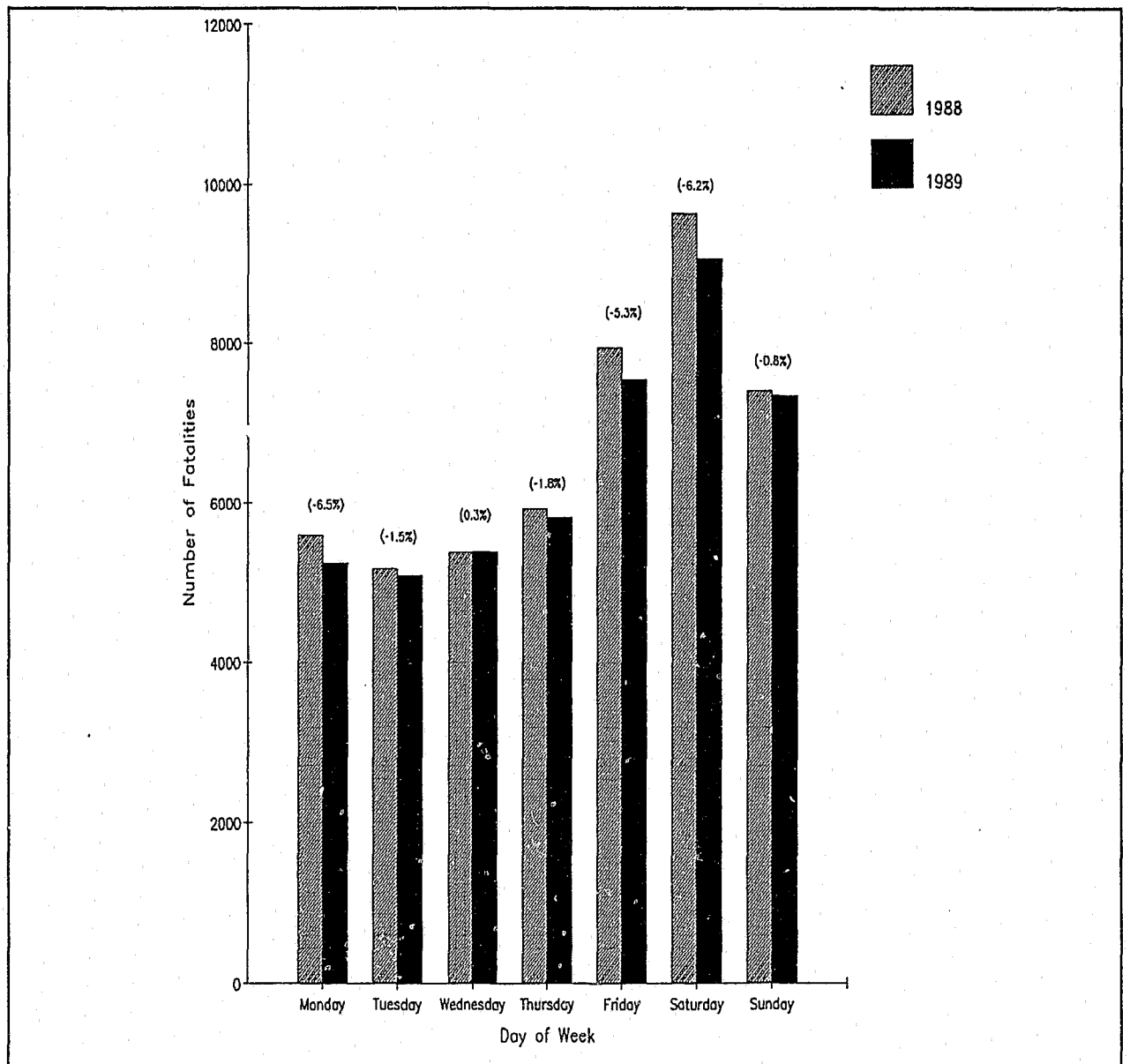

Figure 3-6
Percentage Change in Fatalities by Day of Week and Year

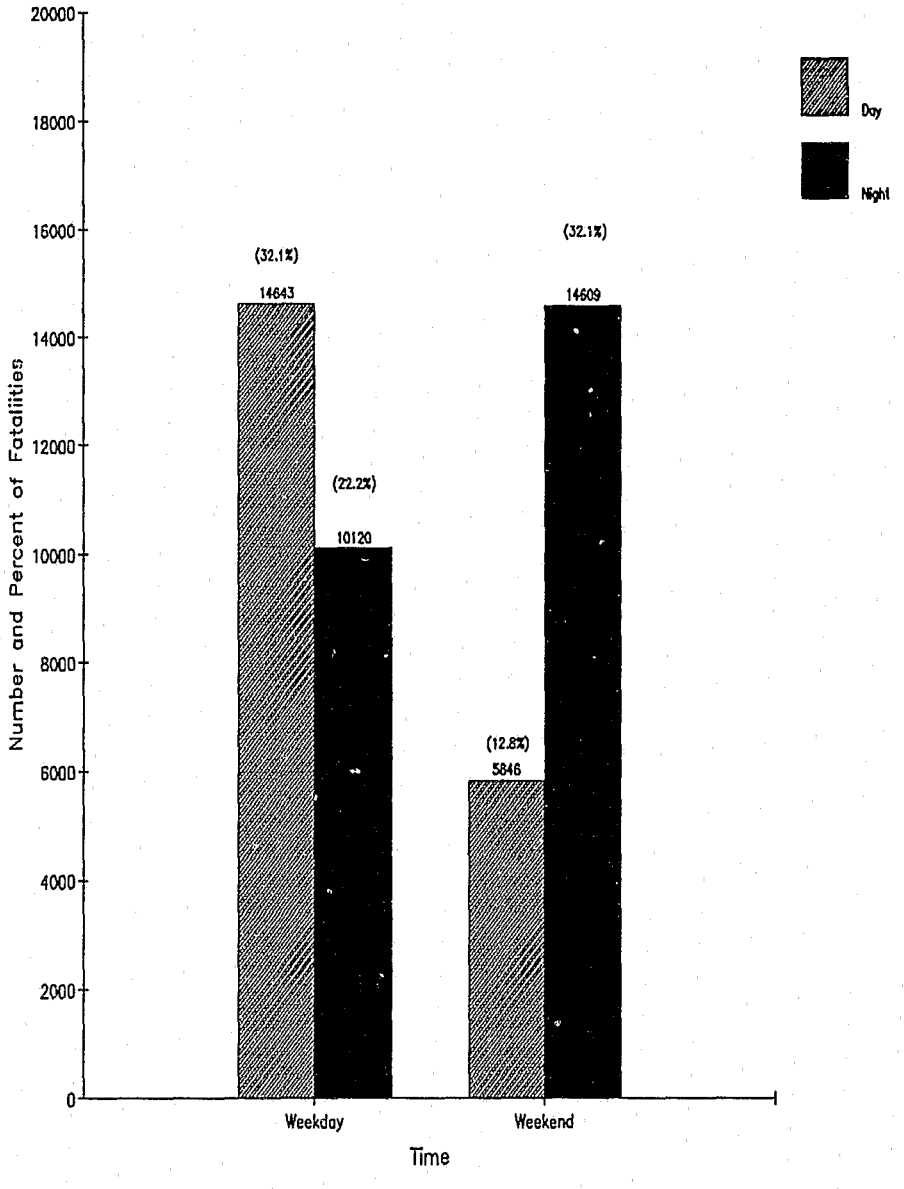

Figure 3-7
Number and Percent of Fatalities by Time of Day and Day of the Week

Males continued to outnumber females as fatal crash victims in every age group (Figure 3-8). Between the ages of 15 and 44, males outnumber females by almost three to one. (Table does not include 13 fatalities of unknown sex.)

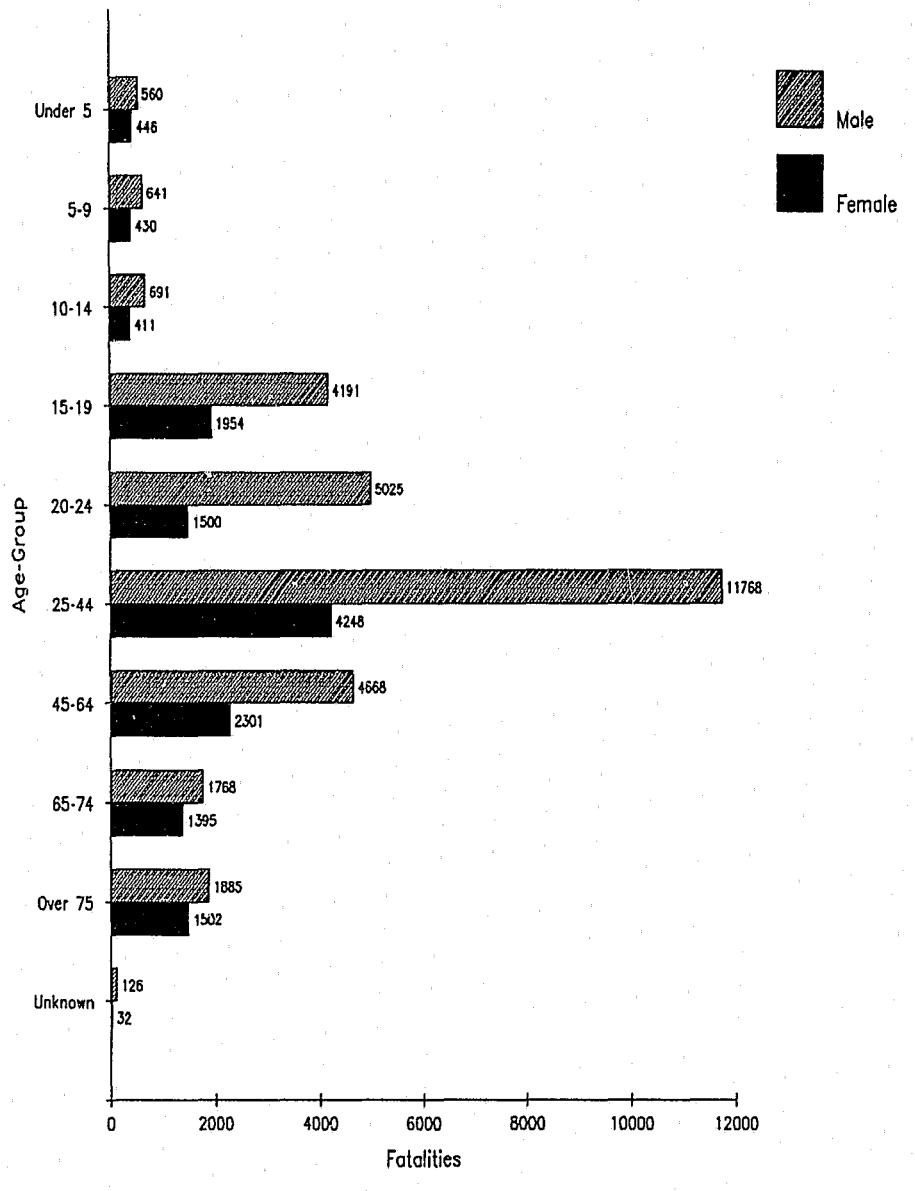

Figure 3-8
Fatalities by Age Group and Sex

As Figure 3-9 shows, almost half (49.5%) of all fatal crashes occurred on arterial roads.

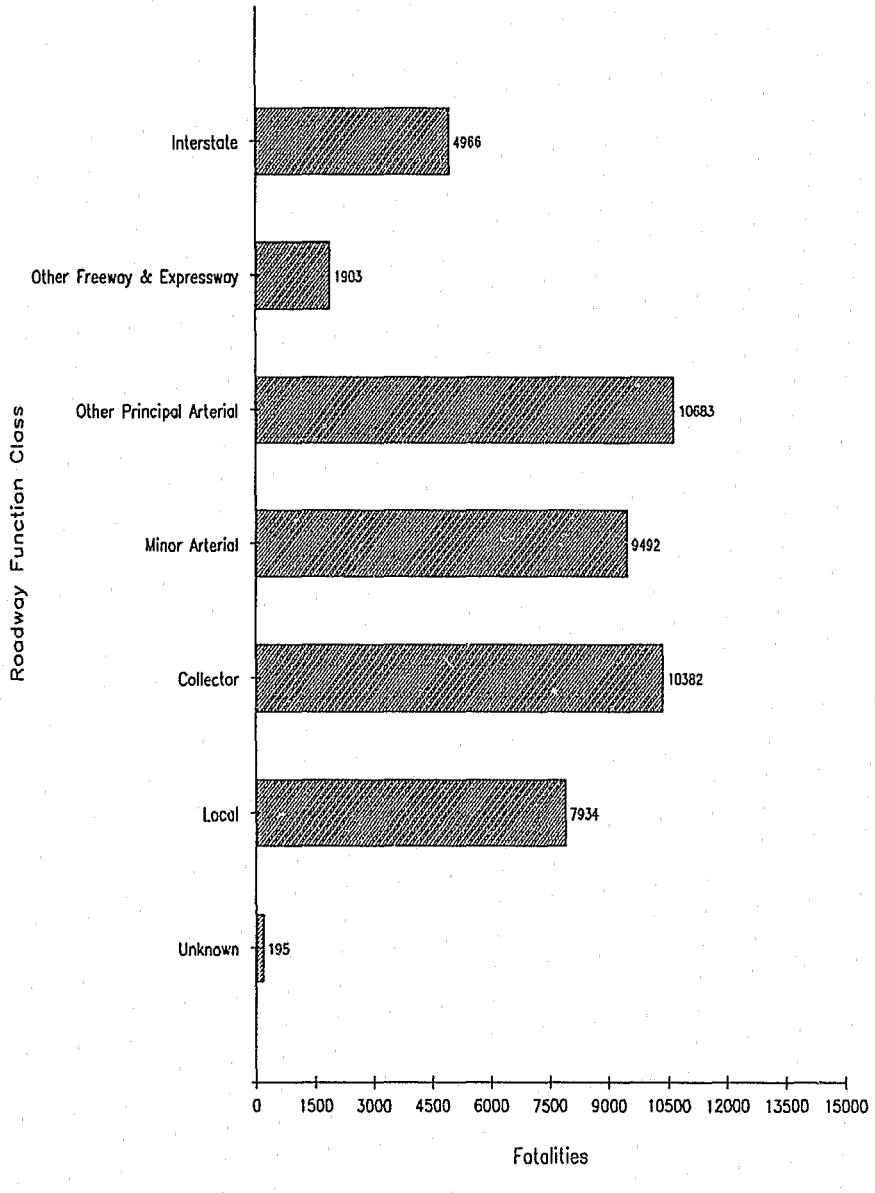

Figure 3-9
Distribution of Fatalities by Roadway Function Class

Almost 90% of the traffic fatalities in 1989 died within 24 hours of the crash (Figure 3-10).

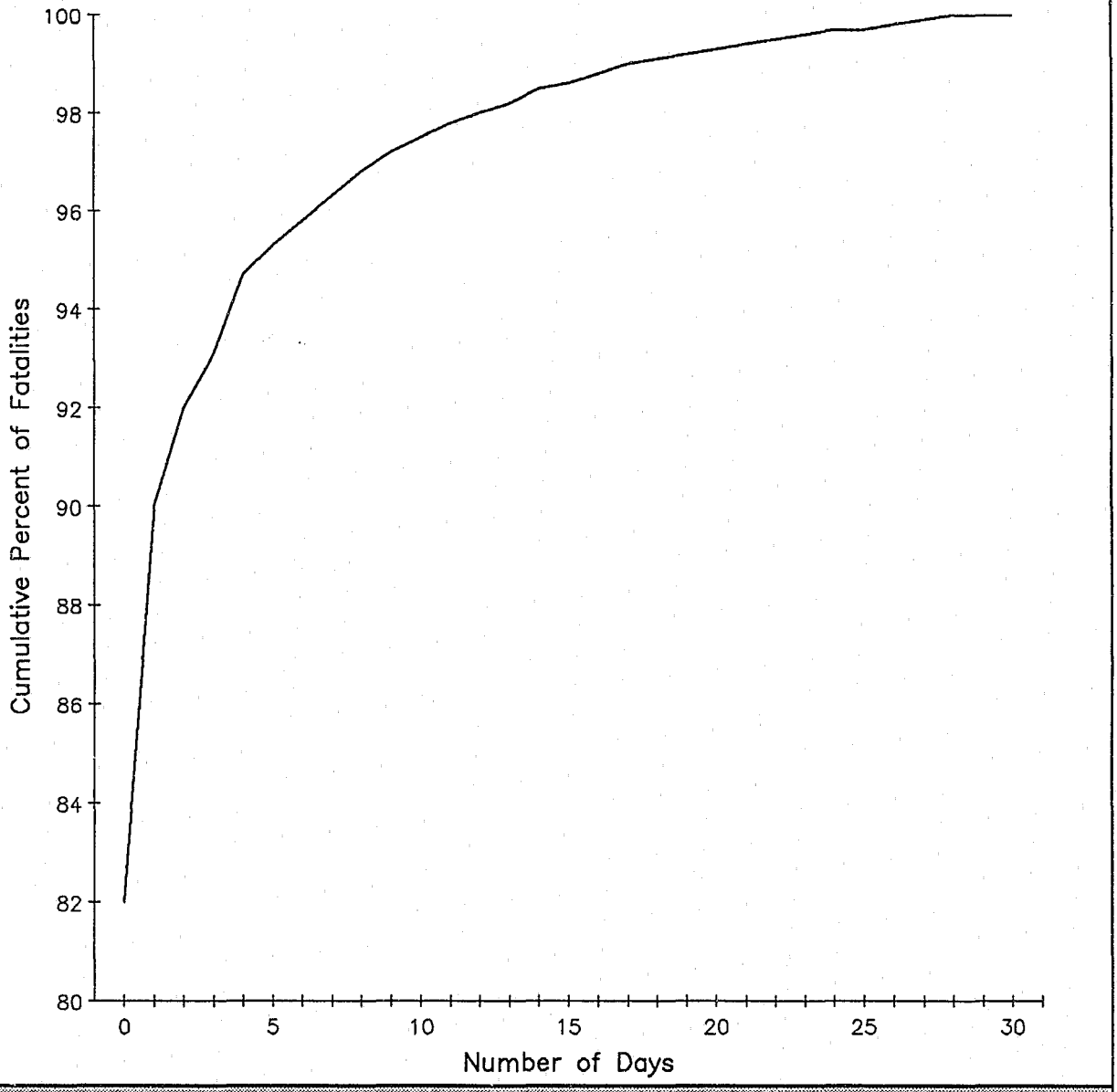

Figure 3-10
Cumulative Percent of Fatalities by Number of Days Between Crash and Death

Chapter 4
State Statistics

Fatalities and Fatal Crashes By State

The fatality rate for 1989 was an all time low of 2.2 fatalities per 100 million vehicle miles traveled. The number of fatalities and percent change from 1988 for each state are shown in Table 4-2. The ranking of states by fatality rate is shown in Table 4-1A and is calculated using VMT from the Federal Highway Administration.

Table 4-1 illustrates fatality rates per licensed driver, per population, and per VMT. The greatest number of fatalities per 100 million VMT were from the states of New Mexico (3.4), Nevada (3.3), and Mississippi and Arkansas (3.2).

Table 4-2 lists fatalities for each state from 1984 through 1989 and compares fatalities for 1988 and 1989. The number of fatalities decreased nationally by 3.3% in 1989. The largest decrease occurred in Delaware, 27.5 percent. However, total fatalities in the state are low and statistical fluctuations of this sort are not unusual. The District of Columbia and 17 states reported increases in fatalities, 32 states reported decreases and one state showed no change.

Table 4-4 indicates state fatality percentages by roadway function class. Almost one-fourth (23.5%) of all fatal crashes nationwide occurred on principal arterial roads other than interstates, freeways, or expressways.

As Table 4-5 indicates, adults aged 25 to 64 accounted for 50.5% of the fatalities across the nation. Children under age 5 were the least represented age group nationwide, comprising only 2.2% of all fatalities. Although passenger cars accounted for the greatest number of occupant fatalities across the country (65.8%), these statistics varied from state to state (Table 4-6). For example, In New Jersey, occupants of passenger cars comprised 76.2% of all fatalities, while in Wyoming they were only 39.0 percent. Light truck occupants were 19.5% of the fatalities nationwide, but in Wyoming they were 36.6%; in contrast, light truck occupants were only 9.8% of the fatalities in both New Hampshire and the District of Columbia.

Table 4-7 indicates that collisions with a motor vehicle and with a fixed object were the two most frequently reported harmful events in most states. However, a few rural states - Utah, North Dakota, Nevada and Wyoming, for example - reported high rates of vehicle overturn (rollovers) in fatal crashes. In the District of Columbia, 42.9% of all fatal crashes were collisions with nonoccupants. This pattern is typical for urban areas.

Fatal crash totals and monthly percentages for each state are listed in Table 4-8. States experiencing severe winter weather conditions had fewer fatal crashes during the winter than during the rest of the year. For example, Idaho had 212 fatal crashes in 1989; of these, 12.7% were in December, January and February; while 34.5% were in July, August and September.

Table 4-1
1989 Fatality Rates per Licensed Drivers, per Population, and per Vehicle Miles Traveled (VMT) by State

State	Total Fatalities	Licensed Drivers (1,000)	Fatalities per 100,000 Drivers	Population (Thousands)	Rate per 100,000 Population	Vehicle Miles Traveled (millions)	Fatalities per 100 million VMT
Alabama	1,029	2,844	36.18	4,118	24.99	40,765	2.5
Alaska	84	300	28.00	527	15.94	3,887	2.2
Arizona	879	2,372	37.06	3,556	24.72	34,816	2.5
Arkansas	647	1,711	37.81	2,406	26.89	20,414	3.2
California	5,412	19,570	27.65	29,063	18.62	251,482	2.2
Colorado	528	2,116	24.95	3,317	15.92	27,577	1.9
Connecticut	406	2,374	17.10	3,239	12.53	26,183	1.6
Delaware	116	481	24.12	673	17.24	6,446	1.8
Dist of Col	72	394	18.27	604	11.92	3,414	2.1
Florida	2,982	9,006	33.11	12,671	23.53	108,877	2.7
Georgia	1,632	4,318	37.80	6,436	25.36	75,705	2.2
Hawaii	149	657	22.68	1,112	13.40	7,750	1.9
Idaho	238	706	33.71	1,014	23.47	8,422	2.8
Illinois	1,748	7,205	24.26	11,658	14.99	81,297	2.2
Indiana	971	3,838	25.30	5,593	17.36	56,192	1.7
Iowa	514	1,922	26.74	2,840	18.10	22,571	2.3
Kansas	428	1,704	25.12	2,513	17.03	21,913	2.0
Kentucky	772	2,392	32.27	3,727	20.71	32,165	2.4
Louisiana	874	2,574	33.95	4,382	19.95	37,914	2.3
Maine	193	887	21.76	1,222	15.79	11,739	1.6
Maryland	726	3,098	23.43	4,694	15.47	38,922	1.9
Massachusetts	700	4,258	16.44	5,913	11.84	46,214	1.5
Michigan	1,631	6,422	25.40	9,273	17.59	79,890	2.0
Minnesota	604	2,429	24.87	4,353	13.88	37,393	1.6
Mississippi	726	1,842	39.41	2,621	27.70	22,895	3.2
Missouri	1,052	3,537	29.74	5,159	20.39	48,087	2.2
Montana	181	598	30.27	806	22.46	8,250	2.2
Nebraska	296	1,065	27.79	1,611	18.37	13,781	2.1
Nevada	308	794	38.79	1,111	27.72	9,408	3.3
New Hampshire	187	809	23.11	1,107	16.89	9,819	1.9
New Jersey	891	5,615	15.87	7,736	11.52	59,898	1.5
New Mexico	538	1,063	50.61	1,528	35.21	15,839	3.4
New York	2,257	10,178	22.18	17,950	12.57	106,059	2.1
North Carolina	1,471	4,484	32.81	6,571	22.39	60,877	2.4
North Dakota	81	425	19.06	660	12.27	5,849	1.4
Ohio	1,772	7,370	24.04	10,907	16.25	84,418	2.1
Oklahoma	648	2,293	28.26	3,224	20.10	32,836	2.0
Oregon	626	2,190	28.58	2,820	22.20	25,820	2.4
Pennsylvania	1,877	7,797	24.07	12,040	15.59	83,855	2.2
Rhode Island	100	676	14.79	998	10.02	6,740	1.5
South Carolina	996	2,339	42.58	3,512	28.36	32,780	3.0
South Dakota	152	492	30.89	715	21.26	6,704	2.3
Tennessee	1,088	3,432	31.70	4,940	22.02	45,639	2.4
Texas	3,357	11,103	30.24	16,991	19.76	159,512	2.1
Utah	303	1,027	29.50	1,707	17.75	13,915	2.2
Vermont	116	410	28.29	567	20.46	5,765	2.0
Virginia	1,004	4,234	23.71	6,098	16.46	59,337	1.7
Washington	781	3,273	23.86	4,761	16.40	43,233	1.8
West Virginia	468	1,306	35.83	1,857	25.20	14,940	3.1
Wisconsin	817	3,294	24.80	4,867	16.79	43,086	1.9
Wyoming	127	333	38.14	475	26.74	5,750	2.2
Total	45,555	165,555 *	27.52	248,239	18.35	2,107,040	2.2
Puerto Rico	542	1,392	38.94	N/A	N/A	12,718	4.3

* The sum of Individual State Data may not equal National totals because numbers have been rounded.
Sources: Fatalities - Fatal Accident Reporting System (FARS)
Licensed Drivers & VMT - Federal Highway Administration (FHWA)
Population - Bureau of the Census

Table 4-1A
Ranking of State Fatality Rates

Rank	State	Fatalities	Miles Traveled (Millions)	Fatality Rate Per 100 Million VMT
1	New Mexico	538	15,839	3.4
2	Nevada	308	9,408	3.3
3	Mississippi	726	22,895	3.2
4	Arkansas	647	20,414	3.2
5	West Virginia	468	14,940	3.1
6	South Carolina	996	32,780	3.0
7	Idaho	238	8,422	2.8
8	Florida	2,982	108,877	2.7
9	Arizona	879	34,816	2.5
10	Alabama	1,029	40,765	2.5
11	Oregon	626	25,820	2.4
12	North Carolina	1,471	60,877	2.4
13	Kentucky	772	32,165	2.4
14	Tennessee	1,088	45,639	2.4
15	Louisiana	874	37,914	2.3
16	Iowa	514	22,571	2.3
17	South Dakota	152	6,704	2.3
18	Pennsylvania	1,877	83,855	2.2
19	Wyoming	127	5,750	2.2
20	Montana	181	8,250	2.2
21	Missouri	1,052	48,087	2.2
22	Utah	303	13,915	2.2
23	Alaska	84	3,887	2.2
24	Georgia	1,632	75,705	2.2
25	California	5,412	251,482	2.2
26	Illinois	1,748	81,297	2.2
27	Nebraska	296	13,781	2.1
28	New York	2,257	106,059	2.1
29	Dist of Columbia	72	3,414	2.1
30	Texas	3,357	159,512	2.1
31	Ohio	1,772	84,418	2.1
32	Michigan	1,631	79,890	2.0
33	Vermont	116	5,765	2.0
34	Oklahoma	648	32,836	2.0
35	Kansas	428	21,913	2.0
36	Hawaii	149	7,750	1.9
37	Colorado	528	27,577	1.9
38	New Hampshire	187	9,819	1.9
39	Wisconsin	817	43,086	1.9
40	Maryland	726	38,922	1.9
41	Washington	781	43,233	1.8
42	Delaware	116	6,446	1.8
43	Indiana	971	56,192	1.7
44	Virginia	1,004	59,337	1.7
45	Maine	193	11,739	1.6
46	Minnesota	604	37,393	1.6
47	Connecticut	406	26,183	1.6
48	Massachusetts	700	46,214	1.5
49	New Jersey	891	59,898	1.5
50	Rhode Island	100	6,740	1.5
51	North Dakota	81	5,849	1.4
	Total	45,555	2,107,040	2.2

Ranking of states is based on actual fatality rate which is shown to one decimal place for reporting purposes.
The sum of individual state VMT may not equal national totals because numbers have been rounded.

Table 4-2
Fatalities by Year for 1984 to 1989 and Percent Change in Fatalities Between 1988 and 1989 by State

State	Year 1984	1985	1986	1987	1988	1989	Percent Change '88-'89
Alabama	932	882	1,081	1,111	1,024	1,029	0.5
Alaska	134	127	101	76	97	84	-13.4
Arizona	869	893	1,007	939	944	879	-6.9
Arkansas	525	534	603	639	610	647	6.1
California	5,020	4,960	5,253	5,504	5,392	5,412	0.4
Colorado	608	579	603	591	497	528	6.2
Connecticut	469	448	455	449	484	406	-16.1
Delaware	130	104	136	146	160	116	-27.5
Dist of Columbia	64	60	44	53	60	72	18.0
Florida	2,814	2,832	2,831	2,839	3,078	2,982	-3.1
Georgia	1,410	1,361	1,530	1,599	1,654	1,632	-1.3
Hawaii	138	126	120	139	148	149	0.7
Idaho	242	255	258	260	257	238	-7.4
Illinois	1,547	1,534	1,596	1,654	1,837	1,748	-4.8
Indiana	925	974	1,038	1,055	1,099	971	-11.6
Iowa	420	474	441	491	557	514	-7.7
Kansas	510	486	500	491	483	428	-11.4
Kentucky	754	712	805	844	838	772	-7.9
Louisiana	961	931	932	826	925	874	-5.5
Maine	232	206	214	232	256	193	-24.6
Maryland	643	729	784	814	781	726	-7.0
Massachusetts	666	742	752	689	725	700	-3.4
Michigan	1,531	1,545	1,605	1,602	1,708	1,631	-4.5
Minnesota	582	608	571	530	612	604	-1.3
Mississippi	679	662	771	756	722	726	0.6
Missouri	967	931	1,129	1,045	1,103	1,052	-4.6
Montana	238	223	222	234	198	181	-8.6
Nebraska	285	237	290	297	261	296	13.4
Nevada	249	259	233	262	286	308	7.7
New Hampshire	192	191	172	179	166	187	12.7
New Jersey	922	964	1,039	1,023	1,051	891	-15.2
New Mexico	497	535	499	568	487	538	10.5
New York	2,060	2,006	2,121	2,339	2,256	2,257	0.0
North Carolina	1,450	1,482	1,647	1,584	1,573	1,471	-6.5
North Dakota	100	90	100	101	104	81	-22.1
Ohio	1,646	1,646	1,673	1,772	1,748	1,772	1.4
Oklahoma	797	744	698	597	638	648	1.6
Oregon	572	559	619	619	677	626	-7.5
Pennsylvania	1,727	1,771	1,894	1,987	1,931	1,877	-2.8
Rhode Island	79	109	124	113	125	100	-20.0
South Carolina	916	951	1,059	1,086	1,031	996	-3.4
South Dakota	143	130	134	134	147	152	3.4
Tennesse	1,095	1,101	1,230	1,247	1,266	1,088	-14.1
Texas	3,912	3,678	3,567	3,260	3,392	3,357	-1.0
Utah	315	303	313	297	297	303	2.0
Vermont	114	115	109	119	129	116	-10.1
Virginia	1,013	976	1,126	1,021	1,072	1,004	-6.3
Washington	746	744	703	780	778	781	0.4
West Virginia	438	420	440	471	460	468	1.7
Wisconsin	822	744	747	797	807	817	1.2
Wyoming	157	152	168	129	155	127	-18.1
Total	44,257	43,825	46,087	46,390	47,087	45,555	-3.3
Puerto Rico	545	593	592	614	582	542	-6.9

Table 4-3
Fatalities by Person Type

State	Driver		Passenger		Pedestrian		Pedalcyclist		Other Nonoccupants		Unknown Driver or Passenger		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
AL	662	64.3	266	25.9	82	8.0	17	1.7	2	0.2	0	0.0	1,029	100.0
AK	48	57.1	23	27.4	11	13.1	2	2.4	0	0.0	0	0.0	84	100.0
AZ	446	50.7	271	30.8	126	14.3	30	3.4	4	0.5	2	0.2	879	100.0
AR	417	64.5	168	26.0	55	8.5	7	1.1	0	0.0	0	0.0	647	100.0
CA	2,930	54.1	1,345	24.9	984	18.2	118	2.2	19	0.4	16	0.3	5,412	100.0
CO	312	59.1	145	27.5	55	10.4	12	2.3	4	0.8	0	0.0	528	100.0
CT	260	64.0	72	17.7	64	15.8	8	2.0	2	0.5	0	0.0	406	100.0
DE	68	58.6	29	25.0	17	14.7	2	1.7	0	0.0	0	0.0	116	100.0
DC	24	33.3	17	23.6	30	41.7	0	0.0	1	1.4	0	0.0	72	100.0
FL	1,509	50.6	720	24.1	655	22.0	90	3.0	3	0.1	5	0.2	2,982	100.0
GA	972	59.6	418	25.6	214	13.1	23	1.4	2	0.1	3	0.2	1,632	100.0
HI	68	45.6	45	30.2	30	20.1	6	4.0	0	0.0	0	0.0	149	100.0
ID	149	62.6	75	31.5	12	5.0	2	0.8	0	0.0	0	0.0	238	100.0
IL	976	55.8	459	26.3	283	16.2	27	1.5	1	0.1	2	0.1	1,748	100.0
IN	625	64.4	246	25.3	77	7.9	19	2.0	3	0.3	1	0.1	971	100.0
IA	328	63.8	137	26.7	40	7.8	7	1.4	0	0.0	2	0.4	514	100.0
KS	270	63.1	120	28.0	33	7.7	3	0.7	0	0.0	2	0.5	428	100.0
KY	490	63.5	206	26.7	69	8.9	5	0.6	0	0.0	2	0.3	772	100.0
LA	497	56.9	218	24.9	138	15.8	19	2.2	2	0.2	0	0.0	874	100.0
ME	115	59.6	50	25.9	25	13.0	3	1.6	0	0.0	0	0.0	193	100.0
MD	405	55.8	175	24.1	137	18.9	7	1.0	1	0.1	1	0.1	726	100.0
MA	392	56.0	152	21.7	141	20.1	15	2.1	0	0.0	0	0.0	700	100.0
MI	959	58.8	448	27.5	188	11.5	32	2.0	2	0.1	2	0.1	1,631	100.0
MN	369	61.1	154	25.5	67	11.1	10	1.7	0	0.0	4	0.7	604	100.0
MS	465	64.0	184	25.3	68	9.4	9	1.2	0	0.0	0	0.0	726	100.0
MO	693	65.9	257	24.4	90	8.6	5	0.5	4	0.4	3	0.3	1,052	100.0
MT	98	54.1	60	33.1	20	11.0	2	1.1	0	0.0	1	0.6	181	100.0
NE	187	63.2	76	25.7	27	9.1	3	1.0	0	0.0	3	1.0	296	100.0
NV	169	54.9	98	31.8	36	11.7	4	1.3	0	0.0	1	0.3	308	100.0
NH	120	64.2	53	28.3	10	5.3	3	1.6	1	0.5	0	0.0	187	100.0
NJ	449	50.4	207	23.2	217	24.4	18	2.0	0	0.0	0	0.0	891	100.0
NM	294	54.6	153	28.4	85	15.8	5	0.9	1	0.2	0	0.0	538	100.0
NY	1,126	49.9	484	21.4	580	25.7	61	2.7	6	0.3	0	0.0	2,257	100.0
NC	863	58.7	378	25.7	203	13.8	26	1.8	0	0.0	1	0.1	1,471	100.0
ND	56	69.1	12	14.8	10	12.3	3	3.7	0	0.0	0	0.0	81	100.0
OH	1,104	62.3	433	24.4	199	11.2	34	1.9	0	0.0	2	0.1	1,772	100.0
OK	408	63.0	168	25.9	62	9.6	10	1.5	0	0.0	0	0.0	648	100.0
OR	379	60.5	179	28.6	53	8.5	12	1.9	1	0.2	2	0.3	626	100.0
PA	1,142	60.8	452	24.1	247	13.2	27	1.4	9	0.5	0	0.0	1,877	100.0
RI	67	67.0	20	20.0	13	13.0	0	0.0	0	0.0	0	0.0	100	100.0
SC	622	62.4	232	23.3	120	12.0	16	1.6	6	0.6	0	0.0	996	100.0
SD	87	57.2	53	34.9	8	5.3	2	1.3	2	1.3	0	0.0	152	100.0
TN	703	64.6	283	26.0	87	8.0	6	0.6	2	0.2	7	0.6	1,088	100.0
TX	1,880	56.0	906	27.0	483	14.4	64	1.9	19	0.6	5	0.1	3,357	100.0
UT	159	52.5	96	31.7	39	12.9	7	2.3	0	0.0	2	0.7	303	100.0
VT	76	65.5	27	23.3	10	8.6	2	1.7	0	0.0	1	0.9	116	100.0
VA	585	58.3	249	24.8	140	13.9	25	2.5	4	0.4	1	0.1	1,004	100.0
WA	474	60.7	183	23.4	109	14.0	8	1.0	4	0.5	3	0.4	781	100.0
WV	296	63.2	139	29.7	32	6.8	1	0.2	0	0.0	0	0.0	468	100.0
WI	506	61.9	228	27.9	68	8.3	13	1.6	2	0.2	0	0.0	817	100.0
WY	80	63.0	42	33.1	3	2.4	1	0.8	0	0.0	1	0.8	127	100.0
Total	26,379	57.9	11,611	25.5	6,552	14.4	831	1.8	107	0.2	75	0.2	45,555	100.0
PR	183	33.8	136	25.1	196	36.2	26	4.8	1	0.1	0	0.0	542	100.0

Table 4-4
Percent of Fatalities by State and Roadway Function Class

State	Total Fatalities	Interstate	Other Freeway & Expressway	Other Principal Arterial	Minor Arterial	Collector	Local	Unknown
AL	1,029	8.6	0.0	25.6	20.1	26.5	19.1	0.0
AK	84	29.6	0.0	15.5	16.7	25.0	14.3	0.0
AZ	879	17.4	0.8	21.2	24.7	15.5	20.5	0.0
AR	647	10.8	1.2	21.5	18.2	21.3	26.6	0.3
CA	5,412	13.3	7.6	29.9	22.5	16.3	10.3	0.0
CO	528	14.8	4.2	32.2	16.9	21.2	10.8	0.0
CT	406	10.3	7.4	23.9	18.5	25.6	13.8	0.5
DE	116	8.6	0.9	33.6	16.4	25.0	15.5	0.0
DC	72	0.0	8.3	12.5	12.5	15.3	51.4	0.0
FL	2,982	9.1	21.3	16.5	15.3	9.7	26.8	1.3
GA	1,632	12.4	0.7	22.6	23.7	23.5	16.9	0.3
HI	149	6.0	19.5	14.8	32.2	22.1	5.4	0.0
ID	238	15.1	0.0	21.4	11.8	26.9	24.8	0.0
IL	1,748	10.0	0.3	16.6	35.2	22.9	15.0	0.0
IN	971	7.9	2.2	21.6	25.0	24.1	19.2	0.0
IA	514	7.6	0.0	34.2	22.0	17.1	19.1	0.0
KS	428	12.9	1.9	23.4	24.8	23.1	14.0	0.0
KY	772	9.5	0.1	18.0	19.3	41.6	11.4	0.1
LA	874	8.7	0.7	13.6	24.8	37.5	13.6	1.0
ME	193	8.8	4.7	14.0	23.3	31.6	17.6	0.0
MD	726	10.1	6.5	31.5	20.2	19.0	10.3	2.3
MA	700	8.0	9.6	34.3	0.4	30.9	16.9	0.0
MI	1,631	7.5	1.5	23.7	22.8	27.4	15.8	1.3
MN	604	7.1	1.8	23.8	24.3	34.3	8.6	0.0
MS	726	9.1	0.3	23.1	23.4	29.1	15.0	0.0
MO	1,052	13.8	2.9	26.9	15.6	26.5	14.4	0.0
MT	181	22.1	0.0	27.1	18.8	19.3	12.7	0.0
NE	296	10.8	0.0	25.3	21.3	22.0	20.6	0.0
NV	308	18.2	1.3	25.3	21.1	26.6	7.5	0.0
NH	187	12.8	3.7	15.5	20.3	28.9	15.5	3.2
NJ	891	9.5	4.0	30.3	26.6	18.6	10.9	0.0
NM	538	22.3	0.0	21.0	24.0	17.1	15.6	0.0
NY	2,257	7.3	5.9	29.5	25.5	17.5	14.2	0.1
NC	1,471	6.5	1.1	15.4	11.8	37.0	28.2	0.0
ND	81	11.1	0.0	22.2	30.9	19.8	16.0	0.0
OH	1,772	9.9	2.1	18.1	21.3	30.6	18.1	0.0
OK	648	13.4	1.9	17.1	17.4	30.6	19.6	0.0
OR	626	7.7	1.6	38.2	20.1	21.7	10.7	0.0
PA	1,877	6.7	1.6	25.6	27.6	19.6	18.9	0.1
RI	100	11.0	4.0	54.0	11.0	11.0	9.0	0.0
SC	996	7.3	0.8	11.0	22.6	31.9	18.5	7.8
SD	152	4.6	0.0	28.9	17.8	30.3	18.4	0.0
TN	1,088	11.9	0.0	22.2	25.1	25.0	15.8	0.0
TX	3,357	16.1	4.6	21.4	8.0	19.1	30.9	0.0
UT	303	27.7	0.3	9.2	15.8	5.9	40.6	0.3
VT	116	12.9	8.6	13.8	18.1	19.0	22.4	5.2
VA	1,004	11.5	1.3	23.3	27.8	25.5	10.4	0.3
WA	781	10.1	1.7	31.0	19.5	25.9	11.9	0.0
WV	468	10.5	0.9	13.9	28.0	37.2	9.6	0.0
WI	817	5.0	1.8	31.0	22.3	24.2	15.7	0.0
WY	127	32.3	2.4	18.1	18.9	21.3	7.1	0.0
Total	45,555	10.9	4.2	23.5	20.8	22.8	17.4	0.4
PR	542	0.0	14.4	15.4	12.2	23.9	34.1	0.0

Table 4-5
1989 Fatalities by State and Age Group

State	Under 5		5 to 15		16 to 20		21 to 24		25 to 64		65+		Unknown		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
AL	23	2.2	63	6.1	137	13.3	95	9.2	564	54.8	147	14.3	0	0.0	1,029	100.0
AK	0	0	12	14.3	14	16.7	3	3.6	49	58.3	6	7.1	0	0.0	84	100.0
AZ	23	2.6	55	6.3	123	14.0	94	10.7	450	51.2	131	14.9	3	0.3	879	100.0
AR	11	1.7	54	8.3	103	15.9	64	9.9	307	47.4	105	16.2	3	0.5	647	100.0
CA	110	2.0	272	5.0	805	14.9	709	13.1	2,793	51.6	686	12.7	37	0.7	5,412	100.0
CO	12	2.3	32	6.1	81	15.3	59	11.2	274	51.9	70	13.3	0	0.0	528	100.0
CT	5	1.2	18	4.4	81	20.0	64	15.8	173	42.6	65	16.0	0	0.0	406	100.0
DE	1	0.9	5	4.3	18	15.5	16	13.8	63	54.3	13	11.2	0	0.0	116	100.0
DC	1	1.4	3	4.2	9	12.5	5	6.9	40	55.6	13	18.1	1	1.4	72	100.0
FL	51	1.7	151	5.1	331	11.1	340	11.4	1,518	50.9	556	18.6	35	1.2	2,982	100.0
GA	51	3.1	94	5.8	263	16.1	174	10.7	844	51.7	193	11.8	13	0.8	1,632	100.0
HI	9	6.0	5	3.4	23	15.4	14	9.4	75	50.3	23	15.4	0	0.0	149	100.0
ID	6	2.5	24	10.1	37	15.5	22	9.2	119	50.0	30	12.6	0	0.0	238	100.0
IL	42	2.4	111	6.4	278	15.9	189	10.8	907	51.9	220	12.6	1	0.1	1,748	100.0
IN	18	1.9	72	7.4	156	16.1	110	11.3	471	48.5	143	14.7	1	0.1	971	100.0
IA	9	1.8	27	5.3	107	20.8	43	8.4	258	50.2	70	13.6	0	0.0	514	100.0
KS	15	3.5	22	5.1	76	17.8	48	11.2	202	47.2	65	15.2	0	0.0	428	100.0
KY	12	1.6	40	5.2	137	17.7	84	10.9	390	50.5	109	14.1	0	0.0	772	100.0
LA	24	2.7	55	6.3	120	13.7	110	12.6	468	53.5	97	11.1	0	0.0	874	100.0
ME	5	2.6	17	8.8	29	15.0	24	12.4	75	38.9	43	22.3	0	0.0	193	100.0
MD	8	1.1	47	6.5	101	13.9	88	12.1	380	52.3	96	13.2	6	0.8	726	100.0
MA	13	1.9	37	5.3	122	17.4	89	12.7	311	44.4	128	18.3	0	0.0	700	100.0
MI	43	2.6	109	6.7	267	16.4	165	10.1	782	47.9	265	16.2	0	0.0	1,631	100.0
MN	13	2.2	38	6.3	104	17.2	64	10.6	274	45.4	109	18.0	2	0.3	604	100.0
MS	25	3.4	53	7.3	107	14.7	90	12.4	350	48.2	95	13.1	6	0.8	726	100.0
MO	23	2.2	64	6.1	180	17.1	121	11.5	521	49.5	143	13.6	0	0.0	1,052	100.0
MT	5	2.8	15	8.3	28	15.5	9	5.0	99	54.7	25	13.8	0	0.0	181	100.0
NE	8	2.7	17	5.7	42	14.2	32	10.8	145	49.0	52	17.6	0	0.0	296	100.0
NV	4	1.3	17	5.5	38	12.3	31	10.1	179	58.1	38	12.3	1	0.3	308	100.0
NH	5	2.7	16	8.6	37	19.8	24	12.8	87	46.5	18	9.6	0	0.0	187	100.0
NJ	19	2.1	47	5.3	114	12.8	84	9.4	461	51.7	163	18.3	3	0.3	891	100.0
NM	19	3.5	31	5.8	78	14.5	71	13.2	287	53.3	51	9.5	1	0.2	538	100.0
NY	36	1.6	125	5.5	271	12.0	244	10.8	1,153	51.1	424	18.8	4	0.2	2,257	100.0
NC	41	2.8	87	5.9	218	14.8	180	12.2	751	51.1	191	13.0	3	0.2	1,471	100.0
ND	1	1.2	3	3.7	12	14.8	11	13.6	34	42.0	20	24.7	0	0.0	81	100.0
OH	45	2.5	99	5.6	303	17.1	217	12.2	848	47.9	260	14.7	0	0.0	1,772	100.0
OK	11	1.7	34	5.2	132	20.4	63	9.7	317	48.9	91	14.0	0	0.0	648	100.0
OR	15	2.4	31	5.0	101	16.1	56	8.9	323	51.6	100	16.0	0	0.0	626	100.0
PA	21	1.1	96	5.1	274	14.6	249	13.3	918	48.9	317	16.9	2	0.1	1,877	100.0
RI	1	1.0	3	3.0	19	19.0	14	14.0	47	47.0	16	16.0	0	0.0	100	100.0
SC	16	1.6	54	5.4	140	14.1	114	11.4	549	55.1	120	12.0	3	0.3	996	100.0
SD	1	0.7	16	10.5	28	18.4	14	9.2	76	50.0	17	11.2	0	0.0	152	100.0
TN	22	2.0	62	5.7	201	18.5	115	10.6	549	50.5	139	12.8	0	0.0	1,088	100.0
TX	99	2.9	224	6.7	559	16.7	375	11.2	1,692	50.4	378	11.3	30	0.9	3,357	100.0
UT	15	5.0	29	9.6	59	19.5	30	9.9	127	41.9	41	13.5	2	0.7	303	100.0
VT	1	0.9	6	5.2	19	16.4	17	14.7	51	44.0	22	19.0	0	0.0	116	100.0
VA	20	2.0	44	4.4	151	15.0	111	11.1	550	54.8	127	12.6	1	0.1	1,004	100.0
WA	12	1.5	47	6.0	121	15.5	82	10.5	410	52.5	109	14.0	0	0.0	781	100.0
WV	10	2.1	35	7.5	84	17.9	49	10.5	229	48.9	61	13.0	0	0.0	468	100.0
WI	23	2.8	51	6.2	128	15.7	94	11.5	384	47.0	137	16.8	0	0.0	817	100.0
WY	4	3.1	9	7.1	20	15.7	13	10.2	68	53.5	13	10.2	0	0.0	127	100.0
Total	1,007	2.2	2,678	5.9	6,986	15.3	5,183	11.4	22,992	50.5	6,551	14.4	158	0.3	45,555	100.0
PR	10	1.8	27	5.0	67	12.4	61	11.3	293	54.1	83	15.3	1	0.1	542	100.0

Table 4-6
Percent of 1989 Occupant Fatalities by State and Vehicle Type

State	Total Occupant Fatalities	Passenger Cars	Motor-cycles	Multi-purpose Vehicles	Light Trucks	Medium Trucks	Heavy Trucks	School Buses	Other Buses	Other Vehicles	Unknown
AL	928	67.9	3.7	2.4	22.4	0.0	2.0	0.0	0.0	1.5	0.1
AK	71	54.9	11.3	8.5	18.3	0.0	0.0	0.0	0.0	5.6	1.4
AZ	719	52.0	10.6	4.7	27.5	0.1	1.8	0.0	0.0	1.3	1.9
AR	585	55.6	3.9	2.1	32.6	0.0	3.8	0.0	0.0	1.7	0.3
CA	4,291	58.8	14.9	3.6	20.2	0.4	1.4	0.0	0.1	0.4	0.1
CO	457	59.5	8.3	6.6	20.1	0.0	2.8	0.2	0.2	2.0	0.2
CT	332	68.1	16.0	1.8	11.4	0.0	1.8	0.0	0.0	0.3	0.6
DE	97	73.2	4.1	0.0	20.6	0.0	2.1	0.0	0.0	0.0	0.0
DC	41	75.6	9.8	0.0	9.8	0.0	0.0	0.0	0.0	2.4	2.4
FL	2,234	71.2	9.5	0.4	16.6	0.0	1.6	0.0	0.1	0.4	0.1
GA	1,393	64.6	4.7	2.6	22.8	0.0	1.5	0.0	0.0	0.8	3.1
HI	113	62.8	15.0	2.7	18.6	0.0	0.0	0.0	0.0	0.9	0.0
ID	224	54.0	11.2	4.9	24.1	0.4	4.5	0.0	0.0	0.9	0.0
IL	1,437	73.9	8.9	3.3	10.8	0.2	2.4	0.1	0.0	0.4	0.0
IN	872	70.4	7.9	1.1	15.7	0.1	1.7	0.1	0.0	0.9	1.9
IA	467	63.4	9.4	2.4	19.9	0.2	2.1	0.0	0.0	2.6	0.0
KS	392	63.0	6.4	3.6	21.9	0.0	3.3	0.8	0.0	1.0	0.0
KY	698	69.5	3.3	2.9	20.6	0.0	2.4	0.1	0.0	1.0	0.1
LA	715	59.7	5.2	3.1	27.3	0.1	2.8	0.0	0.1	1.3	0.4
ME	165	72.1	10.3	0.0	12.7	0.0	3.0	0.0	0.0	1.8	0.0
MD	581	69.5	6.7	3.4	17.6	0.0	1.7	0.0	0.0	0.5	0.5
MA	544	72.2	11.8	2.9	11.2	0.2	0.7	0.0	0.0	0.0	0.9
MI	1,409	75.3	5.2	2.3	15.0	0.0	0.4	0.1	0.0	1.7	0.0
MN	527	68.9	7.4	3.4	15.9	0.9	1.1	0.0	0.0	2.3	0.0
MS	649	67.5	3.7	1.5	23.7	0.2	2.8	0.0	0.0	0.0	0.6
MO	953	63.9	4.8	3.7	22.8	0.0	3.5	0.0	0.0	1.4	0.0
MT	159	40.9	10.1	3.8	35.2	0.0	6.9	0.0	0.0	3.1	0.0
ME	266	62.8	4.9	3.4	22.2	0.0	4.9	0.0	0.0	1.9	0.0
NV	268	59.0	7.8	5.2	25.4	0.4	1.1	0.0	0.0	0.0	1.1
NH	173	68.8	13.3	5.2	9.8	0.0	1.2	0.6	0.0	0.6	0.6
NJ	656	76.2	4.7	3.0	12.0	0.5	2.9	0.0	0.3	0.2	0.2
NM	447	46.8	6.9	7.4	34.7	0.0	2.7	0.0	0.0	0.9	0.7
NY	1,610	75.3	8.7	3.3	10.4	0.2	1.2	0.1	0.1	0.6	0.2
NC	1,242	70.9	4.6	2.3	19.2	0.0	2.3	0.0	0.1	0.6	0.0
ND	68	58.8	1.5	10.3	23.5	1.5	1.5	0.0	0.0	2.9	0.0
OH	1,539	71.5	10.5	2.1	12.8	0.1	0.8	0.0	0.0	0.9	1.1
OK	576	58.2	7.6	3.6	26.6	0.2	2.8	0.0	0.0	1.0	0.0
OR	560	59.1	8.0	4.6	24.5	0.2	3.0	0.0	0.0	0.4	0.2
PA	1,594	74.3	7.1	2.2	12.5	0.3	2.6	0.0	0.0	0.9	0.1
RI	87	71.3	17.2	1.1	10.3	0.0	0.0	0.0	0.0	0.0	0.0
SC	854	66.7	6.3	0.5	21.9	0.0	1.5	0.0	0.1	1.8	1.2
SD	140	60.7	10.0	5.7	20.7	0.0	0.7	0.0	0.0	2.1	0.0
TN	993	65.7	6.0	2.2	23.4	0.1	1.8	0.0	0.0	0.7	0.1
TX	2,791	55.9	8.7	3.8	27.5	0.3	1.8	0.8	0.2	0.9	0.1
UT	257	64.2	8.9	3.5	22.6	0.0	0.8	0.0	0.0	0.0	0.0
VT	104	71.2	6.7	3.8	14.4	0.0	1.0	0.0	0.0	2.9	0.0
VA	835	70.3	4.3	3.7	17.6	0.5	2.6	0.0	0.0	1.0	0.0
WA	660	64.1	10.3	2.3	21.1	0.2	1.4	0.0	0.0	0.6	0.2
WV	435	68.5	4.4	4.8	19.3	0.0	2.5	0.0	0.0	0.5	0.0
WI	734	71.5	9.5	3.0	13.6	0.0	1.2	0.0	0.0	1.1	0.0
WY	123	39.0	7.3	12.2	36.6	0.0	3.3	0.0	0.0	1.6	0.0
Total	38,065	65.8	8.3	3.0	19.5	0.2	1.9	0.1	0.0	0.9	0.4
PR	319	77.1	11.0	4.7	6.0	0.0	0.0	0.3	0.0	0.0	0.9

Table 4-7
Percent of Fatal Crashes by State and First Harmful Event

State	Total Crashes	First Harmful Event: Collision with Mot. Veh. In Trans	Collision with Non-Occupants	Collision with Fixed Objects	Collision with Other Obj. Not Fixed	Non-Collision: Overturn	Non-Collision: Other	Unknown
AL	918	39.4	10.5	35.9	3.8	9.9	0.4	0.0
AK	79	44.3	16.5	17.7	3.8	17.7	0.0	0.0
AZ	770	35.8	19.1	19.4	3.4	20.5	1.4	0.4
AR	577	39.7	10.6	31.5	6.9	9.4	1.9	0.0
CA	4,877	34.9	21.0	25.8	4.2	13.2	1.0	0.0
CO	482	34.4	13.7	28.6	2.3	19.3	1.7	0.0
CT	379	34.8	19.3	39.1	3.4	1.8	1.6	0.0
DE	108	38.0	17.6	40.7	2.8	0.0	0.9	0.0
DC	70	24.3	42.9	25.7	2.9	0.0	4.3	0.0
FL	2,685	42.0	27.1	19.1	2.1	7.7	2.0	0.0
GA	1,422	41.8	16.1	30.4	2.7	8.2	0.8	0.0
HI	129	32.6	25.6	28.7	1.6	8.5	3.1	0.0
ID	212	33.5	6.6	25.9	4.7	26.4	2.8	0.0
IL	1,545	40.1	18.8	27.8	5.1	6.3	1.9	0.0
IN	882	48.9	10.1	29.0	5.9	4.8	1.4	0.0
IA	451	44.6	10.4	25.9	2.9	15.5	0.7	0.0
KS	371	42.3	9.4	28.6	6.5	11.9	1.3	0.0
KY	686	39.2	10.5	39.7	1.7	7.7	1.2	0.0
LA	778	38.2	19.9	33.2	3.1	4.9	0.8	0.0
ME	178	41.0	15.7	31.5	2.8	7.9	1.1	0.0
MD	654	45.3	21.3	28.1	2.3	7.9	1.1	0.0
MA	638	32.1	23.2	38.4	3.4	2.4	0.5	0.0
MI	1,464	48	14.4	25.3	3.6	7.8	0.9	0.0
MN	538	44.8	13.4	20.1	4.6	16.0	1.1	0.0
MS	621	37.5	12.4	34.9	4.8	9.5	0.8	0.0
MO	936	39.5	9.2	34.4	3.7	11.6	1.5	0.0
MT	163	30.1	12.3	27.0	1.8	26.4	2.5	0.0
NE	257	44.4	10.1	20.6	7.0	16.7	1.2	0.0
NV	276	28.6	13.8	25.0	1.1	30.4	1.1	0.0
NH	165	33.3	7.9	42.4	3.0	11.5	1.8	0.0
NJ	814	38.2	27.0	29.1	3.2	1.5	1.0	0.0
NM	469	30.3	18.8	18.1	4.3	26.4	2.1	0.0
NY	2,075	34.7	28.8	29.1	3.3	3.1	1.0	0.0
NC	1,321	44.2	16.7	29.7	2.8	5.1	1.6	0.0
ND	76	39.5	14.5	11.8	6.6	27.6	0.0	0.0
OH	1,574	42.0	13.9	36.0	4.5	2.9	0.8	0.0
OK	569	39.4	11.2	36.9	5.6	5.8	1.1	0.0
OR	546	43.0	11.4	26.4	3.1	15.4	0.7	0.0
PA	1,714	41.8	15.4	35.3	2.7	3.9	0.8	0.1
RI	97	40.2	11.3	44.3	3.1	1.0	0.0	0.0
SC	895	37.3	14.9	31.4	4.4	10.3	1.8	0.0
SD	134	36.6	8.2	30.6	3.7	14.2	6.7	0.0
TN	977	39.3	9.3	36.1	3.4	9.7	2.1	0.0
TX	2,923	37.3	17.5	24.8	5.0	13.4	2.0	0.1
UT	269	32.3	17.1	18.2	3.7	27.9	0.7	0.0
VT	109	34.9	11.0	37.6	5.5	9.2	1.8	0.0
VA	918	35.3	16.7	33.8	4.9	7.0	2.4	0.0
WA	694	39.5	16.0	26.1	2.7	15.0	0.7	0.0
WV	406	38.7	7.4	36.0	2.2	13.8	2.0	0.0
WI	714	46.8	10.1	26.8	3.2	13.0	0.1	0.0
WY	113	31.9	3.5	18.6	1.8	38.1	6.2	0.0
Total	40,718	39.2	17.2	28.8	3.7	9.7	1.3	0.0
PR	515	28.9	42.3	20.4	1.2	3.7	3.5	0.0

Table 4-8
Percent of 1989 Fatal Crashes by State and Month

State	Total Crashes	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AL	918	7.8	6.6	8.3	8.1	10.3	8.4	7.1	8.6	8.3	8.6	8.5	9.4
AK	79	5.1	8.9	6.3	2.5	15.2	6.3	8.9	10.1	11.4	11.4	10.1	3.8
AZ	770	7.1	7.7	10.5	8.3	7.9	8.6	8.6	6.9	9.5	9.5	6.4	9.1
AR	577	5.7	6.2	6.1	8.3	8.5	9.0	9.0	10.1	8.7	10.2	8.3	9.9
CA	4,877	7.3	7.2	7.6	8.0	8.5	7.5	9.8	9.4	9.3	8.8	8.2	8.2
CO	482	5.2	4.6	6.6	8.3	10.2	9.5	9.3	10.8	9.1	11.8	7.3	7.3
CT	379	6.6	6.6	7.7	7.4	8.4	7.1	8.2	9.8	9.2	9.8	9.0	10.3
DE	108	7.4	7.4	6.5	9.3	0.9	7.4	14.8	11.1	4.6	10.2	11.1	9.3
DC	70	17.1	8.6	10.0	5.7	10.0	7.1	4.3	8.6	11.4	7.1	5.7	4.3
FL	2,685	9.4	8.0	9.6	8.8	8.5	7.4	7.5	7.0	7.6	8.6	7.7	9.8
GA	1,422	6.5	6.5	8.9	7.5	7.5	9.4	9.7	8.6	8.7	9.6	8.3	8.9
HI	129	9.3	4.7	7.8	8.5	7.8	9.3	7.8	7.8	10.1	7.8	10.9	8.5
ID	212	0.9	5.2	5.2	6.1	11.3	11.3	12.3	11.8	10.4	9.9	9.0	6.6
IL	1,545	6.8	6.5	7.1	6.3	7.2	8.9	10.4	8.3	9.4	9.5	8.9	10.6
IN	882	6.8	6.6	7.8	6.1	10.3	8.8	9.9	8.8	7.9	9.2	8.7	9.0
IA	451	6.2	3.8	7.3	8.0	10.2	8.2	11.1	9.5	10.4	9.1	6.7	9.5
KS	371	6.2	6.5	9.7	7.5	8.4	7.5	9.7	6.5	8.9	12.4	6.7	10.0
KY	686	8.7	8.9	7.6	7.3	8.5	8.0	9.8	9.5	8.3	6.7	9.0	7.7
LA	778	8.0	5.9	8.0	9.5	7.1	8.7	7.6	7.2	9.1	9.3	8.6	11.1
ME	178	11.8	7.3	7.9	6.7	7.9	7.3	11.2	13.5	8.4	5.6	5.6	6.7
MD	654	6.7	6.0	7.8	7.5	8.3	7.3	10.4	9.6	9.0	10.7	7.8	8.9
MA	638	10.0	6.0	8.6	8.8	8.3	6.9	8.8	9.1	8.0	9.2	7.8	8.5
MI	1,464	8.4	6.6	5.9	5.9	7.7	9.7	9.4	10.8	9.4	8.9	7.1	10.2
MN	538	4.3	5.9	4.6	7.2	9.5	9.5	12.8	9.1	9.7	9.5	8.7	9.1
MS	621	9.3	7.6	7.1	10.5	6.1	7.7	7.4	7.9	10.3	8.7	9.3	8.1
MO	936	5.7	4.9	7.3	8.9	10.5	9.6	10.4	8.2	8.0	8.4	8.8	9.4
MT	163	6.1	2.5	9.8	4.9	6.1	6.7	16.0	12.3	13.5	7.4	8.0	6.7
NE	257	7.4	5.8	8.2	6.2	4.3	8.6	14.0	10.5	8.6	7.8	7.8	10.9
NV	276	2.5	3.6	6.5	9.4	9.8	8.3	9.1	11.6	11.2	8.7	8.0	11.2
NH	165	7.9	9.1	8.5	3.6	12.1	10.9	9.1	9.7	7.9	6.7	8.5	6.1
NJ	814	8.5	8.5	8.6	7.5	6.9	9.1	7.2	9.1	8.2	8.8	8.8	8.7
NM	469	8.1	7.0	6.8	8.1	8.7	8.3	8.1	9.8	8.7	9.2	9.4	7.7
NY	2,075	8.1	5.8	7.7	7.4	9.1	7.0	8.7	11.2	8.4	9.4	8.0	9.2
NC	1,321	6.4	6.6	8.6	8.8	8.2	9.0	9.5	7.7	8.6	10.8	7.9	7.9
ND	76	3.9	2.6	6.6	3.9	11.8	10.5	7.9	14.5	3.9	17.1	9.2	7.9
OH	1,574	7.1	6.6	6.6	8.1	8.7	8.3	8.8	10.0	9.5	10.6	6.9	8.7
OK	569	7.2	6.7	5.8	7.9	9.7	7.9	9.7	10.4	9.3	9.0	8.6	7.9
OR	546	5.5	6.0	6.2	7.1	9.5	10.3	9.3	10.4	7.9	10.4	9.3	7.9
PA	1,714	6.9	6.7	8.0	9.1	7.6	8.4	9.4	8.8	7.7	10.0	7.9	9.6
RI	97	9.3	7.2	6.2	11.3	9.3	7.2	10.3	7.2	6.2	9.3	10.3	6.2
SC	895	7.9	6.5	9.1	8.8	8.5	8.4	8.9	7.0	6.7	9.8	8.7	9.6
SD	134	6.0	7.5	5.2	6.7	9.7	8.2	11.2	13.4	13.4	6.7	6.0	6.0
TN	977	6.4	7.3	9.1	8.8	9.6	8.4	8.0	8.3	8.4	8.7	7.3	9.7
TX	2,923	7.5	6.1	8.0	8.7	8.0	9.6	8.5	10.0	9.3	8.9	7.4	8.1
UT	269	4.8	3.3	4.8	6.7	7.4	11.5	11.5	14.5	12.3	8.6	7.1	7.4
VT	109	13.8	9.2	7.3	3.7	5.5	7.3	4.6	10.1	7.3	10.1	11.9	9.2
VA	918	6.8	5.2	9.3	8.0	7.8	7.6	9.3	7.7	11.4	10.6	8.0	8.4
WA	694	5.3	4.3	7.3	6.9	9.1	8.6	9.5	8.8	11.2	10.2	8.6	9.9
WV	406	8.1	7.9	8.6	8.9	6.2	8.4	8.9	8.9	10.8	8.1	8.9	6.4
WI	714	7.0	4.8	5.2	6.9	8.4	9.7	11.6	9.4	9.9	9.8	9.2	8.1
WY	113	6.2	0.9	5.3	5.3	8.0	16.8	10.6	9.7	11.5	7.1	8.8	9.7
Total	40,718	7.3	6.5	7.8	7.9	8.4	8.5	9.2	9.1	9.0	9.3	8.1	8.9
PR	515	9.1	10.5	10.5	4.9	8.5	8.5	8.0	6.2	7.2	8.2	6.9	11.5

Table 4-9
Restraint Usage by Passenger Car Drivers in Fatal Crashes

State	Restraint Used Number	%	No Restraint Used Number	%	Unknown Number	%	Total Number	%
AL	121	15.0	626	77.4	62	7.7	809	100.0
AK	24	41.4	30	51.7	4	6.9	58	100.0
AZ	179	31.6	316	55.8	71	12.5	566	100.0
AR	65	16.8	301	77.6	22	5.7	388	100.0
CA	1,664	42.4	1,488	37.9	771	19.7	3,923	100.0
CO	146	40.2	212	58.4	5	1.4	363	100.0
CT	144	42.5	183	54.0	12	3.5	339	100.0
DE	30	29.1	67	65.1	6	5.8	103	100.0
DC	24	38.1	23	36.5	16	25.4	63	100.0
FL	1,205	46.5	1,301	50.2	88	3.4	2,594	100.0
GA	211	17.2	636	51.8	380	31.0	1,227	100.0
HI	59	59.6	34	34.3	6	6.1	99	100.0
ID	40	29.9	85	63.4	9	6.7	134	100.0
IL	460	29.9	504	32.7	576	37.4	1,540	100.0
IN	308	37.1	468	56.3	55	6.6	831	100.0
IA	87	23.5	188	50.7	96	25.9	371	100.0
KS	84	29.7	165	58.3	34	12.0	283	100.0
KY	125	20.3	483	78.4	8	1.3	616	100.0
LA	178	31.2	293	51.4	99	17.4	570	100.0
ME	29	19.1	115	75.7	8	5.3	152	100.0
MD	330	51.6	244	38.2	65	10.2	639	100.0
MA	47	8.3	268	47.3	252	44.4	567	100.0
MI	654	44.0	735	49.4	98	6.6	1,487	100.0
MN	163	34.5	235	49.7	75	15.9	473	100.0
MS	34	6.6	480	92.8	3	0.6	517	100.0
MO	252	31.7	431	54.2	113	14.2	796	100.0
MT	34	40.5	49	58.3	1	1.2	84	100.0
NE	37	17.4	141	66.2	35	16.4	213	100.0
NV	82	38.9	113	53.6	16	7.6	211	100.0
NH	17	12.4	75	54.7	45	32.9	137	100.0
NJ	309	37.0	431	51.6	95	11.4	835	100.0
NM	112	41.2	148	54.4	12	4.4	272	100.0
NY	837	43.5	705	36.6	384	19.9	1,926	100.0
NC	637	51.3	459	36.9	147	11.8	1,243	100.0
ND	12	20.0	43	71.7	5	8.3	60	100.0
OH	569	38.2	866	58.1	56	3.8	1,491	100.0
OK	122	29.7	285	69.3	4	1.0	411	100.0
OR	120	29.2	250	60.8	41	10.0	411	100.0
PA	535	31.4	786	46.2	382	22.4	1,703	100.0
RI	5	5.4	39	41.9	49	52.7	93	100.0
SC	228	29.0	539	68.6	19	2.4	786	100.0
SD	16	16.3	81	82.7	1	1.0	98	100.0
TN	243	28.9	564	67.1	33	3.9	840	100.0
TX	1,028	49.0	973	46.3	99	4.7	2,100	100.0
UT	69	31.7	149	68.4	0	0.0	218	100.0
VT	28	31.5	55	61.8	6	6.7	89	100.0
VA	239	29.4	409	50.3	166	20.4	814	100.0
WA	245	43.0	283	49.7	42	7.4	570	100.0
WV	69	19.9	257	74.3	20	5.8	346	100.0
WI	291	44.0	320	48.4	50	7.6	661	100.0
WY	17	29.3	41	70.7	0	0.0	58	100.0
Total	12,564	35.7	17,972	51.1	4,642	13.2	35,178	100.0
PR	176	34.9	325	64.5	3	0.6	504	100.0

Table 4-10
Restraint Usage by Passenger Car Occupants in Fatal Crashes

State	Restraint Used Number	%	No Restraint Used Number	%	Unknown Number	%	Total Number	%
AL	220	15.5	1,106	78.0	92	6.5	1,418	100.0
AK	48	42.9	55	49.1	9	8.0	112	100.0
AZ	327	30.6	615	57.5	127	11.9	1,069	100.0
AR	118	17.1	537	77.7	36	5.2	691	100.0
CA	2,828	39.8	2,968	41.8	1,301	18.3	7,097	100.0
CO	254	37.0	426	62.1	6	0.9	686	100.0
CT	216	40.0	306	56.7	18	3.3	540	100.0
DE	48	27.3	116	65.9	12	6.8	176	100.0
DC	26	26.3	45	45.5	28	28.3	99	100.0
FL	1,924	42.1	2,509	54.8	142	3.1	4,575	100.0
GA	334	16.2	1,198	58.3	524	25.5	2,056	100.0
HI	102	57.0	67	37.4	10	5.6	179	100.0
ID	65	23.6	197	71.4	14	5.1	276	100.0
IL	720	26.4	961	35.3	1,043	38.3	2,724	100.0
IN	433	30.5	807	56.9	178	12.6	1,418	100.0
IA	148	23.3	332	52.4	154	24.3	634	100.0
KS	148	28.7	299	58.1	68	13.2	515	100.0
KY	218	19.6	876	78.6	20	1.8	1,114	100.0
LA	288	28.5	555	55.0	166	16.5	1,009	100.0
ME	56	21.1	197	74.3	12	4.5	265	100.0
MD	505	47.5	460	43.3	98	9.2	1,063	100.0
MA	85	9.5	457	51.1	353	39.4	895	100.0
MI	1,044	40.2	1,403	54.0	151	5.8	2,598	100.0
MN	268	32.3	433	52.1	130	15.6	831	100.0
MS	53	6.0	821	93.1	8	0.9	882	100.0
MO	382	28.8	762	57.4	184	13.9	1,328	100.0
MT	60	36.8	102	62.6	1	0.6	163	100.0
NE	69	17.7	260	66.8	60	15.4	389	100.0
NV	145	37.3	222	57.1	22	5.7	389	100.0
NH	35	14.2	134	54.5	77	31.3	246	100.0
NJ	463	33.4	754	54.4	169	12.2	1,386	100.0
NM	197	38.6	294	57.5	20	3.9	511	100.0
NY	1,381	41.9	1,293	39.2	624	18.9	3,298	100.0
NC	1,022	45.4	993	44.2	234	10.4	2,249	100.0
ND	18	16.5	83	76.1	8	7.3	109	100.0
OH	902	35.3	1,551	60.7	101	4.0	2,554	100.0
OK	181	24.6	504	68.6	50	6.8	735	100.0
OR	224	29.9	456	61.0	68	9.1	748	100.0
PA	850	29.9	1,363	48.0	629	22.1	2,842	100.0
RI	7	4.5	63	40.4	86	55.1	156	100.0
SC	374	27.4	932	68.3	59	4.3	1,365	100.0
SD	27	13.5	172	86.0	1	0.5	200	100.0
TN	385	26.5	1,015	69.8	54	3.7	1,454	100.0
TX	1,715	44.5	1,992	51.7	147	3.8	3,854	100.0
UT	127	28.2	318	70.7	5	1.1	450	100.0
VT	49	32.5	91	60.3	11	7.3	151	100.0
VA	403	30.7	718	54.7	192	14.6	1,313	100.0
WA	423	42.0	509	50.6	74	7.4	1,006	100.0
WV	123	18.1	518	76.1	40	5.9	681	100.0
WI	502	44.0	557	48.9	81	7.1	1,140	100.0
WY	32	27.4	85	72.6	0	0.0	117	100.0
Total	20,572	33.3	33,487	54.2	7,697	12.5	61,756	100.0
PR	215	26.4	598	73.3	3	0.3	816	100.0

Puerto Rico

Fatality data in Puerto Rico is depicted on some of the tables and figures in this report, but is treated separately to conform to the practice of other national data systems. The figures and tables in this section depict the pattern of fatal crashes in Puerto Rico and serve as a comparison to previous year's annual reports.

In Puerto Rico:

There were 542 traffic fatalities, 515 fatal crashes, and 223 nonoccupant fatalities in 1989.

Males far outnumber females as victims of fatal crashes in every age group. In 1989, there were 432 male fatalities compared to 110 female fatalities (Figure 4-2).

The majority of occupant fatalities, 246 or 77.1%, occurred in passenger cars. Of the 816 occupants in those cars, about one-third (30.2%) were killed (Table 4-11).

Of the vehicles involved in fatal crashes, 71.4% were passenger cars (Table 4-12). Light trucks were involved in 12.0% of Puerto Rico's fatal crashes.

Of the fatally-injured drivers who were tested for BAC, 47.0% were legally intoxicated (Table 4-12).

Table 4-11
Number and Percent of Vehicles and Occupants Involved in Fatal Crashes and Occupant Fatalities by Vehicle Type (Puerto Rico)

Vehicle Type	Vehicles Involved Number	%	Occupants Involved Number	%	Occupant Fatalities Number	%
Passenger Cars	505	71.4	816	74.2	246	77.1
Motorcycles	37	5.2	43	3.9	35	11.0
Multipurpose Veh.	28	4.0	45	4.1	15	4.7
Light Trucks	85	12.0	136	12.4	19	6.0
School Buses	2	0.3	3	0.3	1	0.3
Other Buses	3	0.4	3	0.3	0	0.0
Unknown Vehicles	47	6.6	53	4.8	3	0.9
Total	707	100.0	1,099	100.0	319	100.0

Table 4-12
Percent of Driver Fatalities by Blood Alcohol Concentration and Year (Puerto Rico)

Year	None	0.01-0.09	0.10+
1986	43%	9%	48%
1987	41%	11%	48%
1988	44%	11%	45%
1989	45%	8%	47%

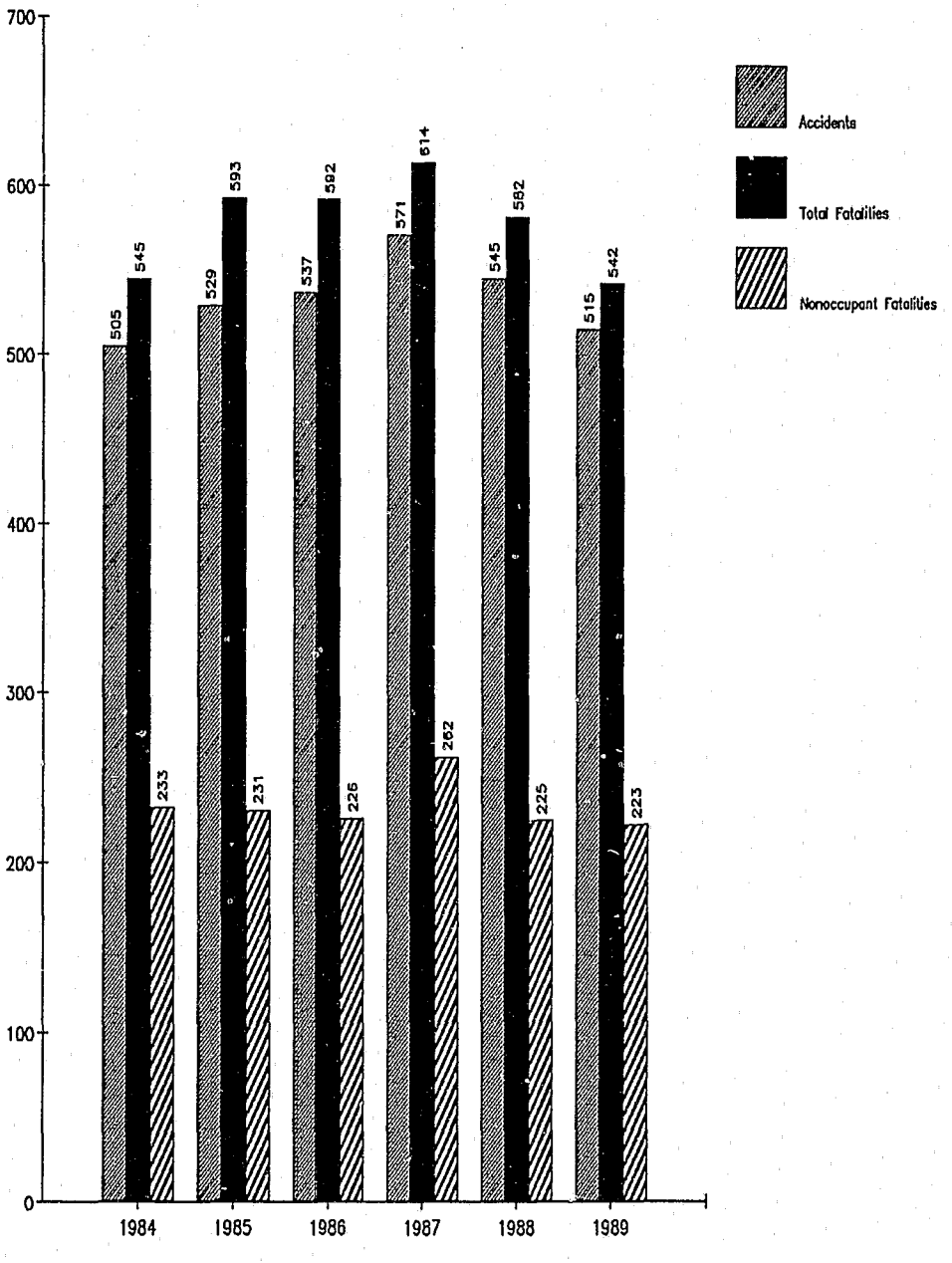

Figure 4-1
Fatalities and Fatal Crashes for 1984-1989
Puerto Rico

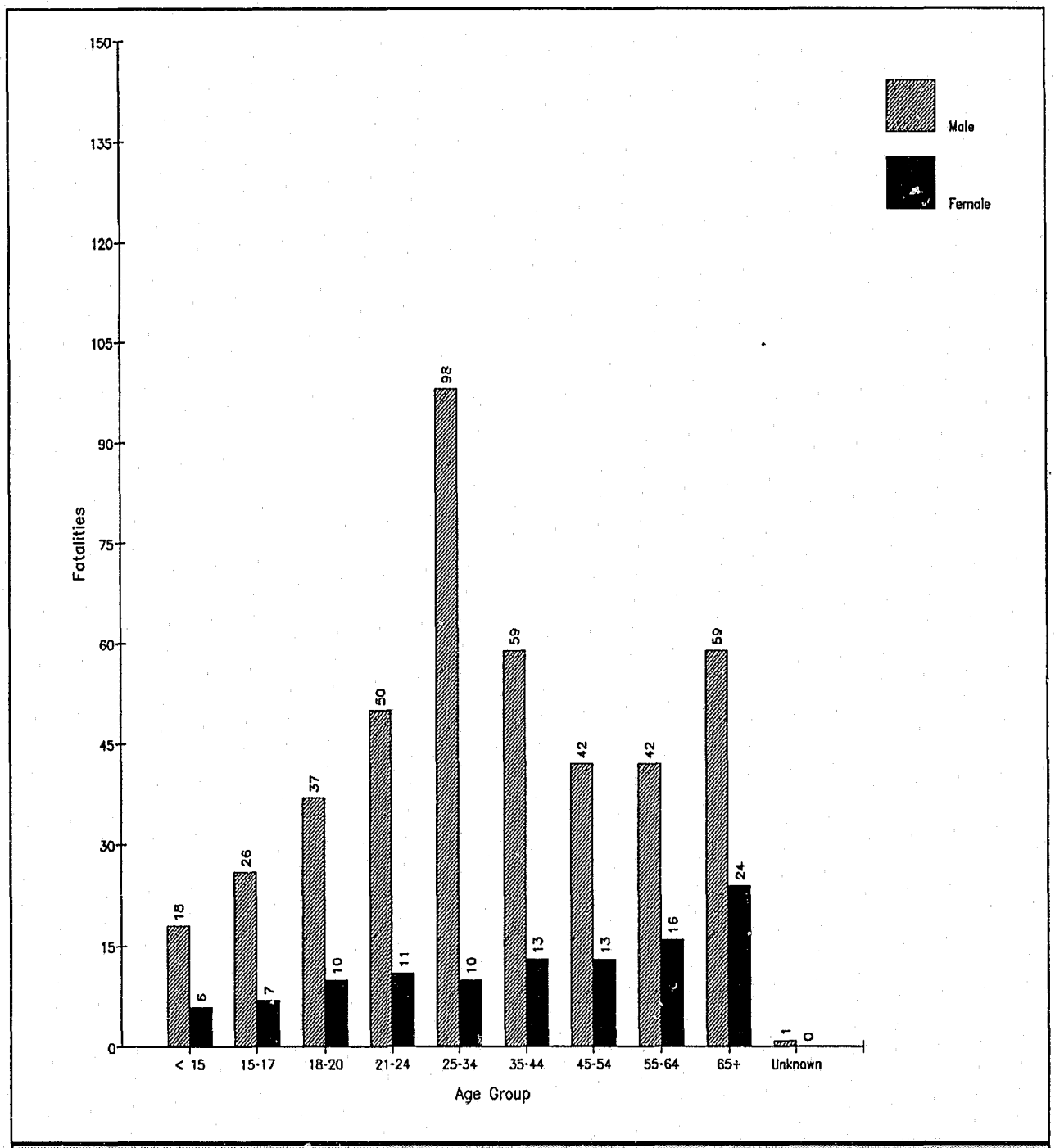

Figure 4-2
Fatalities by Age Group and Sex
Puerto Rico

Chapter 5
Crashes

As used in FARS, the term "crash" includes three necessary characteristics:

- It must involve one or more motorized vehicles and their load in motion on a roadway that is open to the public and ordinarily used for motor travel ("motor vehicle in transport").
- It must involve one or more motor vehicles in transport in a set of events that are not under intentional human control and that lead directly to a fatality within 30 days ("fatal motor vehicle traffic crash").
- It must not directly result from an "act of God" such as an earthquake, flood, or torrential rain, the discharge of a firearm or explosive device, deliberate intent such as an attempted suicide or homicide, an aircraft or watercraft accident, and any injury producing or property damaging event involving a railway train prior to the involvement of a motor vehicle in transport.

This chapter is composed of two sections; the first highlights the vehicle mix in collisions and subsequent fatalities, and the second describes the distribution of highway and other environmental factors existing at the time of the fatal crashes.

Crashes

More than half (58.3%) of all fatal crashes involved only one vehicle (Table 5-1). Most (47.8%) of the 23,732 single vehicle crashes involved collisions with a fixed object. The second most frequent single vehicle crash involved collisions with nonoccupants such as pedestrians, pedalcyclists, or occupants of parked vehicles.

Table 5-1
Distribution of Fatal Crashes by First Harmful Event
Single Vehicle Crashes

First Harmful Event	Number	Percent
Collison with Fixed Object	**11,352**	**47.8**
Tree/Shrubbery	2,947	12.4
Utility Pole/Sign	2,243	9.5
Guard Rail	1,049	4.4
Other Fixed Object	5,113	21.5
Other Object Not Fixed	**1,434**	**6.0**
Non-collision	**4,304**	**18.1**
Nonoccupant	**6,635**	**28.0**
Unknown	**7**	**0.0**
Total	**23,732**	**100.0**

Table 5-2 reveals that the most frequent types of multi-vehicle fatal crashes were angle impact (43.7%) and head-on collision (34.7%).

Table 5-2
Distribution of Fatal Accidents by First Harmful Event and Manner of Collision for Multi-Vehicle Accidents

First Harmful Event/Manner of Collision	Number	Percent
Collision with Motor Vehicle in Transport	**15,916**	**93.7**
Head-On	5,902	34.7
Angle	7,430	43.7
Rear End	1,884	11.1
Side-Swipe	683	4.0
Rear to Rear	17	0.1
Collision with Fixed Object	**465**	**2.8**
Tree/Shrubbery	31	0.2
Utility Pole/Sign	47	0.3
Guard Rail	114	0.7
Other Fixed Object	181	1.1
Other Object Not Fixed	92	0.5
Non-collision	**193**	**1.1**
Nonoccupant	**376**	**2.2**
Collision Type Unknown	**36**	**0.2**
Total	**16,986**	**100.0**

Table 5-3 indicates that the largest group of two vehicle crashes was among two passenger cars (4,613) which resulted in 5,388 fatalities. Collisions between passenger cars and light trucks (3,804) accounted for the next largest number of occupant fatalities (4,436).

In two-vehicle collisions that involved two different categories of vehicles, occupants in the smaller of the two vehicles were more likely to lose their lives. For instance, in accidents involving passenger cars and motorcycles, 97.0% of the fatalities were among the motorcyclists. When trucks collided with other vehicles, the occupants of the trucks were more likely to survive than were occupants of the other vehicles (Table 5-3).

Table 5-3
Two-Vehicle Crashes and Occupant Fatalities by Vehicle Body Type

Vehicle Body Type			Occupant Fatalities				
		Total	1st Vehicle		2nd Vehicle		Total
First Vehicle	Second Vehicle	Accidents	Number	%	Number	%	
Passenger Car	Passenger Car	4,613	5,388	100.0	N/A	0.0	5,388
Passenger Car	Motorcycle	817	26	3.0	829	97.0	855
Passenger Car	Other Motorized Cyc.	32	1	0.0	30	96.8	31
Passenger Car	Light Truck	3,804	3,525	79.5	911	20.5	4,436
Passenger Car	Multipurpose Vehicle	507	467	79.0	124	21.0	591
Passenger Car	Medium Truck	272	304	96.2	12	3.8	316
Passenger Car	Heavy Truck	1,790	2,087	98.1	40	1.9	2,127
Passenger Car	Bus	103	111	99.1	1	0.9	112
Passenger Car	Other Vehicle	108	72	63.7	41	36.3	113
Passenger Car	Unknown	80	42	62.7	25	37.3	67
Motorcycle	Motorcycle	22	24	100.0	N/A	0.0	24
Motorcycle	Other Motorized Cyc.	3	0	0.0	3	100.0	3
Motorcycle	Light Truck	395	418	99.8	1	0.2	419
Motorcycle	Multipurpose Vehicle	45	47	100.0	0	0.0	47
Motorcycle	Medium Truck	23	23	100.0	0	0.0	23
Motorcycle	Heavy Truck	83	87	100.00	0	0.0	87
Motorcycle	Bus	12	12	100.0	0	0.0	12
Motorcycle	Other Vehicle	19	18	90.0	2	10.0	20
Motorcycle	Unknown	10	8	100.0	0	0.0	8
Other Motorized Cyc.	Other Motorized Cyc.	2	2	100.0	N/A	0.0	2
Other Motorized Cyc.	Light Truck	15	15	100.0	0	0.0	15
Other Motorized Cyc.	Multipurpose Vehicle	6	6	100.0	0	0.0	6
Other Motorized Cyc.	Medium Truck	3	3	100.0	0	0.0	3
Other Motorized Cyc.	Heavy Truck	6	6	100.0	0	0.0	6
Other Motorized Cyc.	Bus	0	0	0.0	0	0.0	0
Other Motorized Cyc.	Other Vehicle	1	0	0.0	1	0.0	1
Other Motorized Cyc.	Unknown	1	1	100.0	0	0.0	1
Light Truck	Light Truck	633	742	100.0	N/A	0.0	742
Light Truck	Multipurpose Vehicle	124	73	48.7	77	51.3	150
Light Truck	Medium Truck	85	84	90.3	9	9.7	93
Light Truck	Heavy Truck	622	678	95.9	29	4.1	707
Light Truck	Bus	25	22	95.7	1	4.3	23
Light Truck	Other Vehicle	59	25	39.7	38	60.3	63
Light Truck	Unknown	33	17	70.8	7	29.2	24
Multipurpose Veh.	Multipurpose Vehicle	3	4	100.0	N/A	0.0	4
Multipurpose Veh.	Medium Truck	6	6	100.0	0	0.0	6
Multipurpose Veh.	Heavy Truck	59	72	100.0	4	5.3	76
Multipurpose Veh.	Bus	6	6	100.0	0	0.0	6
Multipurpose Veh.	Other Vehicle	6	2	100.0	4	66.7	6
Multipurpose Veh.	Unknown	4	1	100.0	4	80.0	5
Medium Truck	Medium Truck	6	6	100.0	N/A	0.0	6
Medium Truck	Heavy Truck	16	11	64.7	6	35.3	17
Medium Truck	Bus	1	0	0.0	1	100.0	1
Medium Truck	Other Vehicle	2	2	100.0	0	0.0	2
Medium Truck	Unknown	1	0	0.0	1	100.0	1
Heavy Truck	Heavy Truck	103	109	100.0	N/A	0.0	109
Heavy Truck	Bus	6	2	0.0	2	0.0	4
Heavy Truck	Other Vehicle	17	3	50.0	3	50.0	6
Heavy Truck	Unknown	13	0	0.0	0	0.0	0
Bus	Bus	0	0	100.0	N/A	0.0	0
Bus	Other Vehicle	0	0	100.0	0	0.0	0
Bus	Unknown	1	0	100.0	2	0.0	2
Other Vehicle	Other Vehicle	7	8	100.0	N/A	0.0	8
Other Vehicle	Unknown	1	1	100.0	0	0.0	1
Unknown	Unknown	16	17	100.0	N/A	0.0	17
Total							16,789

Figure 5-1 depicts fatal crashes and number of fatalities by first harmful event. As in previous years, collisions with fixed objects accounted for the largest number of fatal crashes and fatalities, after collisions between motor vehicles.

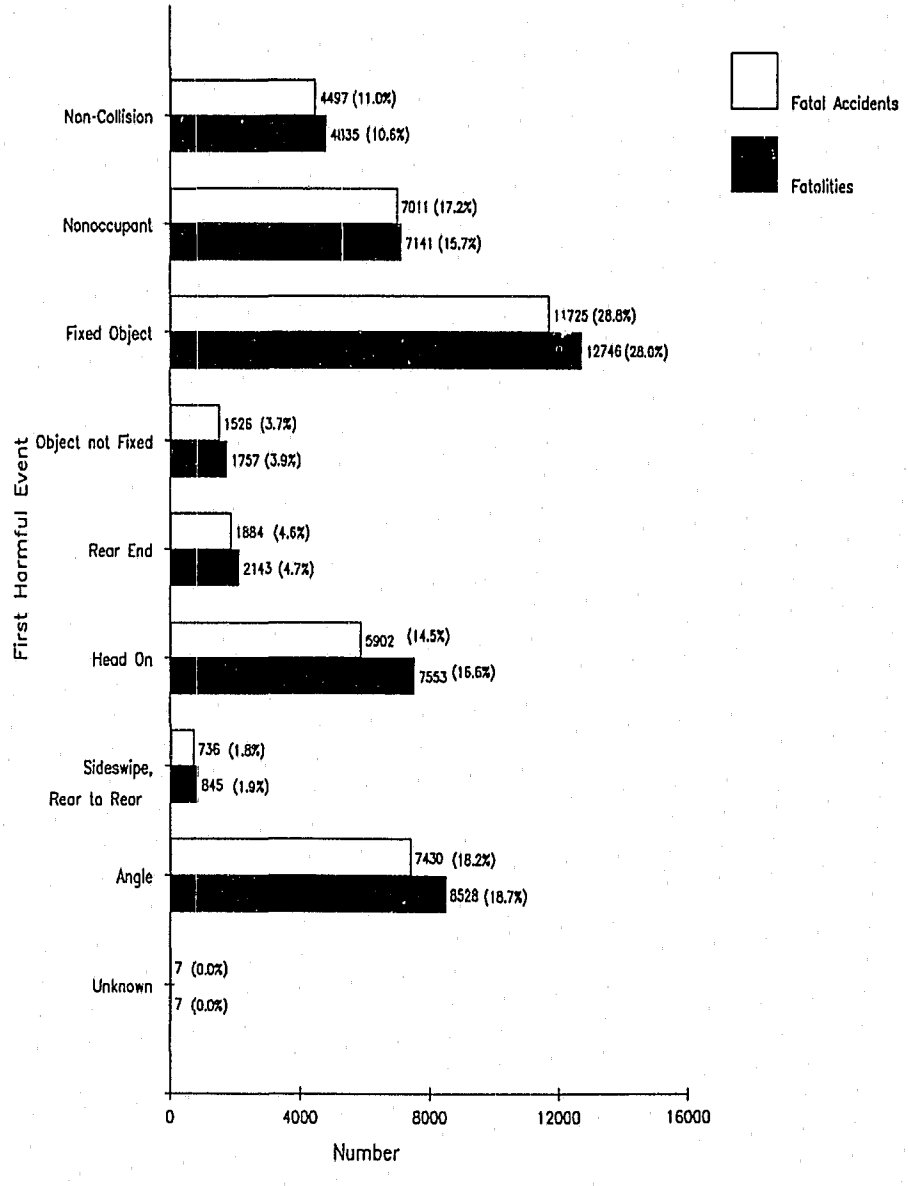

Figure 5-1
Number and Percent of Fatal Crashes and Fatalities by First Harmful Event

Highway and Environment

The kind of roadway, lighting, weather conditions, and type of object with which a vehicle collides are all important factors in fatal crashes. Table 5-5 shows that more than half (57.7%) of all fatal crashes occurred on straight and level roads. More fatal crashes (56.5%) occurred on rural roads than on urban roads (43.5%, Table 5-4).

Table 5-4
Distribution of Fatal Accidents by Speed Limit and Land Use

Land Use	None	5-15	20-25	30-35	40-45	50-55	60-65	Unknown	Total
Rural	96	30	395	1,564	2,842	15,590	1,952	477	22,946
Urban	35	51	1,713	6,361	4,215	4,589	143	590	17,697
Unknown	2	1	6	20	20	18	2	6	75
Total	133	82	2,114	7,945	7,077	20,197	2,097	1,073	40,718

Table 5-5
Fatal Crashes by Roadway Alignment and Roadway Profile

Profile	Alignment Straight	Alignment Curve	Unknown	Total
Level	23,509	5,461	17	28,987
Grade	5,702	4,153	7	9,862
Hillcrest or Sag	780	433	0	1,213
Unknown	406	169	81	656
Total	30,397	10,216	105	40,718

Most of the fatal crashes in rural areas occurred on roads with speed limits of 55 miles per hour, 15,590 or 67.94%, which was the maximum posted speed limit until April 2, 1987. On that date, legislation was enacted to allow states to raise the speed limit up to 65 mph on interstate highways passing through areas with population less than 50,000. In contrast, the largest number of fatal crashes in urban areas took place on roads with posted speed limits of 30 to 35 mph (6,361 or 35.9%) and 50 to 55 mph (4,589 or 25.9%).

Motorcycles were involved in 8.4% of all fatal crashes that occurred on local roads (Table 5-6). In contrast, they were involved in only 2.7% of all fatal crashes that took place on interstates.

Table 5-6
Vehicles Involved in Fatal Crashes by Roadway Function Class

	Interstate		Other Freeway & Expressway		Other Principal Arterial		Minor Arterial		Collector		Local		Unknown		Total	
Body	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Passenger Cars	3,420	52.0	1,746	64.4	9,279	59.4	7,892	59.5	7,551	57.7	5,347	57.3	149	58.7	35,384	58.2
Motorcycles	176	2.7	137	5.1	618	4.0	649	4.9	708	5.4	783	8.4	10	3.9	3,081	5.1
Other Motorized Cycles	1	0.0	1	0.0	21	0.1	17	0.1	30	0.2	43	0.5	0	0.0	113	0.2
Light Trucks	1,445	22.0	501	18.5	3,289	21.1	3,004	22.6	3,307	25.3	2,190	23.5	65	25.6	13,801	22.7
Medium Trucks	67	1.0	25	0.9	177	1.1	150	1.1	164	1.3	86	0.9	3	1.2	672	1.1
Heavy Trucks	1,030	15.7	145	5.3	1,436	9.2	877	6.6	604	4.6	208	2.2	10	3.9	4,310	7.1
Buses	24	0.4	9	0.3	87	0.6	73	0.6	59	0.5	57	0.6	2	0.8	311	0.5
Multipurpose	257	3.9	74	2.7	448	2.9	393	3.0	416	3.2	296	3.2	6	2.4	1,890	3.1
Other Vehicles	37	0.6	13	0.5	66	0.4	67	0.5	114	0.9	148	1.6	2	0.8	447	0.7
Unknown	123	1.9	61	2.2	199	1.3	141	1.1	123	0.9	171	1.8	7	2.8	825	1.4
Total	6,580	100.0	2,712	100.0	15,620	100.0	13,263	100.0	13,076	100.0	9,329	100.0	254	100.0	60,834	100.0

Figures 5-2 and 5-3 depict the distribution of crashes in urban and rural areas among functional classes of highways. The most significant difference between rural and urban crash rates was for crashes that occurred on collector roads; about five times as many fatal crashes took place on rural collector roads (7,720) as on urban collector roads (1,510).

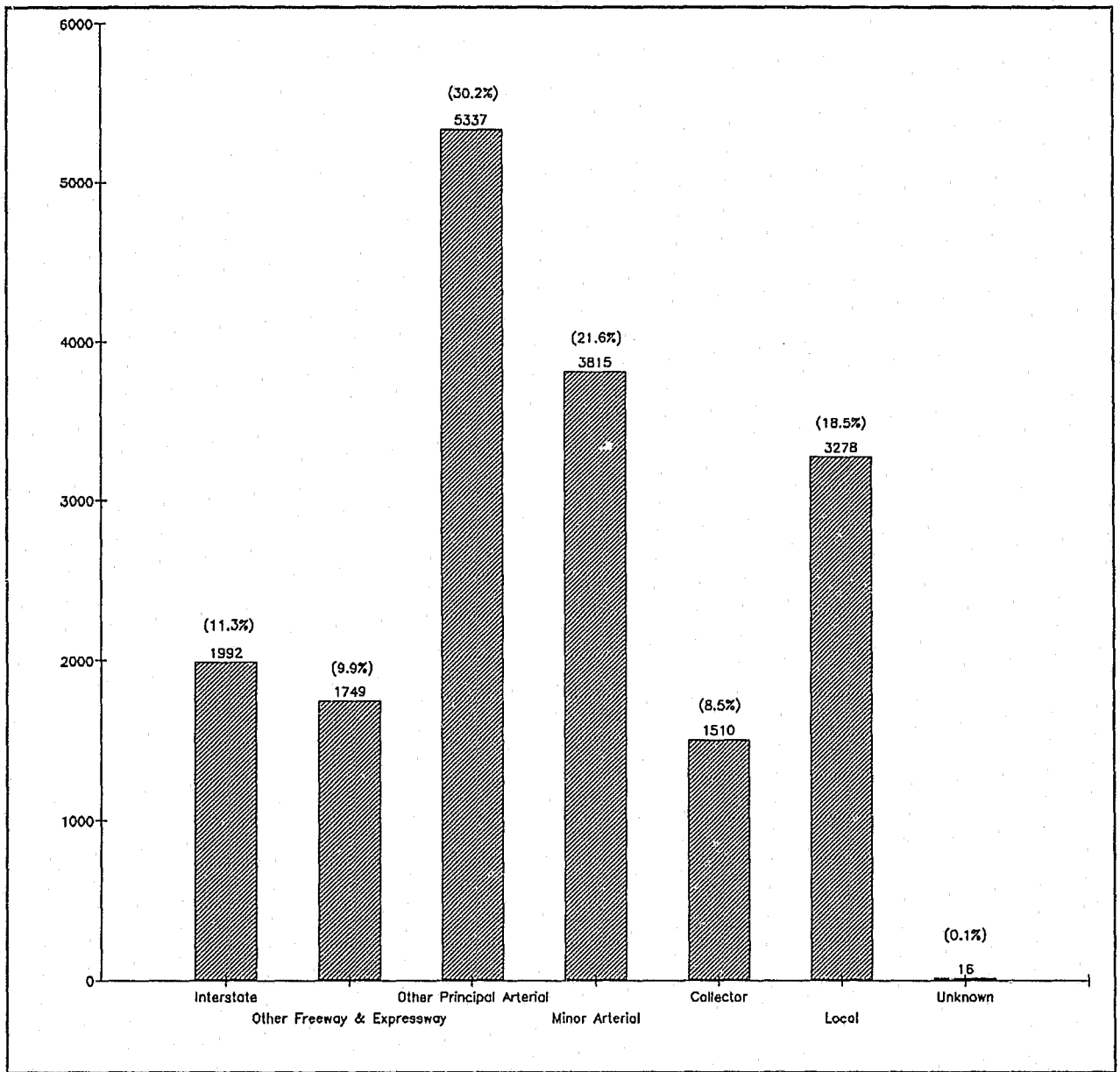

Figure 5-2
Fatal Crashes by Roadway Function Class (Urban)

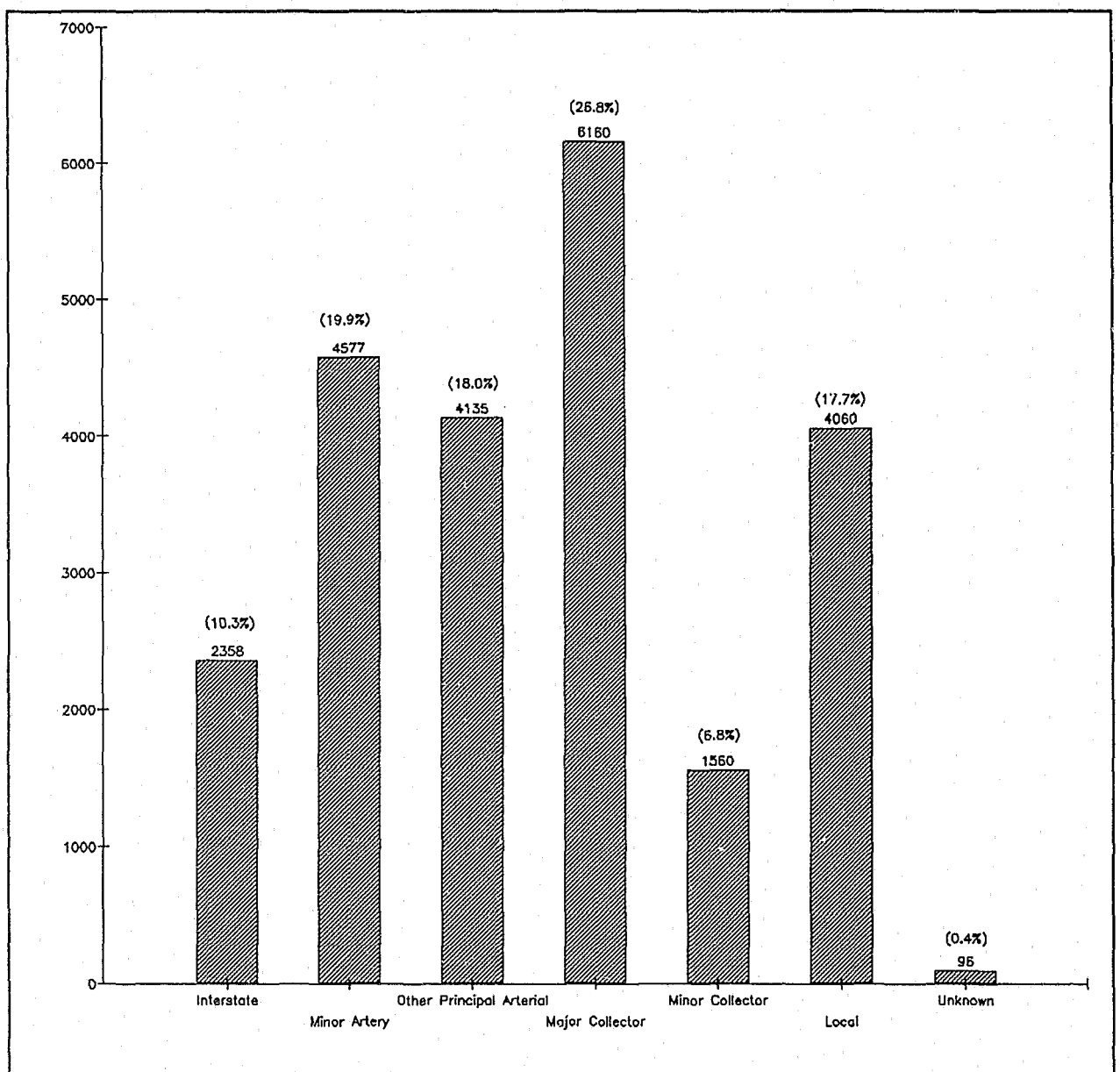

Figure 5-3
Fatal Crashes by Roadway Function Class (Rural)

As shown in Table 5-7, 691 fatal crashes occurred in construction and maintenance zones in 1989. The largest proportion of these fatal crashes took place on interstate (30.5%) and principal arterial (28.8%) roads.

Table 5-7
Fatal Crashes in Construction Zones by Roadway Function Class

Roadway Function Class	Zone				
	Construction	Maintenance	Utility	Unkown Type Work Zone	Total
Interstate	177	17	0	17	211
Other Principal Arterial	148	21	3	27	199
Minor Arterial	80	9	2	14	105
Collector	52	11	0	7	70
Local	40	9	2	5	56
Other Freeway & Expressway	39	2	0	5	46
Unknown	4	0	0	0	4
Total	540	69	7	75	691

Table 5-8 reveals that 37.0% of the crashes occurring in urban and 37.1% of the fatal crashes in rural areas took place on the roadway and away from junctions. A larger number of fatal crashes occurred at urban intersections (5,790) than at rural intersections (3,666).

Table 5-8
Fatal Crashes by Land Use, Junction Type, and Roadway Location

	Relation to Roadway															
	On Roadway		Shoulder		Median		Roadside		Parking Lane		Other		Unknown		Total	
Land Use / Junction	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Rural																
Non-Junction	8,503	34.7	881	55.6	515	45.8	4,264	61.9	8	9.6	4,222	66.5	80	49.7	18,473	45.5
Intersection	3,184	13.0	33	2.1	21	1.9	212	3.1	0	0.0	213	3.4	3	1.9	3,666	9.0
Driveway,Alley Access	361	1.5	14	0.9	1	0.1	29	0.4	0	0.0	22	0.3	0	0.0	427	1.0
Rail Grade Crossing	341	1.4	0	0.0	0	0.0	2	0.0	0	0.0	6	0.1	0	0.0	349	0.9
Unknown	22	0.1	0	0.0	4	0.4	0	0.0	0	0.0	0	0.0	5	3.1	31	0.1
Subtotal	12,411	50.6	928	58.6	541	48.1	4,507	65.4	8	9.6	4,463	70.3	88	54.7	22,946	56.4
Urban																
Non-Junction	6,555	26.7	575	36.3	507	45.1	1,989	28.9	69	83.1	1,591	25.1	54	33.5	11,340	27.9
Intersection	5,035	20.5	68	4.3	67	6.0	354	5.1	6	7.2	251	4.0	9	5.6	5,790	14.2
Driveway,Alley Access	250	1.0	6	0.4	3	0.3	24	0.3	0	0.0	23	0.4	3	1.9	309	0.8
Rail Grade Crossing	212	0.9	2	0.1	0	0.0	2	0.0	0	0.0	4	0.1	2	1.2	222	0.5
Unknown	20	0.1	1	0.1	4	0.4	4	0.1	0	0.0	2	0.0	5	3.1	36	0.1
Subtotal	12,072	49.2	652	41.2	581	51.7	2,373	34.5	75	90.4	1,871	29.5	73	45.3	17,697	43.5
Unknown																
Non-Junction	28	0.1	3	0.2	1	0.1	7	0.1	0	0.0	12	0.2	0	0.0	51	0.1
Intersection	21	0.1	1	0.1	1	0.1	0	0.0	0	0.0	1	0.0	0	0.0	24	0.1
Subtotal	49	0.2	4	0.3	2	0.2	7	0.1	0	0.0	13	0.2	0	0.0	75	0.1
Total	24,532	100.0	1,584	100.0	1,124	100.0	6,887	100.0	83	100.0	6,347	100.0	161	100.0	40,718	100.0

In urban areas, intersections without control devices and with on-color traffic signals had about equal numbers of fatal crashes (2,082 vs. 2,164, Table 5-9). A significant number of fatal crashes also occurred at urban intersections controlled by stop signs (1,317).

In rural areas, most fatal crashes occurred at intersections controlled by stop signs (1,839), followed by areas which lacked any type of control device (1,315, Table 5-9).

Table 5-9
Fatal Crashes at Intersections by Land Use and Traffic Control Device

Traffic Control Device	Rural		Urban		Unknown		Total	
	Number	%	Number	%	Number	%	Number	%
No Controls	1,315	35.9	2,082	36.0	12	50.0	3,409	36.0
On Color Traffic Signal	251	6.8	2,164	37.4	7	29.2	2,422	25.5
Signal Flashing	106	2.9	102	1.8	1	4.2	209	2.2
Other Controls	79	2.2	72	1.2	1	4.2	152	1.6
Stop Sign	1,839	50.2	1,317	22.7	2	8.3	3,158	33.3
Yield Sign	73	2.0	47	0.8	0	0.0	120	1.3
Unknown	3	0.1	6	0.1	1	4.2	10	0.1
Total	3,666	100.0	5,790	100.0	24	100.0	9,480	100.0

Only 13.5% of the fatal crashes that took place during the daytime occurred during rain, sleet, snow, fog, or other adverse atmospheric conditions (Table 5-10).

Table 5-10
Fatal Crashes by Light and Atmospheric Conditions

	Weather					
Light Condition	Normal	Rain	Snow	Sleet Fog & Other	Unknown	Total
Daylight	15,986	1,835	335	267	52	18,475
Dark	11,607	1,180	271	440	58	13,556
Dark but Lighted	6,023	691	70	99	19	6,902
Dusk/Dawn	1,388	169	37	86	4	1,684
Unknown	53	4	3	0	41	101
Total	35,057	3,879	716	892	174	40,718

Table 5-11
Fatal Crashes by Roadway Surface and Atmospheric Conditions

	Weather				
Surface Condition	Normal	Rain/Snow	Sleet Fog & Other	Unknown	Total
Dry	32,499	24	440	49	33,012
Wet	1,640	3,862	238	16	5,756
Snow	297	461	36	2	796
Ice	467	247	171	8	893
Sand & Other	111	1	5	14	131
Unknown	43	0	2	85	130
Total	35,057	4,595	892	174	40,718

Chapter 6
Vehicles

In 1989, 60,834 vehicles were involved in 40,718 fatal crashes. Table 6-1 presents the distribution of vehicles, occupants, and occupant fatalities by vehicle body type. Passenger cars were in more fatal crashes than any other type of vehicle (58.2%). Moreover, passenger car occupant fatalities accounted for two-thirds of the vehicle occupant fatalities. After passenger cars, light trucks accounted for the largest proportion of vehicles involved in fatal crashes (22.7%), followed by heavy trucks (7.1%).

Occupants of light trucks and vans constituted 19.5% of all occupant fatalities and motorcycle riders constituted 8.0%. In contrast, occupants of multipurpose vehicles comprised only 3.0% of the occupants fatalities, occupants of heavy trucks, 1.9%, and occupants of buses only 0.1 percent.

Table 6-1
Involved Vehicles, Occupants and Occupant Fatalities by Vehicle and Body Type

	Vehicles		Occupants		Fatalities	
	Number	%	Number	%	Number	%
Passenger Cars	35,384	58.2	61,756	60.9	25,046	65.8
Convertible	233	0.4	408	0.4	178	0.5
2 Door Sedan, Hardtop, Coupe	16,878	27.7	28,905	28.5	11,998	31.5
3 Door/2 Door Hatchback	1,510	2.5	2,682	2.6	1,228	3.2
4 Door Sedan Hardtop	12,714	20.9	22,408	22.1	8,941	23.5
5 Door/4 Door Hatchback	365	0.6	651	0.6	297	0.8
Station Wagon	2,125	3.5	4,071	4.0	1,495	3.9
Hatchback Doors Unknown	60	0.1	112	0.1	52	0.1
Other Auto	6	0.0	10	0.0	2	0.0
Unknown Auto	1,301	2.1	2,220	2.2	736	1.9
Auto Based Pickup	181	0.3	259	0.3	115	0.3
Auto Based Short Panel	10	0.0	28	0.0	3	0.0
Station Wagon Based Body Unknown	1	0.0	2	0.0	1	0.0
Motorcycles	3,081	5.1	3,718	3.7	3,036	8.0
Other Motorized Cycles	113	0.2	131	0.1	107	0.3
Moped	45	0.1	53	0.1	42	0.1
Three Wheel Motorcycle or Moped	19	0.0	21	0.0	19	0.0
Other Motorcycle - Minibike	31	0.1	38	0.0	29	0.1
Unknown Motorcycle	18	0.0	19	0.0	17	0.0
Light Truck	13,801	22.7	23,642	23.3	7,412	19.5
Van	2,341	3.8	5,337	5.3	1,141	3.0
Commercial Cutaway Van	77	0.1	120	0.1	22	0.1
Other Van	16	0.0	27	0.0	6	0.0
Unknown Van	129	0.2	282	0.3	45	0.1
Pickup	10,231	16.8	16,258	16.0	5,844	15.4
Pickup with Camper	31	0.1	80	0.1	20	0.1
Cab Chassis Based Light Truck	111	0.2	172	0.2	29	0.1
Panel Truck	8	0.0	15	0.0	3	0.0
Truck Based Station Wagon	233	0.4	464	0.5	110	0.3
Other Conventional Light Truck	10	0.0	11	0.0	2	0.0
Unknown Conventional Light Truck	204	0.3	329	0.3	96	0.3
Unknown Light Truck	76	0.1	114	0.1	34	0.1
Unknown Truck	334	0.5	433	0.4	60	0.2
Multipurpose Vehicles	1,890	3.1	3,543	3.5	1,133	3.0
Auto Based Short Utility	467	0.8	837	0.8	306	0.8
Utility Truck	1,399	2.3	2,662	2.6	817	2.1
Utility, Based Body Unknown	24	0.0	44	0.0	10	0.0
Medium Trucks	672	1.1	838	0.8	128	0.3
Single Unit Truck 10,000 to 19,500 Lbs. GVWR	249	0.4	311	0.3	44	0.1
Single Unit Truck 19,500 to 26,000 Lbs. GVWR	111	0.2	139	0.1	16	0.0
Unknown Medium Truck	33	0.1	37	0.0	5	0.0
Single Unit Truck Unknown GVWR	279	0.5	351	0.3	63	0.2
Heavy Trucks	4,310	7.1	4,890	4.8	729	1.9
Single Unit Heavy Truck over 26,000 Lbs.	442	0.7	515	0.5	66	0.2
Truck Tractor	3,787	6.2	4,269	4.2	648	1.7
Unknown Heavy Truck	60	0.1	72	0.1	7	0.0
Unknown Truck	21	0.0	34	0.0	8	0.0

Table 6-1
Involved Vehicles, Occupants and Occupant Fatalities by Vehicle and Body Type

	Vehicles		Occupants		Fatalities	
	Number	%	Number	%	Number	%
***Buses**	311	0.5	1,106	1.1	50	0.1
School Bus	109	0.2	465	0.5	33	0.1
Cross Country/Intercity Bus	32	0.1	186	0.2	3	0.0
Transit Bus	120	0.2	269	0.3	1	0.0
Other Bus	25	0.0	107	0.1	8	0.0
Unknown Bus	25	0.0	79	0.1	5	0.0
Other Vehicles	447	0.7	712	0.7	273	0.7
Large Limousine	3	0.0	4	0.0	2	0.0
Van Based Motorhome	24	0.0	44	0.0	9	0.0
Pickup Based Motorhome	12	0.0	24	0.0	4	0.0
Medium or Heavy Truck Based Motorhome	8	0.0	18	0.0	2	0.0
Unknown Truck Camper/Motorhome	68	0.1	194	0.2	26	0.1
Unknown Truck	40	0.1	47	0.0	30	0.1
Snowmobile	28	0.0	30	0.0	23	0.1
Farm Equipment except Trucks	125	0.2	164	0.2	71	0.2
All Terrain Vehicles	95	0.2	133	0.1	93	0.2
Construct. Equip. except Trucks	32	0.1	32	0.0	8	0.0
Other Vehicles	7	0.0	16	0.0	1	0.0
Three Wheeled Vehicle						
Unknown Body Type	5	0.0	6	0.0	4	0.0
Unknown Body Type	825	1.4	1,006	1.0	151	0.4
Total	60,834	100.0	101,342	100.0	38,065	100.0

** Non-Injured Passengers are not included in this occupant count. All Drivers regardless of injury severity are included.*

Table 6-2 lists the vehicles involved in fatal crashes by most harmful event. More than half (56.9%) of the vehicles in fatal crashes collided with another motor vehicle in transport. Collisions with fixed objects such as trees, signs, and guardrails involved 14.6% of the vehicles in fatal crashes. Non-collisions (mostly rollovers) were the third most harmful event, involving 13.7% of the vehicles in fatal crashes.

Table 6-2
Vehicles Involved in Fatal Crashes by Most Harmful Event

Most Harmful Event	Vehicles	
	Number	%
Non-collision	8,340	13.7
Collision with		
Nonoccupant	7,572	12.4
Tree or Shrubbery	3,497	5.7
Utility Pole or Sign	2,029	3.3
Guard Rail	590	1.0
Other Fixed Object	2,826	4.6
Other Object not Fixed	1,384	2.3
Motor Vehicle in Transport	34,585	56.9
Unknown	11	0.0
Total	60,834	100.0

Tables 6-3 and 6-4 show the distributions of occupant fatalities by most harmful event for single and multi-vehicle crashes according to land use and roadway function class. The largest proportion of single vehicle occupants fatalities occurred on collector roads (27.6%). Further, twice as many single vehicle occupants fatalities occurred in rural areas (12,285) than in urban areas (6,082). Fatalities in multi-vehicle crashes were also more common in rural (11,793) than in urban areas (7,848), (Table 6-4).

Table 6-3
Single Vehicle Occupant Fatalities by
Most Harmful Event, Land Use and Roadway Function Class

Most Harmful Event	Interstate	Other Freeway & Xpressway	Other Principal Arterial	Minor Arterial	Collector	Local	Unkown	Total
Urban	893	616	1,224	1,186	664	1,493	6	6,082
Non-collision Overturn	174	110	114	111	57	149	0	715
Non-collision Other	18	11	29	28	24	116	0	226
Nonoccupant	1	0	3	7	3	5	0	19
Tree or Shrubbery	39	91	159	216	163	281	3	952
Utility Pole or Sign	78	87	352	263	135	252	1	1,168
Guard Rail	210	107	56	36	19	35	0	463
Other Object not Fixed	97	40	104	144	68	221	1	675
Other Fixed Object	274	170	406	381	195	433	1	1,860
Unknown	2	0	1	0	0	1	0	4
Rural	1,581	0	1,407	1,859	4,428	2,951	59	12,285
Non-collision Overturn	728	0	424	440	1,076	680	8	3,356
Non-collision Other	29	0	39	40	71	118	3	300
Nonoccupant	0	0	4	1	3	3	0	11
Tree or Shrubbery	90	0	198	346	951	687	21	2,293
Utility Pole or Sign	74	0	159	219	524	245	5	1,226
Guard Rail	257	0	125	105	136	58	1	682
Other Object not Fixed	141	0	62	94	211	313	5	826
Other Fixed Object	262	0	395	613	1,456	846	16	3,588
Unknown	0	0	1	1	0	1	0	3
Unknown Land Use	0	0	0	0	0	0	26	26
Total	2,474	616	2,631	3,045	5,092	4,444	91	18,393

Head-on collisions account for the largest number of occupant fatalities in the rural areas (47.6%), but in the urban areas over half (53.3%) of the occupant fatalities are in angle crashes when the most harmful event is a collision with another motor vehicle (Table 6-4).

Table 6-4
Multi-Vehicle Occupant Fatalities by Most Harmful Event, Land Use and Roadway Function Class

Most Harmful Event	Interstate	Other Freeway & Xpressway	Other Principal Arterial	Minor Arterial	Collector	Local	Unknown	Total
Urban	839	796	2,853	1,884	537	936	3	7,848
Non-collision Overturn	22	8	21	21	10	14	0	96
Non-collision Other	4	2	6	0	1	2	0	15
Nonoccupant	0	0	2	1	0	2	0	5
Tree or Shrubbery	3	12	5	1	3	2	0	26
Utility Pole or Sign	2	5	6	6	4	0	0	23
Guard Rail	33	12	10	4	1	1	0	61
Other Object not Fixed	10	3	6	10	1	6	0	36
Other Fixed Object	31	14	54	20	3	12	0	134
Motor Vehicle in Transport								
Rear End	338	145	317	144	34	43	2	1,023
Head On	174	181	755	580	187	219	0	2,096
Rear to Rear	0	0	3	5	1	1	0	10
Angle	137	362	1,569	1,042	267	597	1	3,975
Side-Swipe	82	52	95	50	22	35	0	336
Collision, Type Unknown	3	0	4	0	3	2	0	12
Rural	935	0	3,090	3,054	3,648	1,037	29	11,793
Non-collision Overturn	21	0	17	23	21	3	0	85
Non-collision Other	5	0	4	6	10	1	0	26
Nonoccupant	0	0	3	0	2	0	0	5
Tree or Shrubbery	1	0	9	0	3	0	0	13
Utility Pole or Sign	7	0	5	5	10	0	0	27
Guard Rail	22	0	22	20	11	0	0	75
Other Object not Fixed	18	0	12	15	11	4	1	61
Other Fixed Object	22	0	17	18	12	4	0	73
Motor Vehicle in Transport								
Rear End	323	0	270	198	199	58	2	1,050
Head On	279	0	1,502	1,558	1,693	398	9	5,442
Rear to Rear	1	0	1	2	4	2	0	10
Angle	157	0	1,103	1,095	1,564	529	17	4,465
Side-Swipe	76	0	122	105	94	32	0	429
Collision, Type Unknown	3	0	3	9	11	6	0	32
Unknown Land Use	0	0	0	0	0	0	31	31
Total	1,774	796	5,943	4,938	4,185	1,973	63	19,672

Most of the vehicles in fatal crashes were "going straight," (69.1%) and the next greatest number of vehicles were negotiating a curve in the road (14.1%). Turning (generally from one road to another or to a driveway or entrance) was also common in two-vehicle crashes (6.0%) Table 6-5.

Table 6-5
Vehicle Maneuver in Fatal Crashes by Number of Vehicles Involved

Manuver	One	Two	Three	Four	Five +	Total
Going Straight	16,125	20,570	3,969	893	452	42,009
Negotiating a Curve	5,391	2,727	357	78	55	8,608
Turning	467	2,840	306	27	10	3,650
Stopped or Parked	39	673	517	189	222	1,640
Passing	392	779	155	23	8	1,357
Avoiding Animals or Pedestrian	472	395	72	31	42	1,012
Starting or Stopping	157	613	130	31	60	991
Changing Lanes	287	402	110	35	14	848
Other & Unknown	402	255	42	17	3	719

In 1989, 172 vehicles transporting hazardous cargo were involved in fatal crashes. Of these, 71.5% were tractor-trailers and 15.1% were medium or other heavy trucks (Figure 6-1).

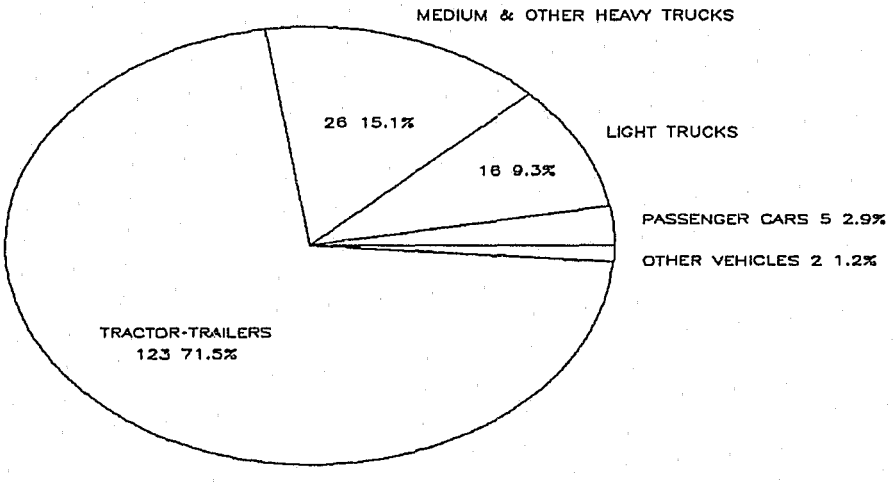

Figure 6-1
Hazardous Cargo-Carrying Vehicles Involved in Fatal Crashes

As indicated in Table 6-6, the proportion of occupants involved in fatal crashes who were killed depended greatly on vehicle type. For instance, 81.7% of those on motorcycles, 40.6% of passenger car occupants and 32.0% of occupants of multipurpose vehicles were killed compared to 14.9% of heavy truck occupants.

The remainder of this chapter correlates various fatal crashes with these vehicles types: passenger cars, motorcycles, light trucks, medium trucks, heavy trucks, multipurpose passenger vehicles, school buses and other buses.

Passenger Cars

Table 6-6
Occupants and Occupant Fatalities by Vehicle Type

Body Type	Occupants	Fatalities	% of Occupants Fatally Injured
Passenger Cars	61,756	25,046	40.6
Motorcycles	3,718	3,036	81.7
Other Motorized Cycles	131	107	81.7
Light Trucks	23,642	7,412	31.4
Multipurpose Vehicles	3,543	1,133	32.0
Medium Trucks	838	128	15.3
Heavy Trucks	4,890	729	14.9
*Buses	1,106	50	4.5
Other Vehicles	712	273	38.3
Unknown	1,006	151	15.0
Total	101,342	38,065	37.6

* Non-injured passengers are not included in this occupant count. All drivers regardless of injury severity are included.

Most of the vehicles on the road are passenger cars, which accounted for the preponderance (58.2%) of the vehicles involved in fatal crashes. Table 6-1 highlights the distribution of vehicles involved, their occupants, and occupant deaths by type of passenger car. Two-door sedan, hardtop, coupes were involved most frequently in fatal crashes (27.7%), and not surprisingly, accounted for 31.5% of the fatalities.

Figure 6-2 illustrates the six-year history of fatal crashes and fatalities involving passenger cars; 35,384 passenger cars were involved in fatal crashes in 1989, down 1.6% from 1988. Additionally, 25,046 passenger car occupants died as a result of these crashes, down 3.0% from 1988.

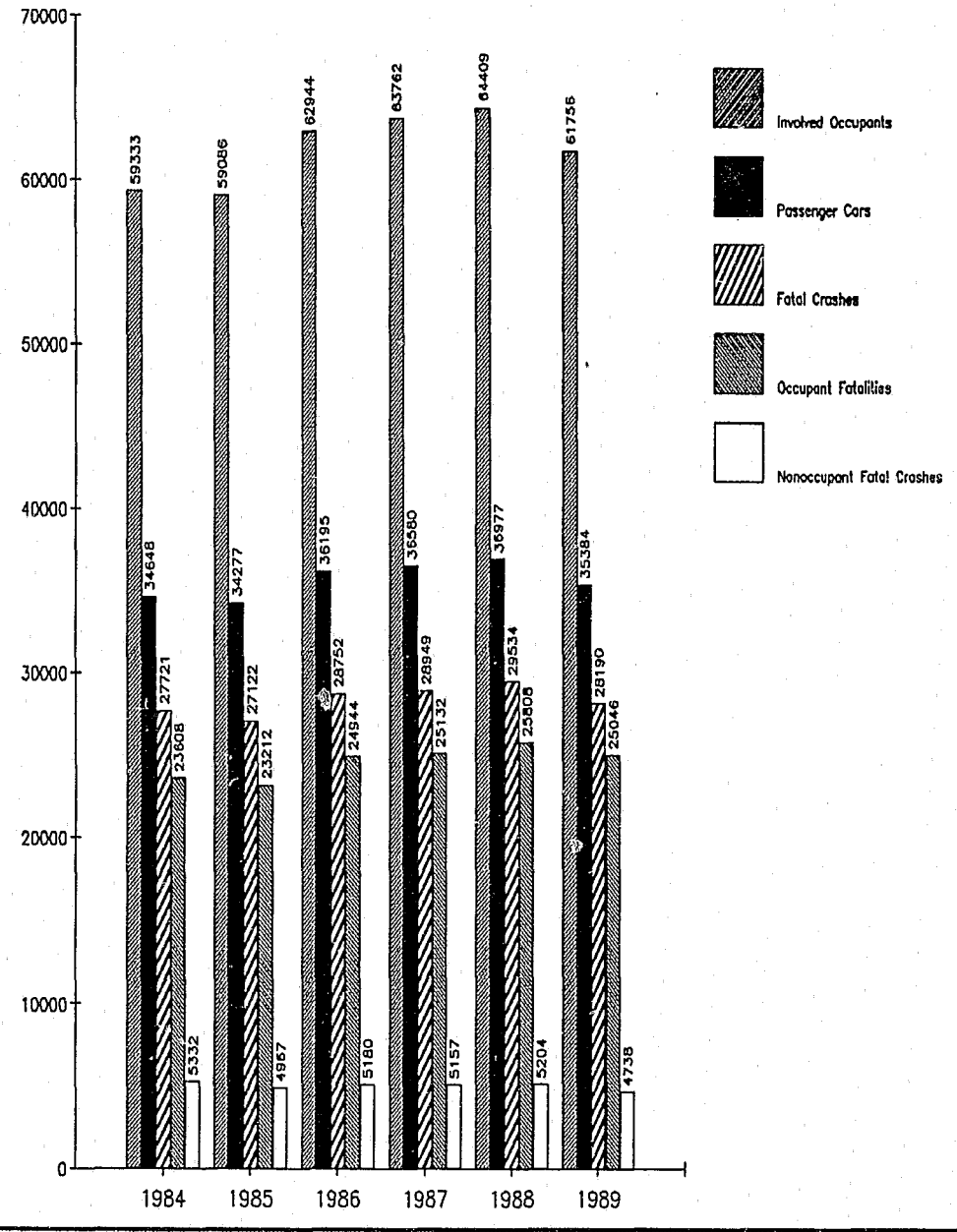

Figure 6-2
Passenger Cars Involved in Fatal Crashes and Related Fatalities for 1984 - 1989

Table 6-7 indicates the distribution of passenger cars in fatal crashes by most harmful event. Collision with a motor vehicle in transport was the most harmful event for more than half (57.0%) of the passenger cars involved in fatal crashes.

Table 6-7
Distribution of Passenger Cars Involved in Fatal Crashes by Most Harmful Event

Collision/Non-Collision Type	Number	Percent of Total
Collision with Motor Vehicle in Transport		
Rear End		
Striking	1,117	3.2
Struck	857	2.4
Both	258	0.7
Unknown	0	0.0
Subtotal	2,232	6.3
Head On	7,644	21.6
Rear to Rear	22	0.1
Angle		
Striking	4,033	11.4
Struck	4,867	13.8
Both	441	1.2
Unknown	8	0.0
Subtotal	9,349	26.4
Sideswipe	918	2.6
Collision with Fixed Object		
Tree or Shrubbery	2,085	5.9
Utility pole or Sign	1,621	4.6
Guard Rail	753	2.1
Other Fixed Object	3,267	9.2
Collision with Object Not Fixed	954	2.7
Collision with Unknown Object	50	0.1
Collision with Nonoccupant	4,387	12.4
Non-collision	2,099	5.9
Unknown	3	0.0
Total	35,384	100.0

The first harmful event in 54.6% of all passenger car occupant fatalities was a collision with another motor vehicle, as shown in Table 6-8.

Table 6-8
Passenger Car Occupant Fatalities by First Harmful Event

	Number	%
Collision with Motor Vehicle in Transport		
Rear End	1,274	5.1
Head On	5,717	22.8
Rear to Rear	15	0.1
Angle	6,144	24.5
Side-Swipe	511	2.0
Collision, Type Unknown	31	0.1
Tree or Shrubbery	2,310	9.2
Utility Pole or Sign	1,719	6.9
Guard Rail	759	3.0
Object not Fixed	995	4.0
Other Fixed Object	3,387	13.5
Non-collision Overturn	1,947	7.8
Non-collision Other	209	0.8
Nonoccupant	25	0.1
Unknown	3	
Total	25,046	100.0

Table 6-10 shows passenger car occupant fatalities by point of principal impact on the vehicle that produced the most property damage or personal injury. An impact on the top of a vehicle might have been caused, for example, by a low bridge overpass. In contrast, undercarriage impact refers to damage sustained on the vehicle's underside. For instance, undercarriage damage may result from a vehicle vaulting over a ramp or curb.

"Underride" refers to crashes in which one vehicle rides under another. The most common example is that of an automobile striking the rear or side of a tractor-trailer and continuing wholly or partly under the truck. For this type of crash, the principal point of impact would be "underride" for the passenger car and "override for the tractor-trailer.

The 25,046 passenger car occupant deaths can be classified by the point of principal impact of their vehicle. When the terms "front," "rear," "left side," and "right side" are used in this report, they refer to the following groups:

- Front - Clock points 11, 12, and 1 (within 45 degrees of direct, head-on collision)
- Rear - Clock points, 5, 6, and 7
- Left Side - Clock points 8, 9, and 10
- Right Side - Clock points 2, 3, and 4

Table 6-10 also provides non-collision data. For instance, if a vehicle rolls over, and if that rollover is the only event in the accident, there is no collision and no coding of impact points.

Table 6-9
Involved Vehicles and Occupant Fatalities by Vehicle Size

Size		Vehicles Number	%	Occupants Number	%	Occupant Fatalities Number	%
Mini Subcompact	- Under 95 Inches	4,145	11.7	7,162	11.6	3,481	13.9
Subcompact	- 95-99 inches	6,144	17.4	10,635	17.2	4,785	19.1
Compact	- 100-104 inches	6,751	19.1	11,980	19.4	4,987	19.9
Intermediate	- 105-109 inches	7,037	19.9	12,377	20.0	4,943	19.7
Full Size	- 110-114 inches	4,024	11.4	6,929	11.2	2,569	10.3
Largest Size	- Over 114 inches	4,476	12.6	7,815	12.7	2,534	10.1
Unknown		2,807	7.9	4,858	7.9	1,747	7.0
Total		35,384	100.0	61,756	100.0	25,046	100.0

Table 6-9 reveals that passenger cars classified as intermediate accounted for the greatest proportion (19.9%) of passenger cars involved in fatal, crashes followed by the compact-sized passenger cars (19.1%). Small cars do not protect occupants as well as larger cars. The percentage of passenger car occupants who are killed decreases as the size of the passenger car increases. Almost half (48.6%) of the occupants of the smallest size passenger car (less than 95 inches) were killed, while less than one-third (32.4%) of the occupants of the largest size car (over 114 inches) died in the crash.

Table 6-10
Distribution of Passenger Car Occupant Fatalities by Point of Principal Impact

Point of Principal Impact	Single Vehicle Number	%	Multi-Vehicle Number	%
Clock 1	651	6.0	693	4.9
Clock 2	270	2.5	415	2.9
Clock 3	921	8.4	2,230	15.8
Clock 4	119	1.1	264	1.9
Clock 5	84	0.8	159	1.1
Clock 6	86	0.8	423	3.0
Clock 7	84	0.8	104	0.7
Clock 8	115	1.1	218	1.5
Clock 9	855	7.8	2,166	15.3
Clock 10	301	2.8	558	4.0
Clock 11	599	5.5	1,226	8.7
Clock 12	4,002	36.6	5,314	37.6
Top	590	5.4	159	1.1
Undercarriage	191	1.7	15	0.1
Underride	26	0.2	93	0.7
Non-Collision	1,721	15.8	4	0.0
Override	1	0.0	1	0.0
Unknown	307	2.8	81	0.6
Total	10,923	100.0	14,123	100.0

Motorcycles

Motorcycle rider fatalities (including fatalities on other motorized cycles) decreased 14.2% between 1988 and 1989 (Table 1-13 in Chapter 1). In 1989, 3,143 motorcyclists were killed (Table 6-11). Figure 6-4 depicts the six year history (1984 through 1989) of fatal crashes involving motorcycles. Figure 6-5 further reveals that by far motorcyclists are more likely to be the party killed when involved in a fatal crash.

Table 6-11
Involved Vehicles, Occupants, and Fatalities by Body Type for Motorcycles

	Vehicles		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%
Motorcycles	3,081	96.5	3,718	96.6	3,036	96.6
Other Motorized Cycles						
Moped	45	1.4	53	1.4	42	1.3
Other & Unknown Motorcycle	68	2.1	78	2.0	65	2.1
Total	3,194	100.0	3,849	100.0	3,143	100.0

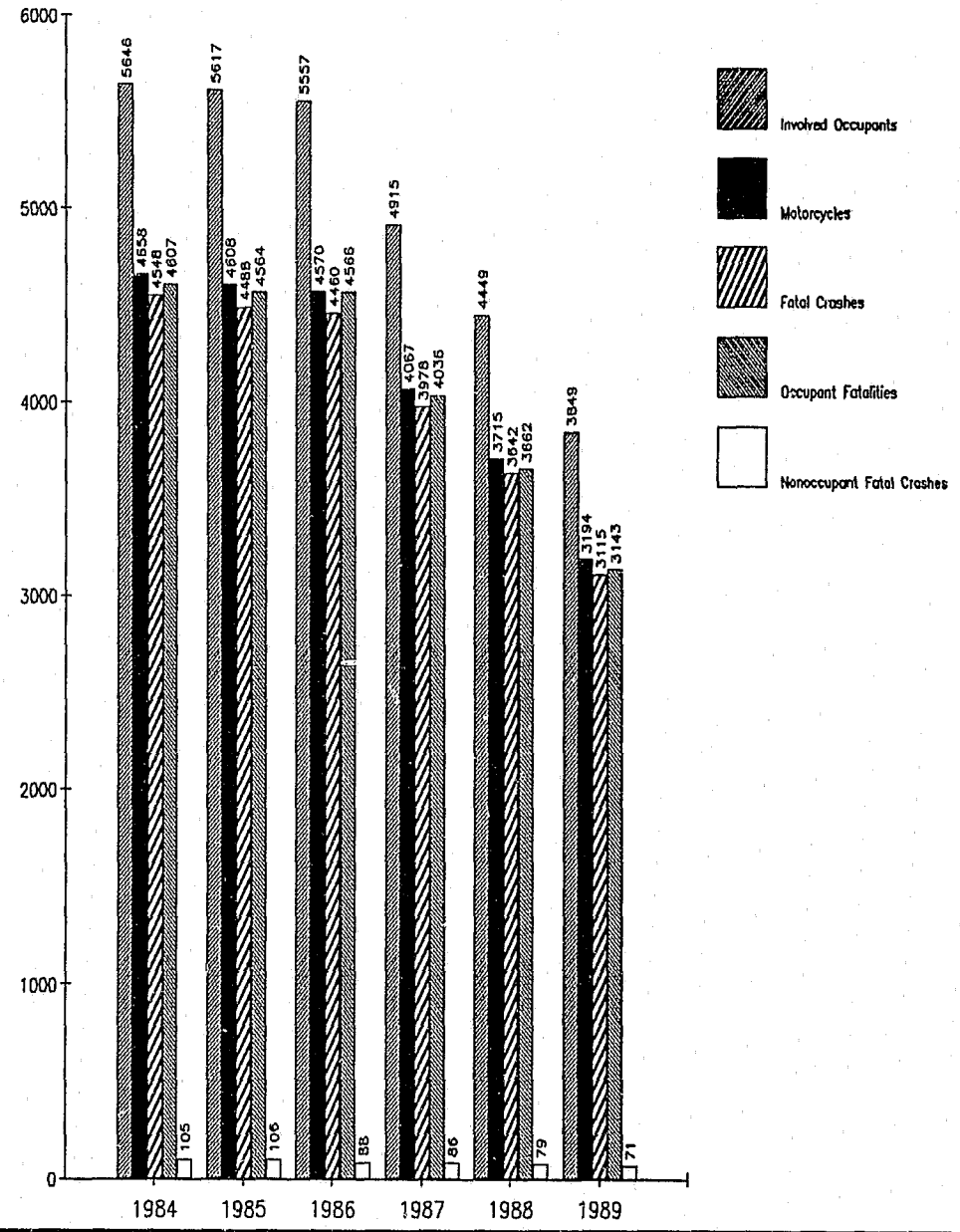

Figure 6-3
Motorcycles Involved in Fatal Crashes and Related Fatalities for 1984 - 1989

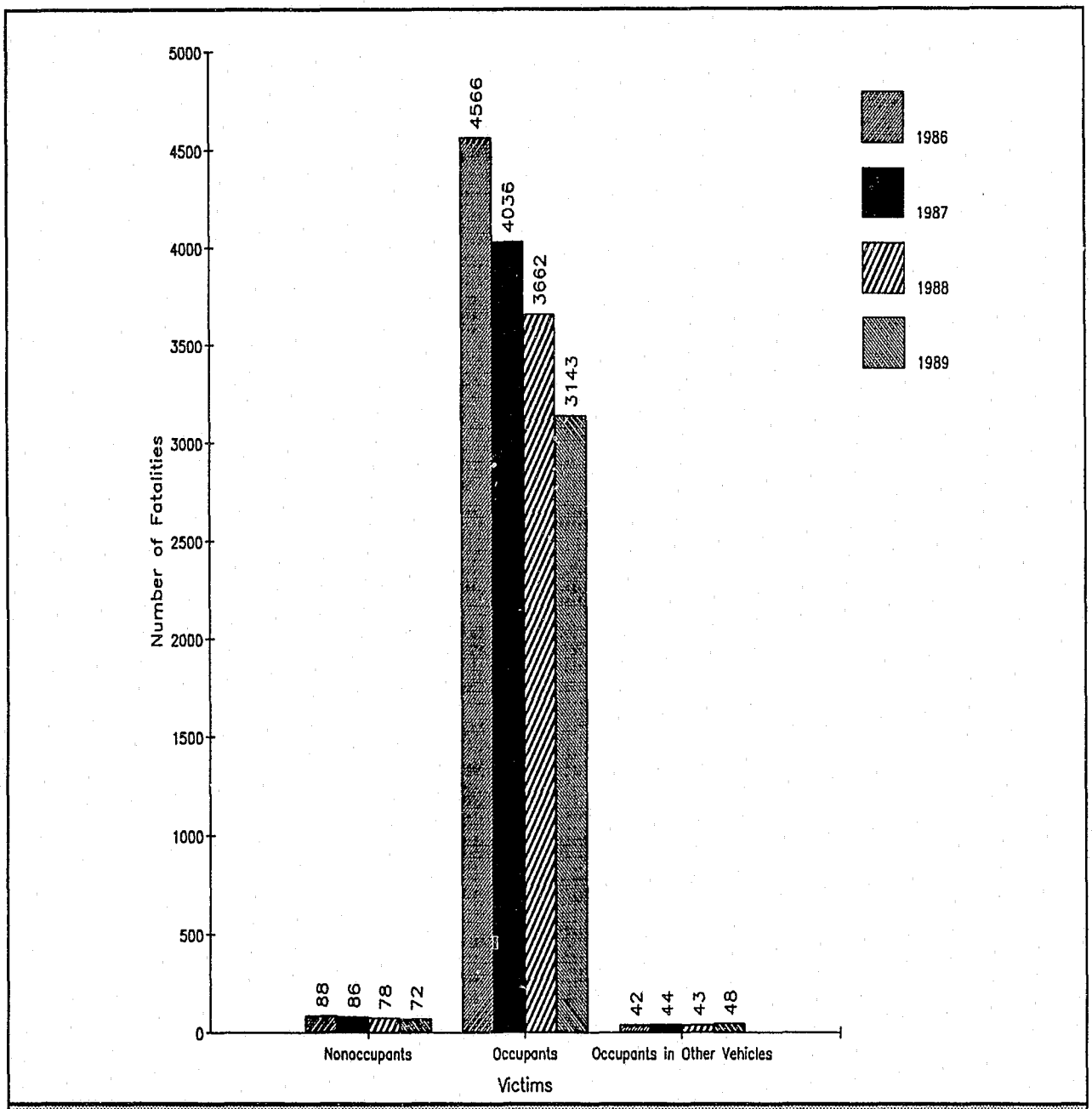

Figure 6-4
Fatalities in Motorcycle Crashes

Table 6-12 shows that of the 3,143 motorcyclists killed in 1989, the largest proportion (65.3%) died as a result of frontal collisions. Table 6-13 indicates the distribution of motorcycles involved in fatal crashes by most harmful event. Collision with a motor vehicle in transport was the most harmful event for half (49.9%) of the motorcycles involved in a fatal crash.

Table 6-12
Distribution of Motorcycle and Other Motorized Vehicle Fatalities by Point of Principal Impact

Point of Principal Impact	Single Vehicle		Multi-vehicle	
	Number	%	Number	%
Clock 1	56	3.9	50	3.0
Clock 2	26	1.8	16	0.9
Clock 3	41	2.8	91	5.4
Clock 4	5	0.3	4	0.2
Clock 5	10	0.7	11	0.6
Clock 6	12	0.8	66	3.9
Clock 7	4	0.3	8	0.5
Clock 8	7	0.5	13	0.8
Clock 9	58	4.0	100	5.9
Clock 10	10	0.7	37	2.2
Clock 11	37	2.6	65	3.8
Clock 12	720	49.7	1,125	66.4
Top	2	0.1	2	0.1
Undercarriage	79	5.5	11	0.6
Underride	0	0.0	0	0.0
Non-Collision	245	16.9	9	0.5
Override	0	0.0	0	0.0
Unknown	137	9.5	86	5.1
Total	1,449	100.0	1,694	100.0

Table 6-13
Distribution of Motorcycles Involved in Fatal Crashes by Most Harmful Event

Collision/Non-Collision Type	Number	% of Total
Collision with Motor Vehicle in Transport		
Rear End		
Striking	154	4.8
Struck	67	2.1
Both	11	0.3
Unknown	0	0.0
Subtotal	232	7.3
Head On	365	11.4
Rear to Rear	6	0.2
Angle		
Striking	711	22.3
Struck	186	5.8
Both	17	0.5
Unknown	2	0.1
Subtotal	916	28.7
Sideswipe	73	2.3
Collision with Fixed Object		
Tree or Shrubbery	124	3.9
Utility pole or Sign	177	5.5
Guard Rail	127	4.0
Other Fixed Object	579	18.1
Collision with Object Not Fixed	98	3.1
Collision with Unknown Object	2	0.1
Collision with Nonoccupant	76	2.4
Non-collision	419	13.1
Unknown	0	0.0
Total	3,194	100.0

Light Trucks

The involvement of light trucks in fatal crashes during the past six years is depicted in Figure 6-5. As revealed in Table 1-12 in Chapter 1, light trucks were involved in 1.4% more fatal crashes in 1989 than in 1988. Further, Table 1-13 in Chapter 1 indicates that light truck occupants fatalities increased by 2.0%.

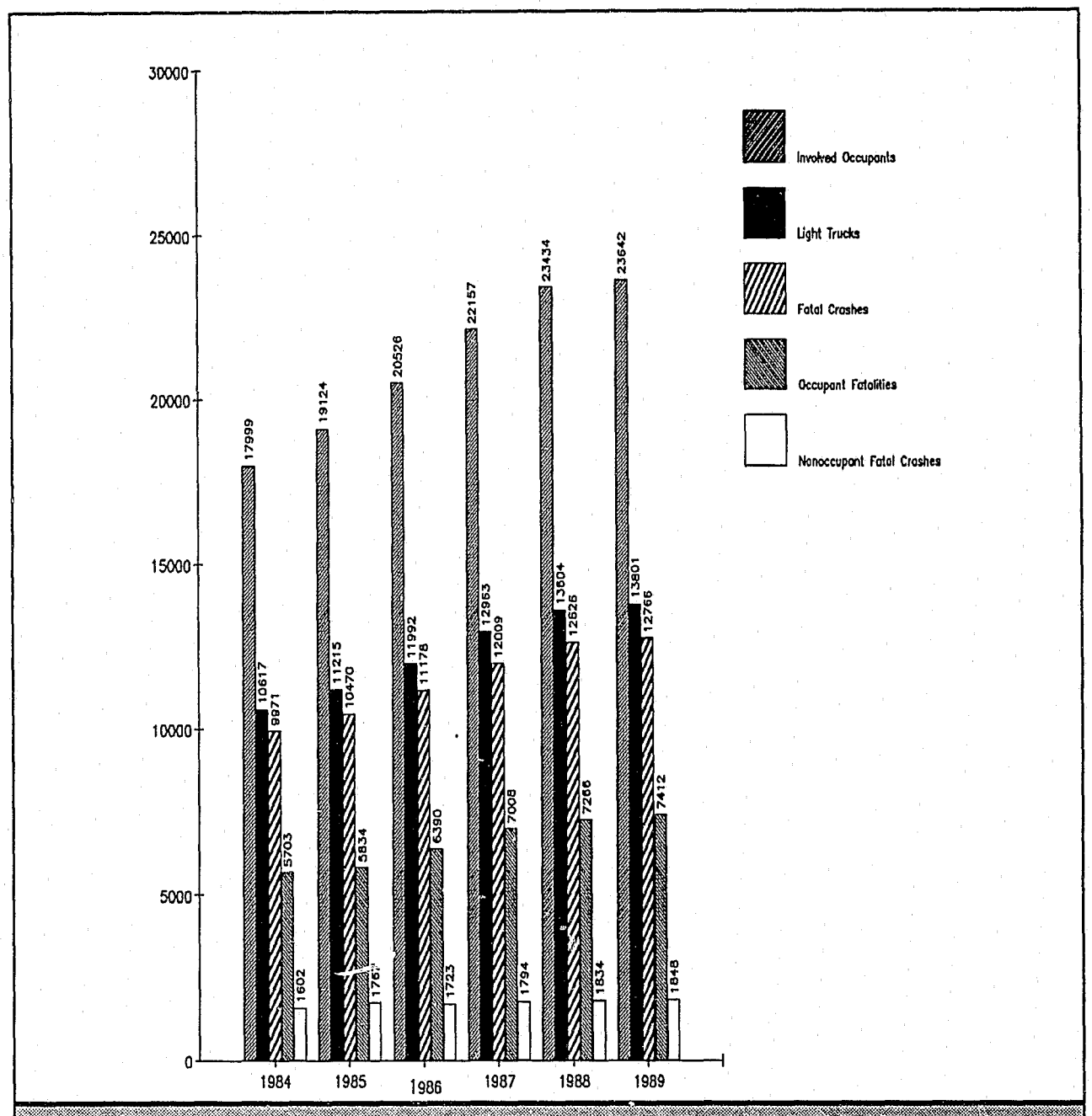

Figure 6-5
Light Truck Involved Fatal Crashes and Related Fatalities for 1984-1989

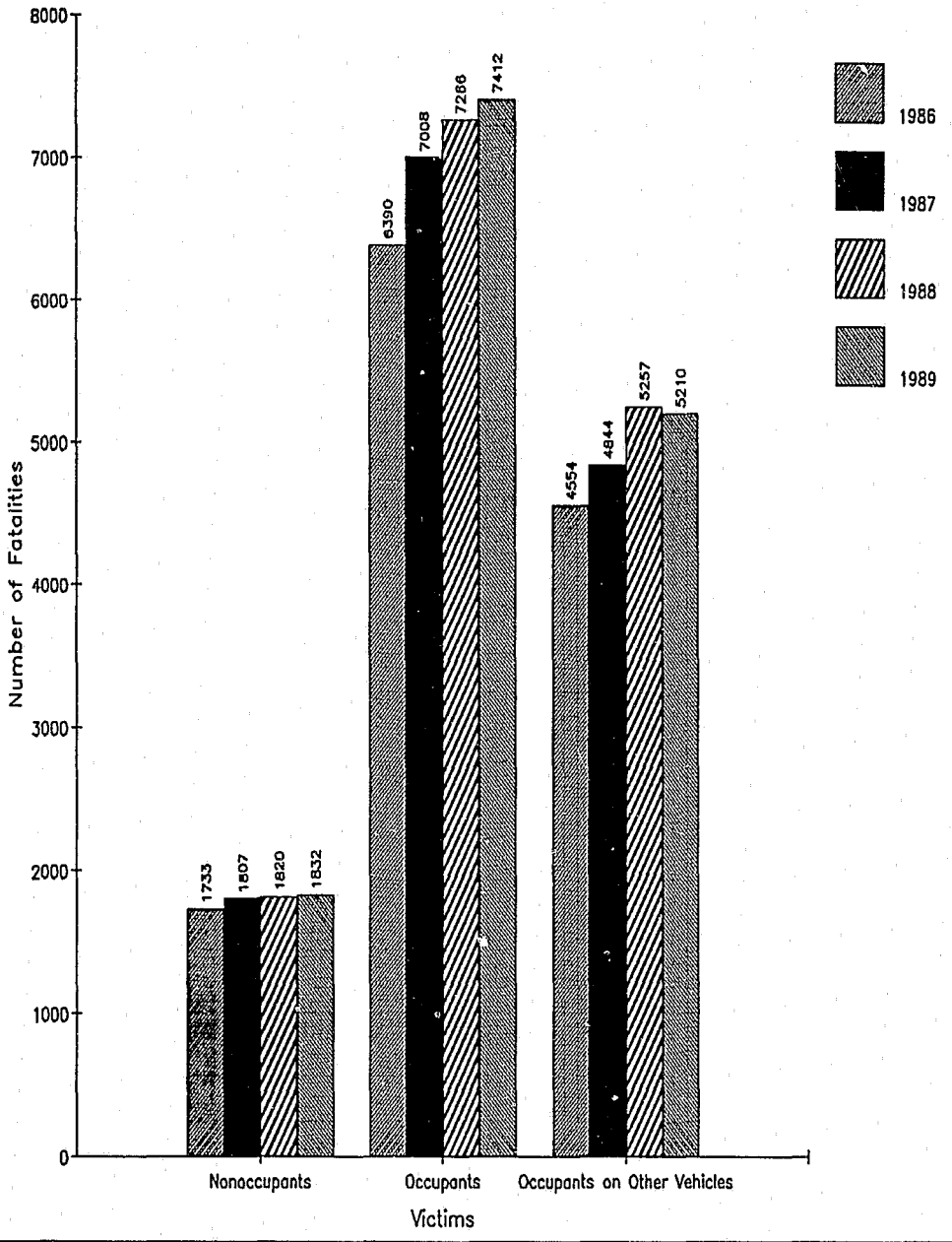

Figure 6-6
Fatalities in Light Truck Crashes

Table 6-14
Involved Vehicles, Occupants, and Fatalities by Body Type for Light Trucks

	Vehicles		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%
Light Trucks						
Van	2,563	18.6	5,766	24.4	1,214	16.4
Pickup	10,262	74.4	16,338	69.1	5,864	79.1
Other Light Truck	362	2.6	662	2.8	144	1.9
Unknown Light Truck	614	4.4	876	3.7	190	2.6
Total	13,801	100.0	23,642	100.0	7,412	100.0

Table 6-15 highlights the distribution of light trucks involved in fatal crashes by most harmful event. The most harmful event for 54.9% of the 13,801 light trucks involved in fatal crashes in 1989 was a collision with another motor vehicle in transport. Almost one half (45.4%) were head-on or angle collisions. Non-collisions accounted for 11.0% of the most harmful events. These non-collisions included falls from the vehicle, rollovers, fires, immersions, and other types of non-collisions. In fatal crashes, light trucks have a greater portion of non-collision events than do passenger cars (Table 6-7) with most of the non-collision events being rollovers.

Table 6-15
Distribution of Light Trucks Involved in Fatal Crashes by Most Harmful Event

Collision/Non-Collision Type	Number	Percent of Total
Collision with Motor Vehicle in Transport		
Rear End		
Striking	485	3.5
Struck	368	2.7
Both	79	0.6
Unknown	2	0.0
Subtotal	934	6.8
Head On	2,944	21.3
Rear to Rear	9	0.1
Angle		
Striking	2,059	14.9
Struck	1,166	8.4
Both	102	0.7
Unknown	3	0.0
Subtotal	3,330	24.1
Sideswipe	357	2.6
Collision with Fixed Object		
Tree or Shrubbery	652	4.7
Utility pole or Sign	405	2.9
Guard Rail	266	1.9
Other Fixed Object	1,275	9.2
Collision with Object Not Fixed	384	2.8
Collision with Unknown Object	33	0.2
Collision with Nonoccupant	1,692	12.3
Non-collision	1,519	11.0
Unknown	1	0.0
Total	13,801	100.0

In one out of every three single vehicle light truck crashes, the point of principal impact was a non-collision (29.5%, Table 6-16).

Table 6-16
Distribution of Light Truck Occupant Fatalities by Point of Principal Impact

Point of Principal Impact	Single Vehicle		Multi-Vehicle	
	Number	%	Number	%
Clock 1	248	5.6	204	6.9
Clock 2	88	2.0	102	3.4
Clock 3	220	5.0	269	9.1
Clock 4	20	0.5	42	1.4
Clock 5	25	0.6	38	1.3
Clock 6	23	0.5	84	2.8
Clock 7	23	0.5	41	1.4
Clock 8	20	0.5	31	1.0
Clock 9	187	4.2	243	8.2
Clock 10	83	1.9	101	3.4
Clock 11	279	6.3	326	11.0
Clock 12	1,418	31.9	1,317	44.4
Top	274	6.2	77	2.6
Undercarriage	65	1.5	11	0.4
Underride	5	0.1	30	1.0
Non-Collision	1,311	29.5	5	0.2
Override	2	0.0	0	0.0
Unknown	152	3.4	48	1.6
Total	4,443	100.0	2,969	100.0

In trucks of all sizes, the proportion of frontal impact fatalities is substantially higher for multi-vehicle crashes than for single vehicle crashes (Tables 6-16, 6-19, and 6-21).

Medium Trucks

In 1989, 672 medium trucks were involved in fatal crashes and 128 of the 838 occupants were killed (Table 6-17). More trucks weighing 10,000 to 19,500 pounds were involved in fatal crashes than were trucks weighing 19,500 to 26,000 pounds (Table 6-17). Figure 6-8 recounts the history of medium truck crashes and occupants deaths for 1984 through 1989.

Table 6-17
Involved Vehicles, Occupants, and Fatalities
by Gross Vehicle Weight Rating for Medium Trucks

	Vehicles		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%
Medium Trucks						
10,000 to 19,500 (GVWR)	249	37.1	311	37.1	44	34.4
19,500 to 26,000 (GVWR)	111	16.5	139	16.6	16	12.5
Unknown (GVWR)	312	46.4	388	46.3	68	53.1
Total	672	100.0	838	100.0	128	100.0

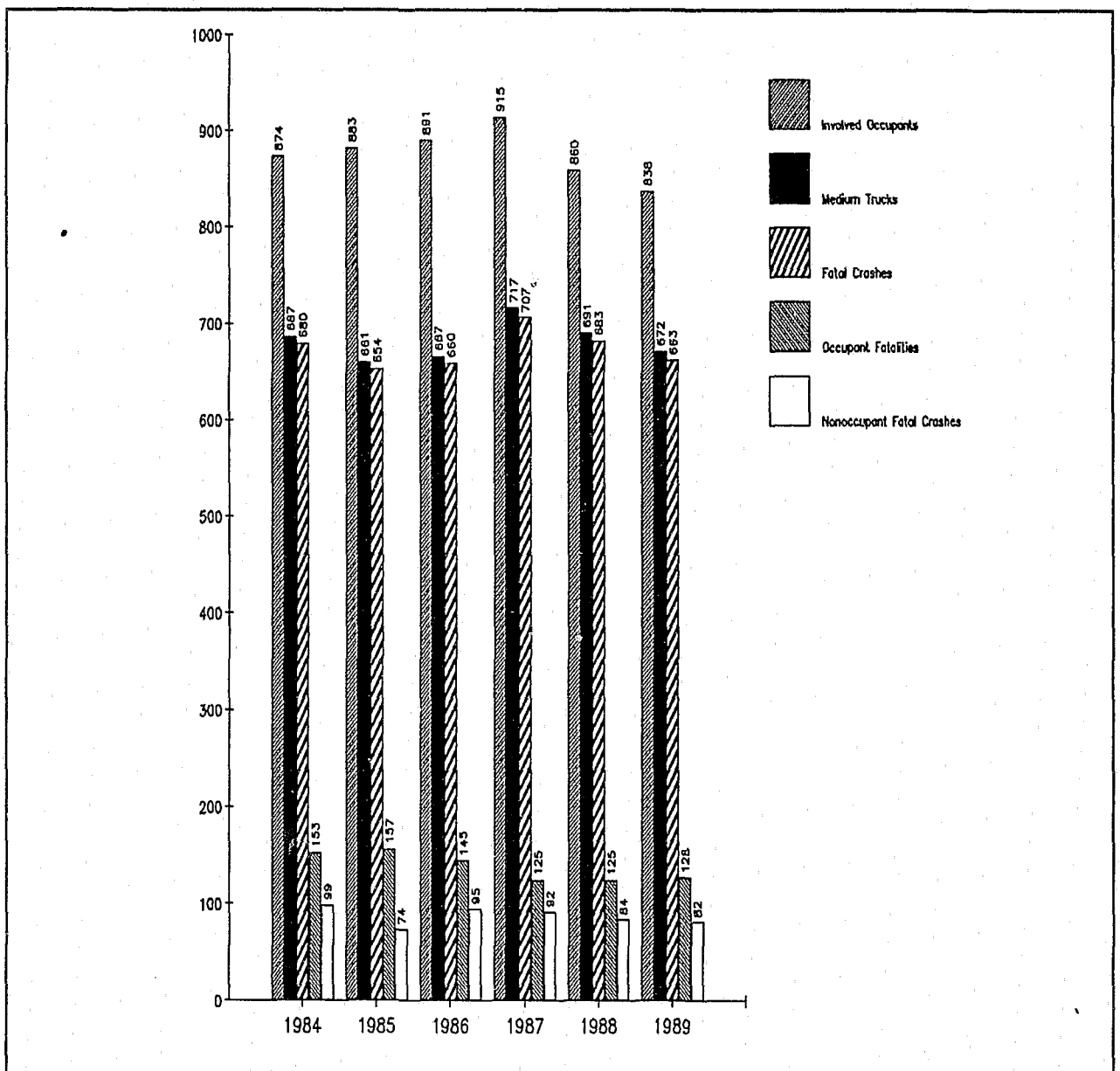

Figure 6-7
Medium Truck Involved Fatal Crashes and Related Fatalities for 1984-1989

Almost 72% of those killed in medium truck crashes were occupants of the other vehicle (Figure 6-8). Collision with another vehicle was the most harmful event for 74.7% of the medium trucks involved in fatal crashes in 1989. Collision with a nonoccupant accounted for (Table 6-18) 10.9% of the medium truck crashes, and non-collision for 6.5%.

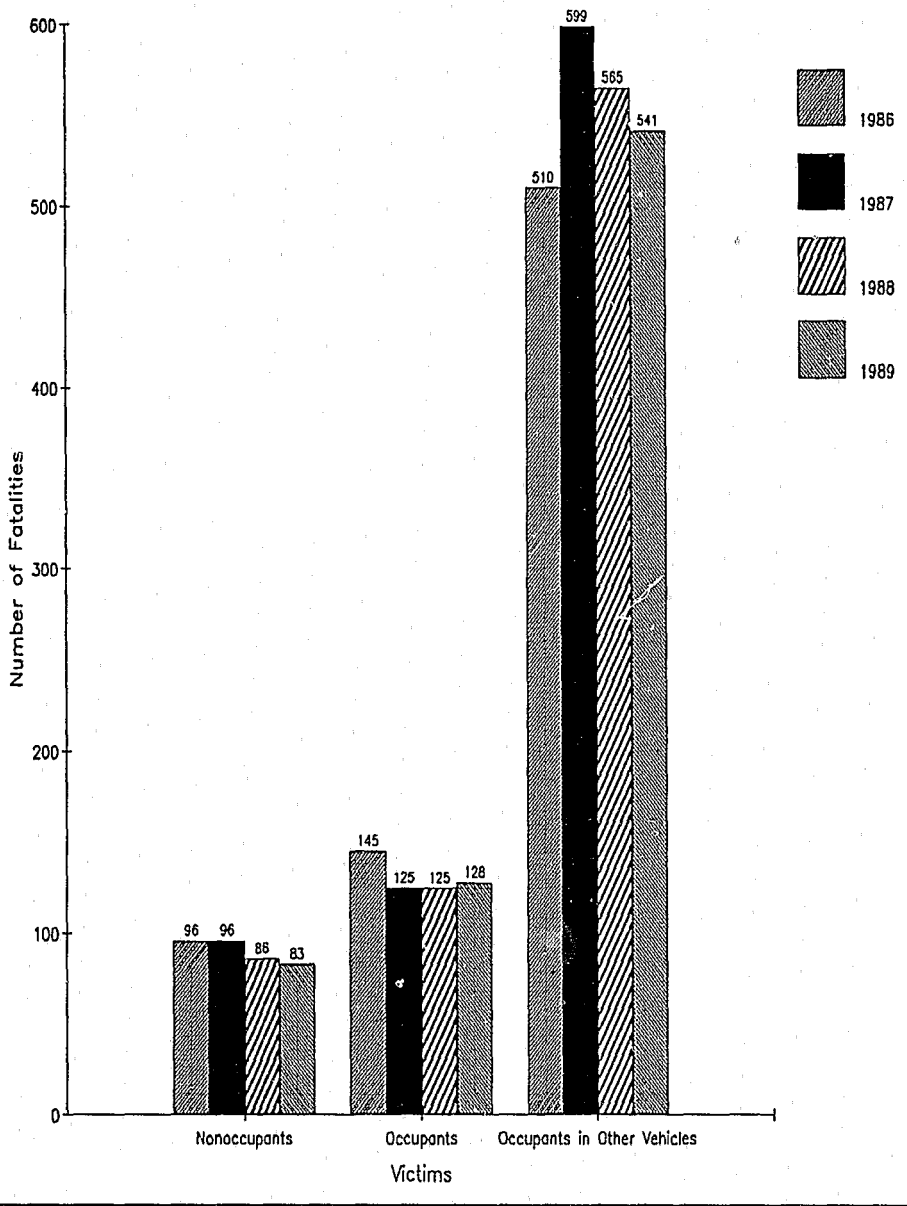

Figure 6-8
Fatalities in Medium Truck Crashes

Table 6-18
Distribution of Medium Trucks Involved in Fatal Crashes by Most Harmful Event

Collision/Non-Collision Type	Number	Percent of Total
Collision with Motor Vehicle In Transport		
Rear End		
Striking	30	4.5
Struck	71	10.6
Both	4	0.6
Unknown	0	0.0
Subtotal	105	15.6
Head On	141	21.0
Rear to Rear	0	0.0
Angle		
Striking	149	22.2
Struck	74	11.0
Both	2	0.3
Unknown	0	0.0
Subtotal	225	33.5
Sideswipe	31	4.6
Collision with Fixed Object		
Tree or Shrubbery	8	1.2
Utility pole or Sign	8	1.2
Guard Rail	9	1.3
Other Fixed Object	20	3.0
Collision with Object Not Fixed		
Collision with Unknown Object	1	0.1
Collision with Nonoccupant	73	10.9
Non-collision	44	6.5
Unknown	0	0.0
Total	672	100.0

Frontal impacts caused approximately one-third (37.3%) of the medium truck occupant fatalities in single vehicle crashes and more than half (75.5%) of all the fatalities in multi-vehicle crashes (Table 6-19).

Table 6-19
Distribution of Medium Truck Occupant Fatalities by Point of Principal Impact

Point of Principal Impact	Single Vehicle Number	%	Multi-vehicle Number	%
Clock 1	2	2.7	0	0.0
Clock 2	0	0.0	0	0.0
Clock 3	4	5.3	4	7.5
Clock 4	1	1.3	0	0.0
Clock 5	1	1.3	0	0.0
Clock 6	0	0.0	4	7.5
Clock 7	0	0.0	0	0.0
Clock 8	1	1.3	0	0.0
Clock 9	3	4.0	1	1.9
Clock 10	1	1.3	1	1.9
Clock 11	1	1.3	9	17.0
Clock 12	25	33.3	31	58.5
Top	5	6.7	2	3.8
Undercarriage	1	1.3	0	0.0
Underride	0	0.0	0	0.0
Non-Collision	29	38.7	0	0.0
Override	0	0.0	0	0.0
Unknown	1	1.3	1	1.9
Total	75	100.0	53	100.0

Heavy Trucks

Figure 6-9 illustrates the involvement of heavy trucks in fatal crashes from 1984 through 1989. Table 6-20 reveals that a collision with another motor vehicle in transport was the most harmful event for most of the heavy trucks involved in fatal crashes (76.5%). This proportion is substantially greater than for passenger cars, motorcycles, or light trucks.

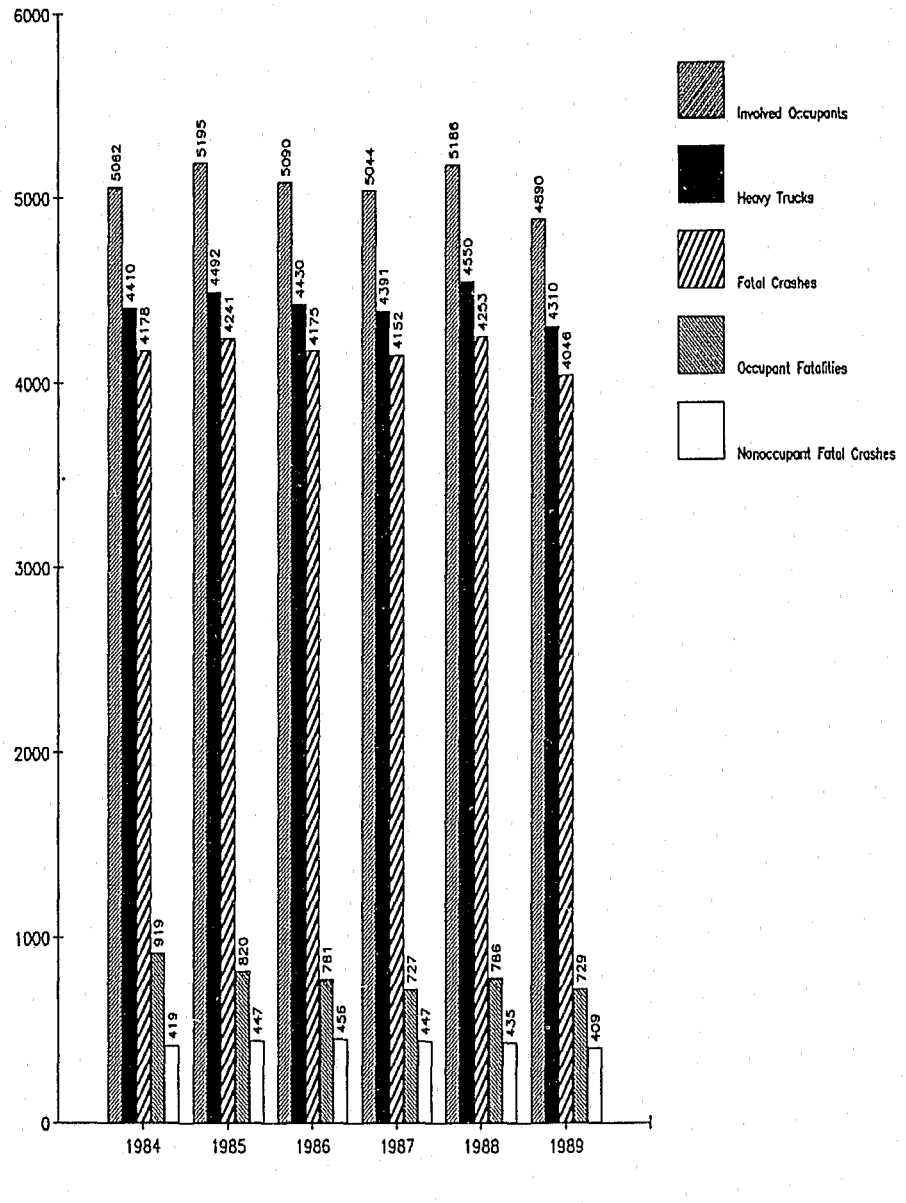

Figure 6-9
Heavy Truck Involved Fatal Crashes and Related Fatalities for 1984-1989

Table 6-20
Distribution of Heavy Trucks Involved in Fatal Crashes by Most Harmful Event

Collision/Non-Collision Type	Number	Percent of Total
Collisoin with Motor Vehicle in Transport		
Rear End		
Striking	289	6.7
Struck	466	10.8
Both	25	0.6
Unknown	0	0.0
Subtotal	780	18.1
Head On	980	22.7
Rear to Rear	2	0.0
Angle		
Striking	789	18.3
Struck	510	11.8
Both	17	0.4
Unknown	1	0.0
Subtotal	1,317	30.6
Sideswipe	220	5.1
Collision with Fixed Object		
Tree or Shrubbery	32	0.7
Utility pole or Sign	33	0.8
Guard Rail	98	2.3
Other Fixed Object	158	3.7
Collision with Object Not Fixed		
Collision with Unknown Object	9	0.2
Collision with Nonoccupant	346	8.0
Non-collision	211	4.9
Unknown	0	0.0
Total	4,310	100.0

Fatalities in heavy truck crashes from 1986 through 1989 are depicted in Figure 6-10. For each of these years, occupants of other vehicles constituted approximately three-fourths (76%) of the victims in collisions with heavy trucks.

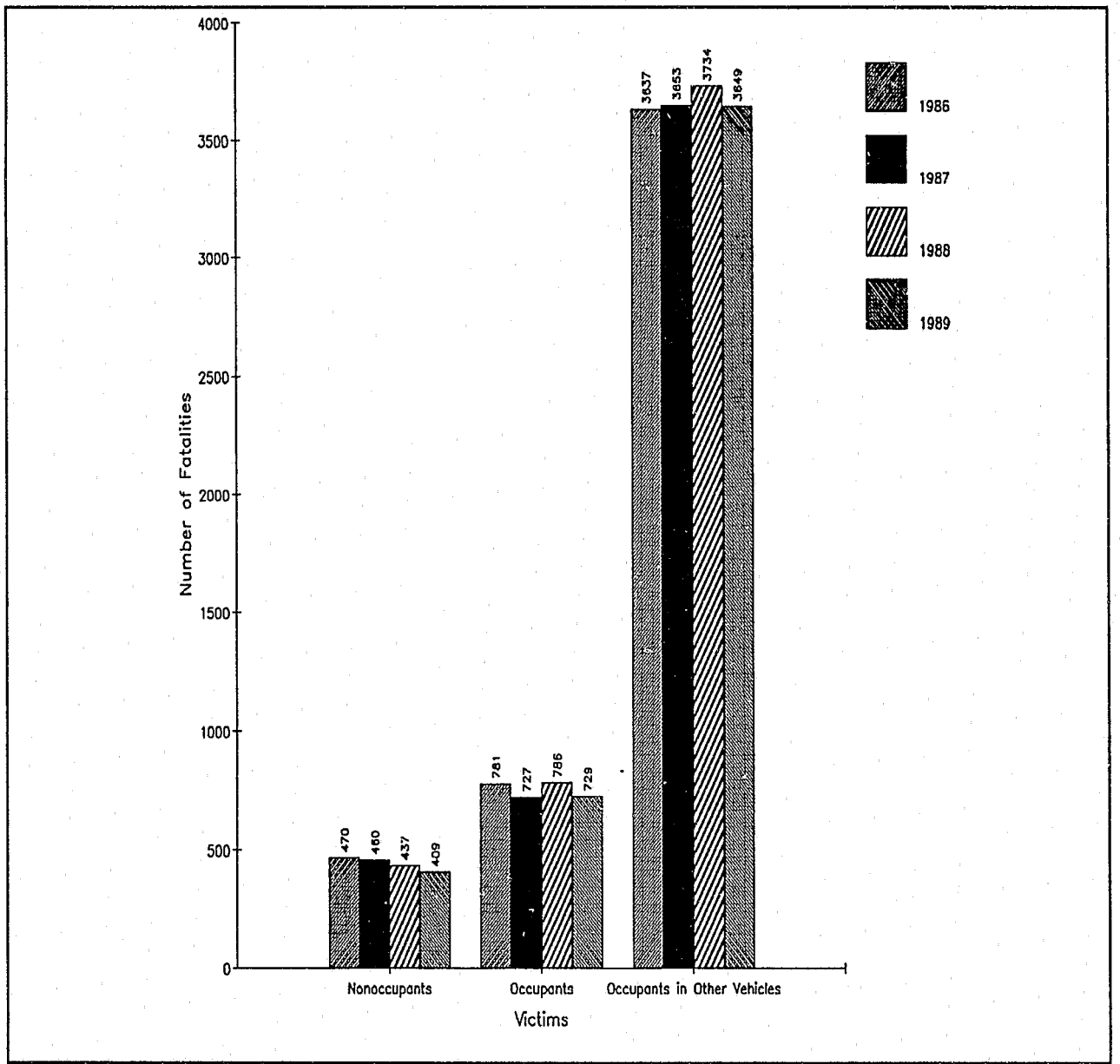

Figure 6-10
Fatalities in Heavy Truck Crashes

As with other types of vehicles, frontal impacts caused the greatest proportion of heavy truck occupant fatalities. The proportion of fatalities in frontal impacts was greater in multi-vehicle crashes than those in single vehicle heavy truck collisions (78.4% as opposed to 49.6%). Non-collisions accounted for 25.5% of the fatalities in single vehicle crashes (Table 6-21).

Table 6-21
Distribution of Heavy Truck Occupant Fatalities by Point of Principal Impact

Point of Principal Impact	Single Vehicle Number	%	Multi-vehicle Number	%
Clock 1	36	7.6	13	5.1
Clock 2	10	2.1	5	2.0
Clock 3	17	3.6	10	3.9
Clock 4	6	1.3	2	0.8
Clock 5	3	0.6	0	0.0
Clock 6	1	0.2	5	2.0
Clock 7	3	0.6	4	1.6
Clock 8	4	0.8	3	1.2
Clock 9	14	3.0	5	2.0
Clock 10	10	2.1	2	0.8
Clock 11	38	8.0	24	9.4
Clock 12	161	34.0	163	63.9
Top	22	4.6	13	5.1
Undercarriage	11	2.3	3	1.2
Underride	0	0.0	0	0.0
Non-Collision	121	25.5	1	0.4
Override	0	0.0	0	0.0
Unknown	17	3.6	2	0.8
Total	474	100.0	255	100.0

School Buses

This category includes vehicles built as school buses and used in school transportation and vehicles of any body type functioning as school buses. In FARS, a "school related crash" is any fatal crash involving a school bus or a vehicle functioning as a school bus (i.e. vans, transit buses, etc.) which is either directly or indirectly involved in the crash. For example, this category would include any crash in which a child embarking or disembarking from a vehicle as listed above, is struck by another vehicle. Because the child was struck after exiting the bus, the crash is classified as school related, even though the bus was neither struck nor was the striking vehicle.

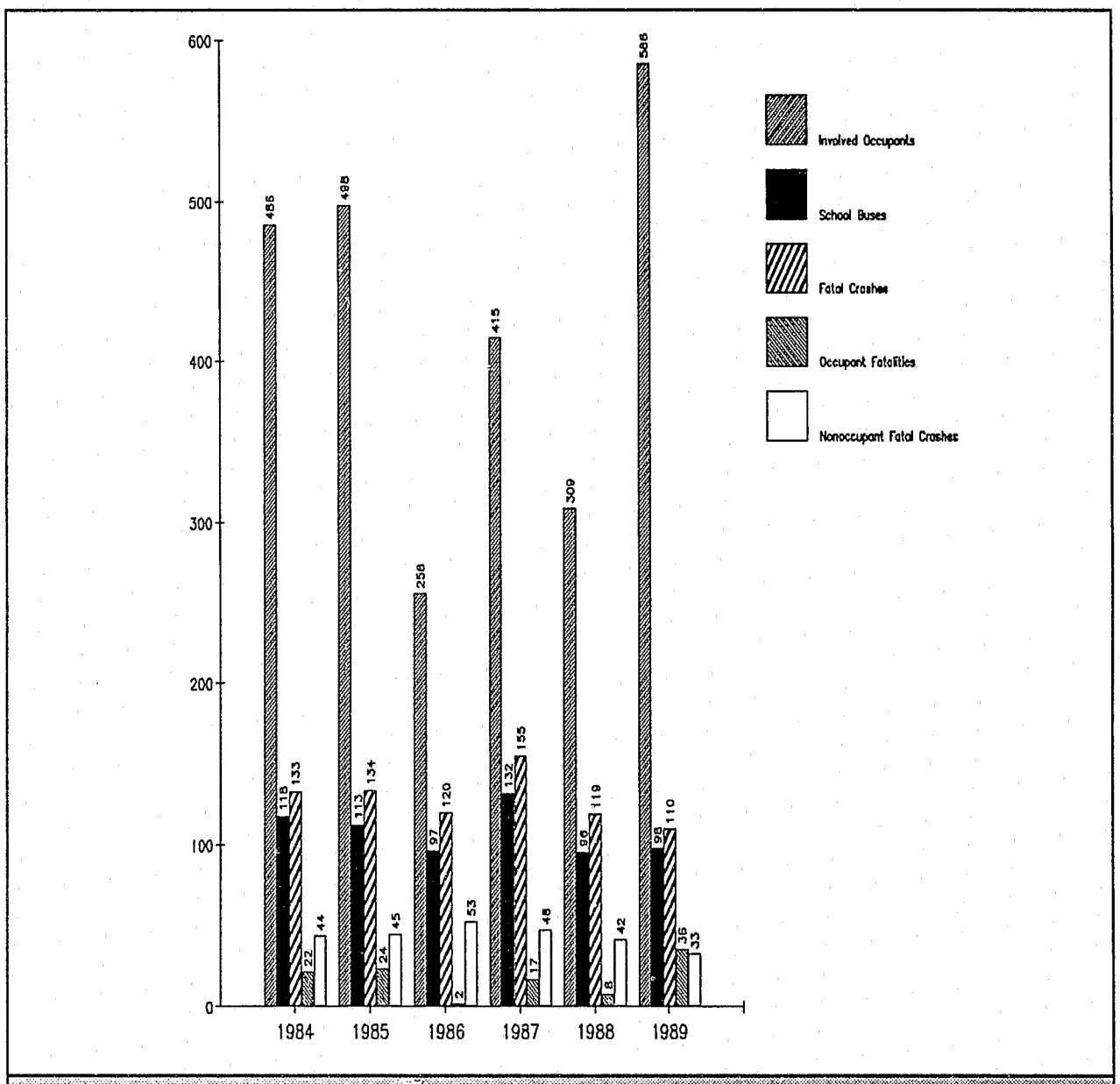

Figure 6-11
School Related Fatalities and Crashes for 1984-1989

A history of school related crashes and fatalities is provided for 1984 through 1989 in Figure 6-11. Non-injured passengers are not included in the involved occupants in Figure 6-11, but all drivers regardless of injury severity are included. In 1989, there were 141 fatalities involving vehicles used for school related activities. Of this amount, 36 fatalities were occupants of the vehicles used, i.e. school buses, transit type buses, or multi-passenger type vehicles; 72 were occupants of other vehicles, and 33 were nonoccupants (pedestrians or pedalcyclists) (Figure 6-12).

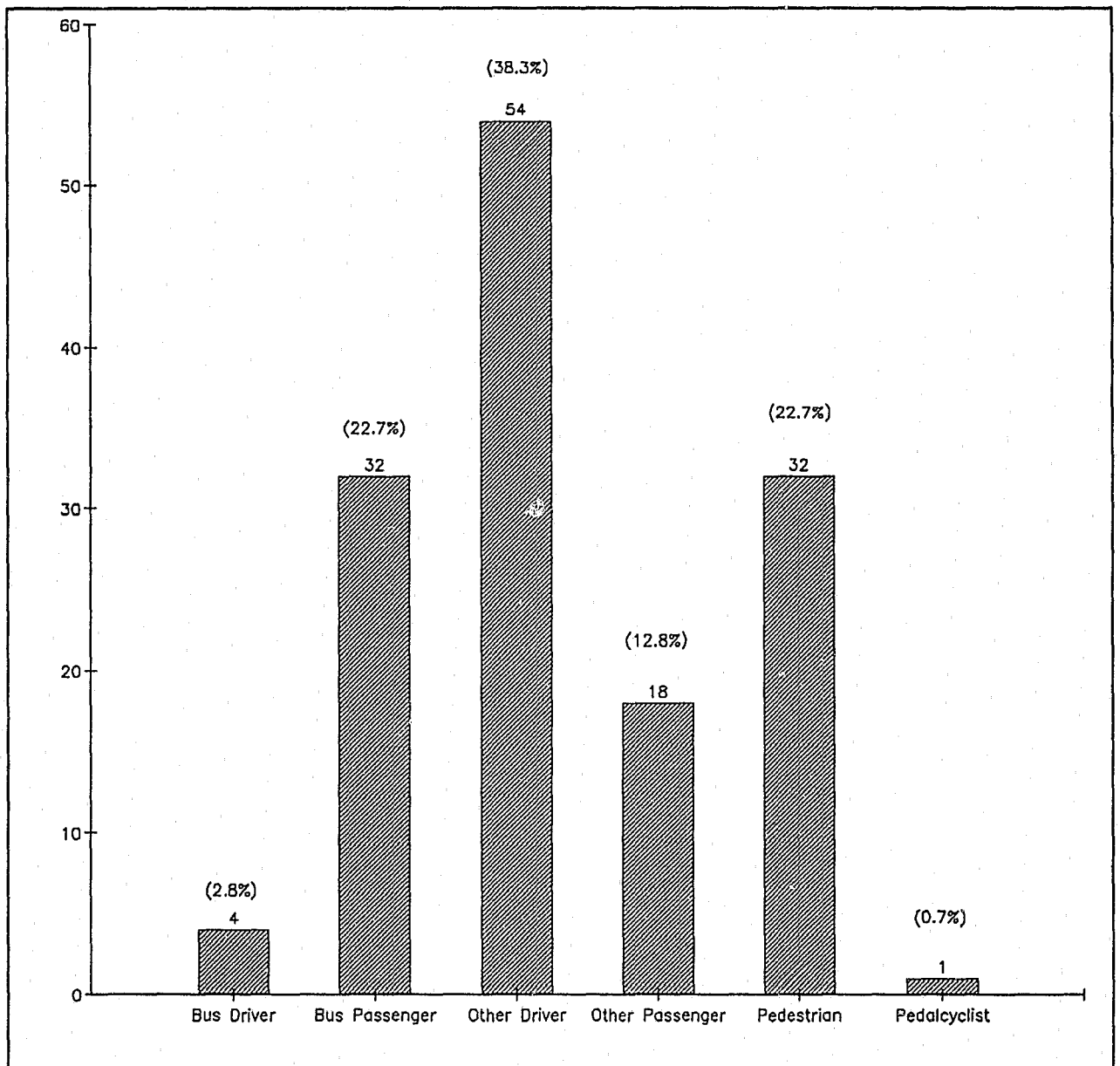

Figure 6-12
Distribution of Fatalities for School Related Crashes

Most of those who lost their lives in crashes involving school buses were drivers of the other vehicles (Figure 6-12).

Pedestrians comprised 32 of the 141 fatalities; of these, 46.9% were between the ages of 5 and 9. The next largest percentage was composed of adults aged 18 and over (34.4%), followed by children aged under 5 (12.5%, Figure 6-13).

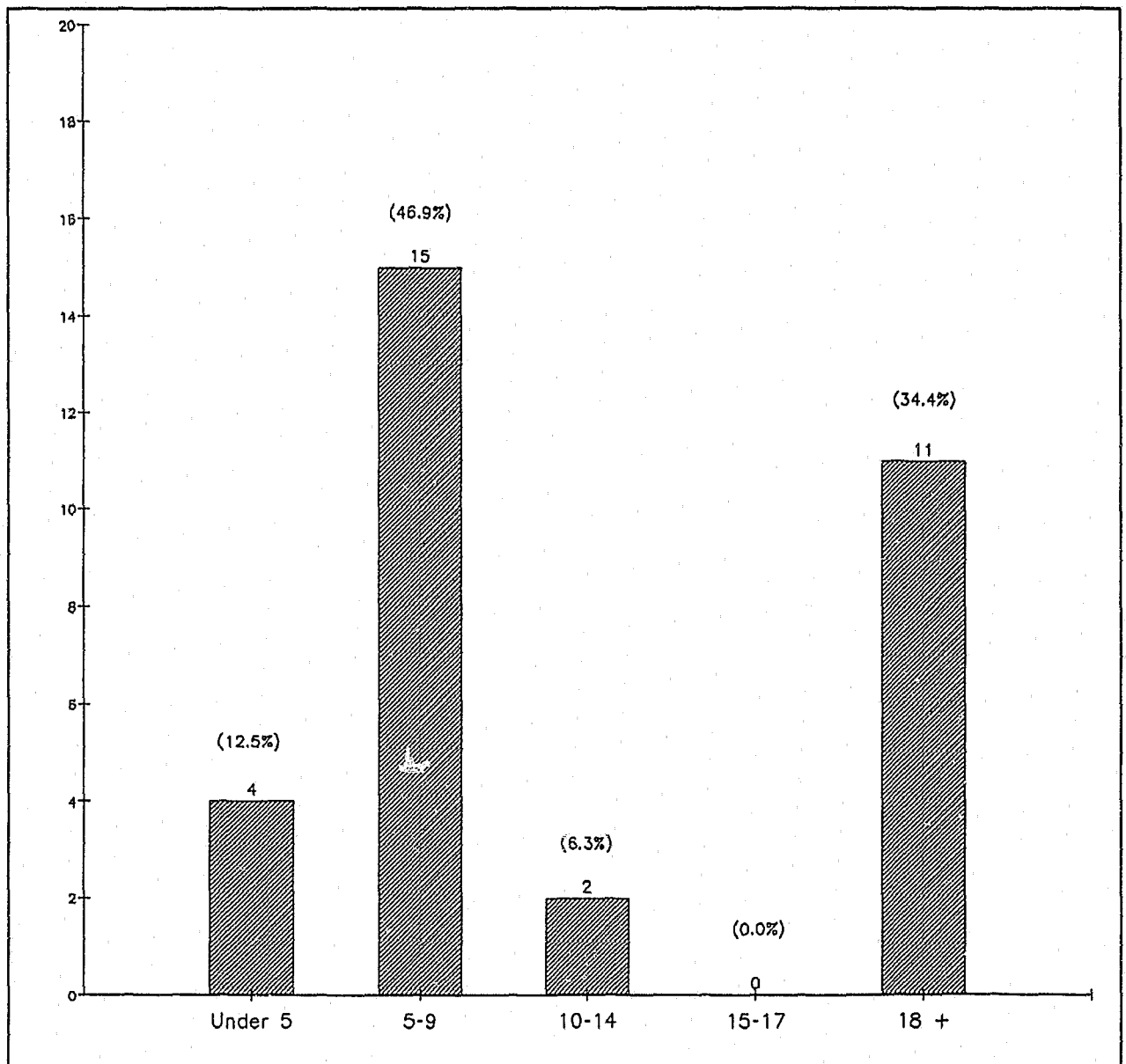

Figure 6-13
Pedestrian Fatalities by Age Group in Fatal School Related Crashes

All Buses

In Table 6-22, involved vehicles, occupants, and fatalities by bus types are listed. The distribution of fatalities involving buses of all types from 1986 to 1989 is shown in Figure 6-15. More occupants of the other vehicle involved in the collision with the bus were killed than occupants on the bus.

Table 6-22
Involved Vehicles,Occupants and Occupant Fatalities by Bus Type

Vehicles	Vehicles		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%
Buses						
School Bus	109	35.0	465	42.0	33	66.0
Cross Country/Intercity Bus	32	10.3	186	16.8	3	6.0
Transit Bus	120	38.6	269	24.3	1	2.0
Other & Unknown Bus	50	16.1	186	16.8	13	26.0
Total	311	100.0	1,106	100.0	50	100.0

Non-Injured Passengers are not included in this occupant count. All Drivers regardless of injury severity are included.

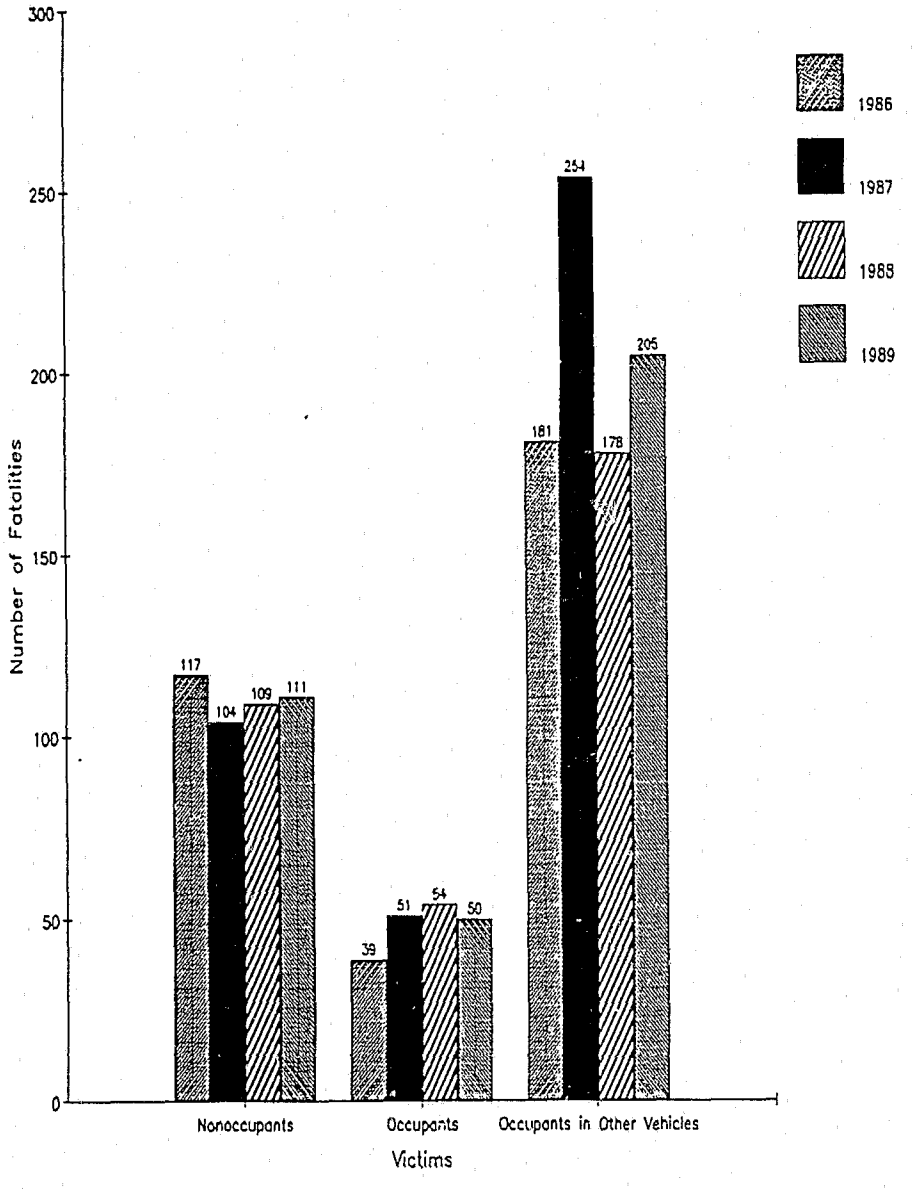

Figure 6-14
Fatalities in Bus Crashes

Table 6-23 shows the distribution of bus occupants fatalities by point of principal impact. Frontal impacts caused 30.0% of the bus fatalities in single vehicle crashes and 80.0% in multi-vehicle crashes. Non-collision accounted for 45.0% of the fatalities.

Table 6-23
Distribution of Bus Occupant Fatalities
by Point of Principal Impact

Point of Principal Impact	Single Vehicle Number	%	Multi-vehicle Number	%
Clock 1	4	20.0	0	0.0
Clock 2	0	0.0	1	3.3
Clock 3	0	0.0	2	6.7
Clock 4	1	5.0	1	3.3
Clock 5	1	5.0	0	0.0
Clock 6	0	0.0	0	0.0
Clock 7	0	0.0	0	0.0
Clock 8	0	0.0	0	0.0
Clock 9	0	0.0	1	3.3
Clock 10	0	0.0	1	3.3
Clock 11	0	0.0	22	73.3
Clock 12	2	10.0	2	6.7
Top	1	5.0	0	0.0
Undercarriage	2	10.0	0	0.0
Underride	0	0.0	0	0.0
Non-Collision	9	45.0	0	0.0
Override	0	0.0	0	0.0
Unknown	0	0.0	0	0.0
Total	20	100.0	30	100.0

Multipurpose Vehicles

In FARS, multipurpose vehicles are defined as a motor vehicle with motive power, except a trailer, designed to carry 10 persons or less which is constructed either on a truck chassis or with special features for occasional off-road operation. Figure 6-16 depicts the distribution of fatalities in multipurpose vehicle crashes from 1984 to 1989. In 1989, 1,133 occupants of these vehicles were killed.

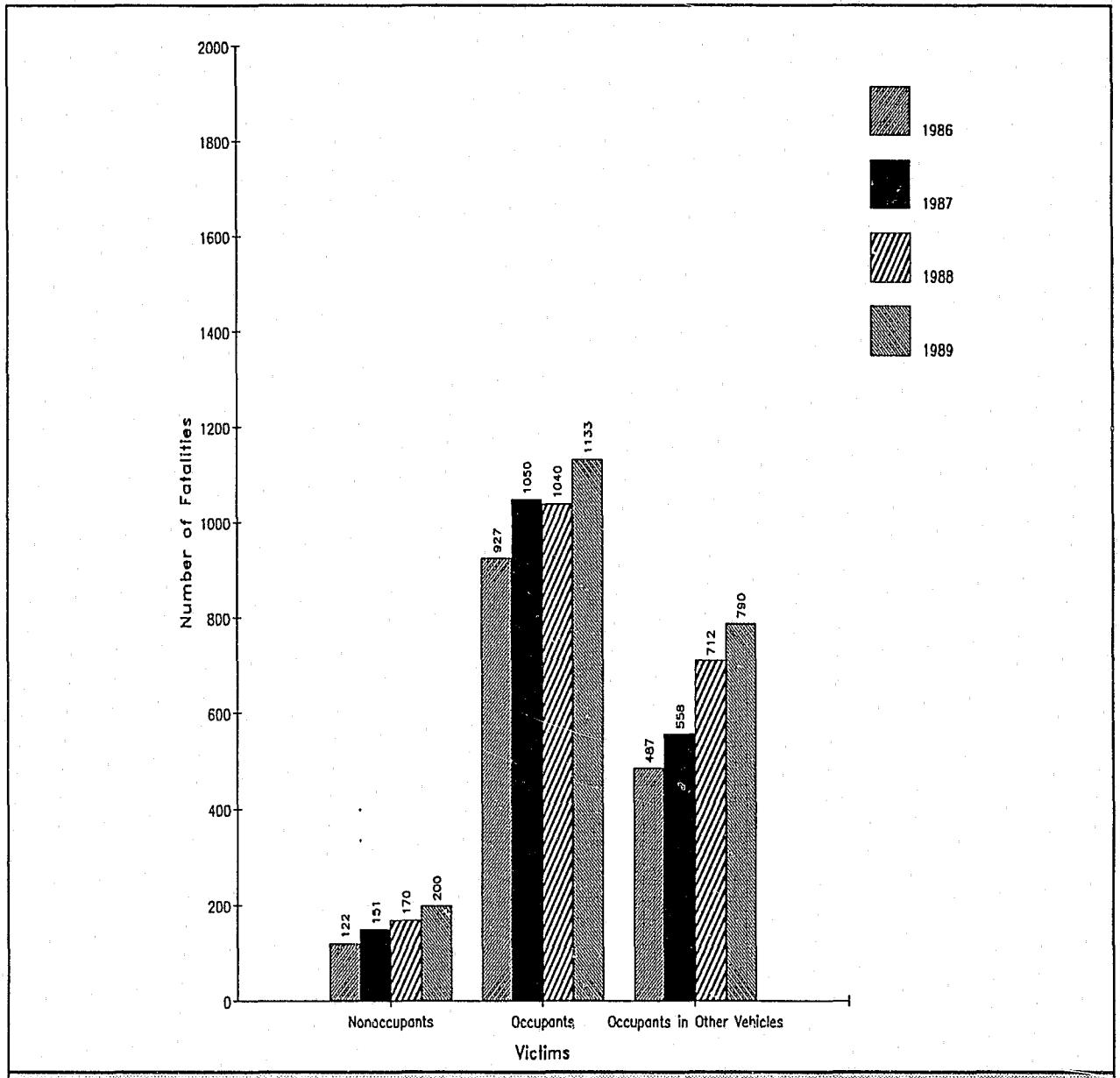

Figure 6-15
Fatalities in Multipurpose Vehicle Crashes

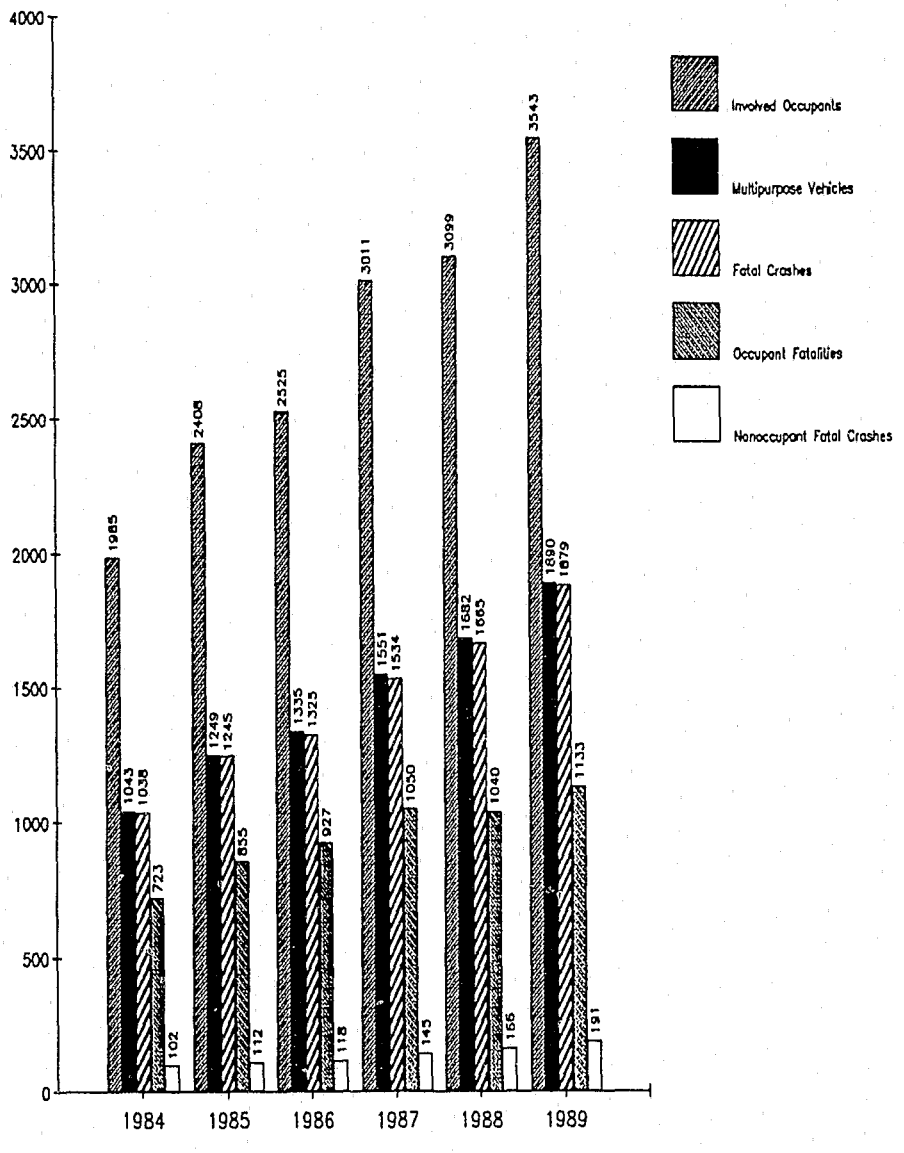

Figure 6-16
Multipurpose Vehicles Involved in Fatal Crashes and Related Fatalities
1984-1989

Table 6-24 illustrates the distribution of multipurpose vehicle occupant fatalities by point of principal impact. Most of the fatalities in both single and multi-vehicle accidents (33.2% and 59.5%, respectively) resulted from frontal impacts. In single vehicle accidents, non-collisions accounted for a significant proportion of the multipurpose vehicle occupant fatalities (41.3%).

Table 6-24
Distribution of Multipurpose Vehicle Occupant Fatalities by Point of Principal Impact

Point of Principal Impact	Single Vehicle Number	%	Multi-vehicle Number	%
Clock 1	39	5.0	22	6.4
Clock 2	12	1.5	12	3.5
Clock 3	29	3.7	18	5.2
Clock 4	4	0.5	4	1.2
Clock 5	5	0.6	2	0.6
Clock 6	5	0.6	16	4.6
Clock 7	5	0.6	5	1.4
Clock 8	2	0.3	6	1.7
Clock 9	28	3.6	31	9.0
Clock 10	14	1.8	6	1.7
Clock 11	35	4.4	32	9.2
Clock 12	187	23.8	152	43.9
Top	46	5.8	22	6.4
Undercarriage	16	2.0	4	1.2
Underride	1	0.1	0	0.0
Non-Collision	325	41.3	1	0.3
Override	0	0.0	1	0.3
Unknown	34	4.3	12	3.5
Total	787	100.0	346	100.0

Table 6-25 reveals that collisions with fixed objects were the most harmful event for 21.0% of the multipurpose vehicles involved in fatal crashes, followed by angle-collisions (20.6%). Head-on collisions accounted for 19.5% of the crashes and non-collisions accounted for 19.2%.

Table 6-25
Distribution of Multipurpose Vehicles Involved in Fatal Crashes by Most Harmful Event

Collision/Non-Collision Type	Number	Percent of Total
Collision with Motor Vehicle in Transport		
Rear End		
Striking	47	2.5
Struck	51	2.7
Both	12	0.6
Unknown	0	0.0
Subtotal	110	5.8
Head On	369	19.5
Rear to Rear	1	0.1
Angle		
Striking	251	13.3
Struck	127	6.7
Both	10	0.5
Unknown	1	0.1
Subtotal	389	20.6
Sideswipe	48	2.5
Collision with Fixed Object		
Tree or Shrubbery	82	4.3
Utility pole or Sign	71	3.8
Guard Rail	58	3.1
Other Fixed Object	185	9.8
Collision with Object Not Fixed	39	2.1
Collision with Unknown Object	1	0.1
Collision with Nonoccupant	174	9.2
Non-collision	363	19.2
Unknown	0	0.0
Total	1,890	100.0

In 1989, there were 1,583 (2.6%) instances of fire occurrence in the total of 60,834 vehicles involved in fatal crashes. In 436 of these fire occurrences, the fire (or explosion) was considered the most harmful event (Table 6-26).

Table 6-26
Fire Occurrence In Vehicles Involved In Fatal Crashes

Vehicle Type	Most Harmful Event Fire/Explosion	Fire Occurrence Yes	No
Passenger Car	224	857	34,527
Light Truck	120	383	13,418
Multipurpose Vehicle	15	48	1,842
Medium Truck	10	28	644
Heavy Truck	53	173	4,137
Motorcycle	10	70	3,124
Bus	0	5	306
Other Vehicle	2	11	436
Unknown Vehicle	2	8	817
Total	436	1,583	59,251

Chapter 7
Occupants

In 1989, 60,398 drivers were involved in fatal crashes. Table 7-1 provides the distribution of drivers by vehicle type, crash type, and age group. The 25-44 age group had the largest percentage of drivers, 43.1%, followed by the under 25 age group at 29.1%. The 45-64 years old and the 65 and over category comprised the remaining drivers involved at 16.9% and 9.0% respectively. Table 7-1 also shows that, as driver age increases, the proportion of fatal crashes that are multi-vehicle also increases.

Table 7-1
Number and Percent of Drivers Involved in Fatal Crashes by Vehicle Type, Crash Type, and Age Group

	Under 15		15 to 17		18 to 20		21 to 24		25 to 44		45 to 64		65 +		Unknown		Total	
Vehicle Type	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Passenger Cars	55	0.2	2,263	6.4	4,488	12.8	4,727	13.4	13,576	38.6	5,368	15.3	4,299	12.2	402	1.1	35,178	100.0
Motorcycles	25	0.8	133	4.3	460	15.0	616	20.1	1,593	51.9	221	7.2	18	0.6	5	0.2	3,071	100.0
Other Motorized Cycles	16	14.2	16	14.2	16	14.2	7	6.2	34	30.1	15	13.3	9	8.0	0	0.0	113	100.0
Light Trucks	25	0.2	574	4.2	1,229	9.0	1,689	12.3	6,549	47.9	2,622	19.2	872	6.4	126	0.9	13,686	100.0
Medium Trucks	0	0.0	4	0.6	23	3.5	84	12.8	351	53.7	158	24.2	28	4.3	6	0.9	654	100.0
Heavy Trucks	0	0.0	2	0.0	30	0.7	274	6.5	2,505	59.0	1,343	31.6	70	1.6	23	0.5	4,247	100.0
Buses	0	0.0	0	0.0	5	1.6	9	2.9	162	52.8	121	39.4	10	3.3	0	0.0	307	100.0
Multipurpose Veh.	4	0.2	115	6.1	221	11.7	245	13.0	1,025	54.4	227	12.1	40	2.1	6	0.3	1,883	100.0
Other Vehicles	46	10.4	13	2.9	32	7.2	38	8.6	135	30.5	110	24.8	64	14.4	5	1.1	443	100.0
Unknown	1	0.1	12	1.5	25	3.1	28	3.4	89	10.9	46	5.6	16	2.0	599	73.4	816	100.0
Total	172	0.3	3,132	5.2	6,529	10.8	7,717	12.8	26,019	43.1	10,231	16.9	5,426	9.0	1,172	1.9	60,398	100.0
Accident Type																		
Single Vehicle	91	52.9	1,561	49.8	3,058	46.8	3,526	45.7	9,926	38.1	3,134	30.6	1,507	27.8	824	70.3	23,627	39.1
Multi-Vehicle	81	47.1	1,571	50.2	3,471	53.2	4,191	54.3	16,093	61.9	7,097	69.4	3,919	72.2	348	29.7	36,771	60.9
Total	172	100.0	3,132	100.0	6,529	100.0	7,717	100.0	26,019	100.0	10,231	100.0	5,426	100.0	1,172	100.0	60,398	100.0

As Table 7-2 illustrates, more passenger car occupants who lost their lives in fatal crashes were sitting in the left front seat (generally, the driver's seat) than in any other position. Forty-seven percent of the occupants of this seat who were in passenger cars involved in fatal crashes died. The lowest proportion of deaths for all of the possible seating positions, front and back, was among occupants sitting in the middle rear seat. Of 1,513 occupants of this position, only 309 were fatalities (20.4%).

Table 7-2
Passenger Car Occupant and Fatality Seating Positions

Seat Position	Fatalities	Occupants	Occupants in Vehicles In Which Fatality Occurred
Front Left	16,705	35,184	22,160
Front Middle	214	846	590
Front Right	5,638	14,963	10,632
Rear Left	801	3,462	2,564
Rear Middle	309	1,513	1,143
Rear Right	925	4,121	2,961
Other & Unknown	454	1,667	1,162
Total	25,046	61,756	41,212

Table 7-3 shows that non-passenger car occupants met similar fates. Of 25,216 occupants in the front left seat, 9,681 or 38.4% died in the fatal crash. The lowest fatality rate occurred in the front middle seat (16.9%).

Table 7-3
Non-Passenger Car Occupant and Fatality Seating Positions

Seat Position	Fatalities	Occupants	Occupants in Vehicles In Which Fatality Occurred
Front Left	9,681	25,216	12,062
Front Middle	233	1,382	867
Front Right	1,702	6,518	3,640
Rear Left	449	1,316	1,042
Rear Middle	84	432	280
Rear Right	147	720	455
Other & Unknown	723	4,002	2,520
Total	13,019	39,586	20,866

Table 7-4 shows that of the 60,398 drivers involved in fatal crashes, more were involved in crashes on Saturday (19.0%) than on any other day of the week. The days on which the next greatest number of drivers were involved in fatal crashes were Friday (16.8%) and Sunday (15.0%).

Table 7-4
Number and Percent of Drivers Involved in Fatal Crashes by Age Group and Day of Week

	Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Unknown		Total	
Age	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 15	31	18.0	26	15.1	10	5.8	25	14.5	23	13.4	26	15.1	31	18.0	0	0.0	172	100.0
15 to 17	499	15.9	338	10.8	357	11.4	343	11.0	372	11.9	578	18.5	645	20.6	0	0.0	3,132	100.0
18 to 20	1,173	18.0	696	10.7	679	10.4	712	10.9	748	11.5	1,084	16.6	1,437	22.0	0	0.0	6,529	100.0
21 to 24	1,373	17.8	811	10.5	786	10.2	817	10.6	958	12.4	1,270	16.5	1,701	22.0	1	0.0	7,717	100.0
25 to 34	2,500	15.7	1,769	11.1	1,796	11.3	1,925	12.1	2,152	13.5	2,620	16.5	3,155	19.8	2	0.0	15,919	100.0
35 to 44	1,372	13.6	1,313	13.0	1,217	12.0	1,300	12.9	1,402	13.9	1,644	16.3	1,851	18.3	1	0.0	10,100	100.0
45 to 54	734	12.2	754	12.5	750	12.4	783	13.0	854	14.2	1,115	18.5	1,040	17.2	1	0.0	6,031	100.0
55 to 64	519	12.4	578	13.8	562	13.4	560	13.3	638	15.2	708	16.9	635	15.1	0	0.0	4,200	100.0
over 64	615	11.3	713	13.1	793	14.6	823	15.2	862	15.9	914	16.8	706	13.0	0	0.0	5,426	100.0
Unknown	226	19.3	113	9.6	119	10.2	108	9.2	132	11.3	201	17.2	273	23.3	0	0.0	1,172	100.0
Total	9,042	15.0	7,111	11.8	7,069	11.7	7,396	12.2	8,141	13.5	10,160	16.8	11,474	19.0	5	0.0	60,398	100.0

Table 7-5 depicts drivers in fatal crashes by age group and time of day. Drivers in the 25 to 34 age group represented 26.3% of the total number of drivers involved in fatal accidents. Of these drivers, 22.4% and 21.7% were involved in crashes in the 4 p.m. to 8 p.m. and 8 p.m. to 12 a.m. time slots, respectively. In general, younger drivers had a much greater proportion of their fatal crashes at night compared to older drivers.

Thirty-nine percent of the 15,919 drivers in the 25 to 34 year old age group were involved in crashes between the hours of 8 p.m. and 4 a.m.

Table 7-5
Number and Percent of Drivers Involved in Fatal Crashes by Age Group and Time of Day

Age	8am to Noon		Noon to 4pm		4pm to 8pm		8pm to 12am		12am to 4am		4am to 8am		Unknown		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Under 15	24	10.5	44	25.6	47	27.3	28	16.3	18	10.5	10	5.8	1	0.6	172	100.0
15 to 17	258	14.0	577	18.4	746	23.8	867	27.7	437	14.0	237	7.6	10	0.3	3,132	100.0
18 to 20	536	23.1	1,002	32.0	1,261	19.3	1,541	23.6	1,507	23.1	652	10.0	30	0.5	6,529	100.0
21 to 24	719	23.3	1,087	14.1	1,500	19.4	1,732	22.4	1,800	23.3	833	10.8	46	0.6	7,717	100.0
25 to 34	1744	18.0	2,458	15.4	3,566	22.4	3,451	21.7	2,873	18.0	1,743	10.9	84	0.5	15,919	100.0
35 to 44	1346	12.5	1,927	19.1	2,439	24.1	1,993	19.7	1,260	12.5	1,086	10.8	49	0.5	10,100	100.0
45 to 54	867	10.3	1,262	20.9	1,513	25.1	1,072	17.8	621	10.3	666	11.0	30	0.5	6,031	100.0
55 to 64	763	6.5	1,054	25.1	1,032	24.6	613	14.6	275	6.5	449	10.7	14	0.3	4,200	100.0
over 65	1369	2.0	1,884	34.7	1,291	23.8	427	7.9	108	2.0	335	6.2	12	0.2	5,426	100.0
Unknown	47	26.0	74	6.3	184	15.7	401	34.2	305	26.0	125	10.7	36	3.1	1,172	100.0
Total	7,673	12.7	11,369	18.8	13,579	22.5	12,125	20.1	9,204	15.2	6,136	10.2	312	0.5	60,398	100.0

Table 7-6 highlights the type and number of previous violations in the past three years for each of the 60,398 drivers involved in fatal crashes in 1989. Most of the drivers involved had no previous crashes (78.1%); of these 42,448 drivers, 90.0%, held valid licenses.

However, Table 7-6 also indicates that 6,470 of the 60,398 drivers involved in fatal crashes (10.7%) did not have valid drivers' licenses. Of the 6,470 drivers with invalid licenses, 17.9% had at least one prior driving while intoxicated conviction, and 23.1% had at least one previous speeding violation conviction.

Almost 5% of the total drivers involved (60,398) in fatal crashes had a prior driving while intoxicated (DWI) violation and 25.3% had previous speeding violations.

Table 7-6
Number and Percent of Drivers Involved in Fatal Crashes by License Status and Number of Previous Violations

License Status	Invalid License		Valid License		Unknown		Total	
	Number	%	Number	%	Number	%	Number	%
Previous Accidents								
None	4,706	72.7	42,448	81.5	2	0.1	47,156	78.1
One	1,028	15.9	7,596	14.6	1	0.1	8,625	14.3
Two	213	3.3	1,579	3.0	0	0.0	1,792	3.0
Three	53	0.8	295	0.6	0	0.0	348	0.6
Four	12	0.2	79	0.2	0	0.0	91	0.2
Five or More	6	0.1	18	0.0	0	0.0	24	0.0
Unknown	452	7.0	60	0.1	1,850	99.8	2,362	3.9
Total	6,470	100.0	52,075	100.0	1,853	100.0	60,398	100.0
Previous License Suspensions								
None	2,608	40.3	47,990	92.2	3	0.2	50,601	83.8
One	1,702	26.3	2,611	5.0	0	0.0	4,313	7.1
Two	735	11.4	823	1.6	0	0.0	1,558	2.6
Three	370	5.7	349	0.7	0	0.0	719	1.2
Four	219	3.4	108	0.2	0	0.0	327	0.5
Five or More	384	5.9	134	0.3	0	0.0	518	0.9
Unknown	452	7.0	60	0.1	1,850	99.8	2,362	3.9
Total	6,470	100.0	52,075	100.0	1,853	100.0	60,398	100.0
Previous Driving While Intoxicated Violations								
None	4,863	75.2	50,476	96.9	3	0.2	55,342	91.6
One	857	13.2	1,388	2.7	0	0.0	2,245	3.7
Two	225	3.5	133	0.3	0	0.0	358	0.6
Three	54	0.8	13	0.0	0	0.0	67	0.1
Four	16	0.2	5	0.0	0	0.0	21	0.0
Five or More	3	0.0	0	0.0	0	0.0	3	0.0
Unknown	452	7.0	60	0.1	1,850	99.8	2,362	3.9
Total	6,470	100.0	52,075	100.0	1,853	100.0	60,398	100.0
Previous Speeding Violations								
None	4,524	69.9	38,253	73.5	2	0.1	42,779	70.8
One	855	13.2	9,065	17.4	1	0.1	9,921	16.4
Two	351	5.4	3,037	5.8	0	0.0	3,388	5.6
Three	149	2.3	1,074	2.1	0	0.0	1,223	2.0
Four	71	1.1	376	0.7	0	0.0	447	0.7
Five or More	68	1.1	210	0.4	0	0.0	278	0.5
Unknown	452	7.0	60	0.1	1,850	99.8	2,362	3.9
Total	6,470	100.0	52,075	100.0	1,853	100.0	60,398	100.0
Previous Other Moving Violations								
None	4,165	64.4	42,886	82.4	2	0.1	47,053	77.9
One	1,028	15.9	6,732	12.9	0	0.0	7,760	12.8
Two	444	6.9	1,598	3.1	1	0.1	2,043	3.4
Three	169	2.6	488	0.9	0	0.0	657	1.1
Four	98	1.5	172	0.3	0	0.0	270	0.4
Five or More	114	1.8	139	0.3	0	0.0	253	0.4
Unknown	452	7.0	60	0.1	1,850	99.8	2,362	3.9
Total	6,470	100.0	52,075	100.0	1,853	100.0	60,398	100.0

Figure 7-1 compares drivers in fatal crashes with licensed drivers by age group. Drivers aged 16 through 19 years old were involved in fatal crashes at more than twice the rate as would be expected from their driver license population.

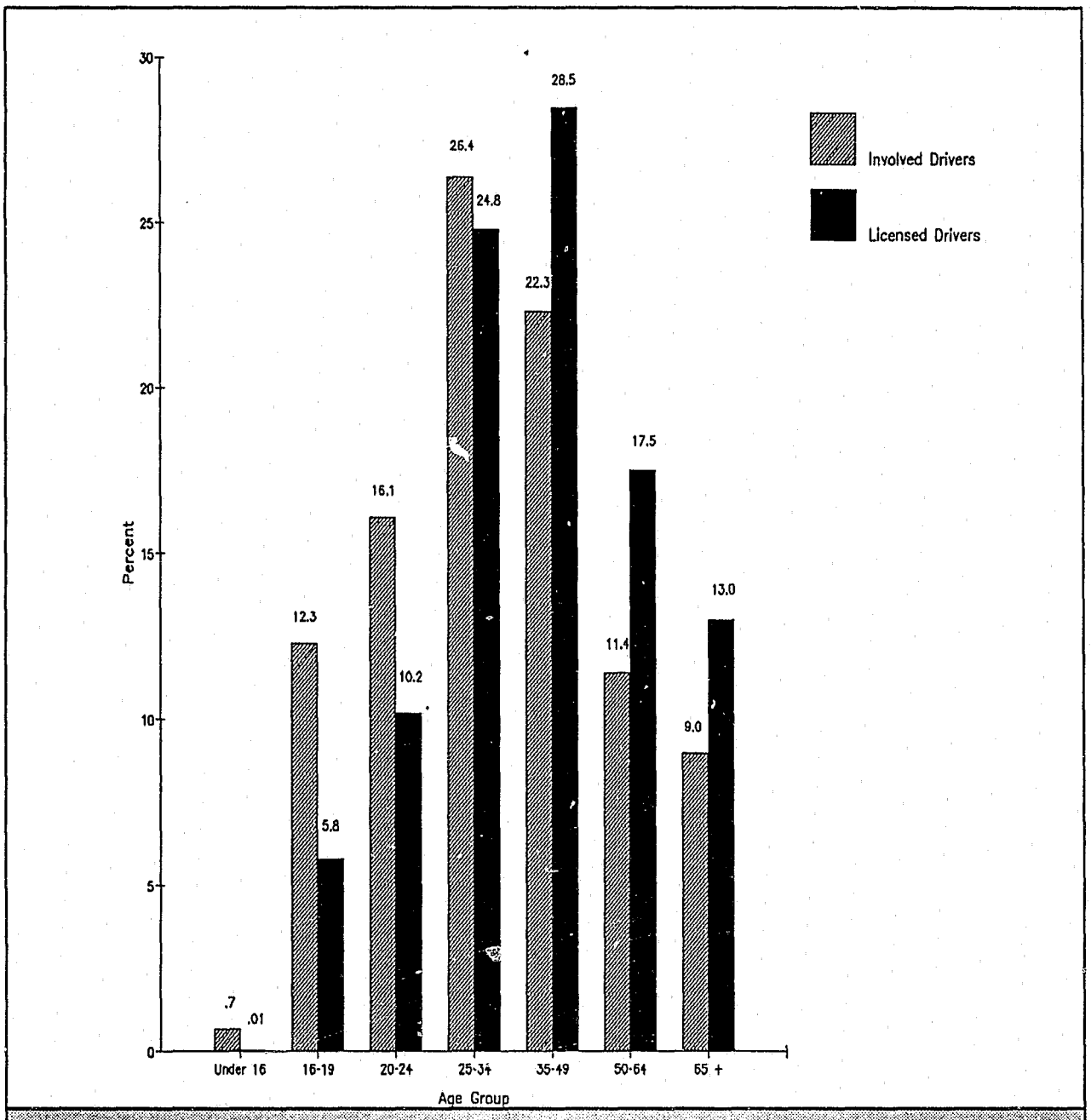

Figure 7-1
Percentage of Drivers Involved in Fatal Crashes vs. Percentage of Licensed Drivers by Age Group

Figure 7-2 provides data on the 22,373 drivers who had at least one of the following previous offenses: license suspended or revoked; previous recorded driving while intoxicated (DWI) conviction; previous speeding conviction; and previous other harmful moving violation within the past three years before the crash.

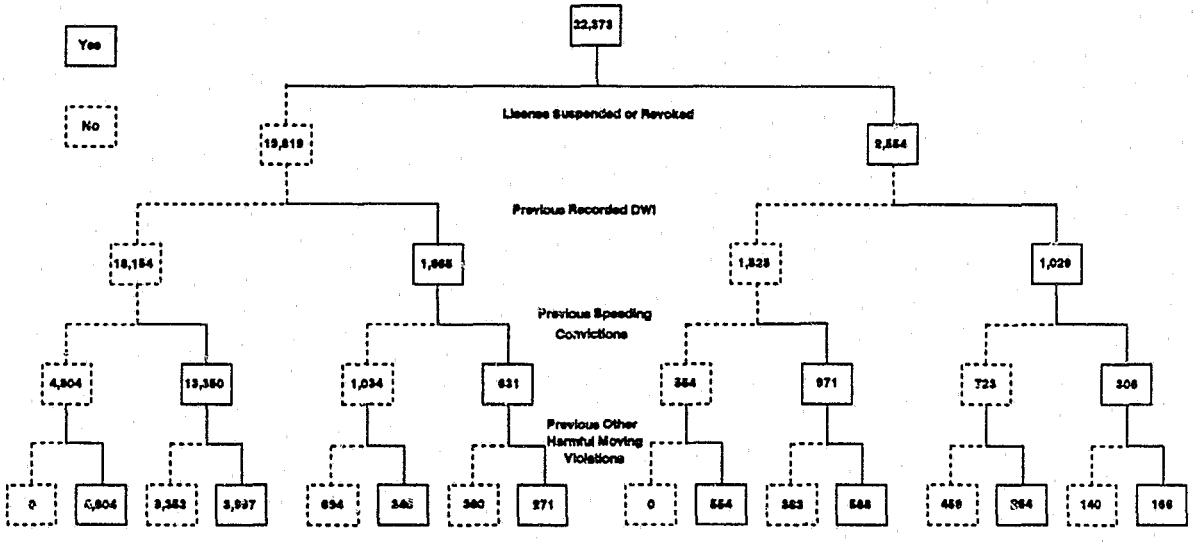

Figure 7-2
Involved Drivers with at Least One Previous Offense

Table 7-7 compares fatalities among motorcycle operators and passengers in states with and without helmet laws. In states requiring helmets, 68.1% of those involved in fatal motorcycle crashes were wearing helmets, as compared to only 24.4% crashes in states without helmet laws (when helmet usage was known). Because of the very high fatality rate of all motorcyclists involved in fatal crashes, no conclusions about the effectiveness of helmets should be drawn from these data.

The data in Table 7-7 do not attempt to relate the effectiveness of mandatory helmet use laws on helmet usage or fatal injury reduction. FARS data, in general do not include crashes where the helmet may have saved the life of the rider. Other studies sponsored by NHTSA have found that helmetless riders receive injuries to the head and neck two to three times as often as do helmeted riders. These data are confirmed by the National Accident Sampling System (NASS).

Table 7-7
Motorcycle Helmet Usage

	States With Helmet Laws				States Without Helmet Laws			
	Involved		Fatalities		Involved		Fatalities	
	Number	%	Number	%	Number	%	Number	%
Drivers								
Wearing Helmet	751	57.1	675	62.0	490	20.4	443	22.8
Not Wearing Helmet	302	23.0	272	25.0	1,338	55.7	1,154	59.3
Unknown Helmet Usage	43	3.3	33	3.0	147	6.1	110	5.6
Passengers								
Wearing Helmet	142	10.8	67	6.2	53	2.2	23	1.2
Not Wearing Helmet	67	5.1	37	3.4	341	14.2	202	10.4
Unknown Helmet Usage	6	0.5	2	0.2	32	1.3	14	0.7
Unknowns								
Wearing Helmet	2	0.2	2	0.2	0	0.0	0	0.0
Not Wearing Helmet	2	0.2	1	0.1	0	0.0	0	0.0
Unknown Helmet Usage	0	0.0	0	0.0	2	0.1	1	0.1
Total	1,315	100.0	1,089	100.0	2,403	100.0	1,947	100.0
Wearing Helmet	895	68.1	744	68.3	543	22.6	466	23.9
Not Wearing Helmet	371	28.2	310	28.5	1,679	69.9	1,356	69.6
Unknown Helmet Usage	49	3.7	35	3.2	181	7.5	125	6.4

Chapter 8
Nonoccupants

In 1989, motor vehicle crashes claimed the lives of 7,490 nonoccupants. Pedestrians accounted for most (6,552 or 87.5%) of these fatalities; pedalcyclists accounted for 831 or 11.1%, and other nonoccupants, 107 or 1.4%. Nonoccupant fatalities are highlighted by type of striking vehicle in Table 8-1. The majority of fatally injured nonoccupants (58.2%) were struck by passenger cars; light trucks accounted for the second largest group of fatalities (23.2%). Heavy trucks were responsible for 5.0% of the nonoccupant deaths and medium trucks for 1.1%. Motorcycles took 58 lives, or .9% of the total, and multipurpose vehicles took 174 lives or 2.6%.

Table 8-1
Nonoccupant Fatalities by Striking Vehicle
(Single Vehicle Crashes Only)

	Number	Precent
Passenger Cars	3,964	58.2
Motorcycles	58	0.9
Other Motorized Cycles	1	0.0
Light Trucks	1,578	23.2
Medium Trucks	72	1.1
Heavy Trucks	339	5.0
Buses	99	1.5
Multipurpose Vehicles	174	2.6
Other Vehicles	25	0.4
Unknown	501	7.4
Total	6,811	100.0

Table 8-2
All Involved and Fatally-Injured Occupants and Nonoccupants by Age Group

	Occupants				Nonoccupants				Total			
	Involved		Fatalities		Involved		Fatalities		Involved		Fatalities	
Age Group	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Under 15	8,876	8.8	1,922	5.0	1,405	16.6	1,259	16.8	10,281	9.4	3,181	7.0
15 to 17	7,876	7.8	2,544	6.7	312	3.7	248	3.3	8,188	7.5	2,792	6.1
18 to 20	11,550	11.4	4,385	11.5	383	4.5	313	4.2	11,933	10.9	4,698	10.3
21 to 24	12,144	12.0	4,738	12.4	542	6.4	445	5.9	12,686	11.6	5,183	11.4
25 to 34	22,284	22.0	8,685	22.8	1,503	17.8	1,294	17.3	23,787	21.7	9,979	21.9
35 to 44	13,328	13.2	5,053	13.3	1,113	13.2	989	13.2	14,441	13.2	6,042	13.3
45 to 54	7,976	7.9	3,067	8.1	729	8.6	643	8.6	8,705	7.9	3,710	8.1
55 to 64	5,840	5.8	2,586	6.8	742	8.8	675	9.0	6,582	6.0	3,261	7.2
Over 64	8,514	8.4	5,020	13.2	1,594	18.8	1,531	20.4	10,108	9.2	6,551	14.4
Unknown	2,954	'2.9	65	0.2	134	1.6	93	1.2	3,088	2.8	158	0.3
Total	101,342	100.0	38,065	100.0	8,457	100.0	7,490	100.0	109,799	100.0	45,555	100.0

Table 8-3 describes nonoccupant fatalities by location and land use. Most fatalities involving nonoccupants occurred in urban areas, on the roadway, and away from intersections. In fact, 3,430 nonoccupant fatalities occurred on non-intersection roadways in urban areas as compared with 1,832 in rural areas. In urban areas, 733 nonoccupant fatalities took place on the roadway at an intersection, in comparison with 140 rural in areas.

Table 8-3
Nonoccupant Fatalities by Location and Land Use (7,490)

	Rural	Urban	Unknown	Total
Intersection				
In Crosswalk	24	504	1	529
On Roadway	140	733	2	875
Other & Unknown	11	62	0	73
Subtotal	175	1,299	3	1,477
Non-Intersection				
In Crosswalk	1	37	0	38
On Roadway	1,832	3,430	15	5,277
Other & Unknown	267	400	3	670
Subtotal	2,100	3,867	18	5,985
Unknown	8	20	0	28
Total	2,283	5,186	21	7,490

Pedestrians

Pedestrian fatalities are depicted by age group and location in Table 8-4. Most crashes claiming the lives of pedestrians occurred away from intersections; in fact, more than four times as many pedestrians were killed away from intersections (5,286) compared to those killed at intersections (1,241).

Table 8-4
Pedestrian Fatalities by Location and Age Group

	Under 5	5 to 9	10 to 17	18 to 44	45 to 64	65+	Unknown	Total	%
Intersection									
In Crosswalk	13	21	19	107	100	241	2	503	7.7
On Roadway	19	41	41	206	140	211	10	668	10.2
Other & Unknown	3	3	3	31	12	18	0	70	1.1
Subtotal	35	65	63	344	252	470	12	1,241	18.9
Non-Intersection									
In Crosswalk	0	3	2	8	10	14	0	37	0.6
On Roadway	196	303	263	2,062	871	908	76	4,679	71.4
Other & Unknown	26	22	57	290	102	71	2	570	8.7
Subtotal	222	328	322	2,360	983	993	78	5,286	80.7
Unknown	0	0	1	14	7	3	0	25	0.4
Total	257	393	386	2,718	1,242	1,466	90	6,552	100.0
Percent	3.9	6.0	5.9	41.5	19.0	22.4	1.4	100.0	

As illustrated in Tables 8-5 and 8-6, the age of the pedestrian is an important variable. The pedestrian problem has historically been termed by some as a problem of "the young, the old, and the drunk." However, in terms of pedestrian fatalities or involvements per 100,000 population, this characterization may be misleading. Since 1980, pedestrian fatalities per 100,000 population for children under age 14 have been lower than for adults aged 14 to 64 and less than half the rate of adults 65 or older. Since 1980, annual pedestrian fatalities for children under 14 have dropped 34.6%.

Table 8-5
Pedestrian Fatalities in the United States by Age Group and Year (1980-1989)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Percent Change 80-89
Under 14	1,250	1,145	1,042	1,012	987	978	957	952	946	817	-34.6
14 - 64	4,916	4,823	4,705	4,322	4,444	4,248	4,272	4,232	4,229	4,179	-15.0
65 +	1,728	1,628	1,449	1,388	1,463	1,454	1,430	1,483	1,596	1,466	-15.2
Unknown	176	241	135	104	131	128	120	78	99	90	-48.9
Total	8,070	7,837	7,331	6,826	7,025	6,808	6,779	6,745	6,870	6,552	-18.8
Fatalities Total Traffic	51,091	49,301	43,945	42,589	44,257	43,825	46,087	46,390	47,087	45,555	-10.8

Table 8-6
Pedestrian Fatalities per 100,000 Population in the U.S. by Age Group and Year

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Percent Change 80-89
Under 14	2.6	2.4	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.6	-38.5
14-64	3.2	3.1	3.0	2.7	2.8	2.6	2.6	2.6	2.5	2.5	-21.9
65+	6.7	6.2	5.4	5.1	5.2	5.1	4.9	5.0	5.2	4.7	-24.2
Total	3.6	3.4	3.2	2.9	3.0	2.8	2.8	2.8	2.8	2.6	-27.8

The sex of the pedestrian is also a significant variable. Table 8-7 reveals that since 1980, males accounted for about 70% of the pedestrian fatalities. This differs somewhat within each age group, but males are nonetheless over-represented within each group. In 1989, for pedestrians under age 14, 62% were males; for ages 14 to 64, 75% were males; and for those 65 and over, 59% were males.

Table 8-7
Percent of Pedestrian Fatalities that are Male/Female by Pedestrian Age Group and Year (1980-1989)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Under 14										
Percent Male	64	62	62	65	63	62	66	64	63	62
Percent Female	36	38	38	35	37	38	34	36	37	38
14 - 64										
Percent Male	74	75	74	75	77	74	76	76	75	75
Percent Female	26	25	26	25	23	26	24	24	25	25
65 +										
Percent Male	61	60	62	58	61	56	58	60	58	59
Percent Female	39	40	38	42	39	44	42	40	42	41
All Ages										
Percent Male	70	70	70	70	71	69	70	71	69	70
Percent Female	30	30	30	30	29	31	30	29	31	30

Note: 2 Fatalities with Unknown age and sex are not included in this table.

Figure 8-1, which illustrates nonoccupant fatalities by land use, indicates that pedestrian fatalities in urban areas accounted for 61.5% of the total number of nonoccupant fatalities, as compared to 25.8% for pedestrian fatalities in rural areas.

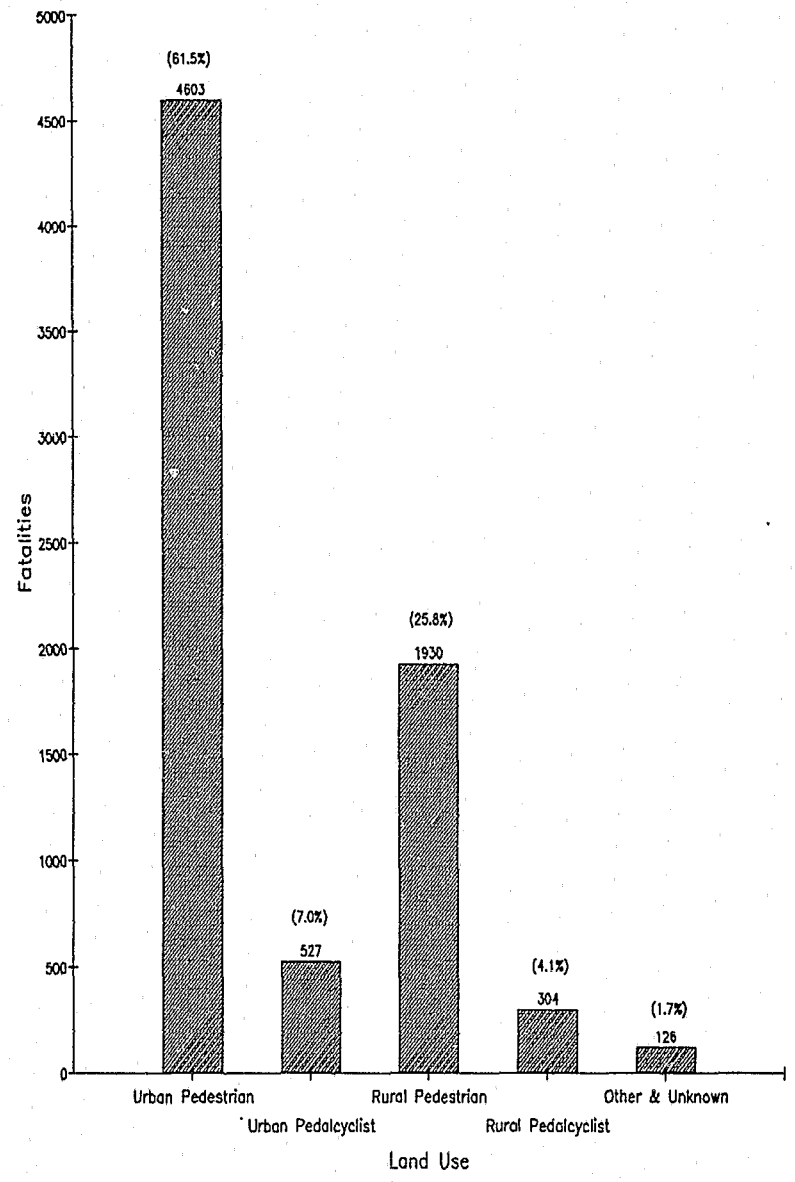

Figure 8-1
Nonoccupant Fatalities by Land Use

Figure 8-2 indicates that nearly the same number of pedestrians were killed on weekday days as on weekday nights (28.6 versus 28.9%). A greater difference in the percentages is revealed between weekend days, when only 7.8% of pedestrians lost their lives, and on weekend nights, when 34.2% were killed.

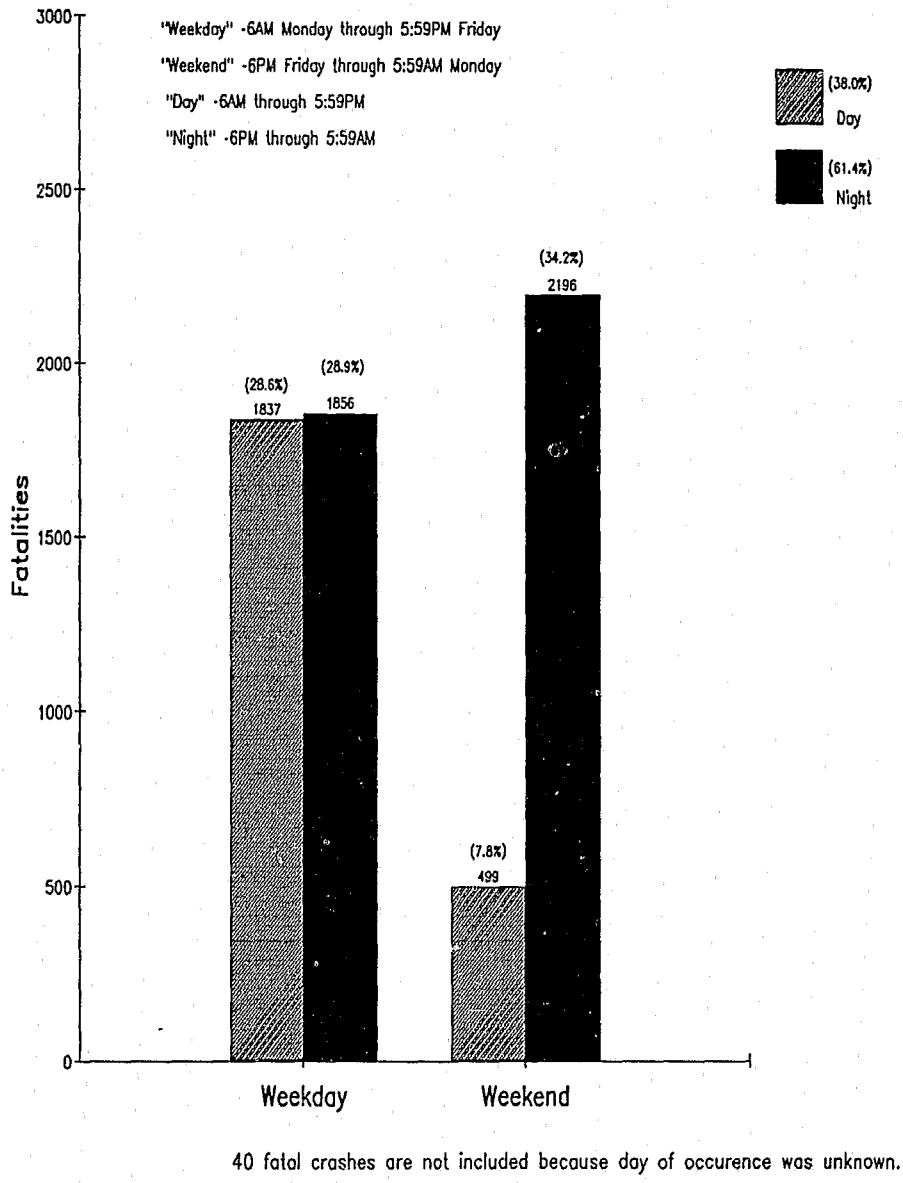

Figure 8-2
Crashes Involving Pedestrian Fatalities by Day of Week

Table 8-8 illustrates pedestrian fatalities by time of day. Nearly two-thirds of the pedestrians were killed between the hours of 6:00 p.m. to 5:59 a.m., compared with 6:00 a.m. to 5:59 p.m. Figure 8-3 shows that the largest proportion of pedestrians lost their lives on principal arterial roads (29.1%), followed by minor arterials (20.4%), and local roads (18.9%).

Table 8-8
Pedestrian Fatalities by Time of Day

Time of Day	Number	%
6:00AM to 5:59PM	2,371	36.2
6:00PM to 5:59AM	4,141	63.2
Unknown	40	0.6
Total	6,552	100.0

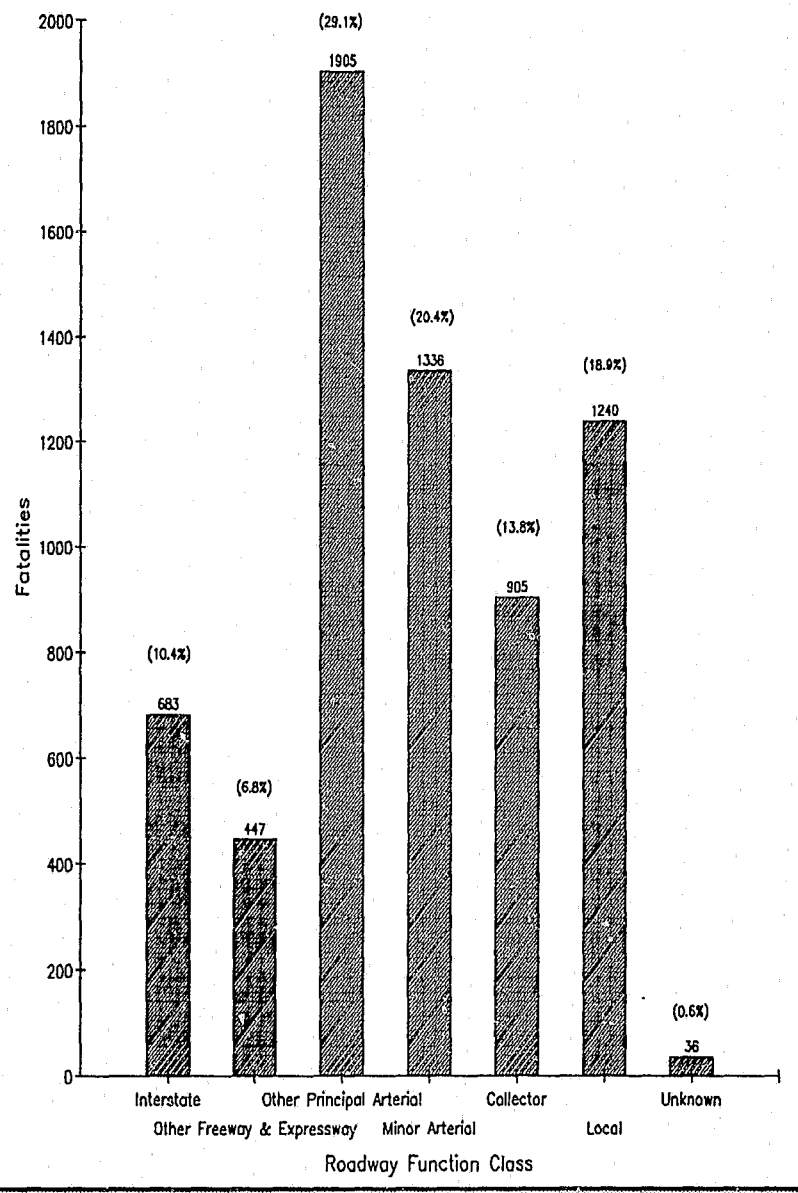

Figure 8-3
Pedestrian Fatalities by Roadway Function Class

Pedalcyclists

Table 8-9 shows that 831 pedalcyclists were killed in 1989. Like pedestrians, most pedalcyclists were killed away from intersections (73.4%). The preponderance of pedalcyclist fatalities occurred on the roadway, away from intersections (66.8%). Children aged 10 to 17 constituted 32.3% of the fatalities.

Table 8-9
Pedalcyclist Fatalities by Location and Age-Group

	Under 5	5 to 9	10 to 17	18 to 44	45 to 64	65+	Unknown	Total	%
Intersection									
In Crosswalk	0	6	9	4	0	3	0	22	2.6
On Roadway	2	36	67	59	12	17	1	194	23.3
Other & Unknown	1	0	2	0	0	0	0	3	0.4
Subtotal	3	42	78	63	12	20	1	219	26.4
Non-Intersection									
In Crosswalk	0	0	1	0	0	0	0	1	0.1
On Roadway	15	90	172	201	42	34	1	555	66.8
Other & Unknown	2	8	16	21	3	4	0	54	6.5
Subtotal	17	98	189	222	45	38	1	610	73.4
Unknown	0	0	1	1	0	0	0	2	0.2
Total	20	140	268	286	57	58	2	831	100.0
Percent	2.4	16.8	32.3	34.4	6.9	7.0	0.2	100.0	

Figure 8-1 also indicates that more pedalcyclists were killed in crashes in urban areas (527) than in rural areas (304). The distribution of pedalcyclist fatalities is illustrated by roadway function class in Figure 8-4. The greatest proportion of pedalcyclists lost their lives on local roads (30.6%), followed by other principal arterials (22.6%), collector roads (21.4%), and minor arterials (19.6%). Only 6 (or 0.7%) of the pedalcyclists were killed on interstates.

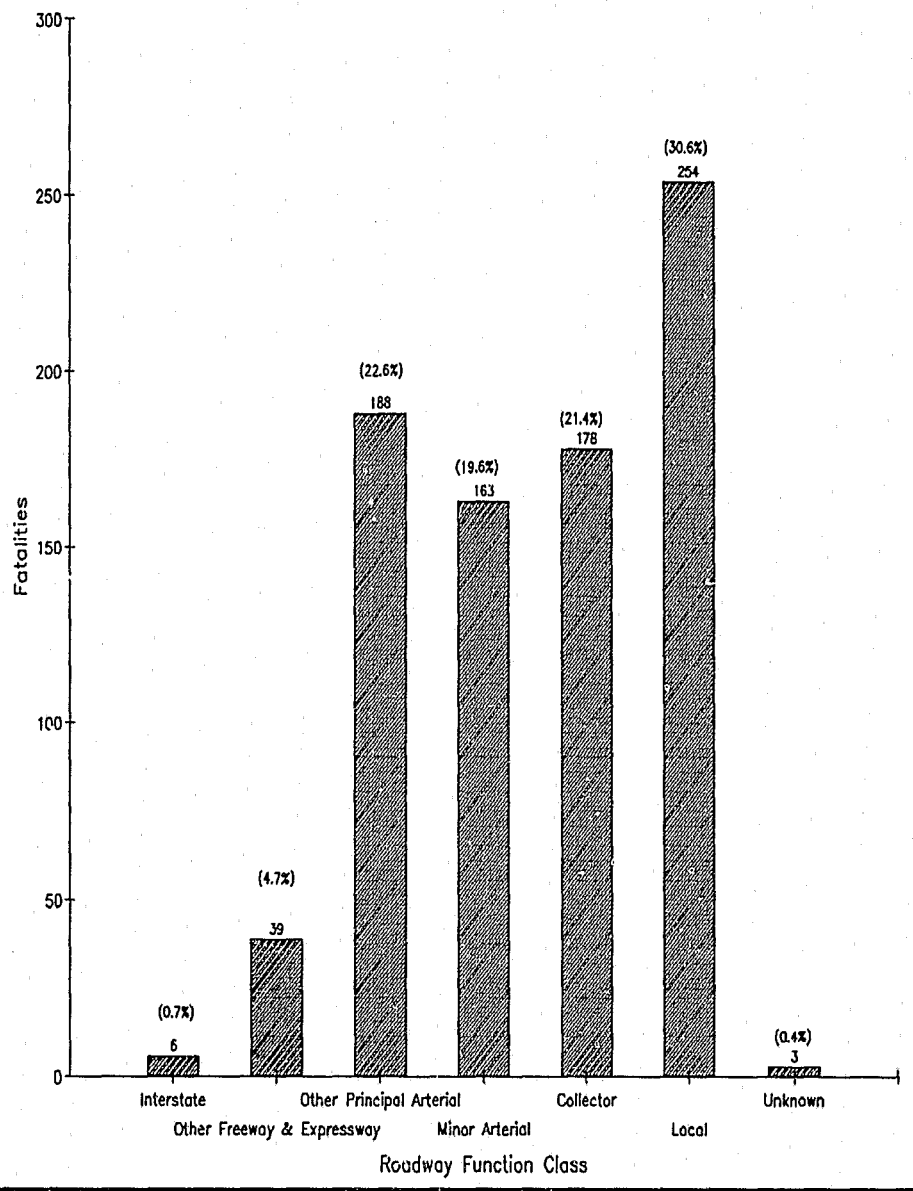

Figure 8-4
Pedalcyclist Fatalities by Roadway Function Class

Table 8-10 reveals that more than half (58.7%) of the pedalcyclist fatalities occurred in the daytime between 6:00 a.m. and 5:59 p.m. The remainder (41.3%) took place in nighttime hours between 6:00 p.m. and 5:59 a.m.

Table 8-10
Pedalcyclist Fatalities by Time of Day

Time of Day	Number	%
6:00AM to 5:59PM	488	58.7
6:00PM to 5:59AM	343	41.3
Total	831	100.0

Other Nonoccupants

Table 8-11 indicates that 107 "other nonoccupants" were killed in traffic crashes in 1989. Most of these were occupants of vehicles not in transport, but some were people on horseback and occupants of animal-drawn conveyances.

Table 8-11
Other Nonoccupant Fatalities by Location and Age-Group

	Under 5	5 to 9	10 to 17	18 to 44	45 to 64	65+	Unknown	Total	%
Intersection									
In Crosswalk	0	0	0	1	1	2	0	4	3.7
On Roadway	0	2	5	4	1	0	1	13	12.1
Other & Unknown	0	0	0	0	0	0	0	0	0.0
Subtotal	0	2	5	5	2	2	1	17	15.9
Non-Intersection									
In Crosswalk	0	0	0	0	0	0	0	0	0.0
On Roadway	5	10	10	12	5	1	0	43	40.2
Other & Unknown	2	2	7	20	11	4	0	46	43.0
Subtotal	7	12	17	32	16	5	0	89	83.2
Unknown	0	0	0	0	1	0	0	1	0.9
Total	7	14	22	37	19	7	1	107	100.0
Percent	6.5	13.1	20.6	34.6	17.8	6.5	0.9	100.0	

Figure 8-5 illustrates other nonoccupant fatalities by roadway function class. The largest percentage (27.1) occurred on interstate roads, followed by local roads (21.5%). Only 5 of the 107 fatalities occurred on expressways or freeways other than interstates.

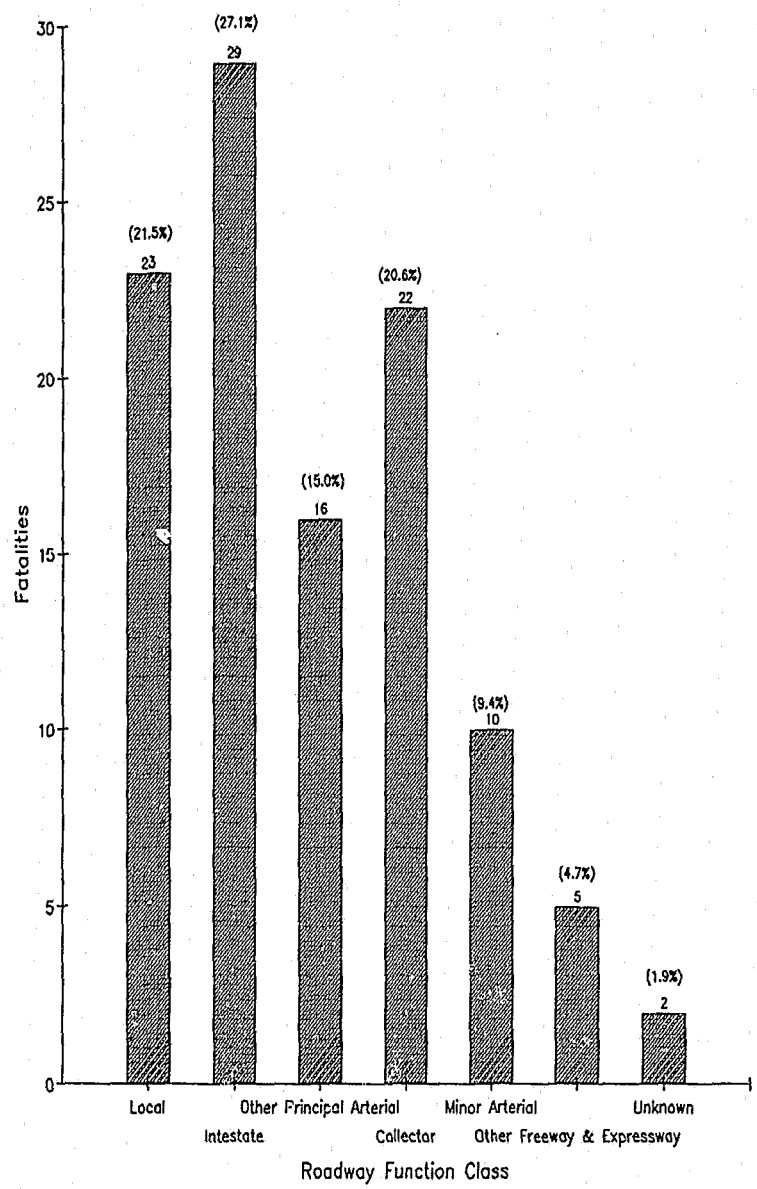

Figure 8-5
Other Nonoccupant Fatalities by Roadway Function Class

Chapter 9
Emergency Medical Services

The Fatal Accident Reporting System has collected Emergency Medical Services (EMS) scene response times (minutes elapsed from notification of an accident to EMS arrival at the scene) since 1975. Since in most states there is no central organization that collects all EMS or basic life support (BLS) data, the two data elements that comprise scene response time are difficult to capture.

The 1985 issue of the FARS Annual Report was the first to include a chapter describing the response time for EMS and the results of the data collections efforts in each state. As a part of an intensified quality control effort in 1986, some outlying data were not included in the overall average response times in this chapter. The outlying data included some response times where notification time was incorrectly coded as after the arrival time. This resulted in a calculation of response times that approximated a 24-hour period of time. Also any response times over two hours were considered outlying, hence, these data were not included in the calculation of average response times.

Seventeen states have reported EMS scene response times in 80% or better of their fatal crashes since 1982. Table 9-1 shows the average scene response times (notification and arrival) by land use (urban or rural accidents) for these 17 states from 1982 to 1989.

Table 9-1
Average Response Time Between Notification and Arrival at the Scene for Emergency Medical Services for 17 Reporting States

Year	Percent of Case Where EMS Times Reported In FARS (17 States*)		Average EMS Scene Response Times (Minutes)	
	Urban	Rural	Urban	Rural
1982	76.33	79.25	6.04	11.60
1983	78.44	78.13	5.62	11.61
1984	83.12	86.74	5.69	11.60
1985	84.52	88.37	6.07	11.71
1986	84.75	87.14	5.76	11.66
1987	84.89	87.95	5.85	11.59
1988	83.94	86.90	5.89	12.02
1989	83.86	87.12	5.65	11.99

*Reporting rates in FARS include the actual time, as well as the coded value of 0000, which means not notified, offically cancelled, or not transported.

* States which have had reporting rates of approximately 80 percent or better for years 1982-1989 are: Connecticut, Delaware, District of Columbia, Hawaii, Idaho, Illinois, Kansas, Louisiana, Missouri, Nevada, New Hampshire, Oregon, South Carolina, Washington, West Virginia, Wisconsin, and Wyoming.

Note: Response times are defined as the number of minutes between reported EMS notification time and the reported EMS arrival time at the scene of the crash.

For the years 1985 to 1989, a total of 28 states provided complete reporting on at least 80% of the crashes. Table 9-2 shows the average scene response times for these 28 states. Improved reporting for scene response times continue to maintain a high level. In 1989, 37 states reported EMS notification and arrival time at the 80% level or better (Table 9-3).

Table 9-2
Average Response Time Between Notification and Arrival at the Scene for Emergency Medical Services for 28 Reporting States

Year	Percent of Case Where EMS Times Reported In FARS (28 States*) Urban	Rural	Average EMS Scene Response Times (Minutes) Urban	Rural
1985	83.71	87.43	5.93	11.60
1986	84.59	86.38	5.99	11.40
1987	86.00	86.88	5.87	10.94
1988	86.92	87.48	5.94	11.36
1989	86.76	87.95	5.70	11.27

* States which have had reporting rates of 80 percent or better for years 1985-1989: Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Hawaii, Idaho, Illinois, Iowa, Kansas, Louisiana, Maine, Maryland, Mississippi, Missouri, Nebraska, Montana, Nevada, New Hampshire, Oregon, Rhode Island, South Carolina, South Dakota, Washington, West Virginia, Wisconsin, and Wyoming.

Table 9-3
States Where at Least 80 Percent of the Fatal Accident Cases Contained Valid EMS Notification and Scene Arrival Times

Year	Number of States	States
1982	20	CT, NH, RI, DE, DC, WV, SC, TN, IL, WI, LA, KS, MO, NE, WY, HI, NV, OR, WA
1983	29	CT, NH, PR, DE, DC, MD, WV, FL, GA, MS, SC, IL, WI, AR, LA, TX, IA, KS, MO, NE, CO, SD, WY, HI, NV, AK, ID, OR, WA
1984	29	CT, NH, PR, DE, DC, MD, WV, FL, GA, MS, SC, IL, WI, AR, LA, TX, IA, KS, MO, NE, CO, SD, WY, HI, NV, AK, ID, OR, WA
1985	31	CT, ME, NH, RI, PR, DE, DC, MD, WV, FL, GA, MS, SC, IL, IN, WI, AR, LA, IA, KS, MO, NE, CO, MT, SD, WY, HI, NV, ID, OR, WA
1986	32	CT, ME, NH, RI, PR, DE, DC, MD, WV, GA, MS, SC, IL, IN, WI, AR, LA, TX, IA, KS, MO, NE, CO, MT, SD, WY, HI, NV, AK, ID, OR, WA
1987	34	CT, ME, NH, RI, PR, DE, DC, MD, WV, FL, GA, KY, MS, SC, IL, IN, WI, AR, LA, TX, IA, KS, MO, CO, MT, ND, SD, WY, HI, NV, AK, ID, OR, WA
1988	35	CT, ME, NH, RI, PR, DE, DC, MD, WV, FL, GA, KY, MS, SC, IL, IN, WI, AR, LA, TX, IA, KS, MO,NE, CO, MT, ND, SD, WY, HI, NV, AK, ID, OR, WA
1989	37	CT, ME, NH, RI, PR, DE, DC, MD, WV, FL, GA, KY, MS, SC, IL, IN, WI, AR, LA, NM, OK, TX, IA, KS, MO, NE, CO, MT, ND, SD, WY, HI, NV, AK, ID, OR, WA

Average scene response times for comparative years vary between 1 to 6 percent among the two groups of states (17 and 28). This may be due to the larger population in which the average was calculated or better reporting of EMS information in the larger group of states. However, there is no apparent trend in the reduction of scene response times between 1982 and 1988.

The scene response times vary among the 17 states between 5.62 and 6.07 minutes for urban, and 11.59 and 12.02 minutes for rural accidents between the years 1982 to 1989 (Table 9-1). For the 28 states, times vary between 5.70 and 5.99 minutes for urban, and 10.94 and 11.60 minutes for rural accidents between the years 1985 to 1989 (Table 9-2).

Tables 9-4 and 9-5 illustrate the percent of accidents in which scene response times fell within the specified times (i.e., 0-10 minutes, 11-20 minutes for urban and rural accidents, respectively) between 1982 and 1989. Tables 9-4 and 9-5 are based on the 17 good reporting states. The number of records indicates the number of observations on which the distributions are based.

It appears that between 87 and 91 percent of all urban scene responses for EMS occur within the first ten minutes of notification of the accident, and between 97 and 90 percent of all responses occur within 20 minutes of notification for the 17 states surveyed between 1982 and 1989.

Table 9-4
Percent of Urban Accidents Where EMS Scene Response Times Fell Within Designated Minutes for 17 Reporting States Between 1982 and 1989

Time (In minutes)	Year 1982	1983	1984	1985	1986	1987	1988	1989
0-10	86.80	90.25	90.57	88.64	89.65	89.43	88.84	89.98
11-20	10.85	8.45	8.31	8.89	7.95	8.66	9.55	8.66
21-30	1.58	1.14	0.84	1.32	1.77	1.27	0.96	1.20
31-40	0.34	0.07	0.12	0.56	0.12	0.30	0.29	0.15
41-50	0.20	0.00	0.00	0.18	0.06	0.00	0.07	0.03
51-60	0.00	0.00	0.06	0.06	0.12	0.07	0.18	0.03
61-120	0.20	0.07	0.06	0.31	0.32	0.26	0.07	0.07
Number of Records	1,447	1,395	1,539	1,585	1,585	2,667	2,690	2,563

Note: Response times are defined as the number of minutes between reported EMS notification time and the reported EMS arrival time at the scene of the crash.

Table 9-5
Percent of Rural Accidents Where EMS Scene Response Times Fell Within Designated Minutes for 17 Reporting States Between 1982 and 1989

Time (In minutes)	Year 1982	1983	1984	1985	1986	1987	1988	1989
0-10	56.89	55.49	59.38	56.44	56.30	57.68	54.70	54.95
11-20	31.51	31.13	30.11	31.70	31.07	31.14	32.58	33.14
21-30	7.84	8.74	8.33	7.61	8.77	7.60	8.97	8.25
31-40	2.11	2.60	2.42	2.46	2.09	2.44	2.28	1.98
41-50	1.05	1.25	0.84	1.15	1.00	0.55	0.77	0.89
51-60	0.20	0.26	0.42	0.30	0.39	0.18	0.18	0.37
61-120	0.36	0.49	0.46	0.30	0.42	0.41	0.48	0.39
Number of Records	2,459	2,229	2,593	2,599	2,588	4,386	4,769	4,589

Note: Response times are defined as the number of minutes between reported EMS notification time and the reported EMS arrival time at the scene of the crash.

Table 9-6
EMS Reporting and Average Response Times in FARS for Fatal Crashes in Urban Areas (All States)

Year	Number of Fatal Crashes where EMS Times Were Reported	Percent of Urban Fatal Crashes Where EMS Times Were Known	Average EMS Response Times (In Minutes)
1982	5,726	33.37	6.83
1983	6,224	37.28	5.71
1984	7,538	43.86	5.64
1985	8,317	48.06	5.88
1986	8,369	46.24	6.40
1987	9,215	51.46	6.28
1988	9,523	53.45	6.39
1989	9,565	54.05	6.30

Note: Response times are defined as the number of minutes between reported EMS notification time and the reported EMS arrival time at the scene of the crash.

Table 9-7
EMS Average Scene Response Times by State for Urban Areas

State	1980 Number of Minutes	1980 Number of Records	1980 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	---	0	100.00	8.48	120	56.20
Alaska	2.00	2	92.85	5.44	25	19.35
Arizona	9.66	181	56.17	7.44	152	54.35
Arkansas	---	0	100.00	6.15	121	19.33
California	6.58	12	99.54	6.00	108	96.32
Colorado	9.63	49	80.55	5.76	180	17.80
Connecticut	5.37	251	29.49	5.64	253	5.59
Delaware	5.82	47	2.08	5.36	36	18.18
Dist of Columbia	9.05	37	2.63	9.38	68	2.85
Florida	---	0	100.00	5.15	1,123	20.91
Georgia	5.26	19	93.35	6.47	475	11.54
Hawaii	6.78	73	2.66	5.61	70	4.11
Idaho	4.28	42	2.32	6.40	27	6.89
Illinois	7.66	6	99.40	4.57	585	34.41
Indiana	6.00	1	99.73	5.06	333	4.58
Iowa	3.50	2	98.55	5.56	118	3.27
Kansas	5.61	113	24.66	6.80	83	8.79
Kentucky	---	0	100.00	6.37	144	8.28
Louisiana	7.36	179	38.90	6.38	199	18.44
Maine	10.00	1	97.61	5.00	36	2.70
Maryland	---	0	100.00	5.74	350	1.96
Massachusetts	---	0	100.00	6.51	64	86.41
Michigan	7.45	11	98.67	4.85	371	35.02
Minnesota	5.90	141	47.38	6.13	103	40.11
Mississippi	4.94	17	87.40	6.82	127	13.60
Missouri	7.08	226	27.56	6.02	298	0.99
Montana	8.00	11	74.41	6.47	17	15.00
Nebraska	5.51	49	40.96	5.13	58	6.45
Nevada	6.85	115	6.50	6.48	85	26.72
New Hampshire	4.57	47	0.00	5.84	33	2.94
New Jersey	2.80	5	99.30	8.88	42	92.92
New Mexico	10.33	3	97.61	5.03	104	16.80
New York	8.12	91	93.86	6.90	463	66.05
North Carolina	---	0	100.00	---	0	100.00
North Dakota	---	0	100.00	5.06	15	0.00
Ohio	4.00	3	99.68	5.80	175	73.99
Oklahoma	4.66	3	98.97	7.39	113	28.93
Oregon	4.89	125	16.66	5.02	137	0.72
Pennsylvania	---	0	100.00	6.17	500	31.60
Rhode Island	4.00	81	7.95	3.35	79	0.00
South Carolina	7.84	186	0.53	7.78	148	17.77
South Dakota	5.09	11	45.00	5.00	17	0.00
Tennesse	6.21	341	10.73	8.43	246	32.60
Texas	5.69	1,004	42.85	9.20	1,165	14.27
Utah	5.72	75	47.91	5.11	42	54.83
Vermont	---	0	100.00	9.06	16	5.88
Virginia	6.00	1	99.55	---	0	100.00
Washington	4.56	288	27.08	4.78	261	9.05
West Virginia	5.31	35	41.66	6.19	76	3.79
Wisconsin	5.51	141	26.56	4.75	180	3.22
Wyoming	6.93	15	34.78	8.25	24	0.00

Note: Response times are defined as the number of minutes between notification time and the reported EMS arrival time at the scene of the crash.

Table 9-8
EMS Reporting and Average Response Times in FARS for Fatal Crashes in Rural Areas (All States)

Year	Number of Fatal Crashes where EMS Times Were Reported	Percent of Rural Fatal Crashes Where EMS Times Were Known	Average EMS Response Times (in Minutes)
1982	9,613	44.31	12.88
1983	10,041	47.33	11.47
1984	13,125	58.55	11.02
1985	14,116	64.55	11.15
1986	14,448	62.90	11.35
1987	15,372	65.25	11.04
1988	16,496	67.97	11.33
1989	15,209	66.29	11.33

Note: Response times are defined as the number of minutes between reported EMS notification time and the reported EMS arrival time at the scene of the crash.

The scene response times vary among all states between 5.64 and 6.83 minutes for urban, and 11.02 and 12.88 minutes for rural accidents between the years 1982 and 1989 (Tables 9-6 and 9-8).

The average scene response times by state for 1982 through 1988 have been calculated by land use (urban and rural), using those cases where both EMS notification and arrival times were known. Tables 9-7 and 9-9 indicate the average scene response time by state for urban and rural areas, respectively. Also represented in these tables are the "number of records" used to calculate the average time and the "percent of unknown records" which indicates the percent of cases where either EMS notification and/or EMS arrival times are unknown.

Studies have indicated that the effectiveness of EMS depends upon the time elapsed from injury to delivery to definitive care. As this elasped time increases the probability of optimum outcome of definitive care decreases gradually up to about one hour, after which it decreases rapidly. This first hour from the time of injury to delivery of definitive care is referred to as the "Golden Hour".

The total prehospital time consists of three components, the EMS notification time, the EMS scene response time, and the EMS on scene treatment and transport time. The sum of these delays should not exceed the "Golden Hour".

For 1989, the FARS report includes three new tables of EMS response times. Tables 9-10 through 9-15 indicate the average elapsed time for: EMS arrival at the scene to EMS arrival at the hospital, time of accident to EMS notification, and time of accident to EMS arrival at the hospital by state by land use. It should be noted that in FARS, EMS arrival at the hospital time is only recorded when a person is transported for treatment. If the fatalities occur on-scene, EMS time at the hospital is coded '0000', therefore calculations of elapsed time for arrival at the hospital can not be made.

Table 9-9
EMS Average Scene Response Times
By States for Rural Areas

State	1988 Number of Minutes	1988 Number of Records	1988 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	---	0	100.00	11.98	256	60.24
Alaska	24.50	6	88.23	15.05	39	18.75
Arizona	19.12	249	40.71	16.07	300	31.35
Arkansas	---	0	100.00	11.50	350	18.03
California	26.00	1	99.95	11.18	16	99.17
Colorado	17.78	323	13.40	15.41	186	29.27
Connecticut	8.93	133	18.90	7.75	104	4.58
Delaware	8.10	85	2.29	7.41	62	3.12
Dist of Columbia	NA	NA	NA	NA	NA	NA
Florida	---	0	100.00	8.81	1,106	9.86
Georgia	9.84	495	53.39	9.94	832	5.45
Hawaii	11.46	83	9.78	10.34	52	7.14
Idaho	14.28	209	14.34	13.64	170	7.10
Illinois	9.83	12	98.43	12.98	613	6.12
Indiana	---	0	100.00	9.16	516	3.18
Iowa	5.00	1	99.75	10.15	299	9.11
Kansas	12.09	263	26.12	12.76	247	11.78
Kentucky	---	0	100.00	10.44	502	5.10
Louisiana	12.60	474	39.77	12.36	337	36.17
Maine	8.00	1	99.48	10.04	123	12.76
Maryland	---	0	100.00	8.65	293	0.00
Massachusetts	22.00	1	99.51	8.54	11	93.41
Michigan	5.80	10	98.63	9.80	692	22.24
Minnesota	12.14	269	43.24	11.00	231	36.88
Mississippi	---	0	100.00	7.53	382	19.40
Missouri	11.47	440	38.28	12.00	611	3.78
Montana	18.54	74	68.24	14.03	128	10.49
Nebraska	9.73	165	35.03	9.88	168	13.84
Nevada	16.43	154	13.96	23.03	82	48.75
New Hampshire	9.56	121	5.46	9.38	113	9.60
New Jersey	7.50	4	98.68	12.31	32	85.45
New Mexico	17.50	6	98.45	14.36	201	41.57
New York	10.76	102	88.53	9.07	614	13.64
North Carolina	---	0	100.00	7.17	23	97.59
North Dakota	---	0	100.00	14.18	49	19.67
Ohio	---	0	100.00	13.01	167	81.46
Oklahoma	12.33	18	96.59	11.95	360	12.19
Oregon	10.81	313	28.04	11.74	389	4.65
Pennsylvania	---	0	100.00	10.28	683	30.44
Rhode Island	6.14	21	30.00	6.05	18	0.00
South Carolina	13.16	558	0.35	12.64	621	13.14
South Dakota	13.12	81	51.78	15.53	98	16.23
Tennesse	10.22	553	11.52	11.34	490	19.93
Texas	12.58	1,627	20.92	14.27	1,287	17.71
Utah	15.96	95	35.37	16.67	114	35.22
Vermont	19.00	2	98.14	11.05	54	37.20
Virginia	---	0	100.00	---	---	100.00
Washington	10.76	292	35.39	9.44	311	23.58
West Virginia	10.79	281	30.44	11.22	311	4.89
Wisconsin	10.36	395	39.69	10.49	486	7.95
Wyoming	18.75	123	32.41	17.85	80	10.11

Note: Respnse times are defined as the number of minutes between notification time and the reported EMS arrival time at the scene of the crash.

Table 9-10
Average Elapsed Time from Time of EMS Arrival at Scene to EMS Arrival at Hospital by State for Urban Areas

State	1988 Number of Minutes	1988 Number of Records	1988 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	20.62	127	57.23	19.33	101	63.13
Alaska	20.20	20	23.07	21.26	23	25.80
Arizona	21.83	6	98.34	29.00	1	99.70
Arkansas	23.33	12	90.55	---	0	100.00
California	21.70	24	99.20	25.04	83	97.17
Colorado	24.50	136	21.38	21.74	138	36.98
Connecticut	25.94	84	72.09	27.39	66	75.37
Delaware	23.57	64	8.57	24.66	33	25.00
Dist of Columbia	18.00	53	3.63	17.78	69	1.42
Florida	25.00	1	99.90	23.69	13	99.08
Georgia	27.11	416	31.35	30.00	359	33.14
Hawaii	26.85	47	28.78	24.53	60	17.80
Idaho	26.80	31	22.50	21.56	23	20.69
Illinois	25.57	14	98.56	25.16	6	99.32
Indiana	23.45	213	33.01	23.10	267	23.49
Iowa	22.02	78	38.09	20.07	93	23.77
Kansas	22.70	86	17.30	27.13	75	17.58
Kentucky	23.88	110	19.11	24.22	115	26.75
Louisiana	20.50	2	99.09	24.76	17	93.03
Maine	19.58	17	34.61	23.41	31	16.21
Maryland	---	0	100.00	---	0	100.00
Massachusetts	14.34	32	93.58	13.34	44	90.65
Michigan	15.00	3	99.58	20.33	3	99.47
Minnesota	---	0	100.00	---	0	100.00
Mississippi	7.80	111	15.26	6.88	127	13.60
Missouri	24.31	225	30.55	22.67	212	29.56
Montana	19.00	20	25.92	17.73	15	25.00
Nebraska	17.32	43	20.37	16.63	52	16.12
Nevada	18.02	75	29.90	19.83	78	32.75
New Hampshire	22.06	29	42.00	21.25	28	17.64
New Jersey	22.44	69	90.29	22.39	23	96.12
New Mexico	21.32	59	50.83	21.07	82	34.40
New York	26.17	140	89.13	28.44	279	79.54
North Carolina	24.00	20	93.90	---	0	100.00
North Dakota	14.30	10	37.56	23.41	12	20.00
Ohio	30.53	260	63.17	28.53	132	80.38
Oklahoma	23.33	68	59.03	26.19	87	45.28
Oregon	25.20	104	37.72	23.20	102	26.08
Pennsylvania	23.61	381	50.00	24.96	383	47.60
Rhode Island	25.65	44	52.17	25.57	42	46.83
South Carolina	13.61	44	73.00	17.75	16	91.11
South Dakota	26.41	17	0.00	18.46	13	23.52
Tennesse	22.73	161	62.38	22.96	113	69.04
Texas	28.39	711	46.74	28.12	594	56.29
Utah	---	0	100.00	---	0	100.00
Vermont	32.33	3	57.14	17.85	14	17.64
Virginia	---	0	100.00	---	0	100.00
Washington	33.09	167	45.24	29.54	176	38.67
West Virginia	29.20	43	35.82	29.49	55	30.38
Wisconsin	28.80	121	28.82	28.32	128	31.18
Wyoming	16.33	15	31.81	19.37	16	33.33
Total	24.84	4,516	74.65	24.67	4,399	75.14

Note: Response times are defined as the number of minutes between reported EMS arrival time at the scene of the crash and reported EMS arrival at hospital.

Table 9-11
Average Elapsed Time from Time of EMS Arrival at Scene to EMS Arrival at Hospital by State for Rural Areas

State	1988 Number of Minutes	1988 Number of Records	1988 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	31.89	229	63.36	29.48	195	69.72
Alaska	35.43	30	50.00	31.96	29	39.58
Arizona	47.33	3	99.37	40.33	3	99.31
Arkansas	31.54	31	92.34	27.00	1	99.76
California	25.50	2	99.89	29.40	10	99.48
Colorado	38.31	173	37.54	35.58	108	58.93
Connecticut	35.26	41	71.52	36.79	24	77.98
Delaware	33.24	70	4.11	30.15	58	9.37
Dist of Columbia	NA	NA	NA	NA	NA	NA
Florida	---	0	100.00	26.60	10	99.18
Georgia	39.26	713	18.60	38.97	720	18.18
Hawaii	41.64	37	40.32	33.92	41	26.78
Idaho	40.77	104	44.68	37.44	109	40.43
Illinois	34.50	2	99.71	10.50	2	99.69
Indiana	35.04	399	36.96	34.24	358	32.83
Iowa	35.15	231	37.22	35.18	188	42.85
Kansas	31.78	199	34.10	37.22	185	33.92
Kentucky	33.23	401	30.98	33.07	368	30.43
Louisiana	56.00	1	99.83	21.14	7	98.67
Maine	36.86	89	56.58	39.67	80	43.26
Maryland	---	0	100.00	---	0	100.00
Massachusetts	---	0	100.00	---	0	100.00
Michigan	42.50	6	99.26	36.50	2	99.77
Minnesota	---	0	100.00	0.00	1	99.72
Mississippi	8.21	366	26.50	7.91	382	19.40
Missouri	36.92	307	53.05	37.04	282	55.59
Montana	35.35	80	48.71	32.25	86	39.86
Nebraska	26.75	96	46.66	30.20	115	41.02
Nevada	45.94	58	61.07	41.69	56	65.00
New Hampshire	27.21	37	63.00	30.15	66	47.20
New Jersey	27.06	33	87.05	29.09	11	95.00
New Mexico	40.15	116	62.93	38.75	133	61.33
New York	37.80	146	81.16	37.32	337	52.60
North Carolina	29.99	128	88.06	12.05	20	97.91
North Dakota	36.32	37	51.31	34.41	39	36.06
Ohio	43.07	158	82.04	35.47	71	92.12
Oklahoma	33.89	231	41.37	34.25	246	40.00
Oregon	40.91	218	45.77	40.26	266	34.80
Pennsylvania	37.70	414	58.64	38.24	412	58.04
Rhode Island	23.00	6	76.92	33.45	11	38.88
South Carolina	15.42	66	91.14	24.06	29	95.94
South Dakota	35.80	56	49.09	32.76	65	44.44
Tennesse	30.61	218	68.31	28.11	137	77.61
Texas	36.79	698	58.10	36.40	674	56.90
Utah	---	0	100.00	---	0	100.00
Vermont	36.66	36	64.70	36.90	43	50.00
Virginia	---	0	100.00	---	0	100.00
Washington	40.48	179	54.68	39.81	232	42.99
West Virginia	39.81	225	33.43	43.60	234	28.44
Wisconsin	31.75	238	55.43	31.49	213	59.65
Wyoming	41.15	57	46.72	43.02	41	53.93
Total	34.58	6,966	71.30	34.46	6,700	70.80

Note: Response times are defined as the number of minutes between reported EMS arrival time at the scene of the crash and EMS arrival at hospital.

Table 9-12
Average Elapsed Time from Time of Crash to EMS Notification by State for Urban Areas

State	1988 Number of Minutes	1988 Number of Records	1988 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	8.66	142	52.18	13.58	112	59.12
Alaska	1.83	18	30.76	7.30	13	58.06
Arizona	4.26	142	60.77	3.46	154	53.75
Arkansas	2.91	107	15.74	4.05	126	16.00
California	5.88	72	97.60	5.73	116	96.05
Colorado	6.09	147	15.02	4.95	167	23.74
Connecticut	1.91	246	18.27	2.20	224	16.41
Delaware	4.49	63	10.00	4.75	36	18.18
Dist of Columbia	5.88	53	3.63	6.73	68	2.85
Florida	3.48	696	31.56	4.75	1,097	22.74
Georgia	5.10	481	20.62	4.43	467	13.03
Hawaii	5.23	65	1.51	5.05	67	8.21
Idaho	2.88	36	10.00	6.58	24	17.24
Illinois	4.52	935	3.90	4.76	848	4.93
Indiana	4.37	286	10.06	4.48	322	7.73
Iowa	3.80	104	17.46	4.44	105	13.93
Kansas	4.92	95	8.65	9.70	78	14.28
Kentucky	3.02	118	13.23	2.84	139	11.46
Louisiana	6.10	151	31.67	4.16	190	22.13
Maine	5.66	21	19.23	6.02	34	8.10
Maryland	5.31	385	4.93	4.47	348	2.52
Massachusetts	1.23	76	84.77	2.20	69	85.35
Michigan	3.85	493	30.95	3.65	407	28.72
Minnesota	1.51	133	21.30	1.59	129	25.00
Mississippi	6.09	110	16.03	7.25	127	13.60
Missouri	6.43	315	2.77	5.72	292	2.99
Montana	4.96	25	7.40	5.00	17	15.00
Nebraska	3.12	40	25.92	2.00	44	29.03
Nevada	4.53	82	23.36	4.60	75	35.34
New Hampshire	2.42	42	16.00	3.75	29	14.70
New Jersey	6.84	105	85.23	6.85	40	93.26
New Mexico	2.20	87	27.50	3.67	79	36.80
New York	4.41	295	77.11	4.21	437	67.96
North Carolina	5.91	23	92.98	---	0	100.00
North Dakota	5.93	15	6.25	7.80	15	0.00
Ohio	4.39	338	52.12	4.72	176	73.81
Oklahoma	7.11	79	52.41	9.09	95	40.25
Oregon	3.08	149	10.77	3.16	131	5.07
Pennsylvania	3.84	537	29.52	4.00	505	30.91
Rhode Island	2.14	91	1.08	2.05	79	0.00
South Carolina	8.38	155	4.90	7.62	162	10.00
South Dakota	2.12	16	5.88	1.46	15	11.76
Tennesse	14.28	264	38.31	13.92	208	43.01
Texas	8.08	1,129	15.43	8.71	1,124	17.29
Utah	3.34	47	48.91	3.36	47	49.46
Vermont	3.50	2	71.42	5.18	16	5.88
Virginia	---	0	100.00	---	0	100.00
Washington	4.69	215	29.50	4.19	214	25.43
West Virginia	4.63	65	2.98	4.72	73	7.59
Wisconsin	3.35	157	7.64	2.52	180	3.22
Wyoming	3.52	19	13.63	5.18	22	8.33
Total	5.15	9,467	46.87	5.30	9,542	46.08

Note: Response times are defined as the number of minutes between time of crash and reported EMS notification time.

Table 9-13
Average Elapsed Time from Time of Crash to EMS Notification by State for Rural Areas

State	1988 Number of Minutes	1988 Number of Records	1988 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	13.57	288	53.92	14.75	249	61.33
Alaska	11.55	29	51.66	6.16	31	35.41
Arizona	11.04	348	27.59	9.82	323	26.08
Arkansas	8.16	339	16.29	8.70	359	15.92
California	12.43	16	99.14	8.78	19	99.01
Colorado	11.04	238	14.07	10.46	180	31.55
Connecticut	2.35	113	21.52	1.23	78	25.44
Delaware	5.42	69	5.40	6.48	60	6.25
Dist of Columbia	NA	NA	NA	NA	NA	NA
Florida	7.52	1,510	13.11	7.80	1,076	12.30
Georgia	8.91	733	16.32	8.77	804	8.63
Hawaii	6.88	54	12.90	7.61	49	12.50
Idaho	9.81	156	17.02	9.71	167	8.74
Illinois	9.63	651	6.06	9.50	611	6.43
Indiana	7.47	580	8.37	6.45	500	6.19
Iowa	9.79	287	22.01	10.73	265	19.45
Kansas	12.06	254	15.89	13.29	226	19.28
Kentucky	7.80	522	10.15	7.80	480	9.26
Louisiana	9.53	389	35.27	10.03	348	34.09
Maine	10.24	168	18.04	10.69	118	16.31
Maryland	4.67	300	1.63	4.47	285	2.73
Massachusetts	0.77	18	89.65	1.00	12	92.81
Michigan	6.39	702	13.54	6.44	769	13.59
Minnesota	4.42	283	24.33	5.30	264	27.86
Mississippi	7.06	366	26.50	8.11	380	19.83
Missouri	11.73	601	8.10	12.50	597	5.98
Montana	14.83	136	12.82	13.96	122	14.68
Nebraska	9.90	99	45.00	13.27	129	33.84
Nevada	21.56	83	44.29	18.98	80	50.00
New Hampshire	5.41	74	26.00	9.27	103	17.60
New Jersey	6.91	57	77.64	4.20	30	86.36
New Mexico	13.62	182	41.85	18.06	189	45.05
New York	6.05	566	26.96	5.48	550	22.64
North Carolina	7.57	137	87.22	11.13	23	97.59
North Dakota	19.37	59	22.36	12.28	46	24.59
Ohio	8.74	348	60.45	7.13	184	79.57
Oklahoma	15.64	281	28.68	15.41	319	22.19
Oregon	7.30	372	7.46	6.81	366	10.29
Pennsylvania	8.41	735	26.57	7.47	684	30.34
Rhode Island	6.04	25	3.84	4.77	18	0.00
South Carolina	11.99	699	6.17	11.65	665	6.99
South Dakota	13.02	85	22.72	11.72	95	18.80
Tennesse	14.08	500	27.32	14.14	420	31.37
Texas	14.83	1,323	20.58	14.16	1,267	18.99
Utah	12.15	119	28.31	12.30	123	30.11
Vermont	12.57	45	55.88	10.29	51	40.69
Virginia	---	0	100.00	---	0	100.00
Washington	8.57	235	40.50	8.89	275	32.43
West Virginia	7.16	311	7.98	7.76	306	6.42
Wisconsin	6.88	489	8.42	6.15	484	8.33
Wyoming	11.86	92	14.01	16.76	75	15.73
Total	9.58	16,068	33.80	9.61	14,854	35.26

Note: Response times are defined as the number of minutes between time of crash and the reported EMS notification time.

Table 9-14
Average Elapsed Time from Time of Crash to EMS Arrival at Hospital by State for Urban Areas

State	1988 Number of Minutes	1988 Number of Records	1988 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	34.14	128	56.90	30.86	100	63.50
Alaska	27.00	19	26.92	29.26	23	25.80
Arizona	33.28	7	98.06	41.00	1	99.70
Arkansas	32.25	12	90.55	---	0	100.00
California	37.02	96	96.80	36.56	174	94.08
Colorado	35.26	136	21.38	30.76	138	36.98
Connecticut	32.03	84	72.09	31.62	64	76.11
Delaware	34.93	63	10.00	35.14	34	22.72
Dist of Columbia	36.52	53	3.63	33.52	69	1.42
Florida	33.00	1	99.90	33.23	13	99.08
Georgia	37.28	409	32.50	40.66	360	32.96
Hawaii	39.10	48	27.27	34.95	60	17.80
Idaho	33.29	31	22.50	33.27	22	24.13
Illinois	31.28	14	98.56	27.00	7	99.21
Indiana	31.61	212	33.33	31.98	266	23.78
Iowa	30.92	78	38.09	28.35	94	22.95
Kansas	32.20	84	19.23	39.65	69	24.17
Kentucky	31.90	110	19.11	32.64	115	26.75
Louisiana	47.00	2	99.09	37.70	17	93.03
Maine	30.11	17	34.61	33.51	31	16.21
Maryland	---	0	100.00	---	0	100
Massachusetts	21.92	38	92.38	23.06	49	89.59
Michigan	23.25	4	99.44	29.33	3	99.47
Minnesota	---	0	100.00	---	0	100.00
Mississippi	21.08	110	16.03	20.96	127	13.60
Missouri	36.60	222	31.48	34.67	209	30.56
Montana	26.55	20	25.92	27.06	15	25.00
Nebraska	24.57	42	22.22	23.21	52	16.12
Nevada	26.67	74	30.84	30.01	78	32.75
New Hampshire	29.65	29	42.00	29.17	28	17.64
New Jersey	34.65	69	90.29	35.39	23	96.12
New Mexico	27.62	59	50.83	26.11	80	36.00
New York	33.85	138	89.29	37.85	281	79.39
North Carolina	34.05	20	93.90	---	0	100.00
North Dakota	18.10	10	37.50	37.25	12	20.00
Ohio	40.26	267	62.18	37.91	132	80.38
Oklahoma	35.40	66	60.24	40.01	84	47.17
Oregon	32.50	103	38.24	31.44	103	25.36
Pennsylvania	33.25	382	49.86	34.10	380	48.01
Rhode Island	31.09	44	52.17	31.11	42	46.83
South Carolina	26.46	43	73.62	33.60	15	91.66
South Dakota	33.00	17	0.00	23.41	12	29.41
Tennesse	33.84	155	63.78	31.91	113	69.04
Texas	38.63	718	46.21	38.24	599	55.92
Utah	---	0	100.00	---	0	100.00
Vermont	40.66	3	57.14	28.00	14	17.64
Virginia	---	0	100.00	---	0	100.00
Washington	41.71	169	44.59	37.28	177	38.32
West Virginia	37.84	44	34.32	40.50	54	31.64
Wisconsin	37.71	122	28.23	35.43	130	30.10
Wyoming	22.73	15	31.81	29.93	16	33.33
Total	34.78	4,587	74.25	34.49	4,485	74.65

Note: Response times are defined as the number of minutes between time of crash and the reported EMS arrival time at hospital.

Table 9-15
Average Elapsed Time from Time of Crash to EMS Arrival at Hospital by State for Rural Areas

State	1988 Number of Minutes	1988 Number of Records	1988 % Times Unknown	1989 Number of Minutes	1989 Number of Records	1989 % Times Unknown
Alabama	54.90	225	64.00	51.89	193	70.03
Alaska	45.96	27	55.00	47.64	28	41.66
Arizona	43.66	3	99.37	59.66	3	99.31
Arkansas	51.25	31	92.34	46.00	1	99.76
California	57.53	41	97.80	67.65	39	97.98
Colorado	59.90	163	41.15	54.59	100	61.97
Connecticut	45.60	41	71.52	45.00	24	77.98
Delaware	46.24	69	5.47	42.03	57	10.93
Dist of Columbia	5.88	53	3.63	6.73	68	2.85
Florida	---	0	100.00	36.80	10	99.18
Georgia	53.12	666	23.97	54.90	690	21.59
Hawaii	55.77	36	41.93	50.67	40	28.57
Idaho	58.64	97	48.40	53.85	103	43.71
Illinois	56.00	2	99.71	25.50	2	99.69
Indiana	49.24	391	38.23	48.89	355	33.39
Iowa	51.28	230	37.50	48.41	182	44.68
Kansas	51.45	188	37.74	58.35	175	37.50
Kentucky	48.59	391	32.70	47.59	357	32.51
Louisiana	96.00	1	99.83	43.85	7	98.67
Maine	51.13	89	56.58	54.52	78	44.68
Maryland	---	0	100.00	---	0	100.00
Massachusetts	23.00	1	99.42	49.00	1	99.40
Michigan	61.50	6	99.26	44.66	3	99.66
Minnesota	---	0	100.00	30.00	1	99.72
Mississippi	22.75	366	26.50	23.49	381	19.62
Missouri	57.85	293	55.19	56.70	265	58.26
Montana	58.58	75	51.92	53.20	81	43.35
Nebraska	41.95	91	49.44	44.04	103	47.17
Nevada	69.27	43	71.14	63.95	44	72.50
New Hampshire	39.56	37	63.00	43.43	64	48.80
New Jersey	44.90	33	87.05	45.90	11	95.00
New Mexico	61.43	108	65.49	59.94	121	64.82
New York	50.86	146	81.16	49.53	337	52.60
North Carolina	46.38	127	88.15	29.00	20	97.91
North Dakota	65.30	36	52.63	57.62	37	39.34
Ohio	57.04	149	83.06	48.22	68	92.45
Oklahoma	54.35	214	45.68	54.51	229	44.14
Oregon	53.38	209	48.01	53.30	252	38.23
Pennsylvania	53.73	404	59.64	54.20	410	58.24
Rhode Island	33.83	6	76.92	44.27	11	38.88
South Carolina	35.56	66	91.14	46.39	28	96.08
South Dakota	60.96	55	50.00	57.35	64	45.29
Tennesse	48.37	210	69.47	45.11	133	78.26
Texas	55.07	695	58.28	54.79	672	57.03
Utah	---	0	100.00	---	0	100.00
Vermont	51.24	31	69.60	58.67	43	50.00
Virginia	---	0	100.00	---	0	100.00
Washington	56.48	177	55.19	53.33	224	44.96
West Virginia	55.93	219	35.20	60.05	227	30.58
Wisconsin	46.68	238	55.43	45.51	210	60.22
Wyoming	65.21	55	48.59	61.96	33	69.62
Total	51.32	6,782	72.05	50.96	6,517	71.59

Note: Response times are defined as the number of minutes between the time of crash and the reported EMS arrival time at hospital.

Chapter 10
Classifications of Crash Data

Crashes, injury, and fatality counts as coded in FARS may differ somewhat from those based on the standard definitions in the Manual on Classification of Motor Vehicle Traffic Crashes. The standard was developed to establish uniformity in the classification and use of crash data. As such it applies to all crashes, whether or not they result in death. In part because FARS counts only fatal crashes (and only those where death occurs within 30 days of the crash), FARS counts are not always comparable to the American National Standards Institute (ANSI) classification counts.

However, the following sections summarize 1989 FARS data as distributed among ANSI classifications where applicable. Paragraph numbers cited for each section are those used in the ANSI manual.

People by Injury Severity (ANSI 3.1)

In ANSI, five categories are used to classify accident involved persons by the most severe injury sustained:

- No injury
- Possible injury
- Evident nonincapacitating injury
- Incapacitating injury
- Fatal injury

The level of injury severity used is that which was reported in the crash, with one significant exception--fatalities. Using ANSI manual criteria, for general use in the administration of highway safety programs, the specified period of a fatal injury is 30 days. This 30-day *fatality* counting rule is suitable for most applications, but other *fatality* counting rules are sometimes needed to meet specialized requirements. A 12-month rule for counting *fatalities* is used under World Health Organization procedures adopted for vital statistics reporting in the United States. Experience indicates that, of the deaths from *motor vehicle crashes*, about 98.0% occur within 30 days of the crash.

Manual on Classification of Motor Vehicle Traffic Accidents Fifth Edition, (October 1989) prepared by the Committee on Motor Vehicle Traffic Accident Classification under the direction of the Traffic Records Committee of the National Safety Council Highway Traffic Safety Division.

Personal involvements in FARS counted crashes in 1989 were distributed among the ANSI injury severity classifications as follows:

• No injury	21,703
• Possible injury	7,782
• Non-capacitating	14,173
• Incapacitating	19,351
• Fatal	45,555
• Unknown Severity	421
• Died prior to accident	7
• Unknown	807
• Total	109,799

Vehicles by Damage Severity (ANSI 3.2)

Four categories are specified by ANSI to classify vehicle involvements in crashes by the most severe damage they received:

- No damage
- Other damage
- Functional damage
- Disabling damage

These classifications usually are applied to vehicles involved in police-related accidents. Vehicle involvements in FARS counted crashes are also coded according to ANSI damage classifications. In 1989, this resulted in the following distribution of involved vehicles:

• No damage	1,542
• Other damage	5,370
• Functional damage	9,217
• Disabling damage	42,294
• Unknown damage	2,411
• Total	60,834

Accidents by Injury Severity (ANSI 3.4)

Using ANSI groupings, crashes are classified according to the most severe personal injury sustained in them, as described in 3.1. Using this method of classification, all crashes in FARS are, by definition, fatal.

Accidents by Damage Severity (ANSI 3.5)

Accidents are also classified according to the most severe vehicle damage sustained as in 3.2 above. Using ANSI classifications, the 1989 crashes counted in FARS had the following distribution of most severe vehicle damage:

• No damage	1,182
• Other damage	3,008
• Functional damage	4,652
• Disabling damage	30,272
• Unknown damage	1,604
• Total	40,718

Accidents by Number of Involved Vehicles (ANSI 3.6)

Accidents can also be classified by the number of motor vehicles in transport which were involved. Non-contact vehicles, such as those that forced another off the road but were not themselves involved in an impact, are not counted as accident-involved. FARS crashes in 1989 were classified as follows:

• 1 vehicle	23,732
• 2 vehicles	14,627
• 3 vehicles	1,886
• 4 vehicles	331
• 5 or more vehicles	142
• Total	40,718

Accidents by First Harmful Event (ANSI 3.7)

The first harmful event that occurs in each accident, rather than the most harmful event, is specified in the ANSI manual as a classification for uniformity in crash statistics reporting. The categories are mutually exclusive. The frequency of 1989 FARS counted crashes were distributed among first harmful events as follows:

• Non-collision overturn	3,958
• Other non-collision	560
• Collision with nonoccupant	7,011
• Collision with motor vehicle in transport	15,952
• Collision with fixed object	11,899
• Collision with other object	1,331
• Unknown	7
• Total	40,718

Accidents by Location (ANSI 3.8)

Two mutually exclusive categories of accident location are specified in the ANSI manuals: on-roadway and off-roadway.

Accidents by Location (ANSI 3.8)

Two mutually exclusive categories of accident location are specified in the ANSI manuals: on-roadway and off-roadway.

An on-roadway crash is (1) an event in which the initial point of contact between colliding units or between colliding unit and a fixed or non-fixed object in the first harmful event is within that part of the trafficway designed, improved and ordinarily used for motor vehicle traffic, or (2) a non-collision in which the vehicle involved was partly or entirely on the roadway at the time of the first harmful event. FARS crashes in 1989 occurred:

• On-roadway	24,532
• Off-roadway	16,025
• Unknown	161
• Total	40,718

Junction-related locations include four mutually exclusive categories. Intersection-related crashes occur on approaches to or exits from intersections, interchanges, and driveways as a result of activities, behavior or controls related to the movement of traffic through the intersection. The following are 1989 FARS data distributed among the eight ANSI categories:

• Non-junction	29,864
• At intersection	6,779
• Intersection-related	2,013
• Interchange area	585
• Driveway access	736
• Entrance/Exit Ramp	103
• Rail grade crossing	571
• In crossover	26
• Unknown	41
• Total	40,718

ANSI uses "class trafficway" to describe the six administrative classes of the trafficway where an accident occurred. Class of trafficway can be divided between two mutually exclusive access categories:

- Fully controlled access highway
- Other

All interstate highways and other freeways and expressways coded in FARS data are considered fully controlled.

• Fully controlled	6,099
• Other	34,429
• Unknown	190
• Total	40,718

Land use is classified by ANSI as urban or rural, based on urban area boundaries approved by the Federal Highway Administration. Fatal crashes in 1989 were distributed as follows:

• Urban	17,697
• Rural	22,946
• Unknown	75
• Total	40,718

Crashes are also classified by governmental jurisdiction. County and city jurisdictions were coded in FARS but, in the interest of brevity, the resulting body of data is not included in this report, but are available from NHTSA.

Motor Vehicle Classifications (ANSI 3.9)

Categories for classification of motor vehicles by type include:

- Automobile
- Bus
- Motorcycle
- Truck tractor
- Truck
  - Single-unit truck
  - Truck combination
- Other motor vehicle

There are three mutually exclusive categories of trucks based on gross vehicle weight rating. The categories are:

• Light Truck	gross vehicle weight rating under 10,000 pounds (4,536 kilograms)
• Medium Truck	gross vehicle weight rating 10,000-26,000 pounds (4,536-11,793 kilograms)
• Heavy Truck	gross vehicle weight rating over 26,000 pounds (11,793 kilograms)

Categories used in FARS, although more detailed, are compatible with these ANSI specifications. Summarized according to ANSI definitions, the following vehicle involvements were counted in 1989 FARS crashes.

• Automobile		35,384
• Bus		311
• Motorcycle		3,194
• Truck		20,673
• Truck Tractor	443	
• Single Unit	1,075	
• Truck Combination	3,464	
• Light Truck	15,691	
• Medium Truck	672	
• Heavy Truck	4,310	
• Other Motor Vehicle		1,272
• Total		60,834

Glossary

Alcohol Involvement — NHTSA defines a fatality or fatal crash as alcohol related or alcohol involved if either a driver or a nonoccupant (usually a pedestrian) had a measurable or estimated blood alcohol concentration (BAC) of 0.01% or above. See Chapter 2. Probabilities of alcohol involvement are now calculated for each driver, pedestrian, or crash.

Arterial — A major highway, primarily for through traffic, usually on a continuous route.

Automatic (Passive) Restraint System — Any restraint system that requires no action on the part of the driver or passengers to be effective in providing occupant crash protection (e.g., air bags or passive belts).

Blood Alcohol Concentration(BAC) — The BAC is measured as a percentage by weight of alcohol in the blood (grams/deciliter). A positive BAC level (0.01% and higher) indicates that alcohol was consumed by the person tested. Levels of alcohol involvement are defined as some (0.01% - 0.05%), impaired (0.06% -0.09%), or intoxicated (0.10% or more).

Body Type — Individual types of motor vehicles coded in FARS file.

Buses — Unless otherwise noted, includes school buses, intercity buses, transit buses, and other large motor vehicles used to carry more than ten passengers.

Class Trafficway — A classification of highways based on a route sign.

Construction/ Maintenance Zone — An area, usually marked by signs, barricades, or other devices indicating that highway construction or highway maintenance activities are on-going.

Driver — An occupant of a vehicle who is in physical control of a motor vehicle in transport, or for an out-of-control vehicle, an occupant who was in control until control was lost.

Fatal Motor Vehicle Traffic Crash — A crash that involves a motor vehicle in transport on a traffic way and in which at least one person dies within 30 days of the crash.

First Harmful Event — The first event during a crash that caused injury or property damage.

Fixed Objects — Stationary structures or substantial vegetation attached to the terrain.

Gross Vehicle Weight (GVW) — The maximum rated capacity of a vehicle which includes the weight of the vehicle, all added equipment, driver and passengers, and load.

Heavy Truck

1. Single-unit truck with GVW greater than 26,000 lbs.
2. Tractor-trailer combination
3. Truck with cargo trailer(s)
4. Truck-tractor pulling no trailer

Initial Impact Point — The first impact point that produced personal injury or property damage.

Land Use — The crash location (i.e., urban or rural).

Light Truck — Trucks under 10,000 lbs GVW (e.g., pickups, vans, and truck-based station-wagons).

Mandatory Belt Use Law — A law requiring some adult occupants of some traffic vehicles to use available restraint systems.

Manner of Collision — A classification for crashes in which the first harmful event was a collision between two motor vehicles in transport and is described as one of the following:

- **Angle** — Collisions which are not head-on, rear-end, rear-to-rear or sideswipe
- **Head-on** — Refers to a collision where the front-end of one vehicle collides with the front-end of another vehicle while the two vehicles are traveling in opposite directions.
- **Rear-end** — A collision in which one vehicle collides with the rear of another vehicle.

Manual (Active) Restraint System — Occupant restraints that require some action, usually buckling, before they are effective. They include shoulder belt, lap belt, lap and shoulder belt, infant carrier, or child safety seat.

Medium Truck — Any single-unit truck with GVW between 10,000 and 26,000 lbs.

Moped — A motor-driven cycle capable of speeds up to approximately 30 miles an hour and which can also be pedaled.

Most Harmful Event — The event during a crash for a particular vehicle that is judged to have produced the greatest personal injury or property damage.

Motorcycle — A two or three-wheeled motor vehicle designed to transport one or two people. For the purpose of this report, the following are not included unless otherwise noted: motorscooters, minibikes, and mopeds.

Motor Vehicle in Transport — A motor vehicle which is in motion or on a roadway.

Multipurpose Passenger Vehicle — A motor vehicle with motive power, except a trailer, designed to carry 10 persons or less which is constructed either on a truck chassis or with special features for occasional off-road operation.

Non-collision — A class of crash in which the first harmful event does not involve a collision with a fixed object or non-fixed object. This includes overturn, fire/explosion, gas inhalation, falls from a vehicle and injuries in a vehicle.

Nonoccupant — Any person who is not an occupant of a motor vehicle in transport and includes:

1. Pedestrians
2. Pedalcyclists
3. Occupants of parked motor vehicles
4. Others such as joggers, skateboard riders, people riding on animals, and persons riding in animal-drawn conveyances.

Non-passenger Car — This category includes:

1. Light Trucks
2. Medium Trucks
3. Heavy Trucks
4. Buses
5. Special Vehicles

Objects Not Fixed — Objects that are movable or moving but are not motor vehicles, pedestrians, pedalcyclists, animals, or trains, (e.g., spilled cargo in roadway)

Occupant — Any person who is in or upon a motor vehicle in transport and includes the driver, passengers, and persons riding on the exterior of a motor vehicle (e.g., a skateboard rider who is set in motion by holding onto a vehicle).

Passenger — Any occupant of a motor vehicle who is not a driver.

Passenger Car — Any of the following types of motor vehicles:

1. Convertible
2. 2-door sedan, hardtop, coupe
3. 4-door sedan or hardtop, coupe
4. 3-or 5-door hatchback
5. Automobile with pickup body
6. Station wagon
7. Other small four-wheel motor vehicles used primarily for carrying passengers

Passenger car sizes are as follows:

	Wheelbase
MiniSubcompact	Under 95"
Subcompact	95-99"
Compact	100-104"
Intermediate	105-109"
Full Size	110-114"
Largest Size	Over 114"

Pedalcyclist — A person on a vehicle that is powered solely by pedals.

Pedestrian — Any person not in or upon a motor vehicle or other vehicle.

Principal Impact Point — The impact that is judged to have produced the greatest personal injury or property damage for a particular vehicle.

Roadway — That part of a trafficway used for motor vehicle travel.

Roadway Function Class — The classification describing the character of service the street or highway is intended to provide and includes the following:

- **Interstate** — Limited access divided facility of at least four lanes designated by the Federal Highway Administration as part of the Interstate System.
- **Other Freeways and Expressways** — All urban principal arterial with limited control of access not on the Interstate System.
- **Other Principal Arterial** — Major streets or highways, many with multi-lane or freeway design, serving high volume traffic corridor movements that connect major generators of travel.
- **Minor Arterials** — Streets and highways linking cities and larger towns in rural areas in distributing trips to small geographic areas in urban areas (not penetrating identifiable neighborhoods).
- **Collectors** — In rural areas, routes serving intracounty, rather than statewide travel. In urban areas, streets providing direct access to neighborhoods as well as direct access to arterials.
- **Local Streets and Roads** — Streets whose primary purpose is feeding higher order systems, providing direct access with little or no through traffic.

School Bus — A specific type of vehicle which, independent of ownership or design, is used to transport children to and from school, or to and from school activities.

School Related Crash — Any crash in which a vehicle, regardless of body design, used as a school bus is directly or indirectly involved, such as a crash involving school children alighting from a vehicle.

Special Vehicle

Consists of the following types of vehicles:

1. Snowmobile
2. Farm equipment other than trucks
3. Dune buggy or swamp buggy
4. Construction equipment other than trucks
5. Ambulance
6. Large limousine
7. Self-propelled camper and motor home
8. Fire truck
9. Other special vehicle

Traffic Way

Any road, street or highway open to the public as a matter of right or custom for moving persons or property from one place to another.

Vehicle Type

A series of motor vehicle body types that have been grouped together because of their design similarities. The principal vehicle types used in this report are passenger cars, motorcycles, multipurpose passenger vehicles, light trucks, medium trucks, heavy trucks, buses, and special vehicles. See the definition of each of the vehicle types elsewhere in this glossary.

Appendix A
Alcohol Reporting in 1989

The number of drivers involved in fatal crashes who were tested for blood alcohol concentration (BAC) and reported in FARS has been steadily increasing since 1975. This is especially true for driver fatalities. As Table A-1 indicates, the number of states where approximately 80% or more of the drivers killed were tested for BAC has increased from 7 states in 1975 to 15 in 1980 to 29 in 1989. Overall 75.1% of the driver fatalities in the nation have reported BAC results in the 1989 FARS (see Table A-2). BAC results are very important to NHTSA's goal of tracking alcohol involvement in fatal crashes and evaluating the effectiveness of various alcohol programs.

On the other hand, we know very little about drivers who survive a fatal crash where someone else is killed. Table A-3 shows that BAC results are available only on 23.5% of surviving drivers in fatal crashes in 1989. This rate has more than doubled since 1975, but is still unacceptably low for research purposes. For this reason, NHTSA has developed a method whereby BAC results are estimated for those drivers where BACs are not reported in FARS. A description of this method is explained in Chapter 2. Table A-4 shows that the majority of states (40) now test and report BAC results on at least 70% of the drivers killed in traffic crashes in their states. Combined, those 40 states tested and reported BAC results on 83.1% of their driver fatalities.

Table A-5 shows that most states (28) are improving their testing and reporting rates for BACs on fatally injured drivers since 1987.

Table A-1
Number of States Where Approximately 80% (or more)
of Driver Fatalities were Tested for Blood Alcohol Concentration (BAC)
and the Results were known in FARS

Year	Number of States	States
1975	7	CA,CO,DC,NH,NJ,OR,RI
1976	6	CA,CO,NV,NJ,OR,RI
1977	10	CA,CO,HA,NV,NH,NJ,OR,RI,WA,WI
1978	11	CA,CO,DC,HA,NV,NH,NJ,OR,RI,WA,WI
1979	12	CA,CO,DE,DC,HA,NV,NH,NJ,OR,RI,WA,WI
1980	15	CA,CO,DE,DC,HA,NV,NH,NJ,NM,OR,RI,VT,VA,WA,WI
1981	16	CA,CO,DE,DC,HA,NV,NH,NJ,NM,OR,RI,SD,VT,VA,WA,WI
1982	18	CA,CO,DE,DC,HA,MD,MN,NV,NH,NJ,NM,OR,RI,UT,VT,VA,WA,WV,WI
1983	21	CA,CO,DE,DC,HA,IL,MD,MN,NE,NV,NH,NJ,NM,NC,
1984	26	CA,CO,CT,DE,DC,HA,IL,ME,MD,MN,MT,NE,NV,NJ,NM,NC,OR,RI,VT, VA,WA,WV,WI
1985	32	CA,CO,CT,DE,FL,HA,ID,IL,KY,ME,MD,MA,MN,MT,NE,NV,NJ,NM,NC, ND,OR,PA,RI,SD,TN,UT,VT,VA,WA,WV,WI,WY
1986	32	CA,CO,CT,DE,DC,HA,ID,IL,IN,KY,ME,MD,MA,MN,MT,NE,NV,NH,NJ, NM,NC,OR,PA,SD,TN,VT,VA,VT,WA,WV,WI,WY
1987	29	CA,CO,CT,DE,HA,ID,IL,IN,KY,ME,MD,MA,MN,MT,NE,NV,NJ,NM,NC, OR,PA,SD,TN,VT,VA,WA,WV,WI,WY
1988	30	AK,CA,CO,CT,DE,DC,HA,IL,KY,ME,MD,MA,MN,MT,NE,NV,NJ,NM,NY, NC,OR,PA,RI,SD,VT,VA,WA,WV,WI,WY
1989	29	AK,CA,CO,CT,DE,DC,HA,IL,ME,MD,MA,MN,MT,NE,NV,NJ,NM,NC,OR, PA,RI,SD,UT,VT,VA,WA,WV,WI,WY

Table A-2
Driver Fatalities

Year	Percent Tested with Known Results	Percent Tested with Unknown Results	Percent Not Tested	Unknown if Tested
1975	38.9	9.8	37.7	13.7
1976	40.8	10.2	39.6	9.3
1977	43.2	11.5	33.5	11.8
1978	42.0	12.8	33.8	11.4
1979	44.9	12.6	33.6	9.0
1980	46.6	11.0	34.7	7.7
1981	48.6	10.8	35.1	5.5
1982	54.3	10.8	29.4	5.6
1983	56.7	10.5	28.1	4.7
1984	63.0	9.1	25.6	2.3
1985	66.2	9.4	22.0	2.4
1986	71.3	5.9	20.2	2.5
1987	72.9	4.6	19.6	2.9
1988	74.0	4.3	19.4	2.3
1989	75.1	4.1	18.5	2.3

NOTE: Driver fatalities are about 45% of all drivers in fatal accidents

Table A-3
Surviving Drivers

Year	Percent Tested with Known Results	Percent Tested with Unknown Results	Percent Not Tested	Unknown if Tested
1975	9.9	3.6	73.0	13.5
1976	10.4	4.6	73.2	11.8
1977	10.8	4.8	68.6	15.8
1978	10.9	5.3	69.7	14.2
1979	12.0	5.6	70.6	11.8
1980	13.8	5.4	71.1	9.8
1981	14.6	4.5	73.9	7.0
1982	16.3	5.4	71.5	6.9
1983	16.5	5.7	71.8	6.0
1984	18.4	4.5	72.7	4.4
1985	21.6	4.3	70.9	3.3
1986	22.2	3.8	70.7	3.3
1987	22.2	3.5	71.3	3.0
1988	22.2	3.3	71.5	2.9
1989	23.5	3.4	69.7	3.4

NOTE: Surviving drivers account for about 55% of all drivers in fatal accidents.

Table A-4
States that Tested and Reported BAC Results on at Least 70% of Driver Fatalities
(36 States, District of Columbia, and Puerto Rico)

#Alabama	*New Jersey
Alaska	*New Mexico
*California	#New York
*Colorado	North Carolina
Connecticut	#North Dakota
*Delaware	#Oklahoma
#Florida	*Oregon
#Georgia	Pennsylvania
*Hawaii	*Rhode Island
Illinois	South Dakota
#Indiana	#Tennessee
#Iowa	#Utah
#Kentucky	*Vermont
Maine	*Viginia
Maryland	*Washington
Massachusetts	West Virginia
Minnesota	*Wisconsin
Montana	Wyoming
Nebraska	District of Columbia
Nevada	Puerto Rico

*Original good reporting states testing 80% or more driver fatalities since 1980.

#States reporting 70% or better, but less than 80 percent.

Note: In 1989, the 38 states,District of Columbia and Puerto Rico combined, tested 15,747(83.1%) of 18,940 driver fatalities.

Table A-5
State Reporting Rates of BAC in Driver Fatalities

	Percent of Driver Fatalities Tested With Known BAC Results			Percent of Driver Fatalities Tested BAC Results Unknown			Percent Unknown Driver Fatality Was Tested		
	1987	1988	1989	1987	1988	1989	1987	1988	1989
ARIZONA	64.0	54.1	51.3	4.8	4.1	14.6	12.2	10.0	6.7
ARKANSAS	39.2	29.2	38.4	30.8	40.3	32.6	2.0	3.0	1.0
CALIFORNIA	89.4	89.3	90.4	0.5	0.5	1.1	0.1	0.3	0.1
COLORADO	87.7	88.0	87.2	0.0	0.0	0.0	0.6	0.0	0.0
CONNECTICUT	88.2	89.0	89.6	0.4	0.0	0.0	0.7	7.5	0.0
DELAWARE	95.6	95.7	92.6	0.0	0.0	0.0	0.0	0.0	2.9
FLORIDA	61.7	69.0	70.6	7.5	5.1	5.4	0.4	0.9	1.3
GEORGIA	74.0	67.3	73.5	1.7	2.9	3.3	0.0	0.1	0.0
HAWAII	93.7	91.5	94.1	0.0	0.0	0.0	0.0	0.0	0.0
IDAHO	90.6	71.4	67.8	0.0	2.6	6.7	1.8	0.0	10.1
ILLINOIS	85.3	86.9	89.1	0.2	0.6	0.0	1.2	0.4	0.3
INDIANA	92.4	77.4	78.7	0.6	2.5	0.8	0.3	2.5	1.6
IOWA	74.7	76.9	74.1	0.3	0.6	1.5	0.6	0.0	0.0
KANSAS	60.2	57.3	60.0	0.9	2.0	1.1	0.3	0.3	3.0
KENTUCKY	77.0	80.9	77.6	2.7	2.8	1.4	0.6	0.0	0.8
LOUISIANA	41.5	48.6	63.8	29.0	21.9	12.1	0.0	0.4	0.2
MAINE	86.8	87.5	84.3	0.0	0.0	1.7	0.0	0.6	0.9
MARYLAND	87.1	86.2	89.1	0.0	0.0	0.2	0.0	0.0	0.0
MASSACHUSETTS	86.9	87.7	86.5	2.6	0.0	5.6	6.0	6.9	10.2
MICHIGAN	60.3	60.5	62.0	8.4	9.1	0.3	0.0	0.1	0.0
MINNESOTA	89.6	86.7	85.9	0.7	0.8	0.4	4.7	6.1	7.6
MISSISSIPPI	9.3	6.4	16.3	0.0	0.0	1.3	0.2	0.2	3.9
MISSOURI	63.1	67.3	67.0	2.6	2.2	1.0	13.0	16.4	11.3
MONTANA	86.0	89.7	87.8	0.0	0.0	0.0	0.8	0.8	4.1
NEBRASKA	85.0	80.1	86.6	0.0	1.1	2.4	1.6	2.3	1.1
NEVADA	91.6	90.2	87.0	0.7	0.6	1.7	0.7	1.2	0.6
NEW HAMPSHIRE	74.8	66.3	54.2	0.0	0.0	0.9	0.0	2.0	15.8
NEW JERSEY	87.5	87.3	86.0	0.4	0.6	0.7	0.0	0.0	0.0
NEW MEXICO	86.1	88.6	93.2	1.4	0.7	1.1	6.3	3.0	3.7
NEW YORK	76.3	83.0	77.6	2.2	0.4	5.4	13.3	8.7	13.9
NORTH CAROLINA	85.9	86.6	81.5	4.5	3.4	0.0	0.1	0.4	0.7
NORTH DAKOTA	74.3	75.4	75.0	0.0	0.0	21.7	0.0	0.0	0.0
OHIO	52.9	60.8	45.8	17.6	16.7	0.0	6.4	2.8	5.3
OKLAHOMA	64.9	67.2	77.2	0.0	0.0	0.0	0.0	0.0	0.0
OREGON	90.9	92.3	90.8	0.0	0.0	4.0	0.0	0.0	0.0
PENNSYLVANIA	79.3	79.4	82.4	4.2	4.2	0.0	9.1	9.9	3.7
RHODE ISLAND	34.7	96.0	98.5	0.0	0.0	1.5	65.3	2.7	0.0
SOUTH CAROLINA	43.9	44.7	60.8	11.4	10.4	0.0	1.5	0.8	0.2
SOUTH DAKOTA	89.9	86.6	92.0	0.0	1.2	0.0	1.3	0.0	0.0
TENNESSEE	77.6	77.8	75.7	0.1	0.0	6.2	0.0	0.0	0.0
TEXAS	55.8	57.2	60.5	9.6	8.7	0.0	0.1	0.1	0.1
UTAH	73.4	76.9	86.8	2.1	1.3	0.0	1.4	0.6	0.0
VERMONT	95.0	89.3	85.5	0.0	1.2	0.0	2.5	4.8	6.6
VIRGINIA	84.0	83.6	88.7	0.2	0.2	0.0	3.1	5.6	3.1
WASHINGTON	85.2	91.4	89.5	0.4	0.0	0.0	0.2	0.0	0.0
WEST VIRGINIA	87.8	89.1	88.2	0.7	1.4	1.0	0.0	0.0	0.0
WISCONSIN	85.3	87.7	88.7	1.0	1.5	0.4	0.4	0.6	0.4
WYOMING	87.3	86.5	80.0	5.6	1.0	6.3	0.0	0.0	1.3
DISTRICT OF COLUMBIA	87.5	100.0	83.3	0.0	0.0	4.2	12.5	0.0	0.0
PUERTO RICO	80.3	71.1	72.7	0.0	0.0	0.0	0.0	0.0	0.0
USA	73.3	74.0	75.1	4.5	4.3	4.1	2.6	2.3	2.3

Note: Remaining percent (to add up to 100%) are drivers reported as not tested.

Appendix B
1989 Coding Forms

US Department of Transportation
National Highway Traffic Safety Administration

1989 Fatal Accident Reporting System (FARS)
ACCIDENT LEVEL

Form Approved thru O.M.B. No. 2127-0006

CODED BY: _____

DATE CODED: _____

STATE CASE NO: _____

CASE NUMBER STATE (GSA CODES) 1 2 | 3 4 5 6

TRANSACTION CODE 7 8 = 1
11 – Original Submission
12 – Update or Change
13 – Delete
14 – List

CARD NO. 9 = 1

CITY 14 15 16 17

COUNTY 18 19 20

DATE MONTH 21 22 DAY 23 24 YEAR 25 26 = 8 9

TIME 27 28 29 30
Military Time
9999 – Unknown

Number of Vehicle Forms Submitted 31 32

Number of Person Forms Submitted 33 34

FEDERAL-AID SYSTEM 35
1 – Interstate
2 – Federal Aid Primary (other than interstate)
3 – Federal Aid Urban
4 – Federal Aid Secondary (rural only)
5 – Non Federal Aid
9 – Unknown

ROADWAY FUNCTION CLASS 36 37

RURAL
01 Principal Arterial - Interstate
02 Principal Arterial - Other
03 Minor Arterial
04 Major Collector
05 Minor Collector
06 Local Road or Street
09 Unknown Rural

URBAN
11 Principal Arterial - Interstate
12 Principal Arterial - Other
13 Other Principal Arterial
14 Minor Arterial
15 Collector
16 Local Road or Street
19 Unknown Urban

99 UNKNOWN

ROUTE SIGNING 38
1 – Interstate
2 – U.S. Highway
3 – State Highway
4 – County Road
LOCAL STREET
5 – Township
6 – Municipality
8 – Other
9 – Unknown

TRAFFICWAY IDENTIFIER 39 40 41 42 43 44 45 46 47 48
Actual Posted Number, Assigned Number, or Common Name (if No Posted or Assigned Number)
Except: Nine Fill if Unknown

MILEPOINT 49 50 51 52 53
Actual to Nearest .1 Mile (Assumed Decimal)
Except: 00000 – None
99999 – Unknown

SPECIAL JURISDICTION 54
0 – No Special Jurisdiction
1 – National Park Service
2 – Military
3 – Indian Reservation
4 – College/University Campus
5 – Other Federal Properties
8 – Other
9 – Unknown

FIRST HARMFUL EVENT 55 56
(See Instruction Manual)

MANNER OF COLLISION 57
0 – Not Collision with Motor Vehicle in Transport
1 – Rear-End
2 – Head On
3 – Rear-to-Rear
4 – Angle
5 – Sideswipe, Same Direction
6 – Sideswipe, Opposite Direction
9 – Unknown

RELATION TO JUNCTION 58
1 – Non-Junction
2 – Intersection
3 – Intersection Related
4 – Interchange Area
5 – Driveway, Alley Access, etc.
6 – Entrance/Exit Ramp
7 – Rail Grade Crossing
8 – In Crossover
9 – Unknown

RELATION TO ROADWAY 59
1 – On Roadway
2 – Shoulder
3 – Median
4 – Roadside
5 – Outside Right-of-Way
6 – Off Roadway – Location Unknown
7 – In Parking Lane
8 – Gore
9 – Unknown

TRAFFICWAY FLOW 60
1 – Not Physically Divided (Two Way Trafficway)
2 – Divided Highway, Median Strip (Without Traffic Barrier)
3 – Divided Highway, Median Strip (With Traffic Barrier)
4 – One Way Trafficway
9 – Unknown

NUMBER OF TRAVEL LANES 61
Actual Value Except:
7 – Seven or more lanes
9 – Unknown

SPEED LIMIT 62 63
Actual Miles Per Hour Except:
00 – No Statutory Limit
99 – Unknown

ROADWAY ALIGNMENT 64
1 – Straight
2 – Curve
9 – Unknown

ROADWAY PROFILE 65
1 – Level
2 – Grade
3 – Hillcrest
4 – Sag
9 – Unknown

ROADWAY SURFACE TYPE 66
1 – Concrete
2 – Blacktop (Bituminous)
3 – Brick or Block
4 – Slag, Gravel or Stone
5 – Dirt
8 – Other
9 – Unknown

ROADWAY SURFACE CONDITION 67
1 – Dry
2 – Wet
3 – Snow or Slush
4 – Ice
5 – Sand, Dirt, Oil
8 – Other
9 – Unknown

TRAFFIC CONTROL DEVICE 68 69
(See Instruction Manual)

TRAFFIC CONTROL DEVICE FUNCTIONING 70
0 – No Controls
1 – Device Not Functioning
2 – Device Functioning - Functioning Improperly
3 – Device Functioning Properly
9 – Unknown

HIT AND RUN 71
0 – No Hit and Run
1 – Hit Motor Vehicle in Transport
2 – Hit Pedestrian or Non-Motorist
3 – Hit Parked Vehicle or Object

LIGHT CONDITION 72
1 – Daylight
2 – Dark
3 – Dark but lighted
4 – Dawn
5 – Dusk
9 – Unknown

ATMOSPHERIC CONDITIONS 73
1 – No Adverse Atmospheric Conditions
2 – Rain
3 – Sleet
4 – Snow
5 – Fog
6 – Rain and Fog
7 – Sleet and Fog
8 – Other: Smog, Smoke, Blowing Sand or Dust
9 – Unknown

CONSTRUCTION/MAINTENANCE ZONE 74
0 – None
1 – Construction
2 – Maintenance
3 – Utility
4 – Work Zone, Type Unknown

NOTIFICATION TIME EMS 75 76 77 78
Military Time Except:
0000 – Not Notified
9999 – Unknown

ARRIVAL TIME EMS 79 80 81 82
Military Time Except:
0000 – Not Notified
9999 – Unknown

EMS TIME AT HOSPITAL 83 84 85 86
Military Time Except:
0000 – Not Notified
9999 – Unknown

SCHOOL BUS RELATED 87
0 – No
1 – Yes

RELATED FACTORS 88 89 90 91 92 93

RAIL GRADE CROSSING IDENTIFIER 94 95 96 97 98 99 100
(See Instruction Manual)

CARD NO. 9 = 2

ADDITIONAL STATE INFORMATION (See Instruction Manual) 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33

Number of Non-Motorist Forms Submitted 34 35

HS Form 214 (Rev. 1/89)

U.S. Department of Transportation
National Highway Traffic Safety Administration

1989 Fatal Accident Reporting System (FARS)
VEHICLE/DRIVER LEVEL

Form Approved thru O.M.B. No. 2127-0006

CODED BY _____

DATE CODED _____

STATE CASE NO _____

CASE NUMBER STATE (GSA CODES) 1 2	CONSECUTIVE NUMBER 3 4 5 6	TRANSACTION CODE 21—Original Submission 22—Update or Change 7 8 (2)	CARD NO. 9 (1)	VEHICLE NUMBER (Assigned by Analyst) 10 11

VEHICLE MAKE (See Instruction Manual) 14 15	VEHICLE MODEL (See Instruction Manual) 16 17	BODY TYPE (See Instruction Manual) 18 19	MODEL YEAR Actual Value except 99—Unknown 20 21

VEHICLE IDENTIFICATION NO. 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38
Actual Value except:
Zero Fill if no VIN
Nine Fill if Unknown

REGISTRATION STATE 39 40
GSA CODES Except:
00—Not Applicable
92—No Registration
93—Multiple State Reg., In-State
94—Multiple State Reg., Out-of-State
95—U.S. Government Tags
96—Military Vehicle
97—Foreign Countries
98—Other Registration
99—Unknown

ROLLOVER 41
0—No Rollover
1—First Event
2—Subsequent Event

JACKKNIFE 42
0—Not an Articulated Vehicle
1—No
2—First Event
3—Subsequent Event

TRAVEL SPEED 43 44
Actual Miles Per Hour Except:
00—Stopped Vehicle
97—Ninety-seven MPH or Greater
99—Unknown

HAZARDOUS CARGO 45
0—No
1—Yes
9—Unknown

VEHICLE TRAILERING 46
0—No
1—Yes, One Trailing Unit
2—Yes, Two Trailing Units
3—Yes, Three or More Trailing Units
4—Yes, Number of Trailing Units Unknown
9—Unknown

SPECIAL USE 47
0—No Special Use
1—Taxi
2—Vehicle Used as School Bus
3—Vehicle Used as other Bus
4—Military
5—Police
6—Ambulance
7—Firetruck
9—Unknown

EMERGENCY USE 48
0—No
1—Yes

IMPACT POINT—INITIAL 49 50
00—Non-Collision
01-12—Clock Points
13—Top
14—Undercarriage
15—Underride
16—Override
99—Unknown

IMPACT POINT—PRINCIPAL 51 52
00—Non-Collision
01-12—Clock Points
13—Top
14—Undercarriage
15—Underride
16—Override
99—Unknown

EXTENT OF DEFORMATION 53
0—None
2—Other (Minor)
4—Functional (Moderate)
6—Disabling (Severe)
9—Unknown

VEHICLE ROLE 54
0—Non-Collision
1—Striking
2—Struck
3—Both
9—Unknown

MANNER OF LEAVING SCENE 55
1—Driven
2—Towed Away
3—Abandoned
9—Unknown

FIRE OCCURRENCE 56
0—No Fire
1—Fire Occurred in Vehicle During Accident

NUMBER OF OCCUPANTS 57 58
Actual Value if Total Known
96—96 or more
97—Unknown—Only Injured Reported
99—Unknown

RELATED FACTORS 59 60 61 62
See Instruction Manual "Related Factors—VEHICLE LEVEL"

VEHICLE MANEUVER 63 64
(See Instruction Manual)

MOST HARMFUL EVENT 65 66
(See Instruction Manual)

Class Rec. 9 (2)

DRIVER PRESENCE 14
1—Driver Operated Vehicle
2—Driverless
3—Driver Left Scene
9—Unknown

LICENSE STATE GSA CODES 15 16
Except:
94—Military
95—Canada
96—Mexico
97—Other Foreign Countries
99—Unknown

DRIVER LICENSE STATUS (Irrespective of Vehicle Driven) 17
NO VALID LICENSE
0—Not Licensed
1—Suspended
2—Revoked
3—Expired
4—Cancelled or Denied
VALID LICENSE
5—Single Class License
6—Multiple Class License
7—Learner's Permit
8—Temporary
9—Unknown

DRIVER LICENSE TYPE COMPLIANCE (For This Class Vehicle) 18
0—Not Licensed
1—No License Required for This Class Vehicle
2—No Valid License for This Class Vehicle
3—Valid License for This Class Vehicle
9—Unknown

COMPLIANCE WITH LICENSE RESTRICTIONS 19
0—No Restrictions
1—Restrictions Complied With
2—Restrictions Not Complied With
3—Restrictions, Compliance Unknown
9—Unknown

VIOLATIONS CHARGED 20
0—None
1—Alcohol or Drugs
2—Speeding
3—Alcohol or Drugs and Speeding
4—Reckless Driving
5—Driving with a Suspended or Revoked License
6—Other Moving Violation
7—Non-Moving Violation
8—Violation, Type Unknown or Other Violation
9—Unknown

PREVIOUS RECORDED ACCIDENTS 21 22
Actual Value Except:
00—None
99—Unknown

PREVIOUS RECORDED SUSPENSIONS AND REVOCATIONS 23 24
Actual Value Except:
00—None
99—Unknown

PREVIOUS DWI CONVICTIONS 25 26
Actual Value Except:
00—None
99—Unknown

PREVIOUS SPEEDING CONVICTIONS 27 28
Actual Value Except:
00—None
99—Unknown

PREVIOUS OTHER HARMFUL MV CONVICTIONS 29 30
Actual Value Except:
00—None
99—Unknown

DATE OF LAST ACCIDENT, SUSPENSION, OR CONVICTION 31 32 Mo. 33 34 Yr.
00—No Record
99—Unknown

DATE OF FIRST ACCIDENT SUSPENSION, OR CONVICTION 35 36 Mo. 37 38 Yr.
00—No Record
99—Unknown

DRIVER ZIP CODE 39 40 41 42 43
Actual Value Except
Nine Fill If Unknown

RELATED FACTORS 44 45 46 47 48 49
See Instruction Manual, "Related Factors—DRIVER LEVEL"

HS Form 214A (Rev. 1/89)

US Department of Transportation
National Highway Traffic Safety Administration

1989 Fatal Accident Reporting System (FARS)
PERSON LEVEL

O.M.B. No. 2127-0006
CODED BY: _____
DATE CODED: _____
STATE CASE NO: _____

CASE NUMBER STATE (GSA CODES) [1][2]

CONSECUTIVE NUMBER [3][4][5][6]

TRANSACTION CODE [7][8] — 31 – Original Submission; 32 – Update or Change — 3

CARD NO. [9] — 1

VEHICLE NUMBER (Assigned by Analyst) [10][11] — 00 – Non-Motorist

PERSON NUMBER (Assigned by Analyst) [12][13]

NON-MOTORIST STRIKING VEHICLE NUMBER [14][15]
Assigned Vehicle Number
Except:
99 – Unknown

AGE [16][17]
Actual Value
00 – Up to One Year
97 – Ninety-Seven Years or Older
99 – Unknown

SEX [18]
1 – Male
2 – Female
9 – Unknown

PERSON TYPE [19]
1 – Driver of a Motor Vehicle in Transport
2 – Passenger of a Motor Vehicle in Transport
3 – Occupant of a Motor Vehicle Not in Transport
4 – Occupant of a Non-Motor Vehicle Transport Device
5 – Non-Occupant – Pedestrian
6 – Non-Occupant – Bicyclist
7 – Non-Occupant – Other Cyclist
8 – Non-Occupant – Other or Unknown
9 – Unknown Occupant Type in a Motor Vehicle in Transport

SEATING POSITION [20][21]
00 – Non-Motorist
11 – Front Seat – Left Side (Driver's Side)
12 – – Middle
13 – – Right Side
18 – – Other
19 – – Unknown
21 – Second Seat – Left Side
22 – – Middle
23 – – Right Side
28 – – Other
29 – – Unknown
31 – Third Seat – Left Side
32 – – Middle
33 – – Right Side
38 – – Other
39 – – Unknown
41 – Fourth Seat – Left Side
42 – – Middle
43 – – Right Side
48 – – Other
49 – – Unknown
50 – Sleeper Section of Cab (Truck)
51 – Other Passenger in Enclosed Passenger or Cargo Area
52 – Other Passenger in Unenclosed Passenger or Cargo Area
53 – Other Passenger in Passenger or Cargo Area, Unknown Whether or Not Enclosed
54 – Trailing Unit
55 – Riding on Vehicle Exterior
99 – Unknown

MANUAL (ACTIVE) RESTRAINT SYSTEM – USE [22]
0 – None Used - Vehicle Occupant/Not Applicable - Non-Motorist
1 – Shoulder Belt
2 – Lap Belt
3 – Lap and Shoulder Belt
4 – Child Safety Seat
5 – Motorcycle Helmet
8 – Restraint Used – Type Unknown or Other including Other Helmet
9 – Unknown

AUTOMATIC (PASSIVE) RESTRAINT SYSTEM – FUNCTION [23]
0 – Not Equipped or Non-Motorist
1 – Automatic Belt in Use
2 – Automatic Belt-Not In Use
3 – Deployed Air Bag
4 – Non-deployed Air Bag
9 – Unknown

NON-MOTORIST LOCATION [24][25]
00 – Not Applicable – Vehicle Occupant
01 – Intersection – In Crosswalk
02 – Intersection – On Roadway, Not in Crosswalk
03 – Intersection – On Roadway, Crosswalk Not Available
04 – Intersection – On Roadway, Crosswalk Availability Unknown
05 – Intersection – Not on Roadway
09 – Intersection – Unknown
10 – Non-Intersection – In Crosswalk
11 – Non-Intersection – On Roadway, Not in Crosswalk
12 – Non-Intersection – On Roadway, Crosswalk Not Available
13 – Non-Intersection – On Roadway, Crosswalk Availability Unknown
14 – Non-Intersection – In Parking Lane
15 – Non Intersection – On Road Shoulder
16 – Non-Intersection – Bike Path
17 – Non-Intersection – Outside Trafficway
18 – Non-Intersection – Other, Not on Roadway
19 – Non-Intersection – Unknown
99 – Unknown

EJECTION [26]
0 – Not Ejected
1 – Totally Ejected
2 – Partially Ejected
9 – Unknown

EXTRICATION [27]
0 – Not Extricated
1 – Extricated
9 – Unknown

METHOD OF ALCOHOL DETERMINATION (By Police) [28]
1 – Evidential Test (Breath, Blood, Urine)
2 – Preliminary Breath Test (PBT)
3 – Behavioral
4 – Passive Alcohol Sensor (PAS)
5 – Observed
8 – Other (e.g. Saliva test)
9 – Not Reported

POLICE REPORTED ALCOHOL INVOLVEMENT [29]
0 – No (Alcohol Not Involved)
1 – Yes (Alcohol Involved)
8 – Not Reported
9 – Unknown (Police Reported)

ALCOHOL TEST RESULT [30][31]
Actual Value (Decimal Implied before First Digit) (0.xx)
95 – Test Refused
96 – None Given
97 – AC Test Performed, Results Unknown
99 – Unknown

DRUGS NOTED IN TOXICOLOGY REPORT (Other than alcohol) [32]
0 – No blood test given

Blood Test given, results known	Blood Test given, results unknown
1 – No drugs reported	7 – Test for drugs, results unknown
2 – Drugs reported (excluding nicotine, aspirin)	8 – Unknown if Tested for Drugs
3 – Not tested for drugs	9 – Unknown if blood test given

INJURY SEVERITY [33]
0 – No Injury (0)
1 – Possible Injury (C)
2 – Nonincapacitating Evident Injury (B)
3 – Incapacitating Injury (A)
4 – Fatal Injury (K)
5 – Injured, Severity Unknown
6 – Died Prior to Accident
9 – Unknown

TAKEN TO HOSPITAL OR TREATMENT FACILITY [34]
0 – No
1 – Yes
9 – Unknown

DEATH DATE [35][36][37][38][39][40]
000000 – Not Applicable
999999 – Unknown
MONTH DAY YEAR

DEATH TIME [41][42][43][44]
Military Time Except:
0000 – Not Applicable
9999 – Unknown

RELATED FACTORS [45][46] [47][48] [49][50]
See Instruction Manual
"Related Factors – PERSON LEVEL"

HS Form 214B (Rev. 1/89)

Appendix C
Sample Order Forms

ORDER FORM FOR NHTSA TAPES/DOCUMENTATION

The U.S. Department of Transportation, Volpe National Transportation Systems Center (DOT/VNTSC) has the following NHTSA data tapes , and/or, tape documentation available as specified below. Mark the appropriate blocks with an ("X") to indicate the item(s) desired. Years required should be indicated by circling those dates.

I. AVAILABLE DATA TAPES* ($150.00 per tape, per year)

☐ Fatal Accident Reporting System (FARS)
- Seq. Version - 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990(Prelim)
- SAS Version - 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990(Prelim)

☐ National Accident Sampling System (NASS)
- Sequential Version - 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989
- SAS Version - 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989

☐ National Crash Severity Study (NCSS)
☐ Sequential Version or ☐ SAS Version
- Pre-April (Augmented) - Jan 77 - March 78
- Post-April - April 78 - March 79

☐ Pedestrian Injury Causation Study (PICS)
- 1 Tape-SAS Version only

☐ General Estimates System (GES)
- SAS File - 1988, 1989
- Flat File - 1988, 1989

II. AVAILABLE DOCUMENTATION

☐ Fatal Accident Reporting System
- 1975-1981, 1 document, @ $15.00
- 1982-1985, 1 document, @ $15.00
- 1986, 1 document, @ 15.00
- 1987, 1 document, @ $15.00
- 1988, 1 document, @ $15.00
- 1989, 1 document, @ $15.00

☐ National Accident Sampling System @ $5.00 each year
- 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989

☐ National Crash Severity Study
- 1 document, @ $5.00

☐ Pedestrian Injury Causation Study
- 1 document, @ $5.00

☐ General Estimates System
- 1988, 1 document, @ $5.00
- 1989, 1 document, @ $5.00

* Data tapes are available in EBCDIC Code and tape density of 1600 or 6250 BPI. Specify characteristics desired by circling. Documentation is provided with each tape purchased.

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Marjorie Saccoccio, DTS-44
DOT /Volpe National Transportation Systems Center
Kendall Square
Cambridge, MA. 02142

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