U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

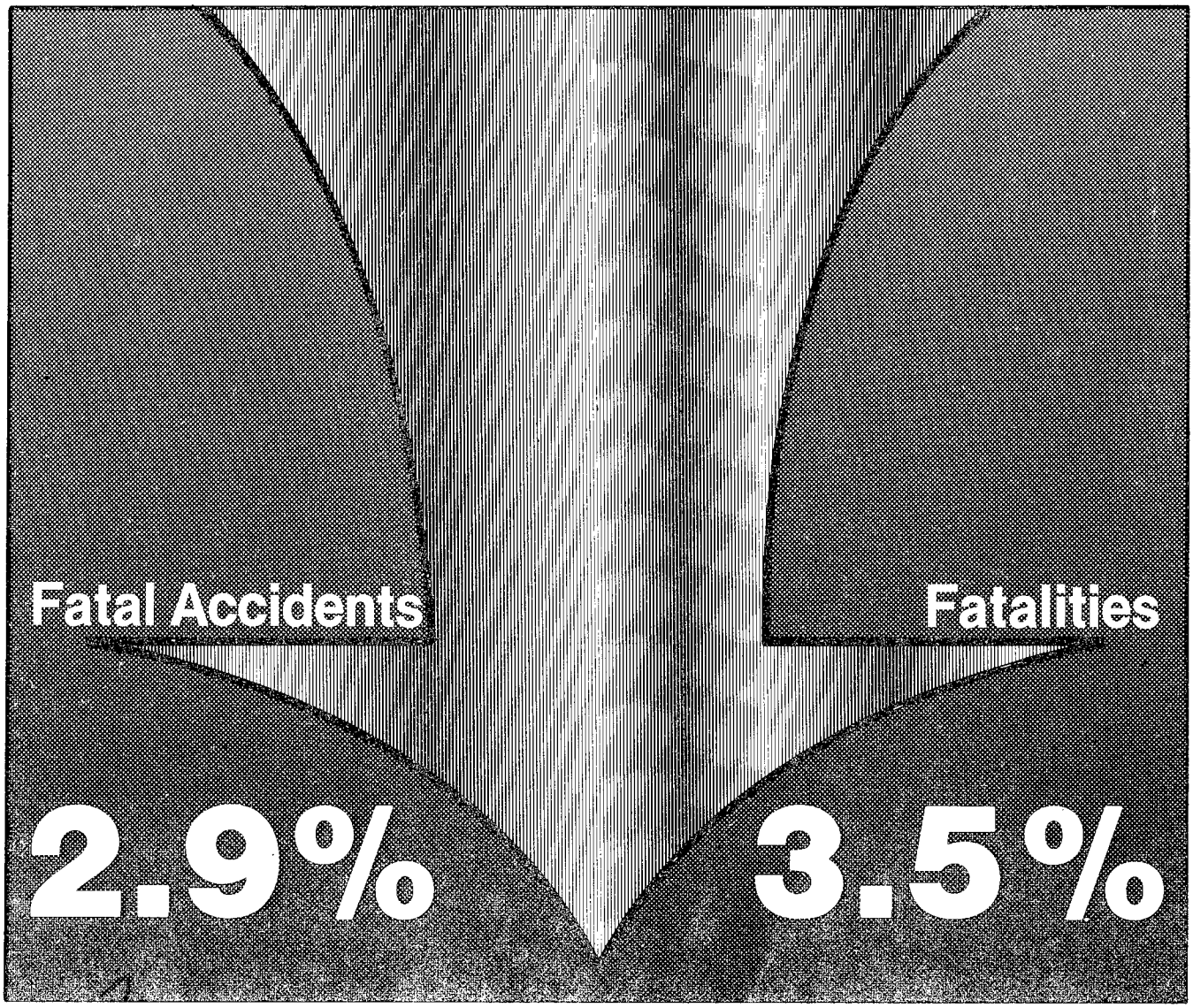
National Center for
Statistics and Analysis

Washington, D.C.
20590

FATAL ACCIDENT REPORTING SYSTEM 1981

PB98-158439

An Overview of U.S. Traffic Fatal Accident and Fatality Data Collected in FARS for the Year 1981



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Highlights 1981

In 1981 FARS reported 43,979 fatal accidents, a decrease of 2.9 percent from the 1980 total of 45,284. In these accidents 49,268 persons were killed—a drop of 3.5 percent from 1980, when 51,091 persons were killed. The number of vehicles involved in these accidents also decreased from 1980, though at a slower rate—a 1.4 percent decline from 63,485 in 1980 to 62,666 in 1981. A summary of the other more significant statistics follows.

- The fatality rate in 1981 was 3.16 fatalities per 100 million vehicle miles of travel, 6.5 percent lower than the 3.38 deaths per 100 million miles in 1980, and the lowest since FARS data collection began.
- As in previous years, the most conspicuous group of persons killed was 20-24 year-old males.
- More than one-third (35.8 percent) of the drivers involved in fatal accidents in 1981 were under age 25, a fraction only slightly below that of 1980. This same age group accounted for fully half of all motorcycle drivers involved in fatal accidents.
- Thirty-one percent of the drivers involved in fatal accidents were known to have been under the influence of alcohol at the time, as were more than 35 percent of the involved pedestrians over the age of 15. FARS data contain test results from only 27.6 percent of the involved drivers.
- Of those drivers tested who had previous convictions for Driving While Intoxicated, more than 50 percent had a Blood Alcohol Concentration greater than 0.10.
- Although Federal Highway Administration (FHWA) figures indicate that 56 percent of 1981 estimated vehicle miles of travel were in urban areas, less than half (43.0 percent) of all fatal accidents occurred in these areas. Most fatal accidents occurred on arterial routes without limited access during normal weather conditions and daylight hours.
- Passenger cars, light trucks, and motorcycles, in that order, were the vehicle types most frequently involved in 1981 fatal accidents and were associated with the largest proportions of occupant fatalities. These fatalities in 1981 were distributed among vehicle types as shown in Table 1. Those which occurred in passenger cars were associated with the first harmful event and manner of collision as shown in Table 2.
- The 143 fatal accidents in 1981 that involved school buses resulted in the deaths of 14 school bus occupants (three drivers and eleven passengers), 48 nonoccupants and 81 occupants of other vehicles.
- In 1981, about 82 percent (40,393) of all motor vehicle traffic fatalities were vehicle occupants. More than two-thirds of these were drivers. These proportions represent virtually no change from 1980 levels (Table 3), but drivers increased as a percent of occupants since 1976.
- Since 1976, motorcycle fatalities have increased 45.6 percent and moped and other motorized cycle fatalities by 113.5 percent, while passenger car fatalities only increased 1.4 percent, and light trucks 25.3 percent.
- Motorcycle riders accounted for 9.6 percent (4,716) of all persons killed, compared to 9.7 percent in 1980.
- In 1981, 18.0 percent of all persons killed were nonoccupants. These included 7,836 pedestrians (88.3 percent of all nonoccupants killed); 935 pedalcyclists (10.5 percent); and 104 other nonoccupants (1.2 percent). (See Table 3.)
- More than three-fifths (64.0 percent) of the 1981 pedestrian fatalities occurred in urban areas, down from 65.4 percent in 1980.
- In 1981, 458 fatal accidents and 503 traffic deaths occurred in Puerto Rico, a 6.7 percent and 3.2 percent drop from 1980 respectively. Nonoccupants accounted for 41.3 percent of all persons killed, in sharp contrast to the U.S. where they accounted for 18 percent of all traffic deaths.

Table 4 presents a ready reference for important FARS 1981 data and other national statistics.

TABLE 1
OCCUPANT FATALITIES AND VEHICLES INVOLVED BY VEHICLE TYPE

	1976		1977		1978		1979		1980		1981	
	Vehicle	Fatalities	Vehicle	Fatalities	Vehicle	Fatalities	Vehicle	Fatalities	Vehicle	Fatalities	Vehicle	Fatalities
Passenger Cars	37,206	26,166	39,038	26,782	40,544	28,153	39,999	27,808	39,059	27,449	38,725	26,545
Percent	66.3	70.5	64.5	68.4	63.2	67.8	61.8	66.3	61.5	65.5	61.8	65.7
Motorcycles	3,266	3,238	4,068	4,008	4,512	4,451	4,730	4,713	5,009	4,961	4,774	4,716
Percent	5.8	8.7	6.7	10.2	7.0	10.7	7.3	11.2	7.9	11.8	7.6	11.7
Other Motorized Cycles	77	74	95	95	131	126	186	181	185	183	157	158
Percent	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.4
Light Trucks	8,369	4,893	9,234	5,266	10,707	6,048	11,490	6,455	11,477	6,566	10,884	6,129
Percent	14.9	13.2	15.3	13.5	16.7	14.6	17.7	15.4	18.1	15.7	17.4	15.2
Medium Trucks	424	129	1,055	297	1,142	351	1,203	344	1,092	285	888	235
Percent	0.8	0.3	1.7	0.8	1.8	0.8	1.9	0.8	1.7	0.7	1.4	0.6
Heavy Trucks	3,999	1,001	4,104	988	4,610	1,042	4,877	1,087	4,284	976	4,317	896
Percent	7.1	2.7	6.8	2.5	7.2	2.5	7.5	2.6	6.7	2.3	6.9	2.2
Buses	319	73	321	42	372	41	347	39	330	46	341	56
Percent	0.6	0.2	0.5	0.1	0.6	0.1	0.5	0.1	0.5	0.1	0.5	0.1
Unknown	1,001	640	925	628	364	252	331	246	418	283	724	445
Percent	1.8	1.7	1.5	1.6	0.6	0.6	0.5	0.6	0.7	0.7	1.2	1.1
Other	1,423	888	1,675	1,043	1,762	1,069	1,599	1,057	1,631	1,178	1,856	1,213
Percent	2.5	2.4	2.8	2.7	2.7	2.6	2.5	2.5	2.6	2.8	3.0	3.0
Total	**56,084**	**37,102**	**60,515**	**39,149**	**64,144**	**41,533**	**64,762**	**41,930**	**63,485**	**41,927**	**62,666**	**40,393**
Percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

TABLE 2
PASSENGER CAR FATALITIES BY FIRST HARMFUL EVENT AND MANNER OF COLLISION (26,545)

First Harmful Event	Number	Percent	Percent Change from 1980
Noncollision	2,465	9.3	–2.7
Nonoccupant	22	0.1	83.3
Fixed Object	9,477	35.7	–8.0
Other Object Not Fixed	1,027	3.9	–1.7
Collision With Motor Vehicle			
Rear End	1,335	5.0	0.0
Head On	6,125	23.1	–3.4
Rear to Rear	9.0	0.0	–25.0
Angle	5,460	20.6	2.8
Sideswipe	581	2.2	15.0
Other	44	0.2	–20.0
Total	**26,545**	**100.0**	**–3.2**

TABLE 3
DISTRIBUTION OF FATALITIES BY PERSON TYPE

	Total	Driver	Passenger	Pedestrian	Pedalcyclist	Unknown Occupant	Other or Unknown Non-Occupant
1976	45,523	24,500	12,497	7,427	914	105	80
Percent	100.0	53.8	27.5	16.3	2.0	0.2	0.2
1977	47,877	26,169	12,873	7,732	922	107	74
Percent	100.0	54.7	26.9	16.1	1.9	0.2	0.2
1978	50,331	28,283	13,108	7,795	892	142	111
Percent	100.0	56.2	26.0	15.5	1.8	0.3	0.2
1979	51,093	28,863	12,964	8,096	932	103	135
Percent	100.0	56.5	25.4	15.8	1.8	0.2	0.3
1980	51,091	28,816	12,972	8,070	965	139	129
Percent	100.0	56.4	25.4	15.8	1.9	0.3	0.3
1981	49,268	28,182	12,041	7,836	935	170	104
Percent	100.0	57.2	24.4	15.9	1.9	0.3	0.2

TABLE 4
1981 NATIONAL STATISTICS AND RATES

National Statistics	
Population (thousands)	229,304
Registered Vehicles (thousands)	165,732
Licensed Drivers (thousands)	147,968
Vehicle Miles Traveled (VMT) (100 Million)	15,550
Fatal Accident Statistics	
Fatal Accidents	43,979
Vehicles in Fatal Accidents	62,666
Fatalities	49,268
Occupants of Vehicles	102,369
Occupants Killed	40,393
Nonoccupants Killed	8,875
Single Vehicle Accidents	26,492
Multiple Vehicle Accidents	17,487
Passenger Cars in Accidents	38,725
Light Trucks in Accidents	10,884
Medium Trucks in Accidents	888
Heavy Trucks in Accidents	4,317
Motorcycles in Accidents	4,774
Involved Drivers	62,120

Rates	
Registered Vehicles Per Person	0.72
VMT Per Registered Vehicle	9,382
Fatal Accidents Per 100 Million VMT	2.83
Licensed Drivers Per Person	0.645
Fatalities Per 100 Million VMT	3.16
Vehicles Per Fatal Accident	1.42
Fatalities Per Fatal Accident	1.12
Fatalities Per 1,000 Population	0.21
Occupants Per Fatal Accident	2.32

Foreword

The Fatal Accident Reporting System (FARS) gathers data on the most severe traffic accidents that occur each year—those that result in loss of human life. As such, it supplies information to the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation that is invaluable to NHTSA in its ongoing efforts to reduce the number of traffic accidents and the losses that result from them. Analysis of such data is an essential precondition of several NHTSA functions intended to effect these reductions: evaluation of existing and proposed highway and motor vehicle safety standards, identification of problem areas, establishment of better safety systems, and generation of improved standards and remedial measures.

FARS is operated and maintained by NHTSA's National Center for Statistics and Analysis (NCSA). To be reported in FARS an accident must have involved a motor vehicle on a roadway customarily open to the public and must have resulted in the death of a person whether that person was the occupant of a vehicle or a nonoccupant. FARS data include only those accidents which result in a death within 30 days. While other systems and some States use a 90-day rule, studies have shown that this results in less than a 2 percent increase in the number of fatalities counted. Also, many other countries report fatalities according to the 30-day rule. In the interest of timely reporting and international conformity, the U.S. Department of Transportation has adopted the 30-day rule.

Other definitions used in FARS are contained in the Glossary.

Unless otherwise noted, all data in this report are taken from the 1976 to 1981 FARS file as of May 5, 1982. As of that time, the 1981 file was 99 percent complete.

FARS data are collected by an agency in each State government operating under contract to NHTSA. These contracts are managed by Regional Contract Technical Managers in 10 NHTSA Regional offices.

FARS analysts are State employees assigned the gathering, translating and transmitting of data. The number of analysts in each State depends on the number of fatal accidents that can be expected to occur in the State based on previous years' records. Analysts gather the data from the State's source documents and translate them to codes on standard FARS forms. Sources of data may include:

- Police Accident Reports
- State Vehicle Registration Files
- State Driver Licensing Files
- State Highway Department Files
- Vital Statistics Documents
- Death Certificates
- Coroner/Medical Examiner Reports
- Hospital Medical Reports
- Emergency Medical Services Reports

Each analyst enters data directly into NHTSA's computerized central data file. Data can only be entered in this way and are automatically checked on-line for range and consistency as part of FARS quality control.

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

Consistency checks insure that no inconsistent data are entered. For example, if an analyst codes 11:00 a.m. as the time of the accident 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.

Other types of data checks in the overall quality control of FARS are for timeliness, completeness, and accuracy.

Timeliness is monitored by the Washington, D.C., FARS staff and the 10 Regional Contract Technical Managers. The number of fatalities submitted by each State is updated weekly and reviewed to assure timely reporting. Similarly, several programs continually monitor and improve the completeness and accuracy of the data.

The system contains descriptions, in a standard format, of each fatal accident reported. The format allows coding of approximately 90 different data elements to characterize each accident and the vehicles and persons involved in it. Some data elements are modified slightly each year to reflect changing user needs, vehicle designs, and areas of highway safety emphasis. Data elements are

reported on three forms:

The Accident Level Form is for such characteristics as the time and location of the accident, the first harmful event, whether it was a "hit and run" accident, whether a school bus was involved, the number of vehicles and persons involved, and weather conditions.

The Vehicle/Driver Level Form is for data on each accident-involved vehicle and driver, such as vehicle type and its role in the accident, initial and principal impact points, the most harmful event, and the driving record and license status of each driver.

The Person Level Form is for data on each person involved in the accident—age and sex; whether the person was a driver, passenger, pedestrian, pedalcyclist or other nonoccupant; alcohol involvement; injury severity, etc.

The forms used for reporting 1981 accidents are in Appendix A.

NCSA each year responds to more than 3,000 requests for FARS information and distributes almost 60 computer tapes of data upon requests from Congress, other federal agencies, State and local governments, research organizations, private citizens and the media.

The data are available for each year that FARS has been in operation, *i.e.* since 1975. Access to the data is available in three ways:

(a) By purchase of a computer tape that can be processed on the user's own computer system. The cost is that of the replacement tape.

(b) By request for specific data from NCSA at no charge. It usually requires about 2 weeks to fill such requests, depending somewhat on the nature and complexity of the data requested.

(c) Through an account with NCSA's computer contractor. Costs include computer time charges.

FARS data do not include any personal identifying information such as names, addresses, or social security numbers. Thus, all data fully conform with provisions of the Privacy Act.

This report presents a wide spectrum of data in many different combinations. However, numerous as are the tables and figures, they illustrate only a small fraction of the potential uses of the data and only suggest the scope of analyses that can be performed using them. This report is not intended to be an analytical presentation. **Statements about the significance of data are based solely on the data and not on statistical analyses.**

Four further caveats should be kept in mind while reading this report. First, percentages shown have, for the most part, been rounded to the nearest 1/10 of 1 percent. As a result, they may not total exactly 100 percent. In figures and tables that present percentages, the base number upon which these percentages are computed is either explained on the figure or indicated by a "100 percent" adjacent to the base number in the tables.

Second, most tables and figures include a number in parentheses in the upper right-hand corner. This number is the population of the primary subject of the figure or table. The primary subject will usually be total fatalities, total fatal accidents, or some subset of either of these two. Subset populations, when used for the first time, are defined in the accompanying text.

Third, as stated above, FARS data are derived from existing State records. These records vary in content and level of detail from State to State. Also, availability of certain FARS data elements vary among jurisdictions. 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 is included in this report to provide complete and unbiased information.

Finally, a most important point: this report contains little exposure or normalized data. Exposure data reflect the number of opportunities that existed for an event to take place. For example, as interesting as it may be to know the number of fatalities in motor vehicle accidents, it is more informative to know the rate at which fatalities occurred relative to the number of vehicle miles driven by all vehicles.

Normalized data are similar in that they are also usually expressed as a rate. However, normalization typically is applied to several numbers drawn from the same population. These numbers are normalized by dividing each by a common denominator, such as the total population. For example, it is meaningless to compare directly the number of passenger cars involved in fatal accidents to the number of light trucks involved in fatal accidents, but if both numbers are divided by the total number of vehicles involved in fatal accidents, the two rates can be compared usefully. Exposure rates can then be calculated for each by dividing the passenger car number by the total of registered passenger cars and the light truck number by the total of registered light trucks. In this way, both normalized data and exposure rates can be obtained. Unless these data transformation techniques are applied, the significance of large or small numbers and large or small differences cannot always be determined.

These data concern *only* fatal accidents. The National Accident Sampling System (NASS) is the complementary data base that reports on *all* accidents, including those which resulted only in nonfatal injury and/or property damage. These nonfatal accidents comprise an important element in accident analysis programs.

To conform with other national statistics systems, fatal accidents that occurred in Puerto Rico are not included in U.S. totals. Chapter VIII of this report presents the data from Puerto Rico separately.

For additional information concerning this 1981 FARS report, contact the National Center for Statistics and Analysis, National Highway Traffic Safety Administration, NRD-33, 400 Seventh Street, S.W., Washington, D.C. 20590, or telephone (202) 472-7040 or 426-4844.

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I. Fatality Profile

During 1981, 49,268 men, women, and children died in motor vehicle traffic accidents. Although this represents a 3.5 percent decline from the 1980 death toll of 51,091, it still means that someone died on the Nation's highways an average of every 10.5 minutes throughout the year. Stated another way, more than 2 percent of all deaths in the U.S. during 1981 occurred as a result of accidents on highways.

A profile of the characteristics of 1981 fatalities is shown in Figures 1a through 1e:

- As in previous years, more fatalities occurred in rural areas than in urban areas (Figure 1a).
- Accidents on principal arterials accounted for the largest share of fatalities (Figure 1b). For every three traffic fatalities that occurred on the Interstate System, seven persons died on minor arterials, the next largest category. See the Glossary, "Roadway Function Class," for the definition of these terms.
- Most deaths resulted from accidents that occurred during normal weather conditions (Figure 1c), with only 12.1 percent of them associated with inclement weather, up from 11.6 percent a year ago.

FIGURE 1a
DISTRIBUTION OF FATALITIES BY LAND USE

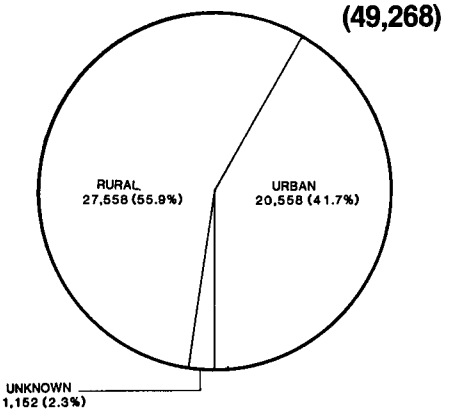


FIGURE 1b
DISTRIBUTION OF FATALITIES BY ROADWAY FUNCTION CLASS

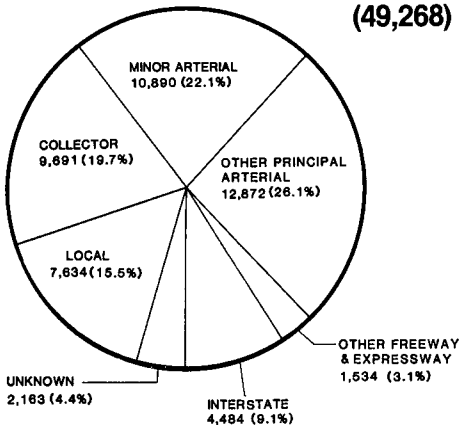
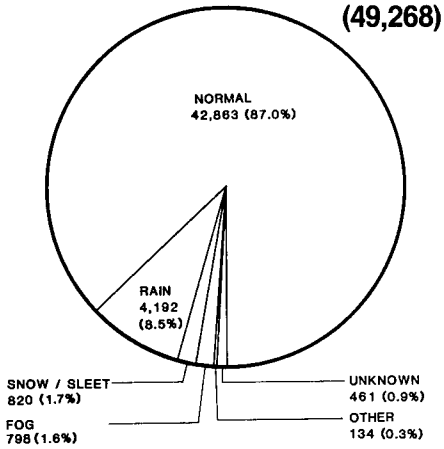


FIGURE 1c
DISTRIBUTION OF FATALITIES BY ATMOSPHERIC CONDITION



- Passenger car occupants accounted for more than half of all fatalities (Figure 1d). Pedestrians accounted for the second largest share (15.9 percent).
- Most persons killed in 1981 accidents were drivers—57.2 percent, up slightly from 1980. Passengers accounted for the next largest share—almost one quarter (Figure 1e), down slightly from 1980.

Ninety percent of the 43,979 fatal accidents in 1981 resulted in a single death each (Figure 2). Rarely were more than three persons killed in an accident. Such multiple-death accidents accounted for

FIGURE 1d
DISTRIBUTION OF FATALITIES BY VEHICLE TYPE

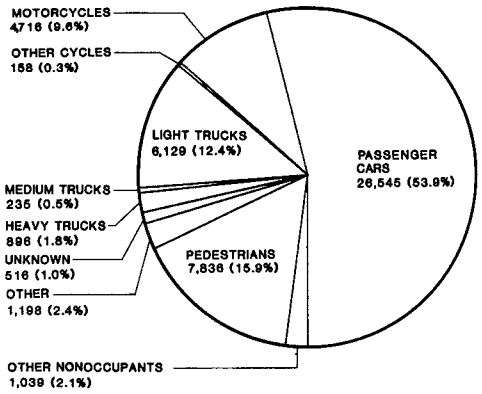


FIGURE 1e
DISTRIBUTION OF FATALITIES BY PERSON TYPE

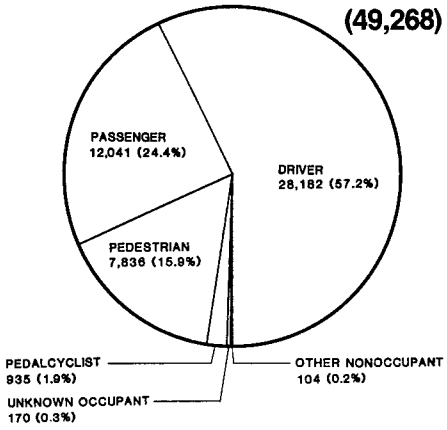
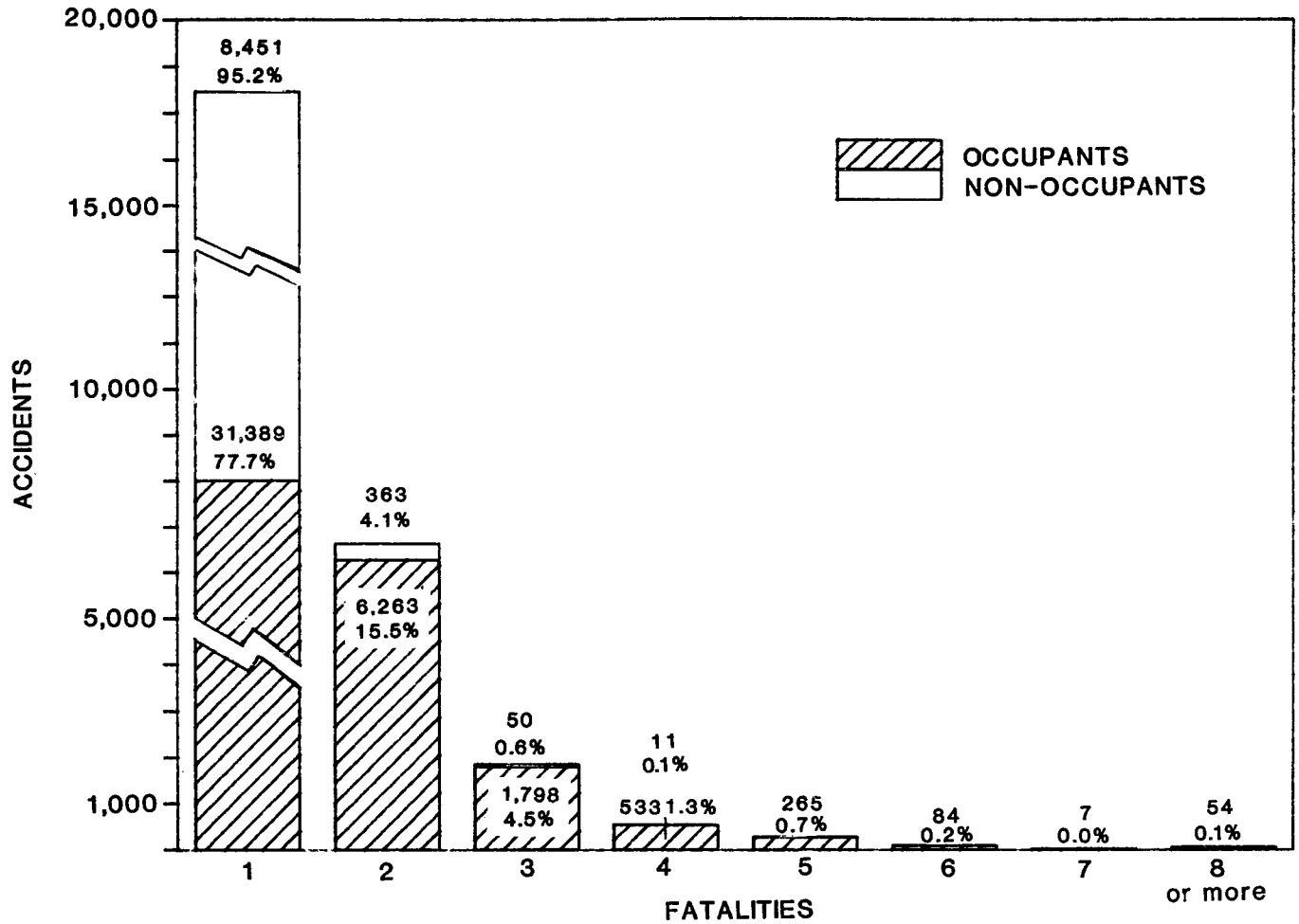


FIGURE 2
NUMBER OF FATALITIES PER FATAL ACCIDENT (49,268)



only 943 (2.3 percent) of all the occupants killed and only 11 (0.1 percent) of all the nonoccupants killed. Overall, an average of 1.12 deaths resulted from each 1981 fatal accident.

During the year, 102,369 persons were occupants of vehicles involved in fatal accidents. Of these occupants, 60.6 percent were drivers; 45.4 percent of these drivers were killed, a fatality rate virtually unchanged from 1980. By comparison, 30.1 percent of all the involved passengers were killed.

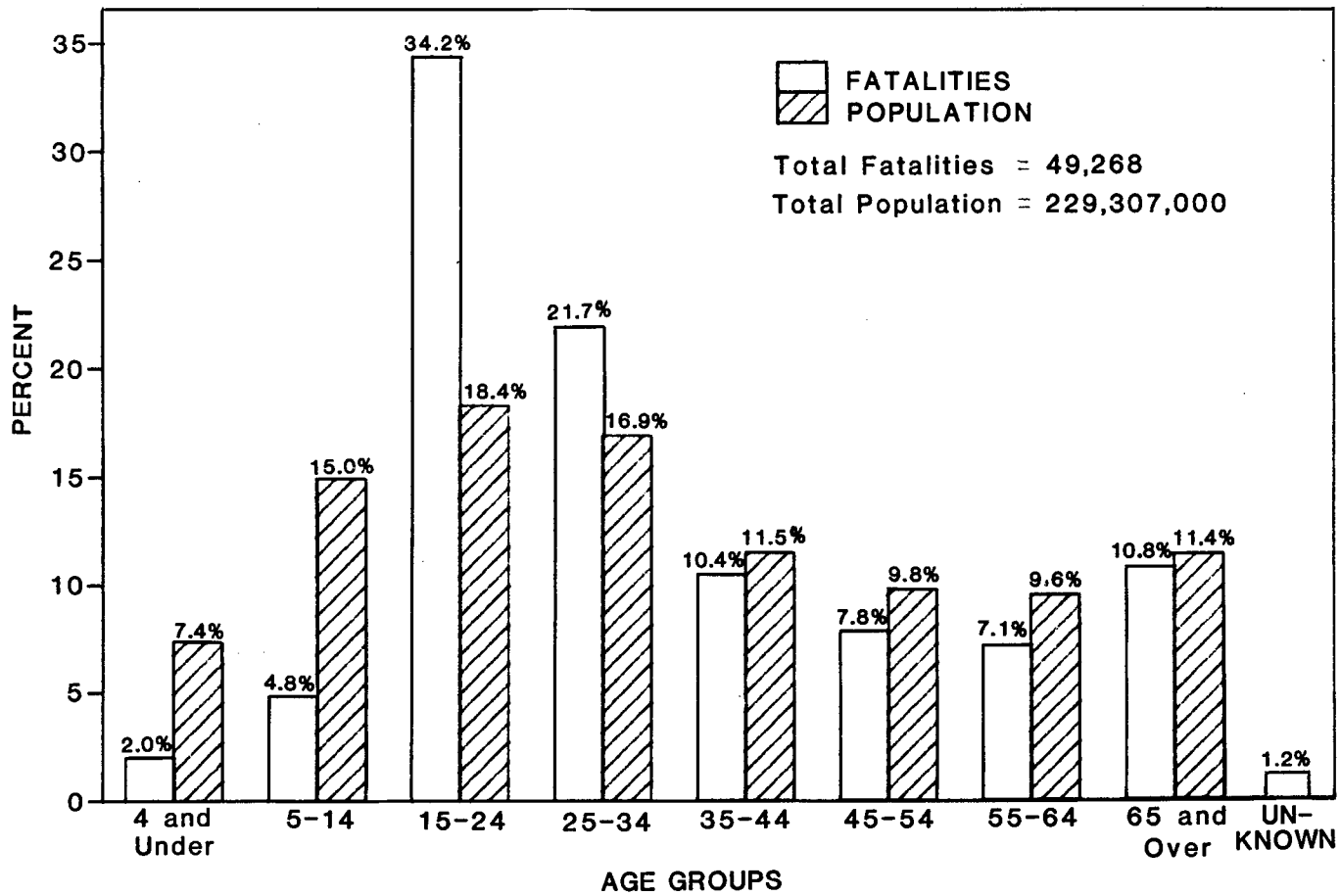
More than half of these passengers were under the age of 25, and 62.1 percent of all drivers killed were under 35 (Table 5). The percent of 15–24 year-olds among all persons killed in motor vehicle accidents in 1981 was nearly double that age group's representation in the national population (Figure 3), and 15–34 year-olds accounted for more than half of all fatalities though they constitute only slightly more than a third of the population.

Comparisons across several years are best made using fatality rates based on

TABLE 5
DISTRIBUTION OF OCCUPANTS BY AGE

	Total Occupants		Driver		Passenger		Unknown	
	Total	Fatalities	Total	Fatalities	Total	Fatalities	Total	Fatalities
4 or Less	2,389	633			2,388	632	1	1
Percent	2.3	1.6			6.0	5.2	0.0	0.0
5-14	4,858	1,077	195	140	4,661	936	2	1
Percent	4.7	2.7	0.3	0.5	11.7	7.8	0.0	0.0
15-24	39,419	15,064	22,088	9,902	17,170	5,057	161	105
Percent	38.5	37.3	35.6	35.1	42.9	42.0	62.9	61.8
25-34	22,902	9,405	16,764	7,446	6,088	1,925	50	34
Percent	22.4	23.3	27.0	26.4	15.2	16.0	19.5	20.0
35-44	11,182	4,382	8,552	3,574	2,614	795	16	13
Percent	10.9	10.8	13.8	12.7	6.5	6.6	6.3	7.6
45-54	7,622	3,116	5,694	2,443	1,924	670	4	3
Percent	7.4	7.7	9.2	8.7	4.8	5.6	1.6	1.8
55-64	6,019	2,777	4,342	2,129	1,674	645	3	3
Percent	5.9	6.9	7.0	7.6	4.2	5.4	1.2	1.8
65 or Over	6,318	3,623	3,999	2,361	2,314	1,257	5	5
Percent	6.2	9.0	6.4	8.4	5.8	10.4	2.0	2.9
Unknown	1,660	316	486	187	1,160	124	14	5
Percent	1.8	1.6	0.8	0.7	2.9	1.0	5.5	2.9
Total	**102,369**	**40,393**	**62,120**	**28,182**	**39,993**	**12,041**	**256**	**170**
Percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

FIGURE 3
PERCENT DISTRIBUTION OF U.S. POPULATION AND FATALITIES



Source for population: U.S. Bureau of Census, July 1981 estimates

exposure data such as the amount of motor vehicle travel. Vehicle miles of travel (VMT), the number of driver licenses in force, and vehicle registration data were obtained from the Federal Highway Administration (FHWA) for this purpose. In Table 6 rates are computed per 100 million VMT, per 10,000 licenses, and per 1,000 registered vehicles for each year from 1976 to 1981.

Differences in the frequency of fatal accidents in different time segments are occasioned by a variety of factors, and the influence of each factor shifts as the time interval under consideration is changed. For example, it is probable that VMT has a significant influence on seasonal distribution of fatalities, but this influence probably diminishes and the influence of driver attentiveness probably increases when considering variations among 4-hour periods of the day: more drivers are likely to become drowsy or to be under the influence of alcohol at night than during daylight hours. Consequently these factors may play a larger role than does VMT in the frequency of accidents during the very late and early hours of the day. It is important to consider the varying effect

TABLE 6
FATALITY RATES

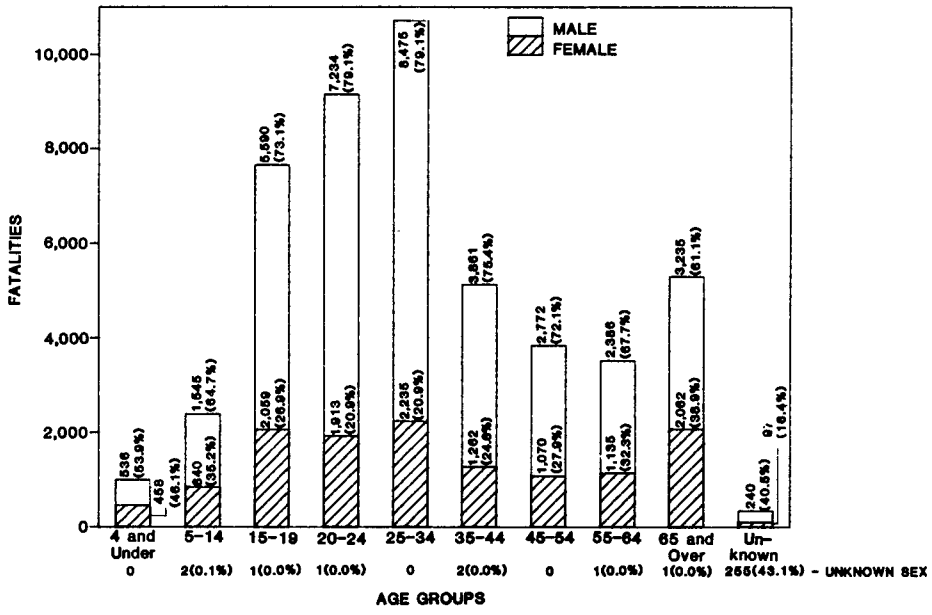
	1976	1977	1978	1979	1980	1981
Number of Traffic Fatalities	45,523	47,878	50,331	51,093	51,091	49,268
Vehicle Miles Traveled (100 Million)	14,024	14,670	15,447	15,291	15,106	15,550
Licensed Drivers (1,000)	134,040	138,120	140,840	143,280	145,970	147,970
Registered Vehicles (1,000)	143,476	147,262	153,637	159,621	164,852	165,732
Fatalities Per 100 Million Vehicle Miles	3.25	3.26	3.26	3.34	3.38	3.16
Annual Percentage Change in Fatalities Per 100 Million Vehicle Miles Traveled	–3.0	+0.3	0.0	+2.4	+1.2	–6.5
Fatalities Per 1,000 Licensed Drivers	0.340	0.347	0.357	0.356	0.350	0.332
Annual Percentage Change in Fatalities Per 1,000 Licensed Drivers	–0.9	+2.1	+2.9	–0.3	–1.7	–4.9
Fatalities Per 1,000 Registered Vehicles	0.317	0.325	0.328	0.320	0.310	0.297
Annual Percentage Change in Fatalities Per 1,000 Registered Vehicles	–1.8	+2.5	+0.9	–2.4	–3.1	–4.1

Steady annual increases in total deaths coincided with continued increases in VMT each year through 1979. However, in 1979 and 1980 fatalities remained almost constant, although VMT decreased. Thus, the rate of deaths per miles driven *increased*. In 1981 this fatality rate *decreased*. The resulting percent change from 1979 to 1980 in fatalities per 100 million VMT was +1.2 percent. From 1980 to 1981, the rate decreased by 6.5 percent to 3.16 deaths per 100 million VMT.

The rate of fatalities per 1,000 licenses in force increased in 1977 and 1978 but declined in 1979, 1980, and 1981. This was also the case for the fatality rate per 1,000 registered vehicles.

In 1981 as in prior years, males outnumbered females as fatal accident victims in every age group. Ages 15–34, of both sexes combined, accounted for more than half of all fatalities (55.7 percent), with males accounting for 43.2 percent and females 12.5 percent (Figure 4).

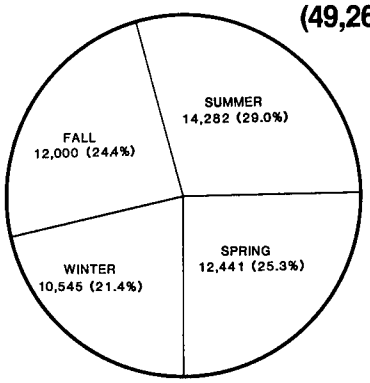
FIGURE 4
FATALITIES BY AGE AND SEX **(49,268)**



of such factors when viewing the remaining figures and tables of this chapter.

As in previous years, the greatest number of fatalities in 1981 occurred in the summer (Figure 5). Nearly 35 percent more traffic deaths occurred during summer than during winter. Almost 5 percent fewer fatalities occurred in spring than in summer, and the total for fall was almost as low as for winter. It cannot be known for certain that the seasonal fatality *rates* differed because exposure data (VMT) on a seasonal basis is lacking.

FIGURE 5
SEASONAL DISTRIBUTION OF FATALITIES



Fatalities by month for 1981 and the monthly averages for the years 1976 through 1980 (Figure 6) reflect the same seasonal variations. Fatalities increased dramatically after April, then decreased after August. The fatalities for motorcycle occupants was far more seasonal.

Several factors can influence these monthly changes from year to year: (a) the yearly increase or decrease in overall fatalities, (b) changes in the severity and duration of winter conditions, and (c) fuel shortages and economic conditions and their effects on driving habits and VMT. While the precise effect of each of these factors is not known, they should be considered when examining monthly fatalities.

The distribution of fatalities by day of the week remained fairly stable in 1981 when compared to 1976–1980 averages, varying by less than 0.4 percent for all days (Figure 7). Fridays, Saturdays, and Sundays accounted for more than half of all 1981 deaths.

FIGURE 6
FATALITIES BY MONTH

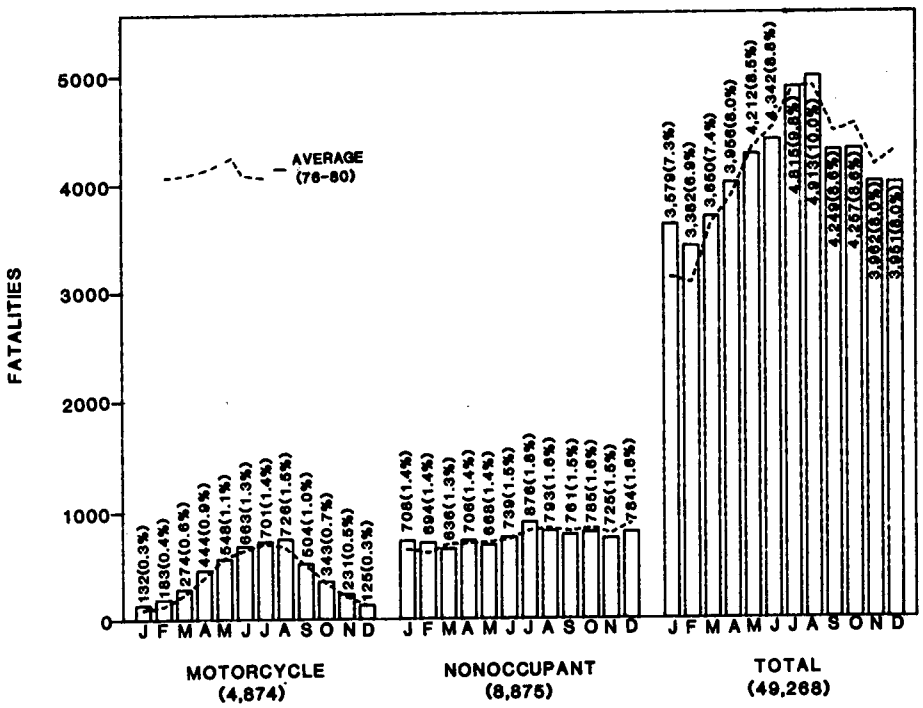
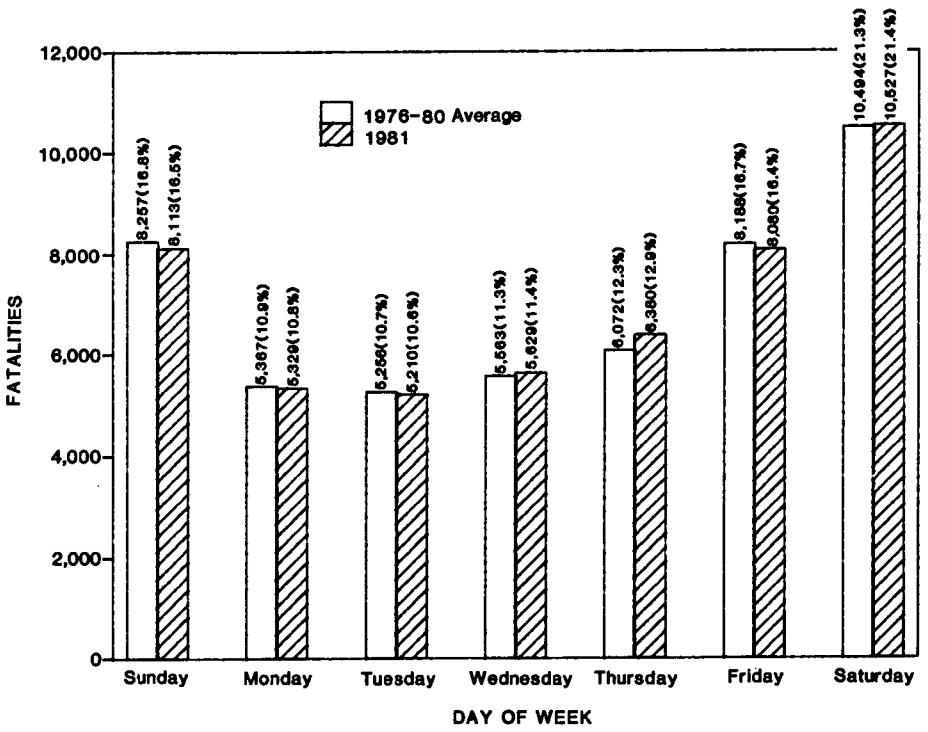


FIGURE 7
FATALITIES BY DAY OF WEEK (49,268)



On weekdays, the fewest deaths occurred between 4 a.m. and 8 a.m., and the largest percentage occurred between 4 p.m. and 8 p.m. (Figure 8). On weekends these highs and lows occurred at different times, but fatality counts still peaked in the afternoon and night hours. Also, the 1976 through 1980 averages for each 4-hour segment were different from 1981 averages. One noteworthy observation is that on weekdays in 1981, as was the case in 1980, the period beginning at 4 a.m. accounted for more than the average number of deaths during the same time interval in the previous years and the periods beginning at 4 p.m. and 8 p.m. accounted for fewer than the average.

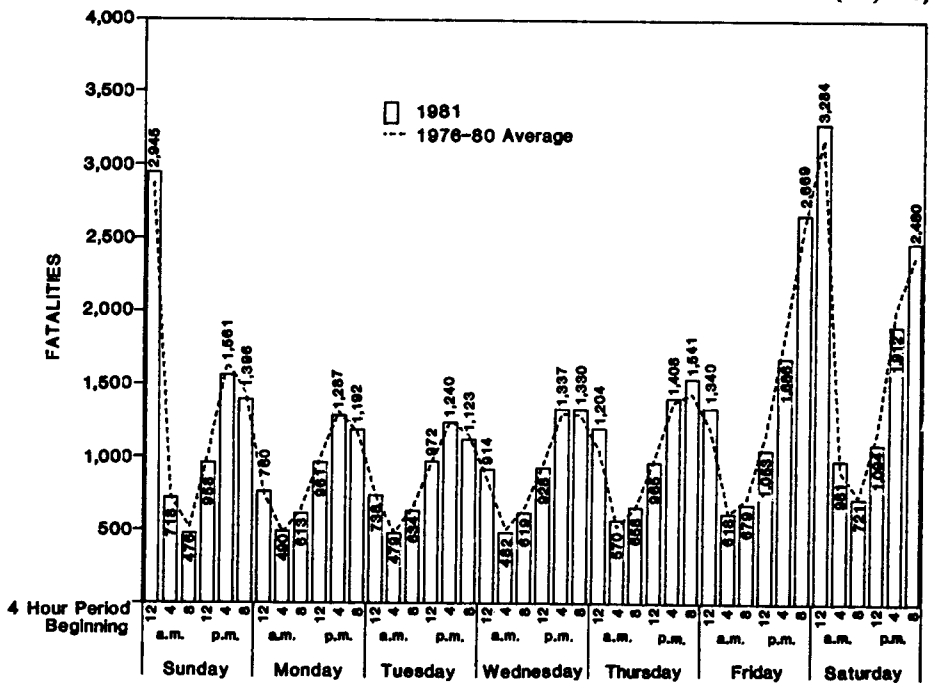
Table 7 lists the number of deaths that occurred on major holidays. The days selected for each holiday are those on which it was assumed most holiday travelers were on the road. The statistics for New Year's were derived somewhat differently from those of other holidays inasmuch as they are for December 31, 1981 (New Year's 1982) and January 1, 1981 (New Year's 1981). This was necessary to include only data pertaining to 1981.

The 21 days included in holiday periods accounted for 6.3 percent of all the deaths in 1981. The most fatal holiday was the 4-day Independence Day period (738 fatalities—1.5 percent of the year's total), followed by the 4-day periods around Thanksgiving (681 deaths), Labor Day (604 deaths), and Memorial Day (588 deaths). By way of comparison, during a typical non-holiday 5-day period, Thursday through Monday, an average of 691 fatalities (1.5 percent of the annual toll) occurred in 1981, a rate virtually unchanged from 1980. Thus, it appears that holiday weekend travel does not result in statistically more significant death tolls than does average non-holiday weekend travel.

Four of every five deaths (83.4 percent) that resulted from traffic accidents occurred on the same day as did the accident (Figure 9).

FIGURE 8
FATALITIES PER 4 HOUR PERIOD BY DAY OF WEEK

(49,268)

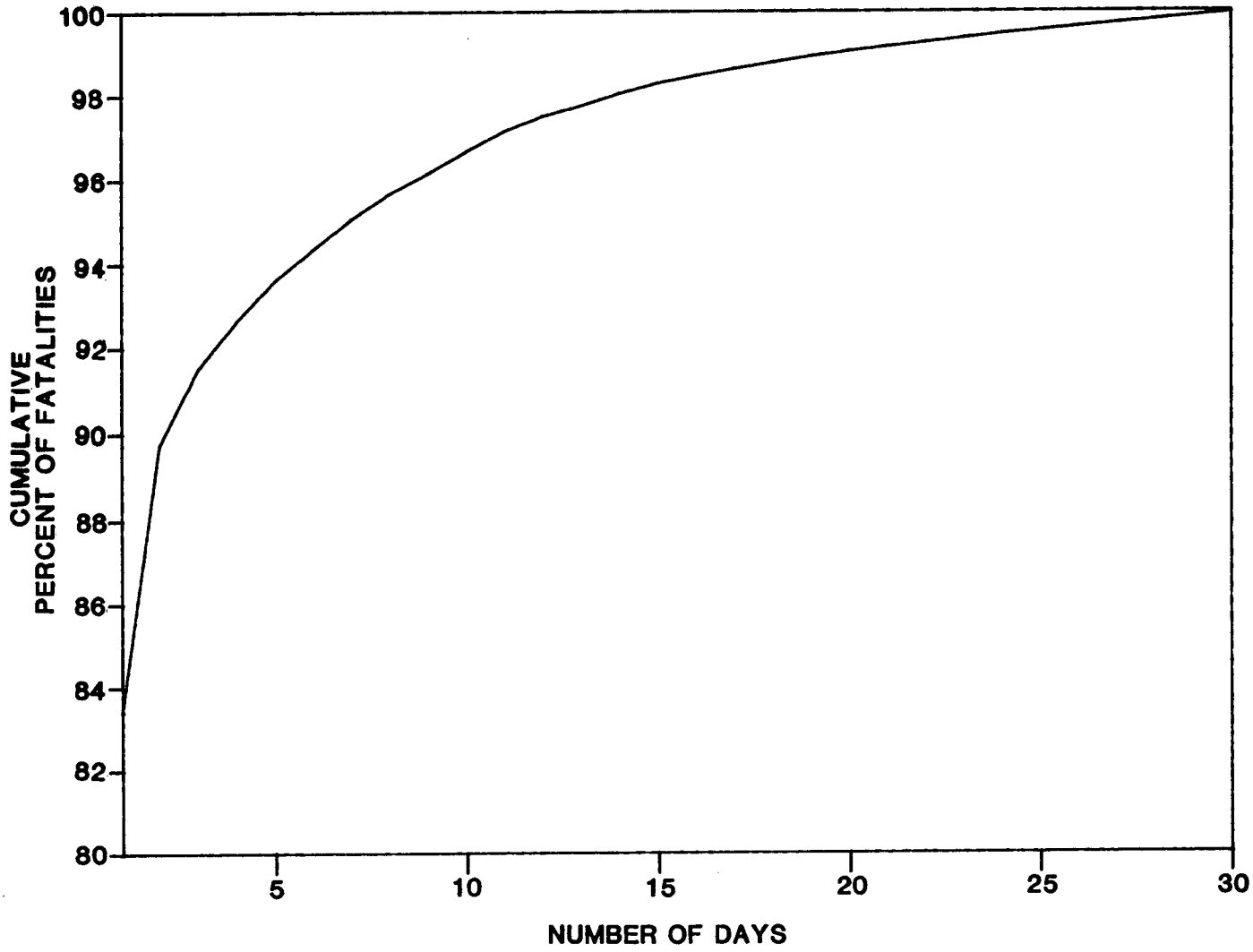


Unknown - 252

TABLE 7
1981 HOLIDAY FATALITIES

	Number	Percent of Total
New Year's Day January 1, 1981 and December 31, 1981	342	0.7
Memorial Day 6:00 p.m. May 22, 1981 to Midnight May 25, 1981	588	1.2
Fourth of July 6:00 p.m. July 2, 1981 to Midnight July 5, 1981	738	1.5
Labor Day 6:00 p.m. September 4, 1981 to Midnight September 7, 1981	604	1.2
Thanksgiving November 25, 1981 to November 29, 1981	681	1.4
Christmas December 24, 1981 to December 27, 1981	577	1.2
Total 1981 Fatalities	**49,268**	**100.0**

FIGURE 9
NUMBER OF DAYS BETWEEN ACCIDENT AND FATALITIES



II. State Statistics

Perhaps the most significant data in the 1981 FARS file reflect already noted sharp declines in fatal accidents (43,979—a 2.9 percent drop from 1980) and total fatalities (49,268 deaths—a 3.5 percent drop). The Nation's fatality rate also decreased, from 3.38 to 3.16 deaths per 100 million vehicle miles of travel (VMT), a decrease of 6.5 percent, with 40 of the states experiencing a rate decrease (Figure 10). VMT by state are preliminary estimates made by FHWA.

FIGURE 10
1981 FATALITY RATE AND PERCENT CHANGE IN FATALITIES FROM 1980

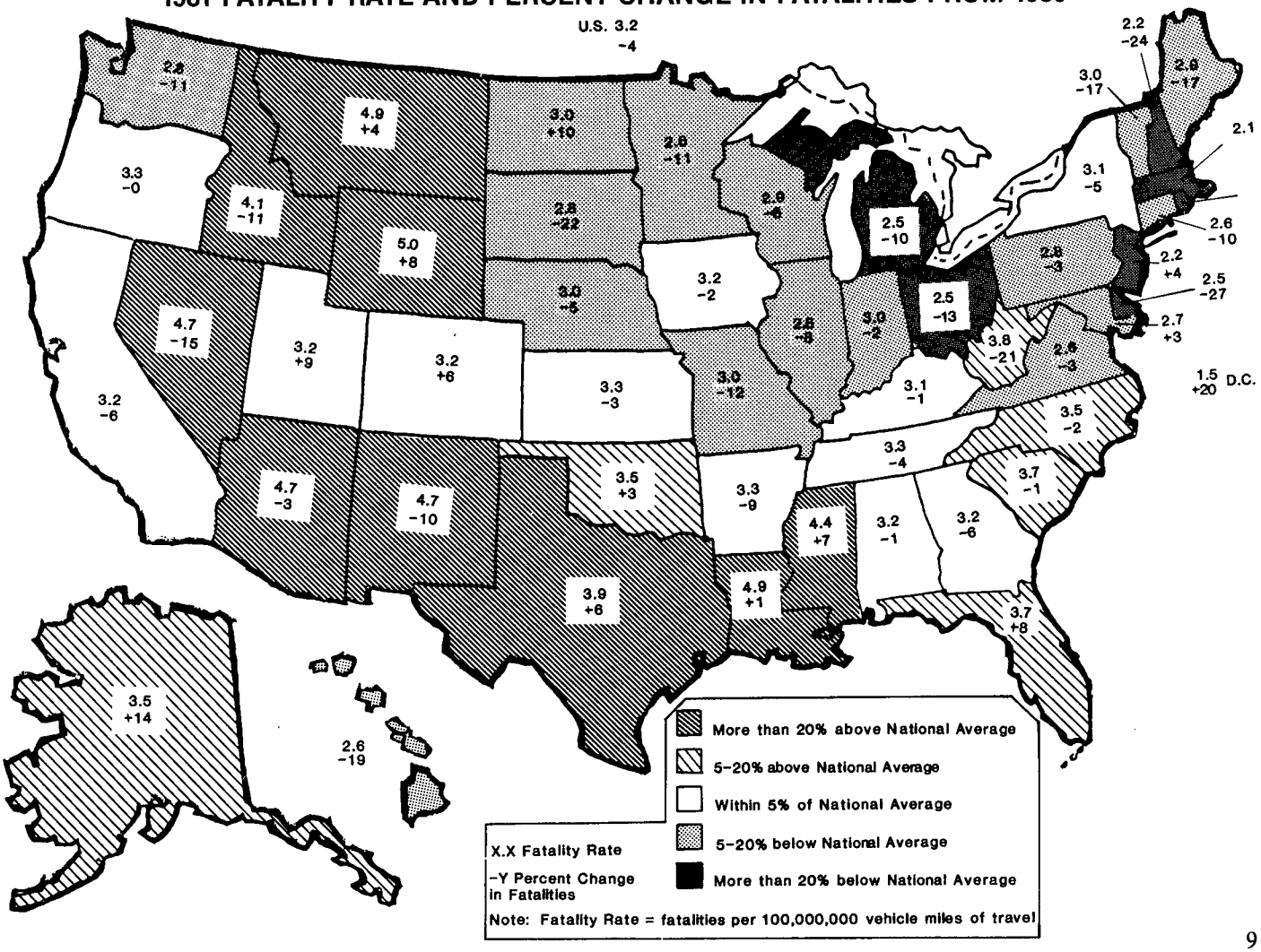


Table 8 lists state fatality rates for 1981, percent changes in the state-by-state death count from 1980 to 1981, and the fatality counts for the previous years.

As could be expected, the two most frequently reported first harmful events in fatal accidents (Table 9) were collisions with motor vehicles in transport and collisions with fixed objects. This was true in most states.

Some notable exceptions were the high incidence of overturn among fatal

TABLE 8

FATALITIES FOR 1976-1981, PERCENT CHANGE IN THE NUMBER OF FATALITIES BETWEEN 1980 AND 1981, AND FATALITIES PER 100 MILLION VEHICLE MILES OF TRAVEL (VMT)

State	1976	1977	1978	1979	1980	1981	% Change in Fatalities 1980-1981	Fatalities Per 100 Million VMT
Alabama	988	1,081	1,142	998	940	933	–0.7	3.2
Alaska	125	135	127	90	88	100	13.6	3.5
Arizona	739	933	1,027	1,029	947	917	–3.2	4.7
Arkansas	531	551	571	548	588	536	–8.8	3.3
California	4,395	4,839	5,310	5,542	5,496	5,170	–5.9	3.2
Colorado	620	694	694	691	709	755	6.5	3.2
Connecticut	417	441	452	568	575	518	–9.9	2.6
Delaware	116	119	125	118	153	111	–27.5	2.5
District of Columbia	56	58	49	44	41	49	19.5	1.5
Florida	1,956	2,021	2,235	2,593	2,825	3,044	7.8	3.7
Georgia	1,264	1,372	1,472	1,524	1,508	1,418	–6.0	3.2
Hawaii	145	149	194	205	186	150	–19.4	2.6
Idaho	279	325	327	333	331	293	–11.5	4.1
Illinois	2,031	2,126	2,140	2,017	1,975	1,821	–7.8	2.8
Indiana	1,258	1,210	1,266	1,299	1,166	1,147	–1.6	3.0
Iowa	779	628	638	655	626	613	–2.1	3.2
Kansas	549	552	572	519	595	580	–2.5	3.3
Kentucky	854	940	878	896	820	812	–1.0	3.1
Louisiana	941	990	1,079	1,195	1,219	1,233	1.2	4.9
Maine	228	213	237	236	265	219	–17.4	2.9
Maryland	660	661	711	671	756	781	3.3	2.7
Massachusetts	789	744	861	917	881	746	–15.3	2.1
Michigan	1,924	1,915	2,020	1,823	1,750	1,564	–10.6	2.5
Minnesota	802	836	962	867	848	753	–11.2	2.6
Mississippi	581	684	784	715	695	744	7.1	4.4
Missouri	1,187	1,181	1,190	1,147	1,175	1,034	–12.0	3.0
Montana	299	316	270	332	325	338	4.0	4.9
Nebraska	397	345	340	330	396	378	–4.6	3.0
Nevada	218	251	305	354	346	294	–15.0	4.7
New Hampshire	157	149	171	184	194	148	–23.7	2.2
New Jersey	1,029	1,082	1,124	1,142	1,120	1,162	3.8	2.2
New Mexico	549	668	669	633	606	544	–10.2	4.7
New York	2,291	2,336	2,436	2,396	2,610	2,487	–4.7	3.1
North Carolina	1,502	1,428	1,492	1,527	1,503	1,475	–1.9	3.5
North Dakota	182	175	181	128	151	166	9.9	3.0
Ohio	1,893	1,835	2,047	2,281	2,033	1,778	–12.5	2.5
Oklahoma	832	852	901	853	959	989	3.1	3.5
Oregon	630	657	708	676	646	645	–0.2	3.3
Pennsylvania	2,021	2,067	2,081	2,153	2,089	2,029	–2.9	2.8
Rhode Island	119	133	108	123	129	102	–20.9	1.8
South Carolina	806	927	883	900	852	845	–0.8	3.7
South Dakota	219	208	191	211	228	177	–22.4	2.8
Tennessee	1,149	1,223	1,241	1,210	1,153	1,104	–4.3	3.3
Texas	3,172	3,635	3,914	4,168	4,366	4,623	5.9	3.9
Utah	250	355	370	321	334	364	9.0	3.2
Vermont	113	116	119	159	137	114	–16.8	3.0
Virginia	1,000	1,118	1,063	1,016	1,045	1,011	–3.3	2.6
Washington	804	912	985	1,015	971	862	–11.2	2.8
West Virginia	489	514	457	512	523	410	–21.6	3.8
Wisconsin	935	931	971	985	972	918	–5.6	2.9
Wyoming	253	246	241	244	245	264	7.8	5.0
Total	**45,523**	**47,878**	**50,331**	**51,093**	**51,091**	**49,268**	**– 3.5**	**3.2**

accidents in the more sparsely populated and mountainous states of Alaska, Colorado, Idaho, Montana, Nevada, New Mexico, the Dakotas, Utah, and Wyoming. In other areas (Arizona, Florida, New York and, most notably, the District of Columbia) collision with a pedestrian or pedalcyclist ranked as either the most frequent or second most frequent first harmful event in fatal accidents. In the District of Columbia such collisions with nonoccupants accounted

TABLE 9
PERCENT OF FATAL ACCIDENTS BY FIRST HARMFUL EVENT (43,979)

		Noncollision		Collision With				
State	Total	Overturn	Other	Pedestrian or Pedalcyclist	Motor Vehicle in Transport	Other Object not Fixed	Fixed Object	Unknown
Alabama	825	14.3	0.8	14.1	36.0	3.3	31.5	
Alaska	90	21.1	2.2	13.3	32.2	6.7	23.3	1.1
Arizona	832	19.2	1.6	23.2	36.5	2.9	15.9	0.7
Arkansas	478	14.2	0.8	13.2	38.3	4.4	29.1	
California	4,670	9.8	1.1	19.6	35.0	4.2	30.4	
Colorado	674	19.9	1.9	12.9	33.4	3.1	28.8	
Connecticut	480	4.2	0.6	16.7	37.5	2.7	38.3	
Delaware	103	4.9		21.4	43.7	3.9	26.2	
District of Columbia	46	2.2		34.8	26.1	6.5	30.4	
Florida	2,751	7.9	2.5	28.2	40.8	3.1	17.6	
Georgia	1,256	9.2	1.0	17.8	37.3	3.1	31.6	
Hawaii	136	11.0	1.5	20.6	31.6	2.9	32.4	
Idaho	256	21.1	2.3	8.2	35.5	1.6	31.3	
Illinois	1,642	8.1	1.0	18.3	39.6	5.0	27.9	
Indiana	1,001	4.6	2.2	13.3	42.3	6.5	31.2	
Iowa	530	10.2	2.8	10.6	41.7	3.8	30.9	
Kansas	510	1.0	1.6	10.0	39.4	5.1	28.8	
Kentucky	720	7.6	1.7	12.5	37.8	2.9	37.5	
Louisiana	1,105	3.5	1.5	22.2	40.1	4.4	28.2	
Maine	191	11.5	6.8	9.9	30.4	2.1	39.3	
Maryland	691	4.8	1.7	19.4	38.5	4.2	31.4	
Massachusetts	682	1.8	1.0	23.8	30.5	3.8	39.1	
Michigan	1,430	7.9	1.0	20.4	41.4	3.7	25.5	
Minnesota	663	13.6	1.4	16.3	40.0	4.1	24.6	0.2
Mississippi	632	12.3	0.8	15.7	39.4	3.6	27.4	0.8
Missouri	909	11.6	0.8	14.3	38.2	3.7	31.5	
Montana	289	30.4	0.3	12.5	27.3	2.8	26.6	
Nebraska	321	14.0	1.6	11.8	44.5	8.1	19.9	
Nevada	258	20.6	4.3	13.6	29.8	2.7	19.0	
New Hampshire	131	7.6		12.2	31.3		48.9	
New Jersey	1,043	2.1	0.9	27.2	35.4	3.9	30.5	
New Mexico	480	26.7	1.5	17.9	25.8	6.5	20.8	0.8
New York	2,279	4.3	1.4	31.1	30.9	3.2	29.3	
North Carolina	1,319	6.5	1.7	19.7	33.6	1.7	36.8	
North Dakota	153	19.6	2.0	10.5	39.9	3.9	24.2	
Ohio	1,568	3.6	1.3	14.9	39.5	4.8	36.0	
Oklahoma	858	1.6	1.3	13.3	44.2	3.5	36.0	0.1
Oregon	566	14.7	1.2	16.4	36.7	3.4	27.6	
Pennsylvania	1,820	3.2	1.7	16.7	36.7	1.7	38.1	1.9
Rhode Island	100		5.0	24.0	37.0	4.0	30.0	
South Carolina	767	14.1	3.3	20.2	33.1	2.2	27.1	
South Dakota	162	29.6	1.9	11.7	25.9	1.9	28.4	0.6
Tennessee	983	9.7	1.4	13.8	37.0	2.4	35.6	
Texas	4,072	9.6	1.5	17.8	40.9	5.2	25.0	
Utah	321	28.3	0.9	15.3	30.2	5.0	20.2	
Vermont	105	11.4	2.9	12.4	18.1	1.0	54.3	
Virginia	907	10.6	2.0	16.6	34.2	3.2	33.4	
Washington	784	17.2	0.9	16.7	37.1	2.3	25.8	
West Virginia	354	13.8	2.0	12.4	38.1	2.5	31.1	
Wisconsin	804	10.2	1.5	15.4	38.6	5.1	29.2	
Wyoming	232	40.1	0.9	8.2	26.7	4.7	19.4	
Total	**43,979**	**9.6**	**1.5**	**18.6**	**37.1**	**3.8**	**29.2**	**0.1**

for more than one-third (34.8 percent) of all fatal accidents, as compared to 26.1 percent for collisions with motor vehicles in transport and 30.4 percent for collisions with fixed objects.

Table 10 lists the 1981 fatal accident totals and monthly percentages by state. Large variations in monthly percentages can be expected in states with small numbers of fatal accidents. Also, as was evident in 1979 and 1980, among states with larger totals, and in geographical

TABLE 10
PERCENT OF FATAL ACCIDENTS BY MONTH (43,979)

State	Total Fatal Accidents	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alabama	825	7.0	5.2	9.8	8.7	8.4	7.3	8.1	10.2	10.2	7.6	9.2	8.2
Alaska	90	5.6	3.3	8.9	7.8	10.0	15.6	8.9	12.2	8.9	8.9	5.6	4.4
Arizona	832	9.0	7.0	7.3	9.1	9.9	7.6	9.5	8.7	7.7	7.8	9.1	7.3
Arkansas	478	5.6	6.5	5.4	7.1	7.5	12.1	9.8	9.4	11.3	9.0	8.4	7.7
California	4,670	7.8	7.1	7.9	8.0	7.6	9.0	10.1	10.0	8.5	8.6	7.7	7.7
Colorado	674	7.9	5.2	4.6	6.7	8.5	9.1	12.9	9.5	9.1	10.2	10.1	6.4
Connecticut	480	6.0	9.4	7.1	6.3	10.6	10.6	9.6	10.2	6.5	9.0	6.7	8.1
Delaware	103	5.8	3.9	6.8	2.9	9.7	12.6	9.7	8.7	9.7	13.6	4.9	11.7
District of Columbia	46	4.3	4.3	10.9	17.4	10.9	15.2	6.5	10.9		8.7	10.9	
Florida	2,751	7.8	9.3	8.4	7.6	8.8	8.1	8.4	7.7	7.6	8.4	9.2	8.8
Georgia	1,256	7.4	7.2	7.9	6.9	8.7	8.7	9.2	10.2	8.6	9.0	8.3	7.9
Hawaii	136	11.8	10.3	5.9	9.6	6.6	7.4	8.8	5.9	8.1	7.4	8.8	9.6
Idaho	256	7.8	5.1	8.2	3.5	12.9	7.4	12.1	9.4	11.7	9.8	6.6	5.5
Illinois	1,642	8.2	6.6	5.7	8.2	8.8	9.5	9.5	10.3	8.7	8.5	8.2	7.9
Indiana	1,001	6.9	6.8	7.5	9.2	8.5	7.5	9.0	11.3	10.1	7.8	8.3	7.2
Iowa	530	6.8	6.4	6.6	6.8	10.2	8.5	9.1	11.9	10.2	10.4	6.4	6.8
Kansas	510	7.6	7.5	5.9	8.6	7.8	11.4	11.6	8.6	8.4	7.1	8.0	7.5
Kentucky	720	7.8	6.8	6.1	9.0	9.3	8.2	9.9	10.4	7.5	9.2	8.2	7.6
Louisiana	1,105	7.4	6.2	8.8	7.8	9.2	6.2	10.1	10.9	10.0	7.1	8.6	7.8
Maine	191	4.7	9.4	9.9	5.8	13.6	8.4	9.9	12.0	7.9	8.4	3.7	6.3
Maryland	691	9.0	6.4	6.2	9.0	9.6	10.7	9.0	7.5	9.0	8.7	8.0	7.1
Massachusetts	682	7.3	8.4	8.8	10.6	8.8	8.4	9.1	8.8	8.2	7.8	7.3	6.6
Michigan	1,430	6.2	6.6	6.9	7.3	7.6	9.9	9.6	11.2	9.5	9.5	6.6	9.2
Minnesota	663	7.5	4.1	5.0	9.4	9.5	10.1	10.7	11.5	6.6	9.5	7.8	8.3
Mississippi	632	6.6	4.9	8.2	9.5	9.2	7.1	10.8	11.4	8.7	7.4	8.2	7.9
Missouri	909	8.5	6.8	7.0	7.3	9.2	7.3	10.5	9.9	9.7	8.8	7.7	7.4
Montana	289	8.0	5.5	5.5	6.9	8.7	8.3	12.5	13.5	6.9	9.0	9.0	6.2
Nebraska	321	7.2	7.2	6.9	7.5	11.5	11.8	10.6	10.0	5.9	8.1	5.6	7.8
Nevada	258	3.9	6.2	11.2	7.8	7.4	10.5	8.9	11.6	8.9	8.9	8.5	6.2
New Hampshire	131	6.9	3.8	6.9	8.4	9.9	13.0	9.2	14.5	4.6	7.6	7.6	7.6
New Jersey	1,043	8.0	7.3	7.5	8.1	8.1	8.7	8.5	9.9	8.1	8.1	8.1	9.6
New Mexico	480	5.4	6.7	4.2	8.1	11.0	9.4	11.0	12.1	9.8	7.9	7.1	7.3
New York	2,279	6.9	6.6	7.7	7.6	8.2	9.8	9.2	9.0	9.3	9.3	8.5	7.9
North Carolina	1,319	7.7	6.7	6.0	8.2	8.6	7.5	9.8	8.8	8.9	10.3	8.6	9.0
North Dakota	153	7.8	3.9	7.2	9.2	8.5	10.5	9.8	7.8	9.2	13.1	7.2	5.9
Ohio	1,568	6.6	7.6	7.0	8.5	8.5	8.5	10.8	9.8	8.9	7.7	7.8	8.4
Oklahoma	858	6.2	7.8	7.6	8.5	8.9	8.3	9.8	10.0	10.5	7.5	7.0	8.0
Oregon	566	7.1	7.4	6.7	6.9	6.7	8.5	11.0	12.5	9.7	7.2	8.0	8.3
Pennsylvania	1,820	6.9	6.9	8.1	6.7	8.2	9.2	9.8	10.0	8.3	9.0	8.7	8.2
Rhode Island	100	13.0	10.0	8.0	5.0	10.0	7.0	8.0	11.0	4.0	12.0	5.0	7.0
South Carolina	767	7.2	6.0	6.3	9.3	8.9	9.0	7.4	10.6	9.3	10.2	7.3	8.7
South Dakota	162	4.3	8.0	9.9	8.0	8.0	9.3	7.4	11.7	9.9	9.3	8.0	6.2
Tennessee	983	7.5	6.6	8.6	9.5	7.1	9.3	8.6	11.1	7.8	9.5	6.8	7.5
Texas	4,072	7.5	7.2	7.4	8.1	9.0	8.4	9.4	9.1	8.1	9.1	8.0	8.6
Utah	321	7.2	5.9	6.9	7.5	6.5	9.7	13.1	11.2	7.2	8.7	8.1	8.1
Vermont	105	7.6	1.9	6.7	5.7	10.5	16.2	14.3	9.5	7.6	9.5	4.8	5.7
Virginia	907	7.1	7.1	5.7	7.9	8.7	9.7	9.0	9.8	9.8	7.3	9.2	8.7
Washington	784	6.5	7.1	7.9	8.2	10.5	9.3	12.0	8.5	6.6	9.4	7.9	
West Virginia	354	6.5	7.9	7.9	9.6	7.3	9.3	10.5	9.6	10.2	8.5	5.9	6.8
Wisconsin	804	6.7	4.4	8.0	9.6	9.5	9.0	10.9	12.1	8.3	7.8	5.3	8.5
Wyoming	232	5.6	2.6	7.3	6.5	4.7	10.3	13.8	12.1	10.8	9.9	9.9	6.5
Total	**43,979**	**7.3**	**6.9**	**7.3**	**8.0**	**8.6**	**8.9**	**9.7**	**10.0**	**8.7**	**8.6**	**8.0**	**8.0**

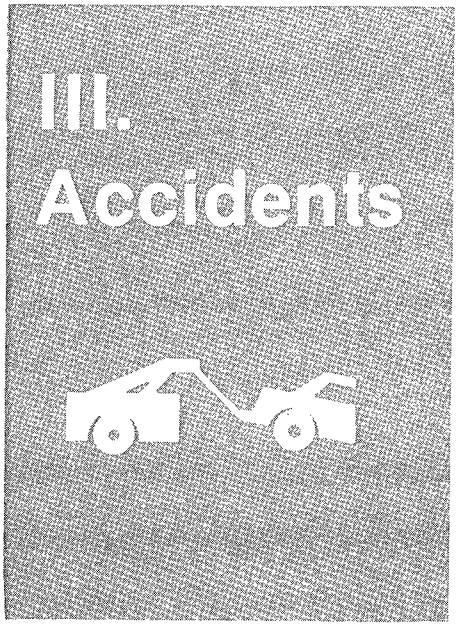
areas with severe weather conditions, fewer fatal accidents occurred during winter months.

The variations in percentages of fatal accidents by functional class of roadway (Table 11) may be caused by differences among the states in the share of total roadway mileage accounted for by each of the types. Nationally, about half of all fatal accidents occurred on arterial routes other than limited access highways. These roadways, plus collector roads and local streets, accounted for four of every five fatal accidents (83.4 percent).

TABLE 11
PERCENT OF FATALITIES BY ROADWAY FUNCTION CLASS (49,268)

State	Total	Interstate	Other Freeway & Expressway	Other Principal Arterial	Minor Arterial	Collector	Local	Unknown
Alabama	933	5.3	0.1	18.5	14.3	33.4	28.4	
Alaska	100	2.0	8.0	35.0	10.0	34.0	9.0	2.0
Arizona	917	13.3	0.3	22.1	29.7	18.4	16.1	
Arkansas	536	8.4	0.2	34.0	15.5	19.8	22.2	
California	5,170	11.2	9.6	37.3	14.8	11.7	15.4	
Colorado	755	14.4	1.6	33.2	15.8	26.4	8.6	
Connecticut	518	16.0	2.9	54.6	5.2	10.2	11.0	
Delaware	111	4.5		39.6	14.4	31.5	9.9	
District of Columbia	49	4.1	14.3	46.9	22.4		12.2	
Florida	3,044	4.7	7.1	13.1	10.8	18.6	3.1	42.6
Georgia	1,418	10.4		14.0	36.8	22.3	16.4	0.1
Hawaii	150	6.0	9.3	19.3	32.7	20.0	12.7	
Idaho	293	8.5		32.4	11.9	24.2	22.9	
Illinois	1,821	7.7		12.8	41.4	17.5	20.3	0.3
Indiana	1,147	7.4	1.0	20.1	28.6	25.5	17.3	
Iowa	613	6.9		28.7	22.7	26.6	15.2	
Kansas	580	7.1	3.8	28.4	17.1	7.4	36.2	
Kentucky	812	7.3	1.4	17.2	21.9	40.1	11.8	0.2
Louisiana	1,233	8.0	0.2	20.8	43.6	26.0	0.3	1.1
Maine	219	1.8	0.9	39.7	14.2	16.9	20.5	5.9
Maryland	781	9.3	4.7	28.7	23.9	21.6	10.9	0.8
Massachusetts	746	8.8	4.4	24.9		48.0	13.8	
Michigan	1,564	7.2	2.0	16.8	35.4	24.2	14.4	
Minnesota	753	6.9	0.7	19.5	26.0	33.6	13.1	0.1
Mississippi	744	7.5	0.3	23.7	24.3	19.0	22.3	3.0
Missouri	1,034	11.2	1.9	37.4	26.0	10.7	12.7	
Montana	338	15.1	0.3	31.1	23.1	11.2	19.2	
Nebraska	378	7.1	0.5	35.2	22.2	11.9	23.0	
Nevada	294	19.7	6.8	22.4	20.4	21.4	9.2	
New Hampshire	148	9.5	0.7	13.5	22.3	37.2	16.9	
New Jersey	1,162	4.6	5.6	31.5	26.8	18.7	12.8	
New Mexico	544	17.3	2.2	40.6	7.4	16.4	16.2	
New York	2,487	5.6	7.3	31.5	26.4	15.5	13.6	0.1
North Carolina	1,475	5.2		22.4	20.9	15.1	36.3	0.1
North Dakota	166	3.0		20.5	27.1	31.3	18.1	
Ohio	1,778	9.2	2.4	21.5	21.2	29.7	16.1	
Oklahoma	989	8.8	0.1	1.6	4.1	3.5	26.1	55.7
Oregon	645	8.2	0.2	35.3	22.6	22.0	11.0	0.6
Pennsylvania	2,029	5.1	1.5	30.4	29.7	17.9	3.8	11.5
Rhode Island	102	9.8	2.0	33.3	2.9	23.5	22.5	5.9
South Carolina	845	6.2		48.9	1.1	29.7	14.2	
South Dakota	177	6.8	0.6	28.2	23.2	15.8	25.4	
Tennessee	1,104	11.1		28.0	9.8	32.4	18.8	
Texas	4,623	15.6	3.1	25.6	23.9	14.3	17.5	
Utah	364	17.6	3.3	23.9	20.3	9.6	25.3	
Vermont	114	11.4		49.1	4.4	3.5	31.6	
Virginia	1,011	9.2	2.1	22.6	27.0	24.4	14.7	
Washington	862	10.6	2.6	19.5	29.4	13.1	24.9	
West Virginia	410	7.1	3.9	51.0	22.9	11.5	3.7	
Wisconsin	918	1.7	0.5	29.2	28.6	22.2	17.6	
Wyoming	264	27.3	0.4	18.6	22.3	26.9	4.5	
Total	**49,268**	**9.1**	**3.1**	**26.1**	**22.1**	**19.7**	**15.5**	**4.4**

III. Accidents



The term "accident" as applied to FARS includes three essential characteristics: (1) it must involve one or more motorized vehicles and their loads in motion on a roadway which is open to the public and ordinarily used for motor vehicle travel ("motor vehicle in transport on a trafficway"); (2) one or more motor vehicles in transport must be involved in a set of events not under human control leading directly to the occurrence of the death of a person within 30 days ("fatal motor vehicle accident"); and (3) the set of events must result directly from something other than "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; or any injury-producing or property-damaging event involving a railway train prior to the involvement of a motor vehicle in transport.

A summary of such accidents in 1981 by their first harmful event (including manner of collision for collisions of vehicles) is depicted in Figure 11. About 60 percent of these accidents involved only one vehicle, down slightly from 1979 and 1980. Overall, the first harmful event in almost half (46.9 percent) of these single-vehicle accidents was collision with a fixed object, and the second most frequent was collision with a nonoccupant. Nonoccupants include pedestrians, pedalcyclists and others not in or upon a motor vehicle in transport. The majority of these were pedestrians.

(In Figure 11a, "other objects not fixed" include railway trains, animals, and parked motor vehicles. "Other fixed objects" include buildings, curbs or walls, dividers, fences, and impact attenuators.)

In almost all multiple-vehicle accidents, the first harmful event reported was collision of two or more motor vehicles in transport (92.5 percent). Angle collisions constituted the most frequent manner in which these accidents occurred, followed by head-on collisions.

(In Figure 11b, "other objects not fixed" include animals, railway trains, parked motor vehicles, and unknown first harmful events. The "other" category of Figure 11b includes unknown manner of collision.)

FIGURE 11a
DISTRIBUTION OF FATAL ACCIDENTS BY FIRST HARMFUL EVENT
SINGLE VEHICLE ACCIDENTS

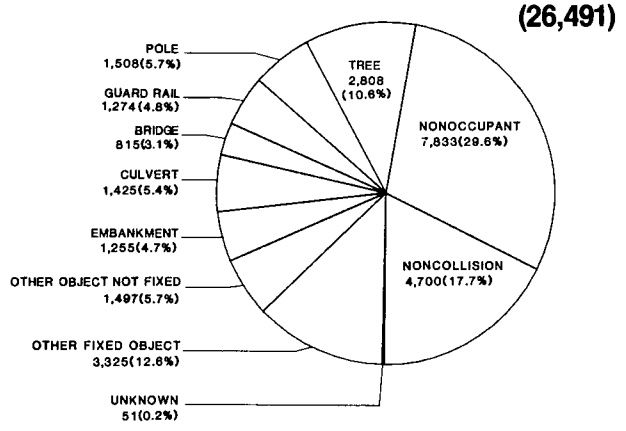
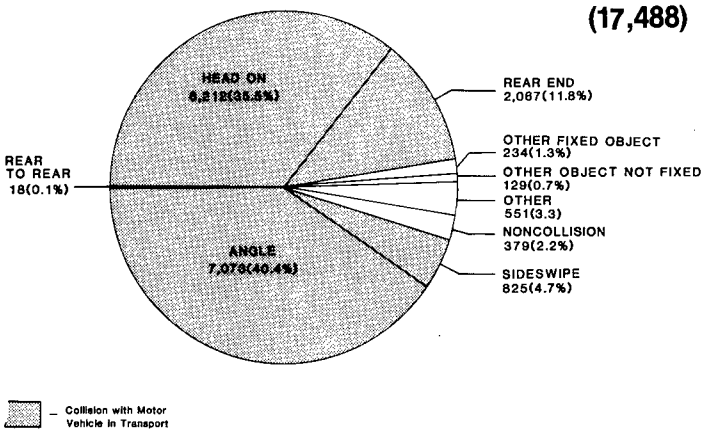


FIGURE 11b
DISTRIBUTION OF FATAL ACCIDENTS BY FIRST HARMFUL EVENT AND MANNER OF COLLISION-MULTI-VEHICLE ACCIDENTS



Collisions

Figure 12 shows the distribution of fatal accidents and occupant deaths among types of collisions. Single-vehicle collisions accounted for 60.3 percent of all fatal accidents and 49.7 percent of all occupant fatalities. The most frequently reported manner of collision in multiple-vehicle accidents, "angle" impact (16.1 percent of all fatal accidents), accounted for 20.0 percent of all occupant deaths. (The "Other" category in Figure 12 includes rear-to-rear collisions and "unknown manner of collision.")

Of the 17,488 fatal multi-vehicle accidents, fully 86.5 percent (15,136) were two-vehicle collisions, and of these, collisions of two passenger cars comprised the single largest group, accounting for 36.9 percent of the total. The next largest group was collisions of passenger cars with light trucks (18.6 percent). In fact, passenger cars were involved in 83.4 percent of the two-vehicle collisions.

Table 12 presents the mix of vehicle types in the 15,135 two-vehicle fatal accidents in 1981. This table is confined to those accidents which involved *only* two vehicles. The Glossary contains descriptions of the vehicle body types included in each category.

More important to safety professionals than vehicle mix are the occupant fatalities associated with it. Table 13 distributes occupant fatalities by the type of vehicle in which they were riding and the type of vehicle with which theirs collided. As in Table 12, the fatality counts are restricted to those resulting from accidents involving only two vehicles.

In these collisions, occupant fatalities were the most frequent for passenger cars, motorcycles and light trucks. Nearly all (99.4 percent) two-vehicle fatal accidents that involved motorcycles resulted in the death of a motorcycle rider. Fatal collisions of a truck with another vehicle more often resulted in the death of an occupant of the other vehicle than to a truck occupant. Only 7 bus occupants were killed in two-vehicle collisions in 1981.

FIGURE 12
ACCIDENTS AND OCCUPANT FATALITIES BY MANNER OF COLLISION

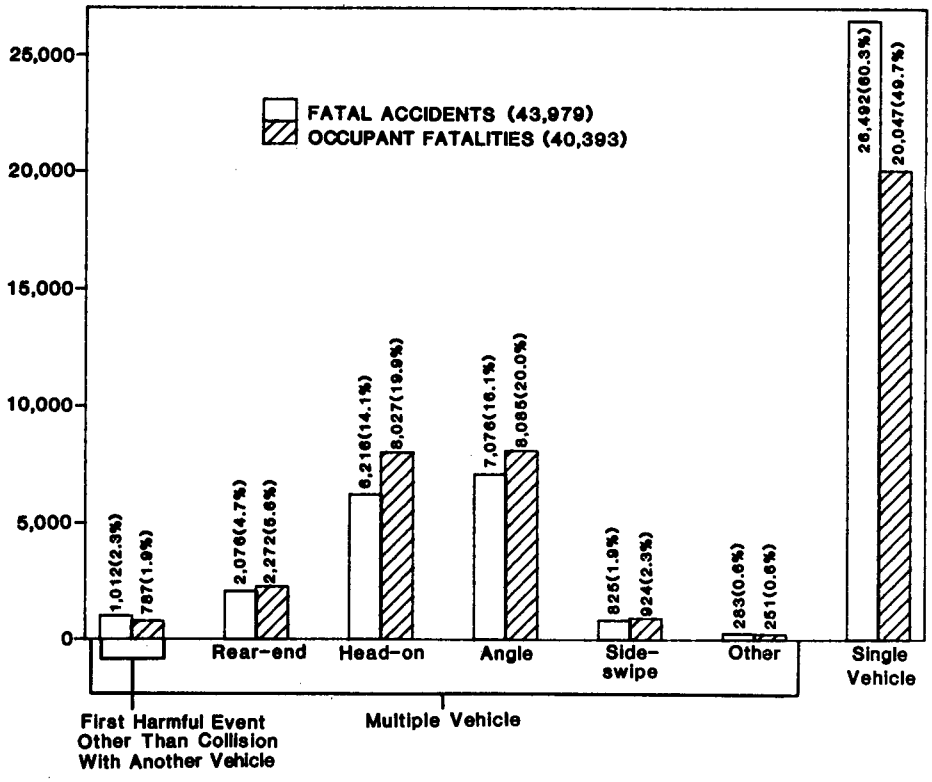


TABLE 12
FATAL ACCIDENTS BY VEHICLE MIX IN TWO-VEHICLE FATAL ACCIDENTS (15,135)

	Unknown	Heavy Trucks	Medium Trucks	Light Trucks	Other Vehicles	Buses	Other Cycle	Motor-Cycles	Passenger Cars
Passenger Cars									5,588
Motorcycles								62	1,385
Other Cycles							2	2	62
Buses						0	3	20	101
Other Vehicles					15	2	3	88	451
Light Trucks				401	112	23	37	581	2,817
Medium Trucks			13	92	13	2	2	49	332
Heavy Trucks		88	44	542	60	2	7	165	1,788
Unknown	20	10	6	22	7	0	1	11	105
Total*	**182**	**2,706**	**553**	**4,627**	**751**	**153**	**119**	**2,363**	**12,629**

*Represents all two-vehicle accident involving respective body type.

TABLE 13
OCCUPANT FATALITY MIX IN TWO-VEHICLE FATAL ACCIDENTS (14,397)

Vehicle in which Fatality Occurred	Other Vehicle: Passenger Car	Motorcycles	Other Cycles	Buses	Other Vehicles	Light Trucks	Medium Trucks	Heavy Trucks	Unknown	Total
Passenger Cars	5,080	5		100	331	2,049	318	1,777	55	9,715
Percent	35.3	0.0		0.7	2.3	14.2	2.2	12.3	0.4	67.5
Motorcycles	1,361	56		20	87	573	49	165	9	2,320
Percent	9.5	0.4		0.1	0.6	4.0	0.3	1.2	0.1	16.1
Other Cycles	62	2	2	3	3	37	2	7		119
Percent	0.4	0.0	0.0	0.0	0.0	0.3	0.0	0.1		0.8
Buses	4						1	2		7
Percent	0.0						0.0	0.0		0.1
Other Vehicles	109	1		2	15	45	12	65	3	252
Percent	0.8	0.0		0.0	0.1	0.3	0.1	0.5	0.0	1.8
Light Trucks	603	4		22	60	357	90	531	11	1,678
Percent	4.2	0.0		0.2	0.4	2.5	0.6	3.7	0.1	11.7
Medium Trucks	14			1	1	3	11	30	1	61
Percent	0.1			0.0	0.0	0.0	0.1	0.2	0.0	.4
Heavy Trucks	43					16	12	79		150
Percent	0.3					0.1	0.1	0.6		1.0
Unknown	41	2			4	12	5	10	21	95
Percent	0.3	0.0			0.0	0.1	0.0	0.1	0.2	0.7
Total	**7,317**	**70**	**2**	**148**	**501**	**3,092**	**500**	**2,666**	**101**	**14,397**
Percent	**50.8**	**0.5**	**0.0**	**1.0**	**3.5**	**21.5**	**3.5**	**18.5**	**0.7**	**100.0**

Highway and Environment

An important element of a fatal accident to be considered is the environment in which it occurred—the type of roadway, light and weather conditions, and the type of object with which the vehicle collided.

As in 1979 and 1980, data indicate that more than half (56 percent) of the 1981 estimated vehicle miles of travel (VMT) were in urban areas (Figure 13b), although considerably less than half (43 percent) of the fatal accidents occurred in these areas (Figure 13a). In urban areas 2.2 fatal accidents occurred for each 100 million VMT. In rural areas the rate was almost two-thirds higher—3.5 accidents per 100 million VMT.

FIGURE 13a
FATAL ACCIDENT ENVIRONMENT
(43,979)

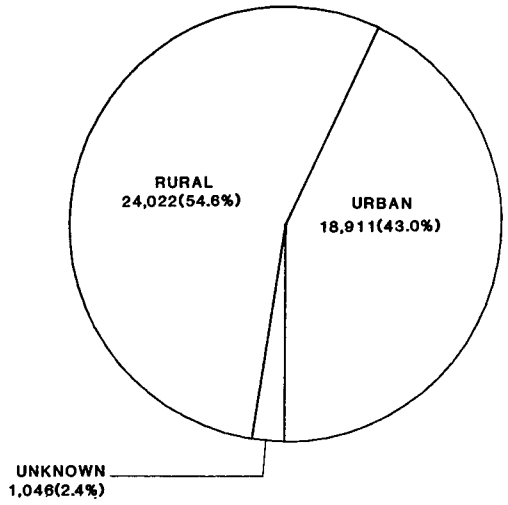
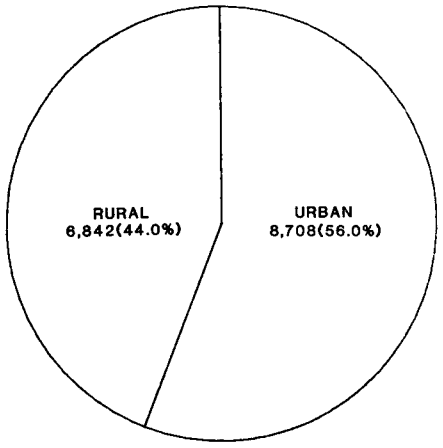


FIGURE 13b
TOTAL VEHICLE MILES OF TRAVEL
(100 Million)
(15,550)



Fatal accidents occurred more frequently on roadways with a 55 mph speed limit than on any other set of roadways (Figure 14). The percentage of these accidents (44.9 percent) was more than three times that of the next highest, those in 30 and 35 mph zones. Not surprisingly, rural areas dominated the frequency of accidents on roadways with a 55 mph speed limit and urban areas dominated the death toll in 30 and 35 mph zones.

Figures 15a and 15b show distributions of accidents in urban and rural areas among functional classes of roadway. The largest differences between urban and rural areas occurred on collector roads. These accounted for only 10.3 percent of fatal accidents in urban areas and 28.2 percent of those in rural accidents. Non-Interstate limited access routes accounted for 10.2 percent of the fatal accidents in urban areas and only 0.1 percent in rural areas, where few such facilities exist.

Table 14 shows the distribution of accident-involved vehicle types among classes of roadway. Overall, non-limited access arterials accounted for slightly more than half of all vehicle involvements (50.5 percent). Eighty-one percent of heavy-truck involvements occurred on the Interstate System, on other freeways, and on arterials, probably because most heavy-truck mileage is on these roads. FHWA estimates that 19.2 percent of the VMT in the U.S. was on the Interstate System, yet the Interstate System accounted for only 8.9 percent of all vehicles involved in fatal accidents. Because exposure data for other road classes is lacking it is not possible to compare this rate to rates of vehicle involvements in fatal accidents on other road systems.

FIGURE 14
FATAL ACCIDENTS ON ROADWAYS BY SPEED LIMIT AND LAND USE

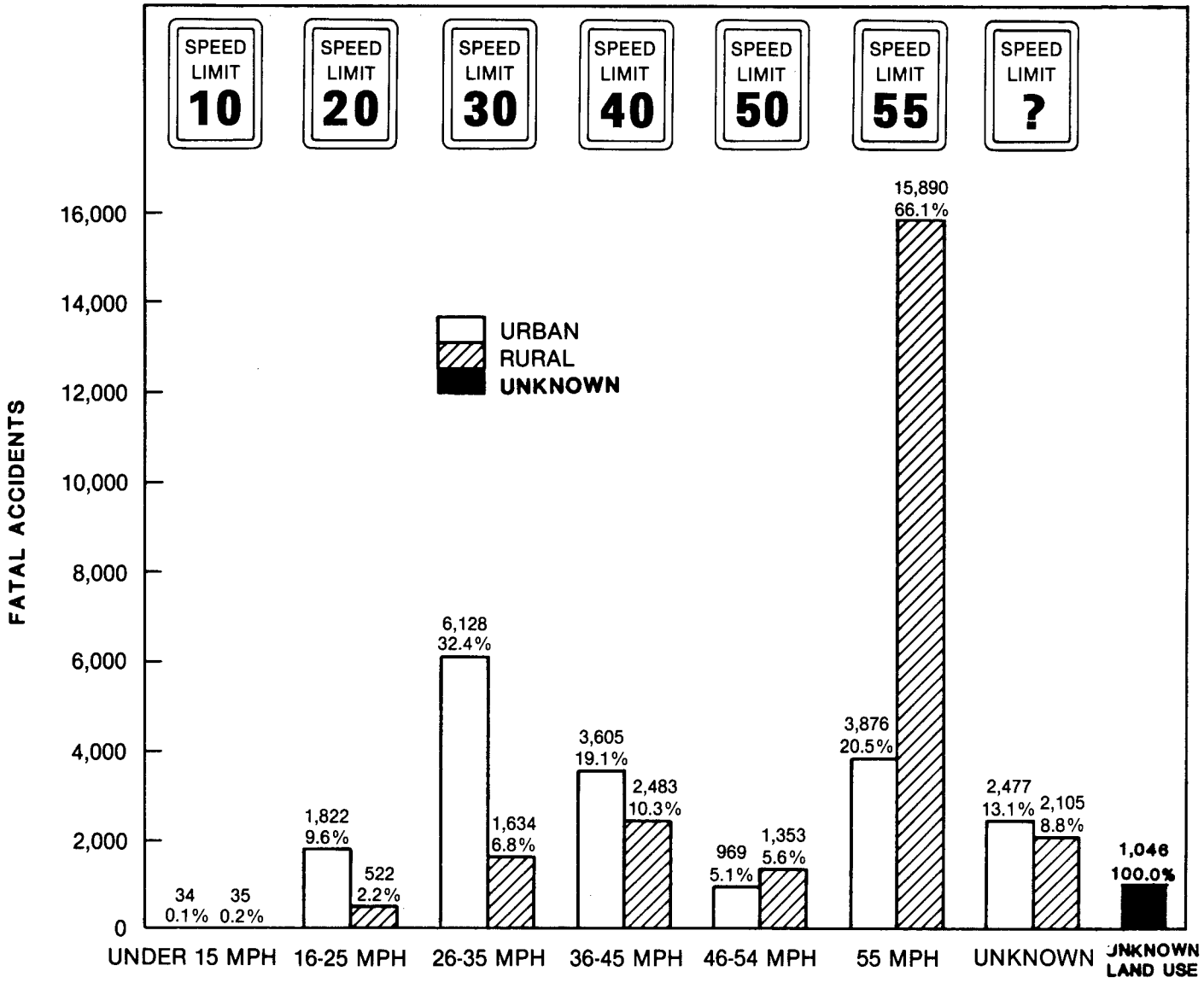


FIGURE 15a
FATAL ACCIDENTS BY ROADWAY FUNCTION CLASS (URBAN)

(18,911)

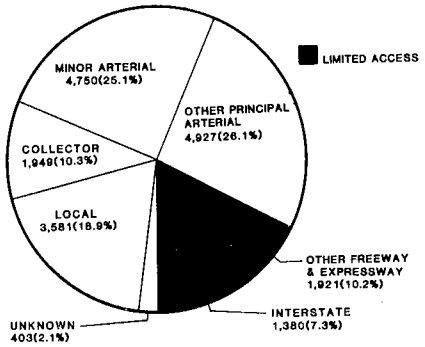


FIGURE 15b
FATAL ACCIDENTS BY ROADWAY FUNCTION CLASS (RURAL)

(24,022)

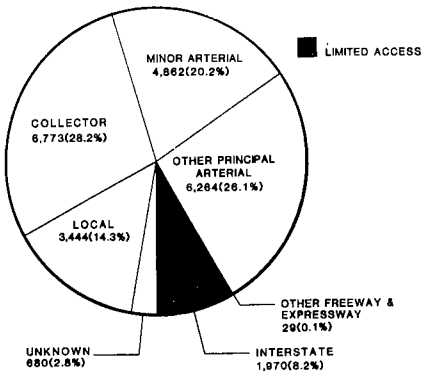


TABLE 14
VEHICLE TYPES INVOLVED IN FATAL ACCIDENTS BY ROADWAY FUNCTION CLASS

	Interstate	Other Freeway & Expressway	Other Principal Arterial	Minor Arterial	Collector	Local Street	Unknown	Total
Passenger Cars	3,226	1,494	10,886	9,164	7,260	5,256	1,439	38,725
Percent	57.8	69.6	62.7	64.3	61.6	59.8	52.5	61.8
Motorcycles	228	148	1,082	1,026	1,044	1,085	161	4,774
Percent	4.1	6.9	6.2	7.2	8.9	12.4	5.9	7.6
Other Motorized Cycles		4	35	33	37	43	5	157
Percent		0.2	0.2	0.2	0.3	0.5	0.2	0.3
Light Trucks	826	295	2,891	2,517	2,277	1,608	470	10,884
Percent	14.8	13.7	16.6	17.6	19.3	18.3	17.1	17.4
Medium Trucks	92	22	273	185	157	126	33	888
Percent	1.6	1.0	1.6	1.3	1.3	1.4	1.2	1.4
Heavy Trucks	1,012	111	1,558	827	457	191	161	4,317
Percent	18.1	5.2	9.0	5.8	3.9	2.2	5.9	6.9
Special Vehicles	33	4	91	74	98	114	11	425
Percent	0.6	0.2	0.5	0.5	0.8	1.3	0.4	0.7
Buses	26	13	85	77	64	65	11	341
Percent	0.5	0.6	0.5	0.5	0.5	0.7	0.4	0.5
Unknown	21	13	118	62	81	46	383	724
Percent	0.4	0.6	0.7	0.4	0.7	0.5	14.0	1.2
Other	113	43	353	297	306	250	69	1,431
Percent	2.0	2.0	2.0	2.1	2.6	2.8	2.5	2.3
Total	**5,577**	**2,147**	**17,372**	**14,262**	**11,781**	**8,784**	**2,743**	**62,666**
Percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

A total of 461 fatal accidents occurred in and around construction and roadway maintenance zones, down from 614 in 1980. Table 15 distributes these accidents by functional class of roadway. The largest proportions occurred on the Interstate System (28.4 percent) and on other principal arterials (25.2 percent).

TABLE 15
FATAL ACCIDENTS IN CONSTRUCTION-MAINTENANCE ZONES BY ROADWAY FUNCTION CLASS

	Construction	Maintenance	Construction or Maintenance	Total
Interstate	117	13	1	131
Other Freeway & Expressway	15	2	1	18
Other Principal Arterial	105	10	1	116
Minor Arterial	69	15	13	97
Collector	41	9	6	56
Local	40	6	6	52
Unknown	10	3	3	16
Total	**397**	**58**	**6**	**461**

Most accidents occurred away from roadway junctions (72.7 percent), as reflected in Figure 16a, and most roadway junctions at which accidents did occur were intersections (Figure 16b). A stop sign was the control device most often present at these intersections (reported at 31.5 percent of the intersections) although intersections with no traffic controls and those with traffic lights were also significantly represented (24.6 and 21.6 percent of the intersections respectively).

Although 59.7 percent of all accidents occurred on the roadway (Figure 16c), more than two out of five occurred off the roadway—at the roadside (23.5 percent), on roadway shoulders (4.8 percent), and at other off-road locations (8.6 percent). (Accidents that occurred off the roadway were included in the FARS file if a set of events involving the loss of control of a motor vehicle began on the roadway or the vehicle was in motion within the trafficway. See Glossary for definition of a "Trafficway".)

33.4 percent of the 521 fatal accidents at rail-highway grade crossings occurred where there were neither stop signs, gates, signals, nor watchmen to alert motorists to oncoming trains (Figure 17).

Fatal accidents occurred most often during normal weather regardless of lighting condition (Figure 18). Indeed, normal weather is associated with 88.5 percent of all fatal accidents that occurred during daylight hours and 98.5 percent of all fatal accidents that occurred on dry roads.

Water, snow, ice or slush on the roadway while it was still raining, snowing, or sleeting accounted for only about 10 percent of all fatal accidents.

(In Figure 18, "other" atmospheric conditions include smog, smoke, and blowing sand or dust. The term "normal" denotes no adverse weather conditions. "Other" roadway surface conditions include dirt and oil.)

FATAL ACCIDENT ENVIRONMENT
FIGURE 16a
RELATION TO JUNCTION

(43,979)

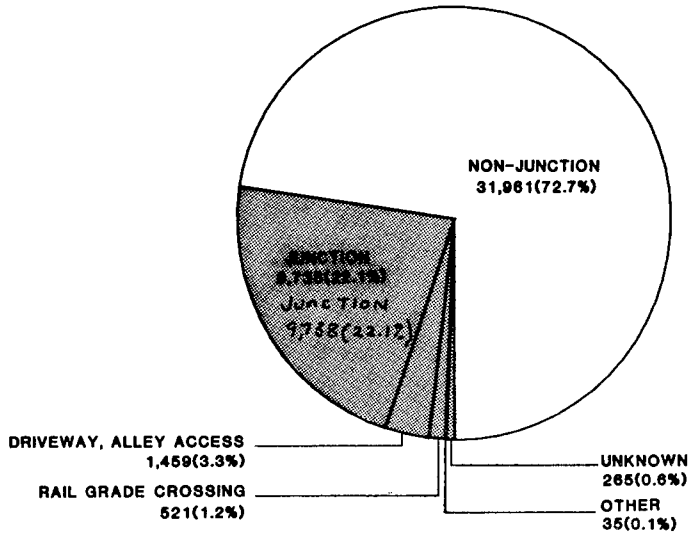


FIGURE 16b
ROAD JUNCTION AND INTERSECTION TRAFFIC CONTROLS

(9,738)

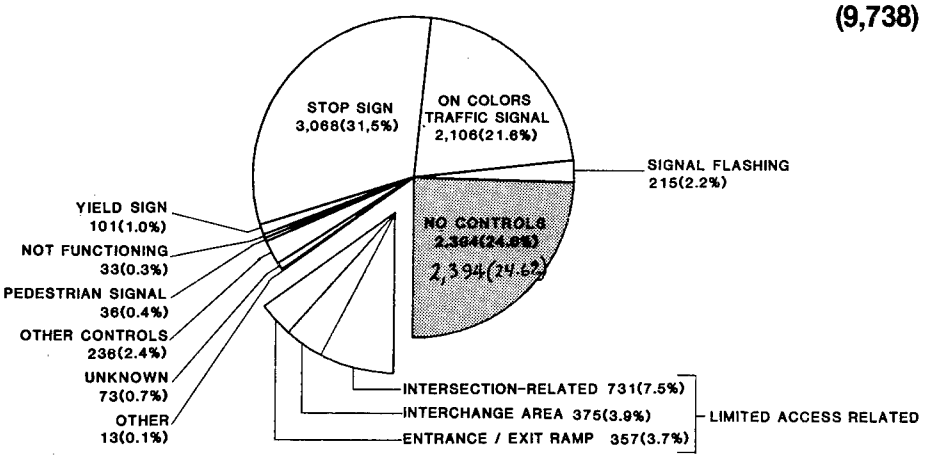


FIGURE 16c
RELATION TO THE ROADWAY

(43,979)

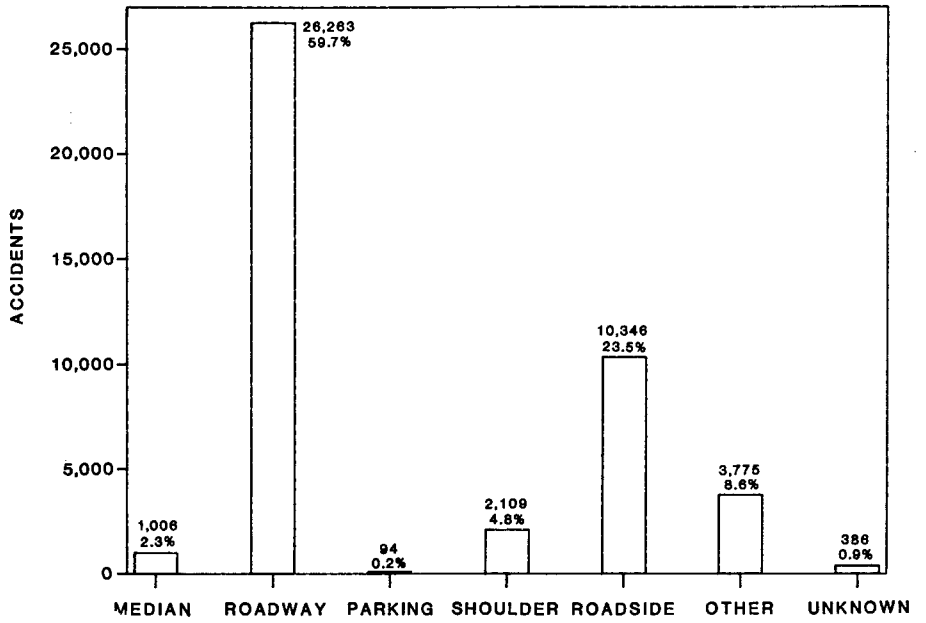


FIGURE 17
FATAL ACCIDENT ENVIRONMENT RAILROAD CROSSING CONTROLS

(521)

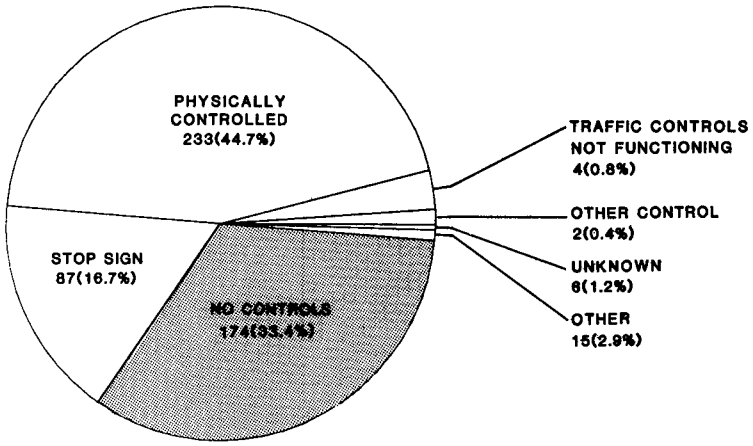
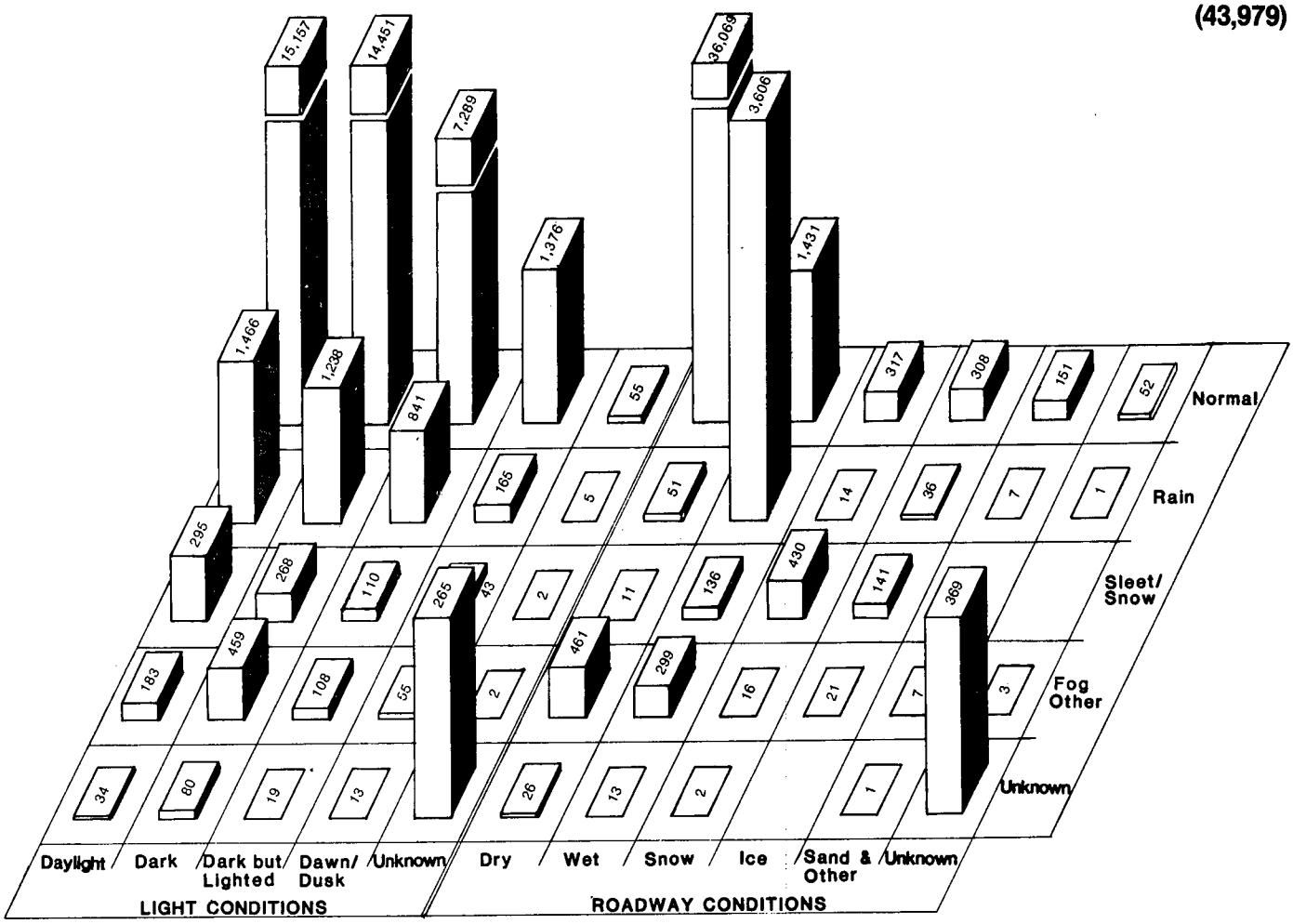
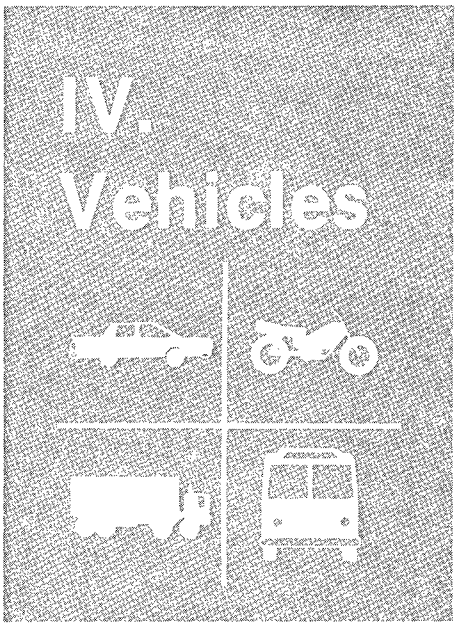


FIGURE 18
ATMOSPHERIC CONDITIONS IN FATAL ACCIDENTS BY LIGHT AND SURFACE CONDITIONS

(43,979)





The 43,979 fatal accidents in 1981 involved 62,666 motor vehicles, 1.3 percent fewer than in 1980. Though significant, this decrease was not as sharp as were the decreases in total fatal accidents, total deaths, or total occupant deaths. Figure 19 represents the number of vehicles per fatal accident.

FIGURE 19
NUMBER OF VEHICLES PER FATAL ACCIDENT

(43,979)

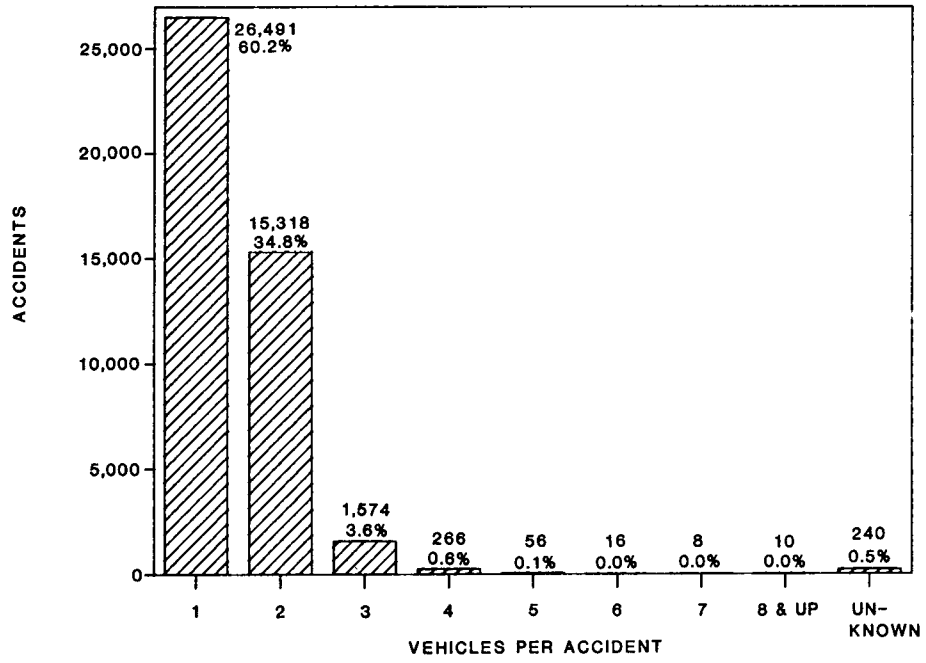


Table 16 presents the distribution of vehicles, vehicle occupants, and associated occupant fatalities among vehicle types. As noted earlier, passenger cars were the most frequently involved and accounted for the largest proportion of occupant deaths. The next two most frequently involved vehicle types, associated with the next largest proportions of occupant fatalities, were light trucks and motorcycles.

Motorcycles accounted for 5,910 (5.8 percent) of the 102,369 occupant involvements but 4,716 (11.7 percent) of the 40,393 occupants killed. Conversely, medium and heavy trucks together accounted for 5.9 percent of all occupants but only 2.8 percent of those killed. (Occupant fatality counts by vehicle body types are presented in Appendix B.)

Figure 20 distributes involved vehicle types by most harmful event. Collisions with parked motor vehicles, animals, and trains are included in the "other objects not fixed" category and "collision with motor vehicle in transport" is a subgroup of "objects not fixed." "Collision with motor vehicle in transport" accounted for 52.2 percent of the most harmful events in fatal accidents. Collisions with roadside structures (i.e., dividers, culverts or ditches, curbs or walls, embankments, fences, light supports, guard rails, sign posts, utility poles, impact attenuators, and bridges or overpasses) were cited as the most harmful event for 8.2 percent of the vehicles. Collisions with other fixed objects (buildings, trees, and shrubbery) were cited for 5.8 percent of the vehicles.

The incidence of most harmful events recorded for the 20,047 occupant deaths that resulted from single-vehicle accidents and the 20,346 occupant deaths from multi-vehicle accidents are shown in Table 17. Details are included for the "collision with fixed object" group and summary data are presented for the "noncollision" and "collision with object not fixed" groups. All three groups are stratified by functional class of roadway and land use.

Trees and shrubbery were struck most frequently in single-vehicle accidents in both urban and rural areas. The second most frequently struck fixed objects were utility poles in urban areas and embankments in rural areas.

The remainder of this chapter examines various aspects of fatal accidents by generic vehicle type.

TABLE 16
NUMBER OF VEHICLES AND OCCUPANTS BY VEHICLE TYPE

Vehicle Type	Number of Vehicles Involved Number	%	Number of Occupants Number	%	Number of Occupant Fatalities Number	%
Passenger Cars	38,725	61.8	66,285	64.8	26,545	65.7
Motorcycles	4,774	7.6	5,910	5.8	4,716	11.7
Other Motorized Cycles	157	0.3	190	0.2	158	0.4
Light Trucks	10,884	17.4	18,239	17.8	6,129	15.2
Medium Trucks	888	1.4	1,166	1.1	235	0.6
Heavy Trucks	4,317	6.9	4,938	4.8	896	2.2
Special Vehicles	425	0.7	781	0.8	266	0.7
Buses	341	0.5	1,009	1.0	56	0.1
Other	1,431	2.3	2,644	2.6	947	2.3
Unknown	724	1.2	1,207	1.2	445	1.1
Total	**62,666**	**100.0**	**102,369**	**100.0**	**40,393**	**100.0**

FIGURE 20
COUNTS OF VEHICLES INVOLVED IN FATAL ACCIDENTS BY MOST HARMFUL EVENT

(62,666)

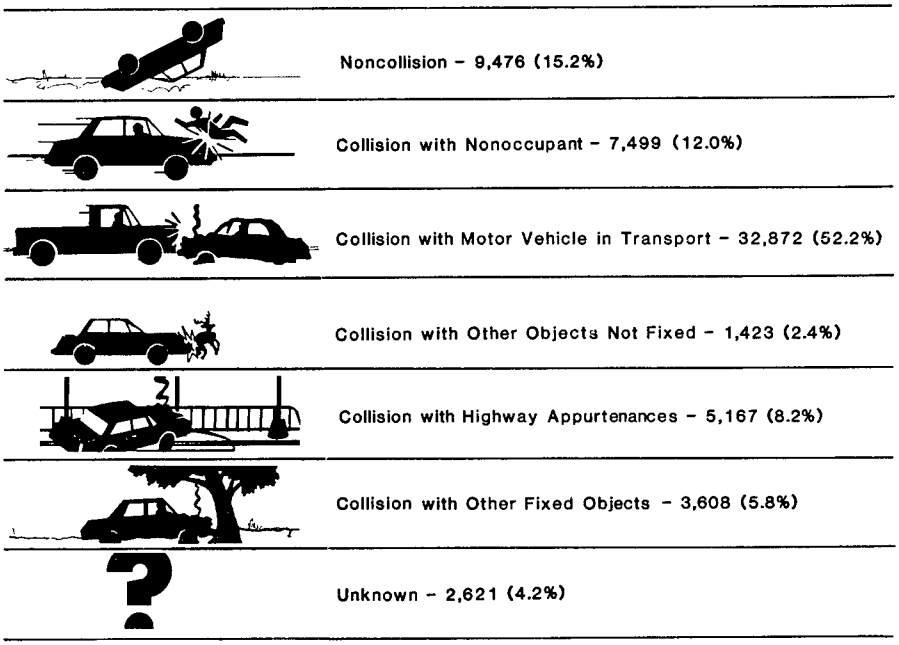


TABLE 17a
MOST HARMFUL EVENT IN SINGLE VEHICLE OCCUPANT FATALITIES BY LAND USE AND ROADWAY FUNCTION CLASS (20,047)

Most Harmful Event	Interstate Freeway	Other Freeways & Expressways	Other Principal Arterials	Minor Arterial	Collector	Local Street	Unknown	Total
URBAN								
Total	**872**	**497**	**1,287**	**1,497**	**813**	**1,611**	**118**	**6,695**
Noncollision	393	198	363	411	202	508	46	2,121
Collision with Object not fixed	79	23	99	169	81	203	3	657
Building		5	31	33	27	34	1	131
Culvert/Ditch	13	6	15	24	9	28	6	101
Curb/Wall	29	19	39	41	30	64	8	230
Divider	30	21	15	4	1	3		74
Embankment	15	10	15	20	8	18		86
Fence	5	3	13	14	10	17	2	64
Guard Rail	112	48	41	32	13	17	3	266
Light Support	15	13	62	58	8	14		170
Sign Post	20	8	16	17	8	21	2	92
Tree/Shrubbery	35	55	180	244	191	363	20	1,088
Utility Pole	19	25	210	270	158	201	12	895
Other Poles/Support	3	3	22	26	18	20	2	94
Impact Attenuator		1						1
Other Fixed Objects	11	13	26	27	15	50	6	148
Bridge or Overpass (Passing Under)	42	29	25	25	6	21	1	149
Bridge or Overpass (Passing Over)	30	12	23	21	10	21	5	122
Unknown	21	5	92	61	18	8		205
RURAL								
Total	**1,250**	**14**	**2,555**	**2,306**	**4,049**	**2,503**	**344**	**13,021**
Noncollision	766	6	1,382	1,124	1,943	1,249	88	6,558
Collision with Object not Fixed	126		99	87	171	226	18	727
Building			9	10	35	15		69
Culvert/Ditch	36	1	99	97	155	71	65	524
Curb/Wall	7		31	13	18	12	3	84
Divider	4		4	1	2	2	3	16
Embankment	40	2	110	101	165	97	38	553
Fence	4		12	18	39	22	2	97
Guard Rail	72	1	75	59	70	19	13	309
Light Support	4		4	4	3	4		19
Sign Post	13		16	12	18	8	5	72
Tree/Shrubbery	52	4	400	383	797	506	54	2,196
Utility Pole	3		113	133	234	116	5	604
Other Poles/Support	4		7	13	22	3	7	56
Impact Attenuator				1				1
Other Fixed Objects	14		40	25	74	40	13	206
Bridge or Overpass (Passing Under)	35		24	15	17	7	2	100
Bridge or Overpass (Passing Over)	40		72	56	111	63	28	370
Unknown	30		57	154	175	43		459

Continued on next page

TABLE 17a — Continued

MOST HARMFUL EVENT IN SINGLE VEHICLE OCCUPANT FATALITIES BY LAND USE AND ROADWAY FUNCTION CLASS (20,047)

Most Harmful Event	Interstate Freeway	Other Freeways & Expressways	Other Principal Arterials	Minor Arterial	Collector	Local Street	Unknown	Total
UNKNOWN								
Total	**2**		**42**	**32**	**2**	**10**	**243**	**331**
Noncollision					2	1	54	57
Collision With Object not Fixed							12	12
Building			1				3	4
Culvert/Ditch							5	5
Curb/Wall	1		1				7	9
Embankment							2	2
Fence							2	2
Guard Rail							3	3
Light Support							1	1
Tree/Shrubbery						2	20	22
Utility Pole						2	8	10
Other Poles/Support							10	10
Other Fixed Objects							3	3
Bridge or Overpass (Passing Under)							1	1
Bridge or Overpass (Passing Over)							1	1
Unknown	1		40	32		5	111	189
Total	**2,124**	**511**	**3,884**	**3,835**	**4,864**	**4,124**	**705**	**20,047**

TABLE 17b

MOST HARMFUL EVENT IN MULTI-VEHICLE OCCUPANT FATALITIES BY LAND USE AND ROADWAY FUNCTION CLASS (20,346)

Most Harmful Event	Interstate Freeway	Other Freeways & Expressways	Other Principal Arterials	Minor Arterial	Collector	Local Street	Unknown	Total
URBAN								
Total	**818**	**640**	**2,560**	**2,221**	**760**	**1,114**	**177**	**8,290**
Noncollision	111	61	143	92	28	43	6	484
Nonoccupant	1	1		1				3
Tree or Shrubbery	2	4	8	17	5	6		42
Utility Pole	4	2	24	13	10	17	1	71
Guard Rail	13	4	2	1				20
Bridge or Overpass	4	3	5					12
Culvert or Ditch	1			2				3
Embankment	1	1	1	1				4
Other Object not Fixed	14	5	8	14	7	10	1	59
Other Fixed Objects	12	15	17	20	2	9	1	76
Collision with Motor Vehicle in Transport								
Rear End	194	81	217	168	52	64	16	792
Head On	219	189	703	643	221	256	40	2,271
Rear to Rear	1	1		2	2			6
Angle	123	186	1,152	1,068	388	662	95	3,674
Sideswipe	51	21	72	80	14	18	6	262
Other	67	66	208	99	31	29	11	511
RURAL								
Total	**806**	**15**	**4,009**	**2,779**	**2,688**	**858**	**366**	**11,521**
Noncollision	127	2	262	147	147	49	11	745
Nonoccupant	2		1		1			4
Tree or Shrubbery	3		9	4	9	2	1	28
Utility Pole			7	12	14	5		38
Guard Rail	4		7	2	5			18
Bridge or Overpass	3		7	2				12
Culvert or Ditch	2		1	1	1			5
Embankment	1		6	1	6	1	1	16
Other Object not Fixed	1	1	8	4	11	2	1	28
Other Fixed Objects	2		8	3	4	2	1	20
Collision with Motor Vehicle in Transport								
Rear End	245	1	303	155	174	45	30	953
Head On	230	6	1,906	1,401	1,150	367	98	5,158
Rear to Rear	3		3	2	2			10
Angle	77	5	1,073	706	919	330	210	3,320
Sideswipe	38		181	107	86	27	7	446
Other	68		227	232	159	28	6	720
UNKNOWN								
Total	**3**		**39**	**28**		**4**	**461**	**535**
Noncollision						1	52	53
Tree or Shrubbery							13	13
Utility Pole							15	15
Guard Rail							1	1
Embankment							2	2
Other Object not Fixed							8	8
Other Fixed Objects							6	6
Collision with Motor Vehicle in Transport								
Rear End			2				20	22
Head On			5	1		1	30	37
Angle			2				121	123
Sideswipe							7	7
Other	3		30	27		2	186	248
Total	**1,627**	**655**	**6,608**	**5,028**	**3,448**	**1,976**	**1,004**	**20,346**

Passenger Cars

Almost three-fifths (61.8 percent) of all vehicles involved in fatal accidents were passenger cars. Table 18 shows the distribution of vehicle involvements and occupant deaths by type of passenger car. Two-door sedans, hardtops, and coupes were the most frequently involved passenger car types (59.7 percent) and accounted for most car occupant deaths (60.6 percent). Next most frequently involved were four-door sedans or hardtops (23.9 percent), which accounted for 23.1 percent of the car occupant fatalities.

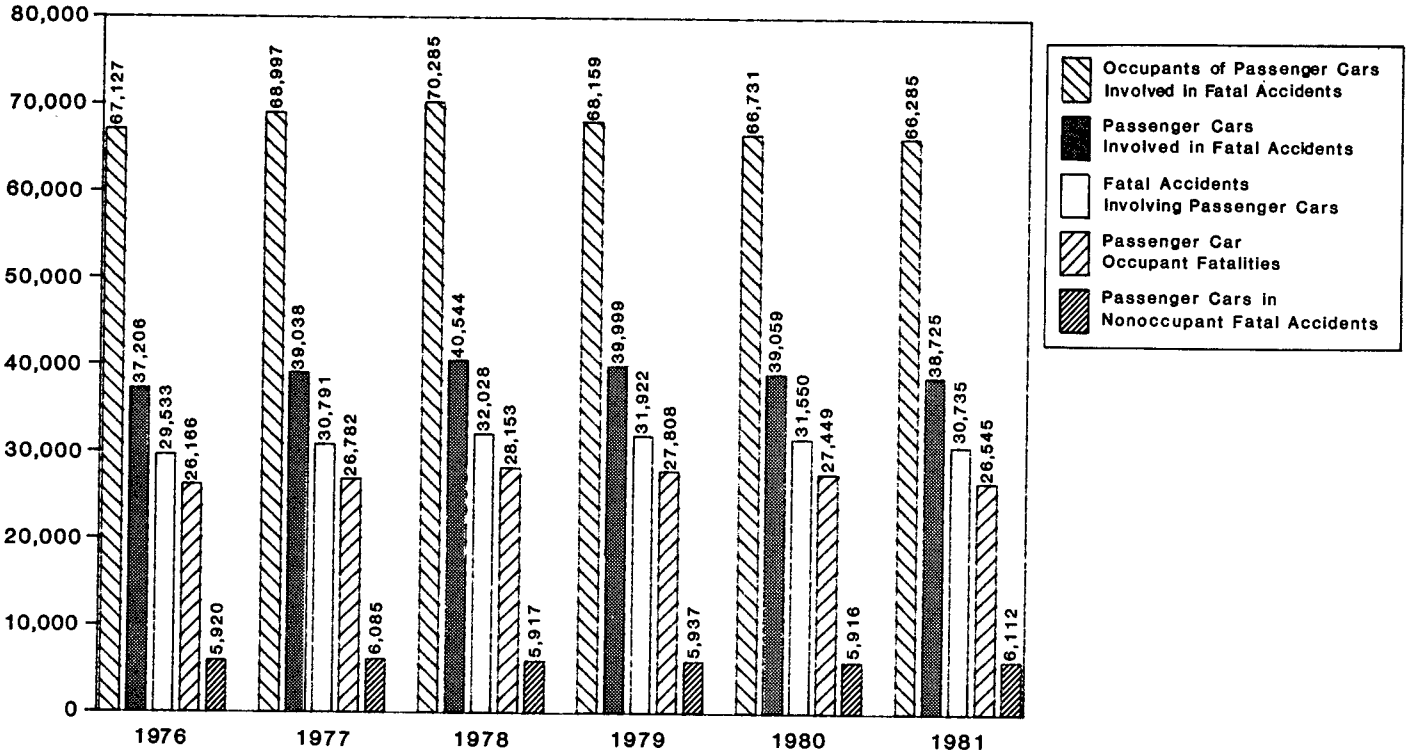
Figure 21 shows the six-year history of fatal accidents and fatalities involving passenger cars; 38,725 passenger cars were involved in 34,885 fatal accidents in 1981, resulting in 26,545 passenger car occupants killed, a decrease of 3.3 percent from 1980.

TABLE 18
ACCIDENTS, VEHICLES, OCCUPANTS AND FATALITIES BY BODY TYPE FOR PASSENGER CARS

	Accidents		Vehicles		Occupants		Occupant Fatalities	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Convertible	379	1.1	380	1.0	614	0.9	304	1.2
2-Door Sedan, Hardtop, Coupe	20,171	57.8	23,106	59.7	39,010	58.9	16,078	60.6
4-Door Sedan, Hardtop	8,570	24.6	9,256	23.9	16,104	24.3	6,137	23.1
Hatchback	833	2.4	838	2.2	1,415	2.1	708	2.7
Auto with Pickup Body	284	0.8	285	0.7	421	0.6	171	0.6
Stationwagon	2,744	7.9	2,807	7.3	5,288	8.0	1,871	7.1
Other Auto	29	0.1	30	0.1	35	0.1	29	0.1
Unknown Type Auto	1,875	5.4	2,023	5.2	3,398	5.1	1,247	4.7
Total	**34,885**	**100.0**	**38,725**	**100.0**	**66,285**	**100.0**	**26,545**	**100.0**

Note: Double counting may occur in accident counts when passenger cars of two body types are involved.

FIGURE 21
PASSENGER CAR INVOLVED FATAL ACCIDENTS AND RELATED FATALITIES FOR 1976 TO 1981



The distribution of involved passenger cars by most harmful event is displayed in Figure 22. Collision with a motor vehicle in transport was the most harmful event for slightly more than half of the passenger cars involved in fatal accidents. Vehicles involved in collisions with other motor vehicles are further subdivided by the "manner of collision," an accident related variable associated with the first harmful event in the accident, which may be inaccurate for collisions of three or more vehicles. Collisions with nonoccupants and noncollisions together accounted for another 26.8 percent. The next most frequently cited event, "collision with tree or shrubbery," involved fewer than half the passenger cars in the nonoccupant or noncollision groups. However, if all fixed-object collisions are combined into a single category, they were cited more often than was either "collision with nonoccupant" or "noncollision."

Collisions with "other objects not fixed," cited for 2.2 percent of the involved passenger cars, are collisions with legally parked motor vehicles, railway trains, and animals. "Other fixed objects" include those not already specified, such as dividers, buildings, impact attenuators, etc.

Each of the 26,545 passenger car occupant deaths in 1981 can also be classified by the point on the vehicle at which the principal impact occurred such as a truck hitting an overpass bridge. When the terms "Front," "Rear," "Left Side," and "Right Side" are used in this report, they refer to groupings as follows:

Front	clock points 11, 12, and 1
Rear	clock points 5, 6, and 7
Left side	clock points 8, 9, and 10
Right side	clock points 2, 3, and 4

The impact points "top," "undercarriage" and "underride" are also included in Figure 23. "Top" was recorded when the vehicle incurred damage from impacting its top against an object during the accident, an example being a truck hitting a bridge overpass. "Undercarriage" refers to the underside of the vehicle. "Underride" refers to accidents in which a vehicle slides under another vehicle, the most common example being that of an automobile striking the rear or side of a tractor-trailer and continuing wholly or partly under the truck. The principal point of impact recorded for such an accident would be "underride" for the striking automobile and "undercarriage" for the struck truck.

FIGURE 22
DISTRIBUTION OF PASSENGER CARS INVOLVED IN FATAL ACCIDENTS BY MOST HARMFUL EVENT

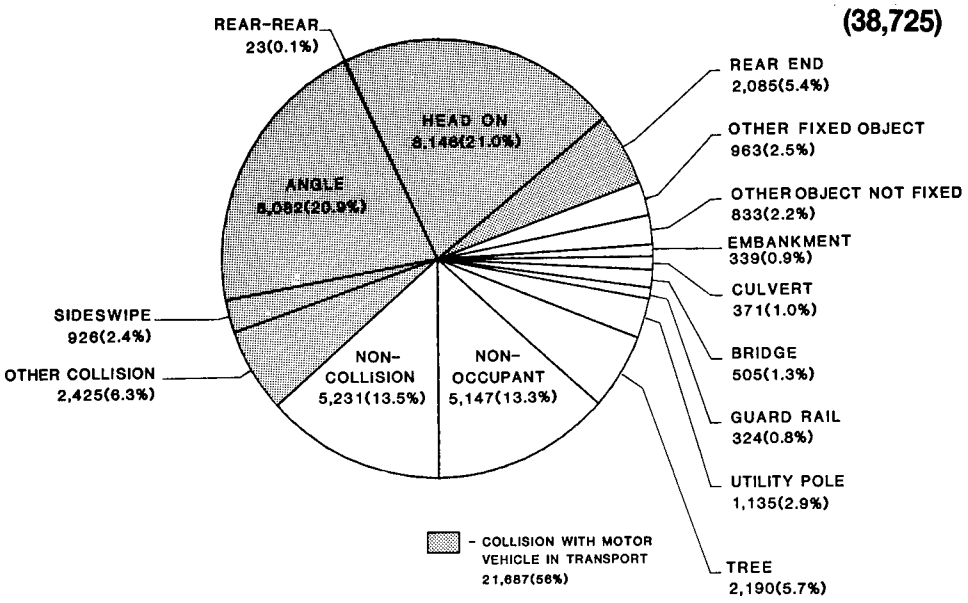
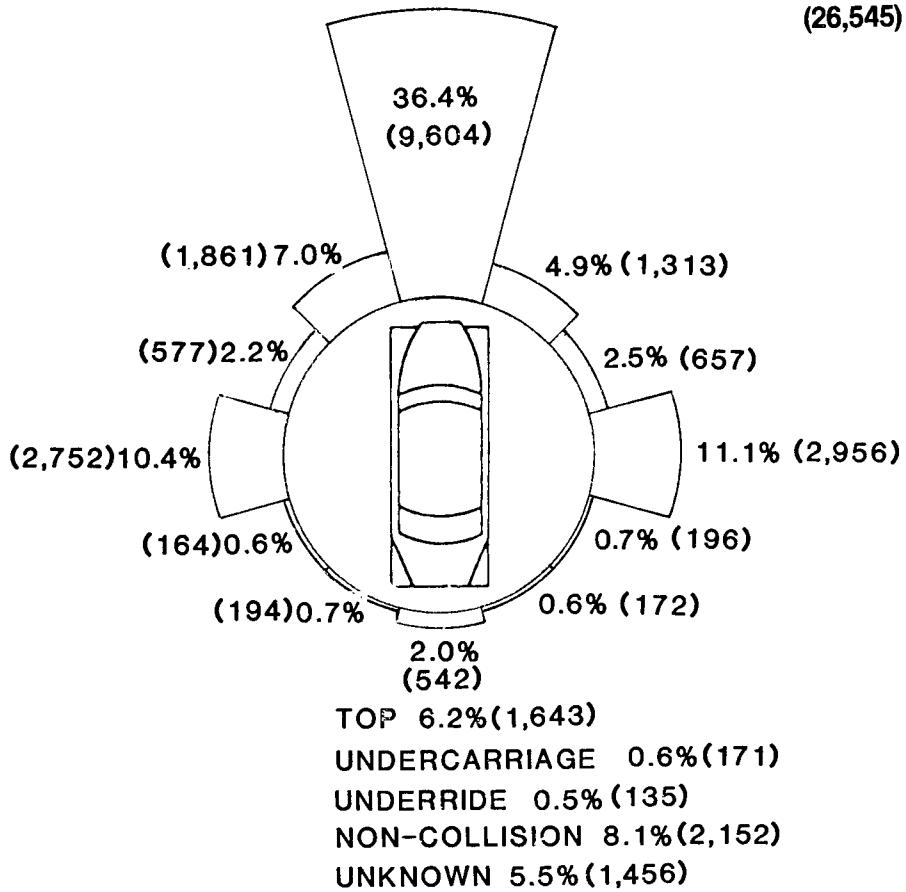


FIGURE 23
DISTRIBUTION OF PASSENGER CAR OCCUPANT FATALITIES BY POINT OF PRINCIPAL IMPACT



Noncollision data are also included. When the only event in an accident is an overturn, for example, the accident is not considered a collision and impact points are not coded.

Frontal collisions were associated with almost half of all passenger car occupant deaths. Occupant deaths were about equal for left and right side collisions and, taken together, accounted for the second largest proportion of passenger car occupant deaths (27.5 percent).

Almost one in ten (8.1 percent) passenger car occupant deaths resulted from noncollision events (e.g., overturn, gas inhalation, vehicle fire, immersion). Another 6.2 percent were associated with principal impacts to the top of the car.

Significantly, subcompact and compact size cars accounted for 14,450 (54.5 percent) of all passenger car occupant deaths, an increase of 5.7 percent over 1980 (Table 19). This increase was concurrent with a *decrease* (3.2 percent) in the same period in overall passenger car occupant fatalities, and may reflect the increasing presence of small cars in the traffic mix, although exposure data such as the number of registered vehicles in each size class are not known at this time. Small subcompact cars had 20.0 percent of the fatalities and only 15.7 percent of the involved vehicles, while large cars had 10.8 percent of the fatalities and 13.9 percent of the vehicles.

The model-year distribution of passenger car involvements in fatal accidents is compared in Figure 24 to the model-year distribution of passenger cars estimated by R.L. Polk and Company to be in operation as of July 1, 1981. The figure does not include the 143 accident-involved 1982 model-year cars because they were introduced in September 1981. Passenger cars 9 years old or older were involved in fatal accidents slightly more often than their representation in the total population would indicate. The newest model cars also appear to be over-represented.

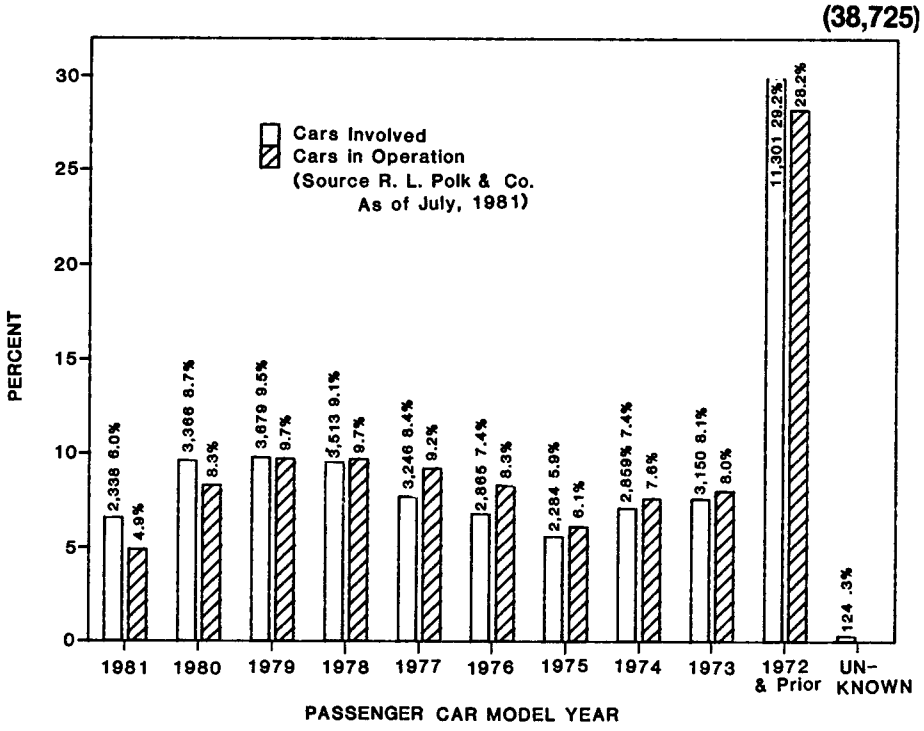
Motorcycles

The term "motorcycles," as used in this section, does not include such types of motorized cycles as mopeds, motorscooters, minibikes, and motorcycle types not specifically named in the FARS file. The total number of riders, rider fatalities, fatal accidents, and motorcycle involvements associated with

TABLE 19
PASSENGER CAR FATALITIES BY VEHICLE SIZE

	Fatalities		Vehicles Involved in Fatal Accidents	
	Number	Percent	Number	Percent
Small Subcompact Wheelbase less than 96"	5,298	20.0	6,078	15.7
Subcompact Wheelbase between 96" and 101"	2,898	10.9	3,660	9.5
Compact Wheelbase between 102" and 111"	6,254	23.6	9,015	23.3
Intermediate Wheelbase between 112" and 120"	5,671	21.4	9,756	25.2
Full Size Wheelbase greater than 120"	2,879	10.8	5,385	13.9
Other Wheelbase Unknown	3,545	13.4	4,831	12.5
Total	**26,545**	**100.0**	**38,725**	**100.0**

FIGURE 24
PASSENGER CAR INVOLVEMENT BY MODEL YEAR



mopeds, motorscooters, minibikes and unknown type motorcycles, in addition to motorcycles, are shown in Table 20.

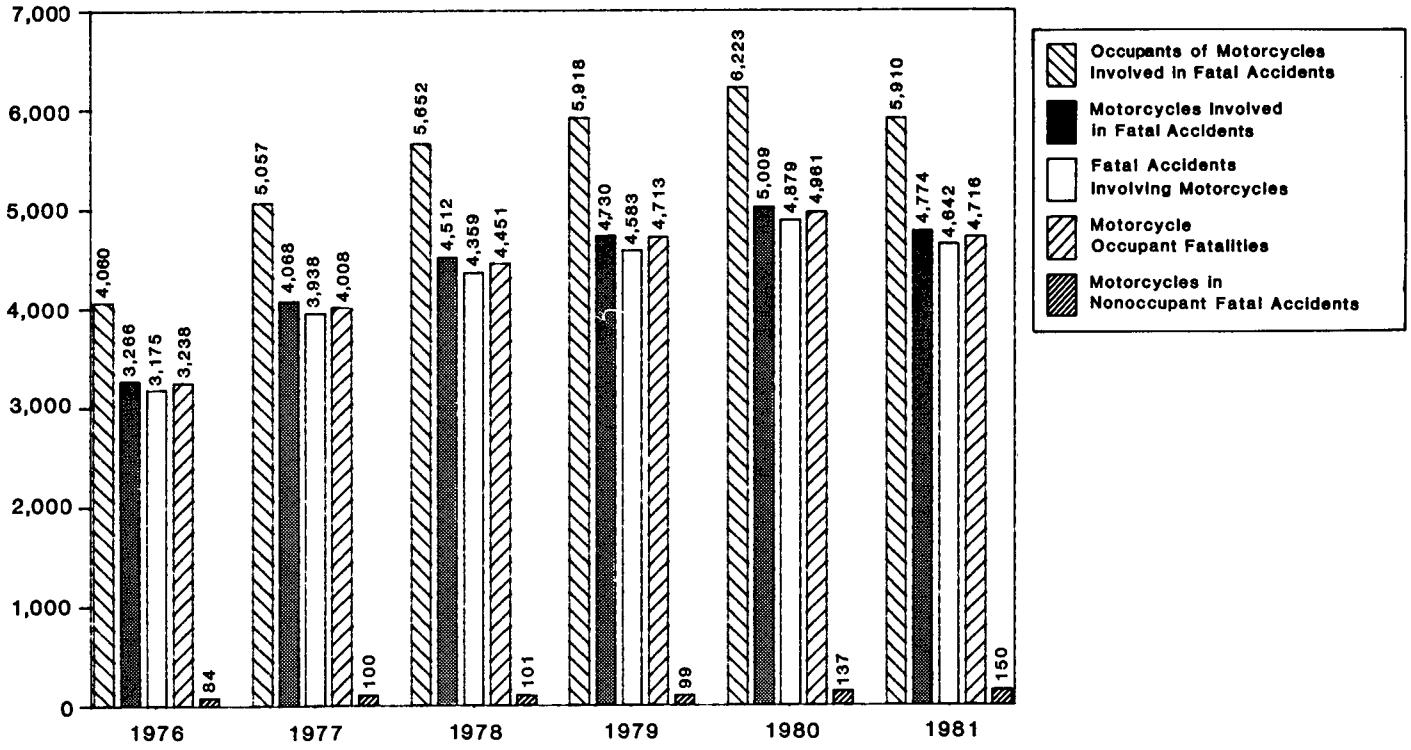
In 1981, 4,716 motorcycle riders were killed in 4,642 accidents that involved 4,774 motorcycles. The six-year history in Figure 25 illustrates that while fatal motorcycle accidents increased from 1976 to 1980, the number of accidents, motorcycles involved, and riders killed all declined in 1981, as did overall fatal accident statistics, but the number of rider fatalities continued to exceed the number of fatal motorcycle accidents. This is the only vehicle type for which this has been true. When a motorcycle was involved in a fatal accident, at least one fatality was always a motorcycle rider: 1.02 motorcyclist fatalities occurred per motorcycle involvement in 1981.

TABLE 20
ACCIDENTS, VEHICLES, OCCUPANTS AND FATALITIES BY BODY TYPE FOR MOTORCYCLES

	Accident		Vehicles		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%	Number	%
Motorcycle	4,642	96.8	4,774	96.8	5,910	96.9	4,716	96.8
Moped	105	2.0	105	2.0	121	2.0	106	2.1
Other Motorcycle	38	0.8	40	0.8	55	1.0	40	0.8
Unknown Motorcycle	12	0.3	12	0.2	14	0.2	12	0.3
Total	**4,797**	**100.0**	**4,931**	**100.0**	**6,100**	**100.0**	**4,874**	**100.0**

Note: Double counting may occur in accident count when two motorcycles of different types are involved.

FIGURE 25
MOTORCYCLE INVOLVED FATAL ACCIDENTS AND RELATED FATALITIES FOR 1976 TO 1981



As was the case with passenger cars, most motorcycles involved in fatal accidents (56.9 percent) collided with other motor vehicles in transport (Figure 26). Motorcycles involved in collisions with other vehicles are further subdivided in the figure by the "manner of collision," an accident related variable associated with the first harmful event in an accident. Also, motorcycles collided with "other fixed objects" 9.4 percent of the time, more than triple the rate of passenger car collisions in this category and more frequently than such collisions experienced by any other vehicle type considered in this chapter. As in fatal accidents involving passenger cars, collision with all types of "fixed objects" was cited more often for motorcycles than was "noncollision."

Of the 4,716 motorcycle riders killed in 1981, frontal impacts were associated even more often than was the case for passenger cars—68.7 percent of motorcycle-rider deaths (Figure 27). Only 8.5 percent of the rider fatalities resulted from noncollision events, including overturns and falls from vehicles. As with passenger cars, little difference was found between fatality rates resulting from principal impacts to the left and right sides.

FIGURE 26
DISTRIBUTION OF MOTORCYCLES INVOLVED IN FATAL ACCIDENTS BY MOST HARMFUL EVENT

(4,774)

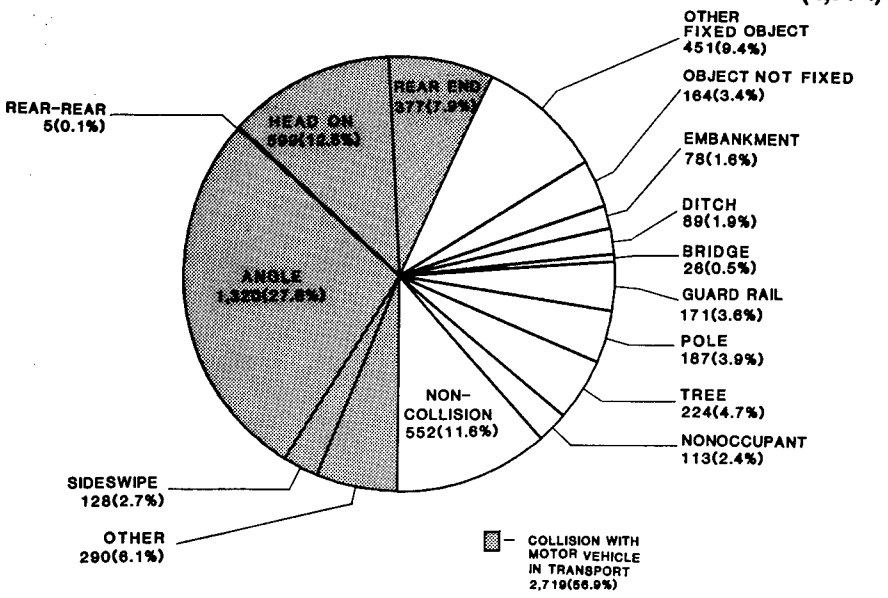
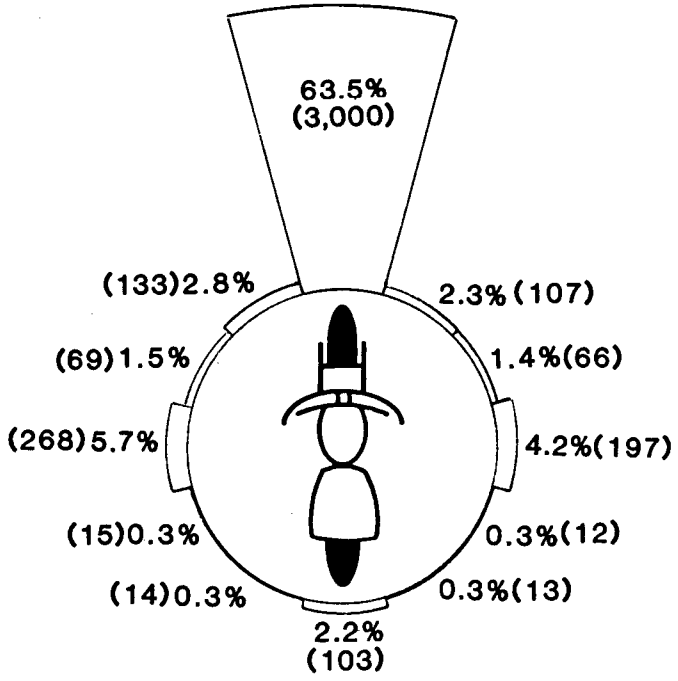


FIGURE 27
DISTRIBUTION OF MOTORCYCLE OCCUPANT FATALITIES BY POINT OF PRINCIPAL IMPACT

(4,716)



TOP 0.4%(17)
UNDERCARRIAGE 0.6%(30)
NONCOLLISION 8.5%(402)
UNKNOWN 5.7%(270)

Light Trucks

Among light trucks were included pickups, vans, and truck-based station wagons. Involvements and fatalities to occupants of these vehicles are listed in Table 21. Pickup trucks were involved more than four times as often as were vans and accounted for more than five times the occupant deaths.

For the first time in the history of the FARS file fatal accidents and occupant deaths associated with light trucks declined in 1981 (Figure 28). The 6,129 light-truck occupant deaths in 1981 represent a decrease from 1980 of 6.6 percent, a major reduction from the 10.5 percent average annual rate of increase that persisted from 1975 to 1979. The largest increase (15.2 percent) occurred from 1977 to 1978.

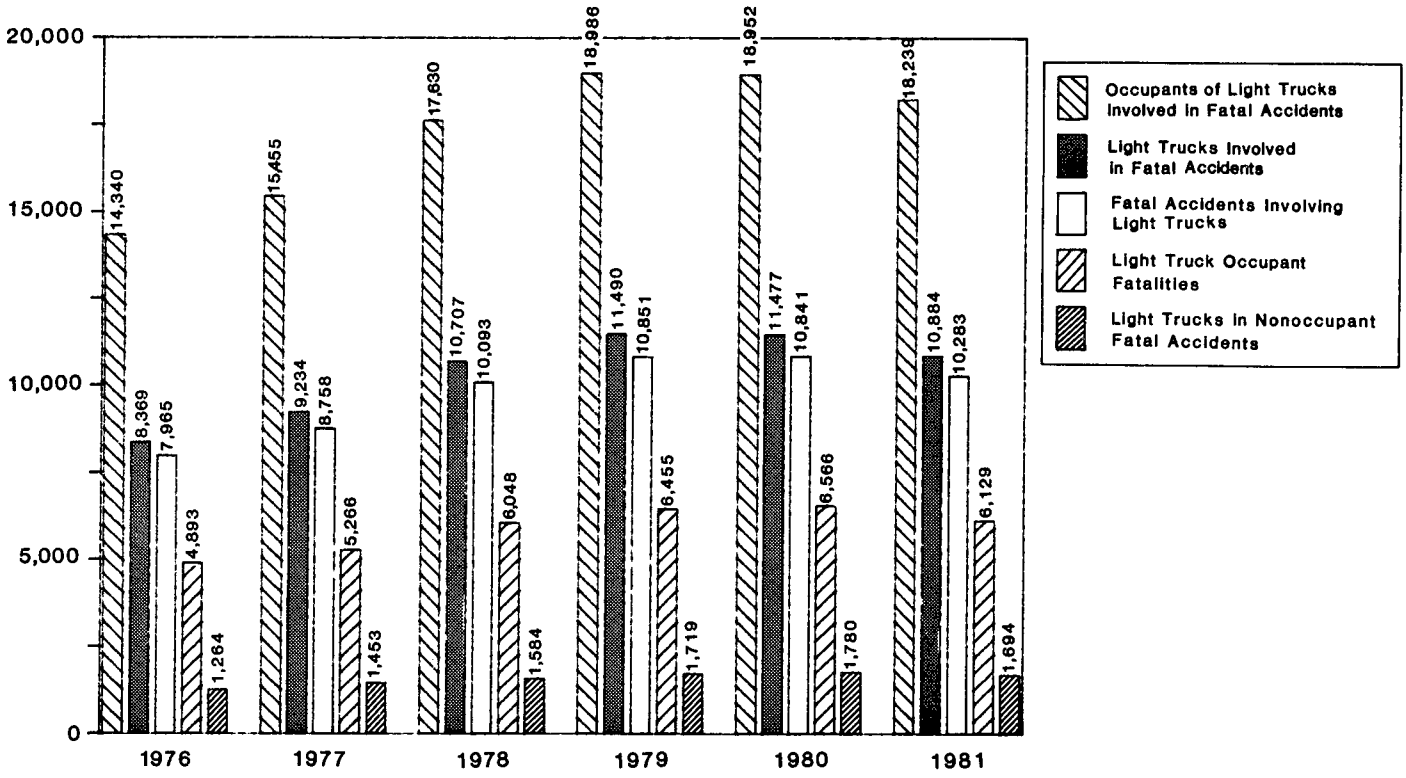
The most harmful event reported for more than half (52.0 percent) of the

TABLE 21
ACCIDENTS, VEHICLES, OCCUPANTS AND FATALITIES BY BODY TYPE FOR LIGHT TRUCKS

	Accident		Vehicle		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%	Number	%
Pickup	8,343	78.0	8,765	80.5	14,218	78.0	5,091	83.1
Van	1,955	18.7	1,983	18.2	3,728	20.4	956	15.6
Truck Based Stationwagon	136	1.3	136	1.2	293	1.6	82	1.3
Total	**10,434**	**100.0**	**10,884**	**100.0**	**18,239**	**100.0**	**6,129**	**100.0**

Note: Double counting may occur in accident count when two light trucks of different body type are involved.

FIGURE 28
LIGHT TRUCK INVOLVED FATAL ACCIDENTS AND RELATED FATALITIES FOR 1976 TO 1981



10,884 light trucks involved in 1981 fatal accidents (Figure 29) was collision with a motor vehicle in transport. Light trucks involved in collisions with other vehicles are further subdivided in the figure by the "manner of collision," an accident related variable associated with the first harmful event in an accident. Noncollision events were cited for another 21.0 percent, including falls from the vehicle, overturns, fires, explosions, gas inhalations, injury in the vehicle, immersions, and other noncollisions. Light trucks collided with nonoccupants in 13.2 percent of the fatal accidents involving light trucks. This was almost the same as that reported for passenger cars (Figure 29 and 22).

The 7.7 percent of occupant deaths associated with "top" principal impacts on light trucks was the largest for any vehicle thus far examined (Figure 30). Again, as with cars and motorcycles, frontal impacts accounted for the single largest share of occupant fatalities (49.4 percent).

FIGURE 29
DISTRIBUTION OF LIGHT TRUCKS INVOLVED IN FATAL ACCIDENTS BY MOST HARMFUL EVENT

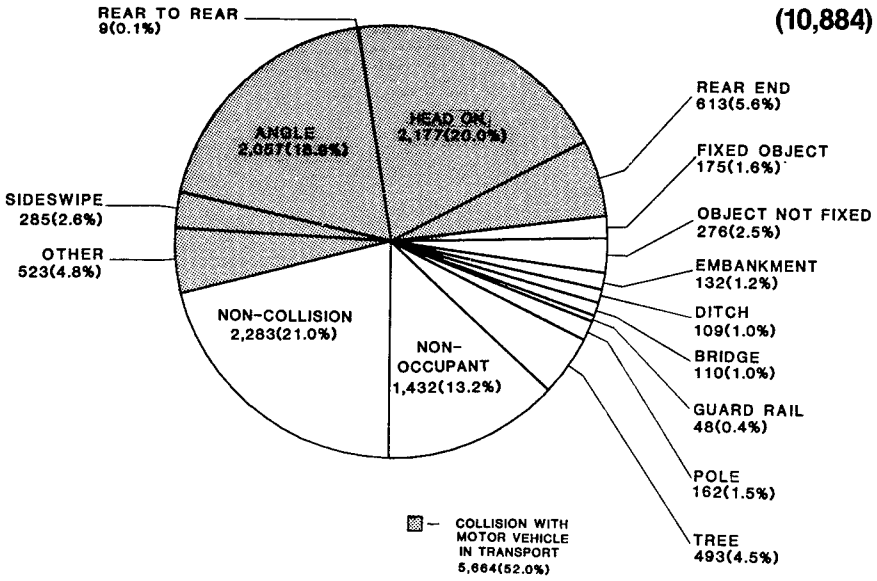
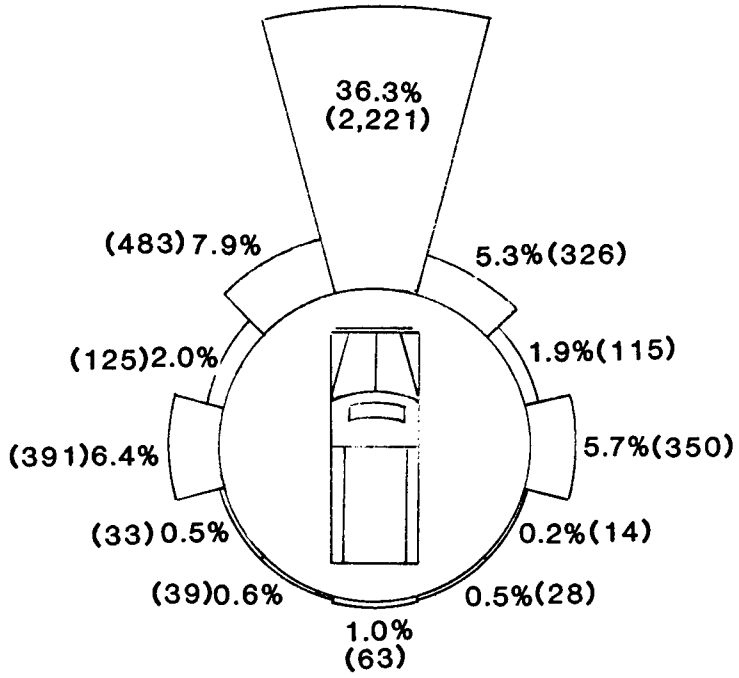


FIGURE 30
DISTRIBUTION OF LIGHT TRUCK OCCUPANT FATALITIES BY POINT OF PRINCIPAL IMPACT



TOP 7.7%(473)

UNDERCARRIAGE 0.9%(55)

UNDERRIDE 0.4%(22)

NON-COLLISION 19.0%(1,166)

UNKNOWN 3.7% (225)

Medium Trucks

"Medium trucks" are defined as single-unit trucks with gross vehicle weights (GVW) between 10,000 and 26,000 pounds. Single-unit trucks of unknown GVW are also included in this group. Table 22 lists vehicle involvements and occupant fatalities for each of the body types.

Fatal accidents involved fewer medium trucks (888) than the other vehicle types, except buses. This has been true every year that FARS has been collecting data. The history of these accidents and of medium truck occupant deaths is shown in Figure 31. The 18.7 percent decrease in fatal accident involvements from 1980 is surpassed by an even larger decrease (17.5 percent) in occupant fatalities to 235 in 1981.

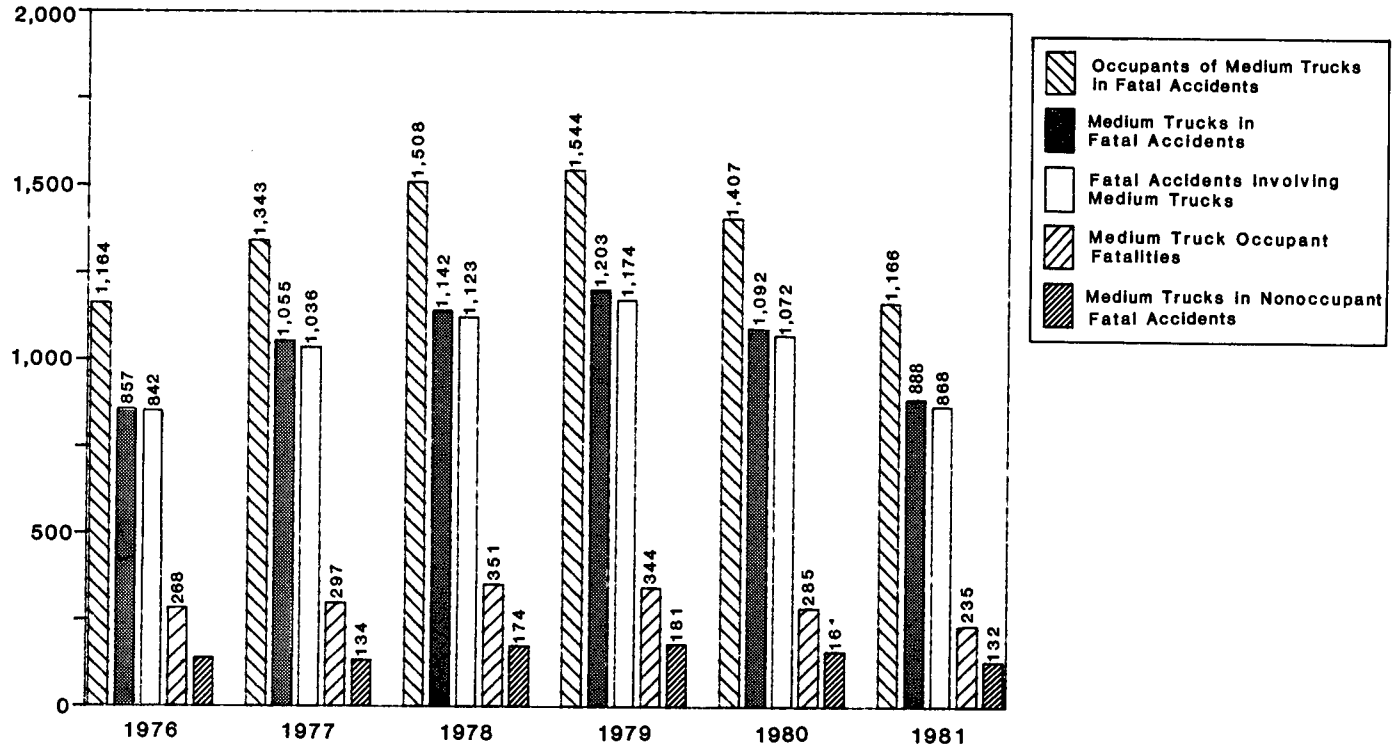
To an even greater degree than the fatal accident experience of other vehicle types considered, the most harmful event cited for most medium truck involvements in 1981 fatal accidents (95.3

TABLE 22
ACCIDENTS, VEHICLES, OCCUPANTS AND FATALITIES BY BODY TYPE FOR MEDIUM TRUCKS

	Accident		Vehicle		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%	Number	%
Single Unit Truck								
10,000 < GVW < 19,501	419	48.1	425	47.9	594	50.9	129	54.9
19,500 < GVW < 26,001	148	17.0	148	16.7	187	16.0	32	13.6
Unknown GVW	304	35.0	315	35.5	385	33.0	74	31.5
Total	**871**	**100.0**	**888**	**100.0**	**1,166**	**100.0**	**235**	**100.0**

Note: Double counting may occur in accident count when two medium trucks of different type are involved.

FIGURE 31
MEDIUM TRUCK INVOLVED FATAL ACCIDENTS AND RELATED FATALITIES FOR 1976 TO 1981



percent) was one of the following (Figure 32):

- Collision with Motor Vehicle in Transport (71.0 percent)
- Noncollision (13.0 percent)
- Collision with Nonoccupant (11.3 percent)

Medium trucks involved in collisions with other vehicles are further subdivided in the figure by the "manner of collision," an accident related variable associated with the first harmful event in an accident.

Also as with other vehicle types, frontal principal impacts accounted for the largest share (38.8 percent) of occupant deaths (Figure 33). However, the proportions of occupant deaths that resulted from top impacts and noncollisions were larger for medium trucks than for all other vehicle types except heavy trucks. Combined, they accounted for 33.6 percent of medium-truck occupant deaths. In FARS, underride is not applicable for this type vehicle.

FIGURE 32
DISTRIBUTION OF MEDIUM TRUCKS INVOLVED IN FATAL ACCIDENTS BY MOST HARMFUL EVENT

(888)

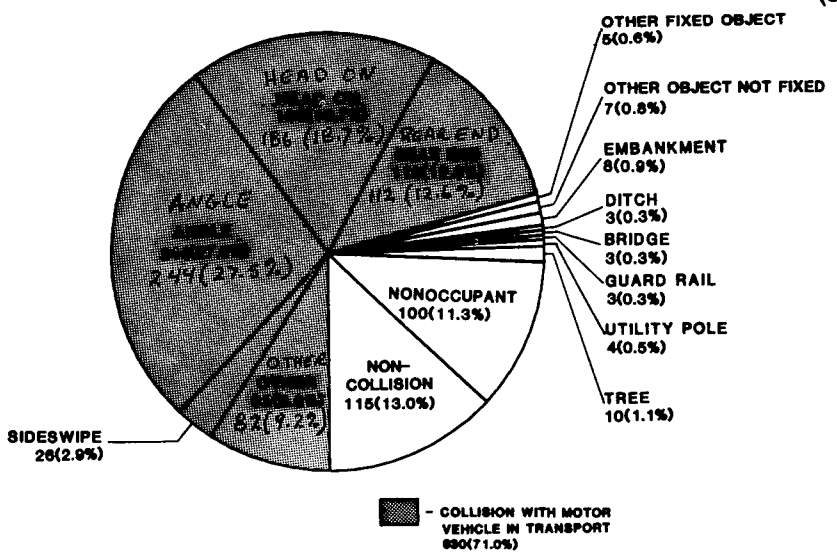
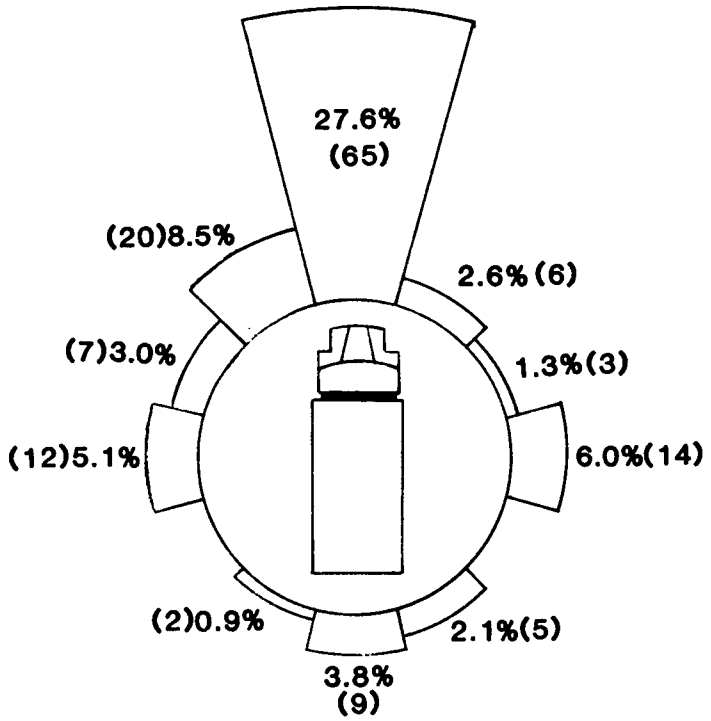


FIGURE 33
DISTRIBUTION OF MEDIUM TRUCK OCCUPANT FATALITIES BY POINT OF PRINCIPAL IMPACT

(235)



TOP 8.1%(19)

UNDERCARRIAGE 1.7%(4)

NON-COLLISION 25.5%(60)

UNKNOWN 3.8%(9)

Heavy Trucks

"Heavy trucks" include (1) single unit trucks with GVW greater than 26,000 pounds, (2) tractor-trailer combinations, (3) trucks with cargo trailer(s), and (4) truck-tractors pulling no trailer. In 1981, 4,317 heavy trucks were involved in fatal accidents and 896 of their occupants were killed. The distribution of these vehicles and deaths by body type is shown in Table 23.

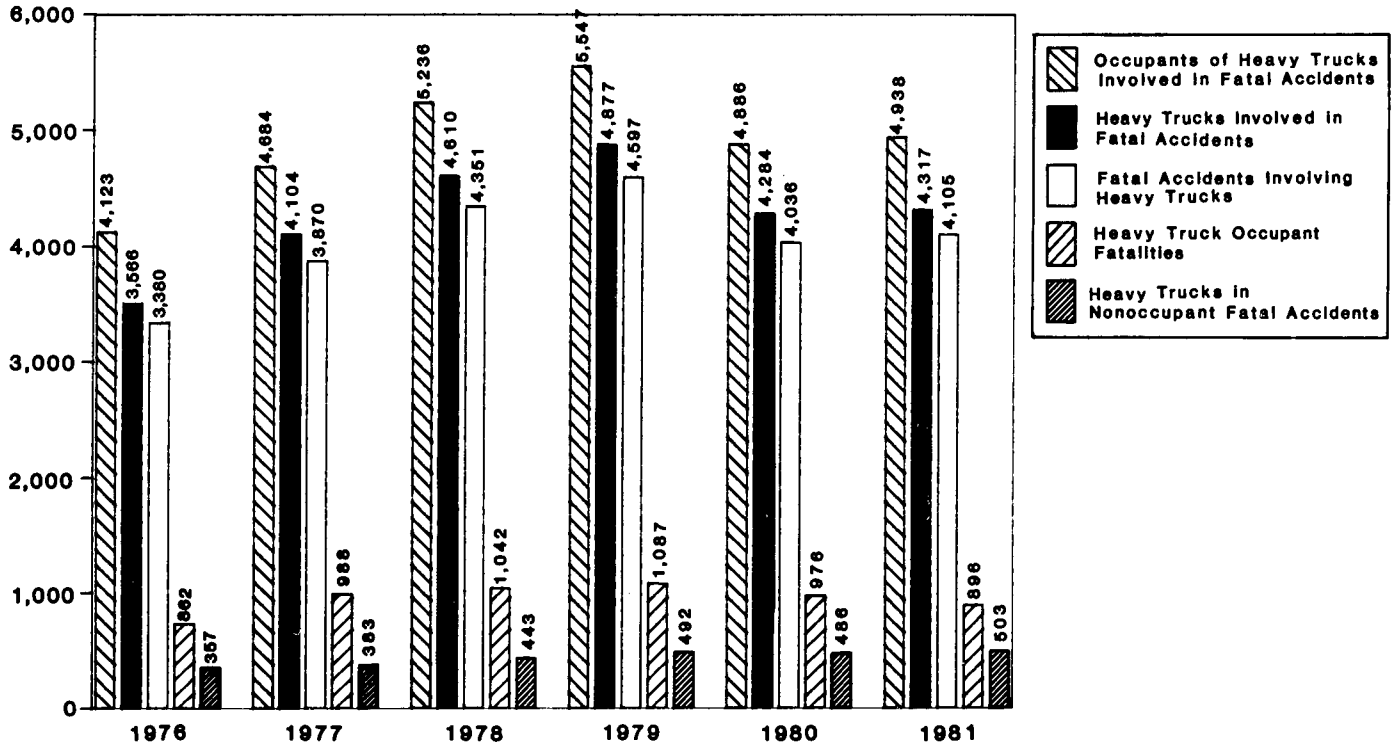
The six-year history (Figure 34) illustrates that while the number of heavy trucks involved in fatal accidents increased sharply from 1976 to 1979, the number of occupants in these trucks who were killed increased more slowly. As a result, the gap between involvements and occupant deaths widened. Since 1979, both involvements and occupant deaths have declined as has the difference between the two. Occupant deaths in 1981 decreased 8.2 percent from 1980.

TABLE 23
ACCIDENTS, VEHICLES, OCCUPANTS AND FATALITIES BY BODY TYPE FOR HEAVY TRUCKS

	Accident		Vehicle		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%	Number	%
Single Unit Truck GVW > 26,000 lbs.	334	8.1	338	7.8	382	7.7	57	6.4
Two-Unit Truck	3,539	85.8	3,721	86.2	4,243	85.9	781	87.2
Multi-Unit Truck	150	3.6	154	3.6	183	3.7	34	3.7
Truck-Tractor	103	2.5	104	2.4	130	2.7	24	2.7
Total	**4,126**	**100.0**	**4,317**	**100.0**	**4,938**	**100.0**	**896**	**100.0**

Note: Double counting may occur in accident count when two heavy trucks of different types are involved.

FIGURE 34
HEAVY TRUCK INVOLVED FATAL ACCIDENTS AND RELATED FATALITIES FOR 1976 TO 1981



Almost three-quarters of the 4,317 heavy trucks involved in fatal accidents (73.7 percent) had a "collision with a motor vehicle in transport" considered the most harmful event, a proportion larger than that of involvements by any of the other vehicle types considered thus far (Figure 35). Heavy trucks involved in collisions with other vehicles are further subdivided in the figure by the "manner of collision," an accident related variable associated with the first harmful event in an accident. Conversely, the proportion of heavy trucks that experienced noncollisions as the most harmful event (12.3 percent) and the proportion that experienced collisions with nonoccupants (8.5 percent) were both smaller than those of any of the other vehicle types except motorcycles.

Vehicle size appears to correlate well with the likelihood of occupant fatality resulting from top impacts (Figure 36). As the size of the vehicle under consideration increases from motorcycle to heavy truck, the proportion of occupant deaths associated with top principal impacts also increases. Top impact was involved in 8.9 percent of the 896 heavy-truck occupant deaths.

As with other vehicle types, frontal impacts are associated with the largest proportion of occupant fatalities. Underride is not applicable to this vehicle type.

FIGURE 35
DISTRIBUTION OF HEAVY TRUCKS INVOLVED IN FATAL ACCIDENTS BY MOST HARMFUL EVENT

(4,317)

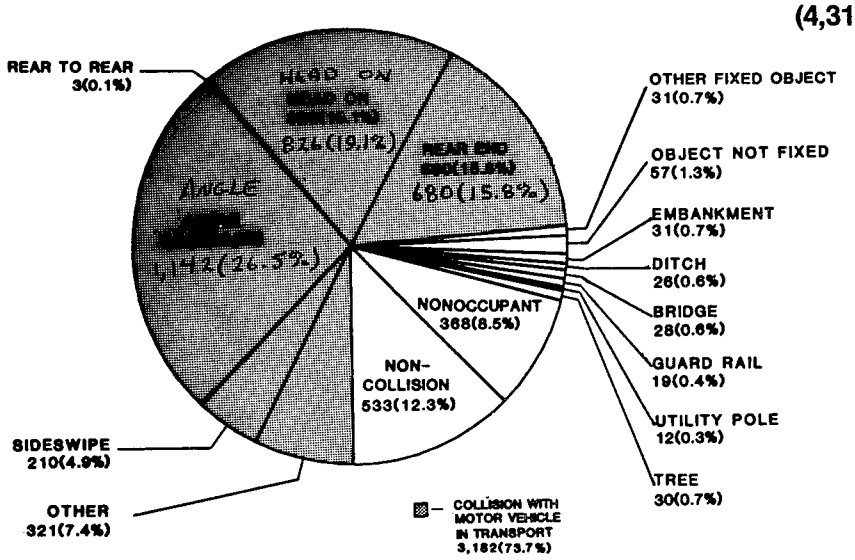
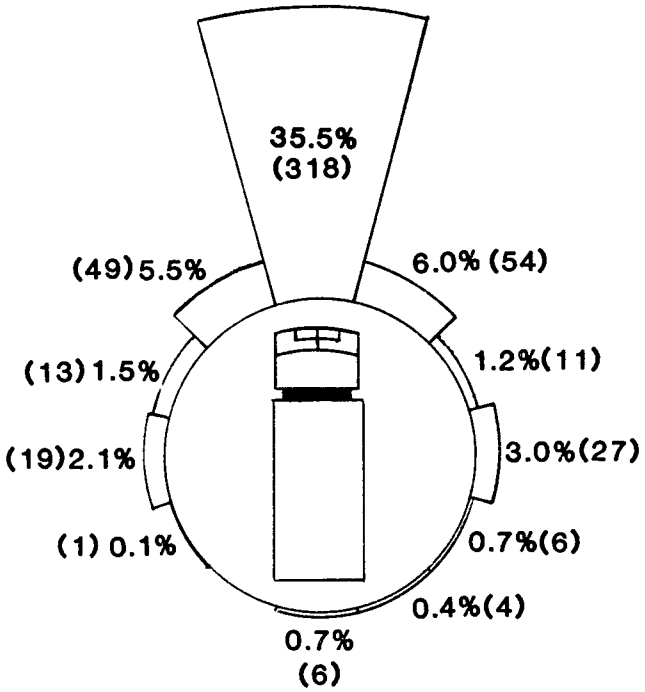


FIGURE 36
DISTRIBUTION OF HEAVY TRUCK OCCUPANT FATALITIES BY POINT OF PRINCIPAL IMPACT

(896)



TOP 8.9%(80)

UNDERCARRIAGE 1.1%(10)

NON-COLLISION 27.5%(246)

UNKNOWN 5.8%(52)

School Buses

This category includes both vehicles *designed* as buses and used in school transportation and vehicles of any body type *functioning* as school buses. (Table 24 includes accident involvements and occupant fatalities for both those school buses *designed* as buses and equivalent data for buses other than those used in school-related transportation.)

A vehicle *functioning* as a school bus is a motor vehicle of any body type which satisfies the following criteria:

- It is externally identifiable from other traffic as a school/pupil transport vehicle;
- It is operated or owned by a public or private school-type institution;
- The institution's students can range from pre-school through high school;
- Its occupants, if any, are associated with the institution; and,
- The vehicle is in operation to or from the school or on a school-sponsored activity at the time of the accident.

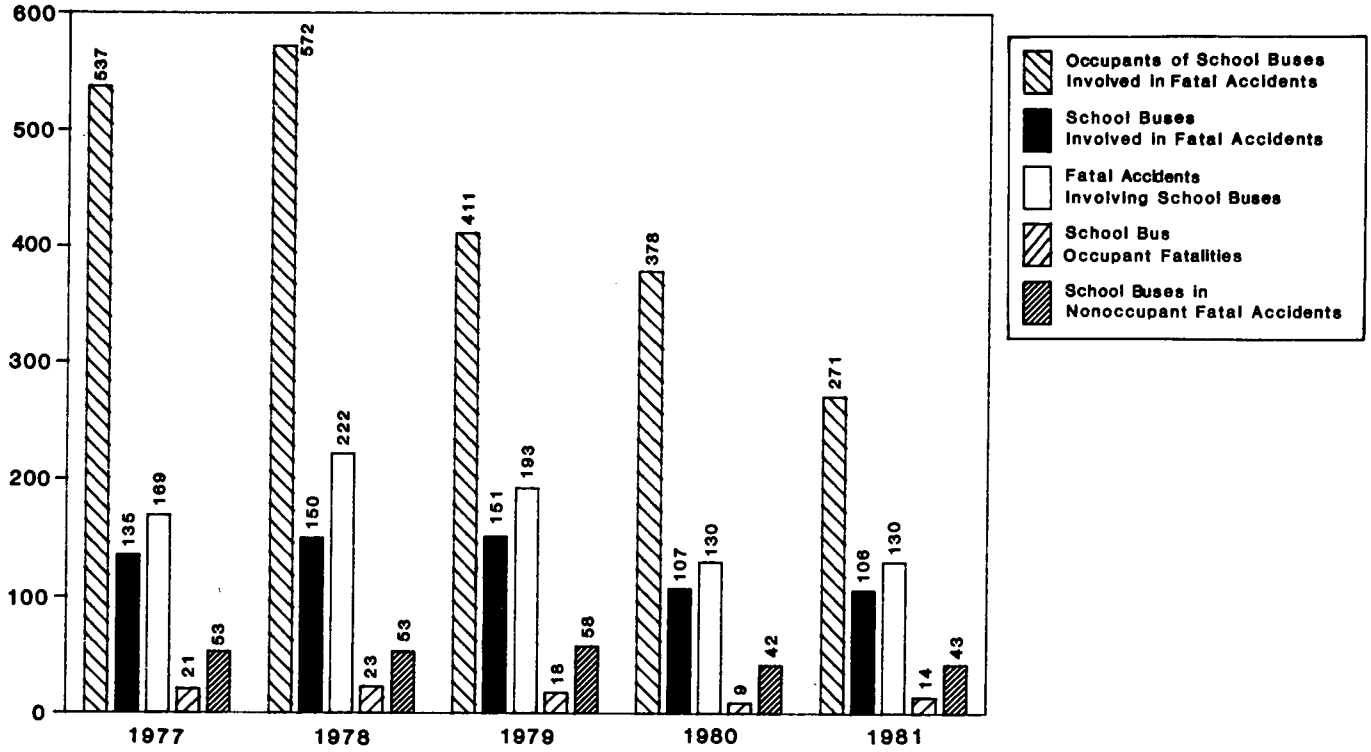
In FARS, a "school bus-related accident" is any fatal accident in which a vehicle functioning as a school bus is either directly or indirectly involved. Thus the category includes, for example, any accident in which a child disembarking from a school bus is struck by another vehicle. The fact that the child was struck after exiting the bus permits the accident to be classified as school bus-related even though the bus was neither a struck nor striking vehicle. Occupants of those vehicles which did not have the typical school bus body type but which were functioning as school buses were included with school bus occupants.

School bus-related accidents have been decreasing since 1978 (Figure 37). The number of deaths declined 50 percent in 1980 from 1979, and 29.1 percent

TABLE 24
ACCIDENTS, VEHICLES, OCCUPANTS AND FATALITIES BY BODY TYPE FOR BUSES

	Accident		Vehicle		Occupants		Occupant Fatalities	
	Number	%	Number	%	Number	%	Number	%
School Bus	109	32.2	110	32.3	272	27.0	12	21.4
Cross Country	48	14.2	48	14.1	231	22.9	6	10.7
Transit Bus	149	44.0	149	43.7	309	30.6	23	41.1
Other Bus	20	5.9	20	5.9	142	14.1	11	19.6
Unknown Bus Type	13	3.8	14	4.1	55	5.5	4	7.1
Total	**339**	**100.0**	**341**	**100.0**	**1,009**	**100.0**	**56**	**100.0**

FIGURE 37
SCHOOL BUS INVOLVED FATAL ACCIDENTS AND RELATED FATALITIES FOR 1977 TO 1981



fewer buses were involved in fatal accidents. In 1981 the downward trend continued, with 143 deaths (down 4.6 percent from 1980) and 106 buses involved in accidents (down 0.9 percent from 1980). A smaller proportion (4.5 percent) of the occupants of school buses that were involved in fatal accidents in 1981 were themselves killed in those accidents than was the case for accident-involved occupants of any of the other types of vehicles considered in this chapter.

The 130 school bus-related accidents in 1981 resulted in 143 deaths. Forty-eight persons killed were nonoccupants and 95 were vehicle occupants, but only 14 of these were occupants of school buses. In Figure 38, which presents a further distribution of these fatalities, "other drivers" and "other passengers" were occupants of involved vehicles which were neither school buses nor vehicles being used as school buses.

The age distribution of the 45 pedestrians killed in the school bus accidents is depicted in Figure 39. Children under nine accounted for about two-thirds of the pedestrian fatalities. The three pedalcyclists reported killed were all in the 10–14 year old group.

FIGURE 38
DISTRIBUTION OF FATALITIES IN FATAL ACCIDENTS INVOLVING SCHOOL BUSES
(143)

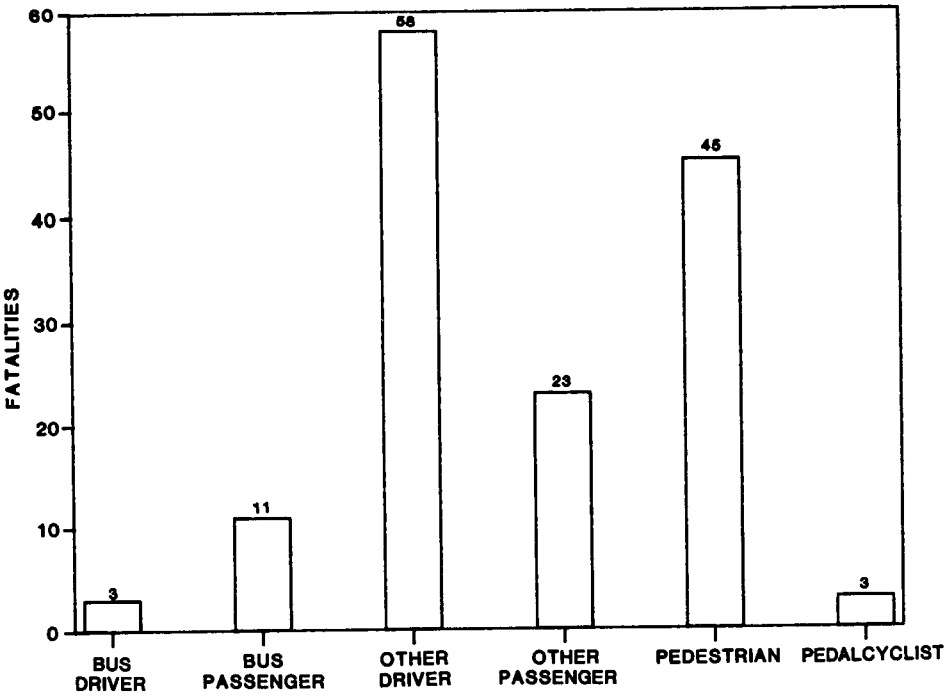
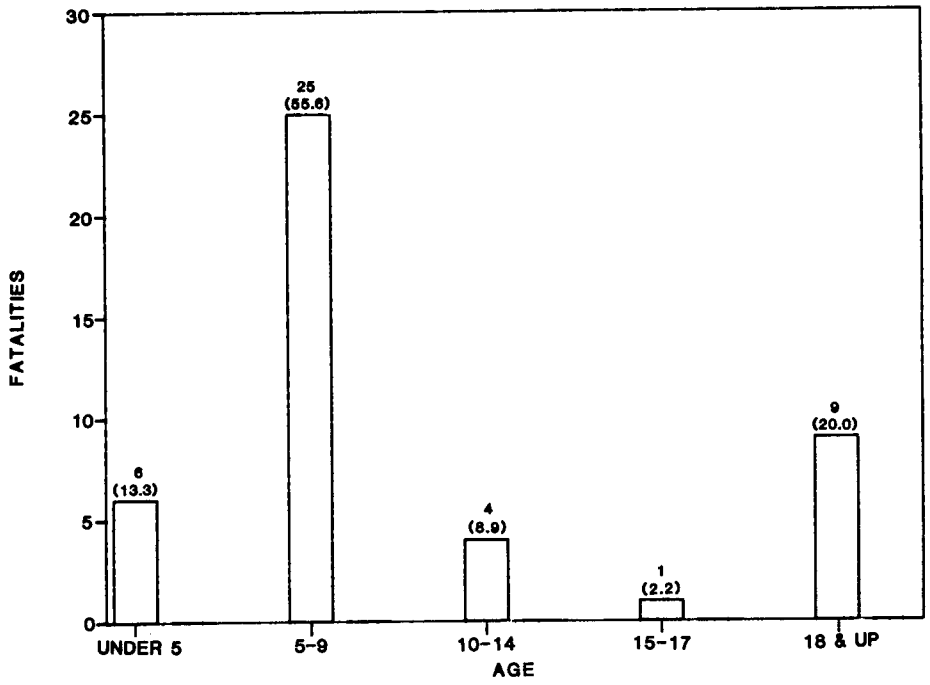
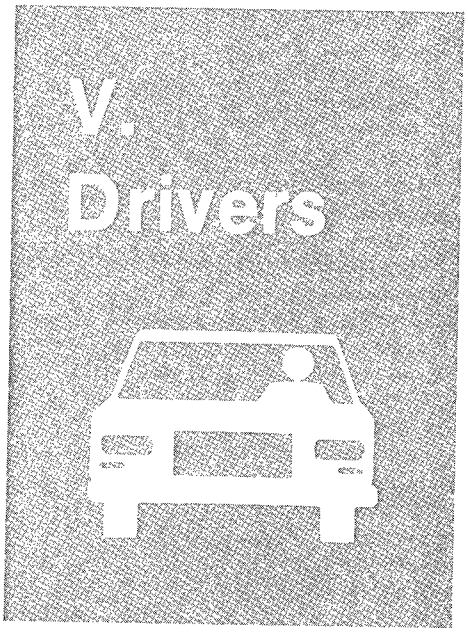


FIGURE 39
PEDESTRIAN FATALITIES IN FATAL SCHOOL BUS ACCIDENTS
(45)



V. Drivers



In 1981, 62,120 drivers were involved in fatal accidents. These were vehicle operators, the "persons behind the wheel," whether or not they were properly licensed. In preparing strategies for highway safety, it is useful to examine the distributions of these individuals by age, severity of injuries sustained, driving record and, particularly, alcohol involvement.

Drivers involved in fatal accidents in 1981 are classified according to age groupings and types of vehicle driven (Table 25). The "other" body types in the motorcycle vehicle class (mopeds, minibikes, motorscooters, and others) are included to provide driver-age distributions for these types of vehicles. The "other" vehicle category consists of buses, special vehicles and unknown truck vehicle types. A distribution by single- and multiple-vehicle accident involvement is also included. Four out of five drivers were male (50,272—80.9 percent) and 18.5 percent were female (11,488). The sex of the other 360 was unknown.

More than 35 percent of all drivers involved in fatal accidents in 1981 were less than 25 years old. This age group accounted for about half of the involved motorcycle drivers, about 33 percent of the drivers of involved light trucks, and 13.1 percent of the drivers of heavy trucks.

It is noteworthy that drivers in the 16–19 age group were about evenly divided between single-vehicle and multi-vehicle fatal accidents, but that older driver groups were progressively less involved in single-vehicle accidents compared to their involvements in multi-vehicle accidents.

TABLE 25
AGE OF DRIVERS INVOLVED IN FATAL ACCIDENTS BY VEHICLE TYPE (62,120)

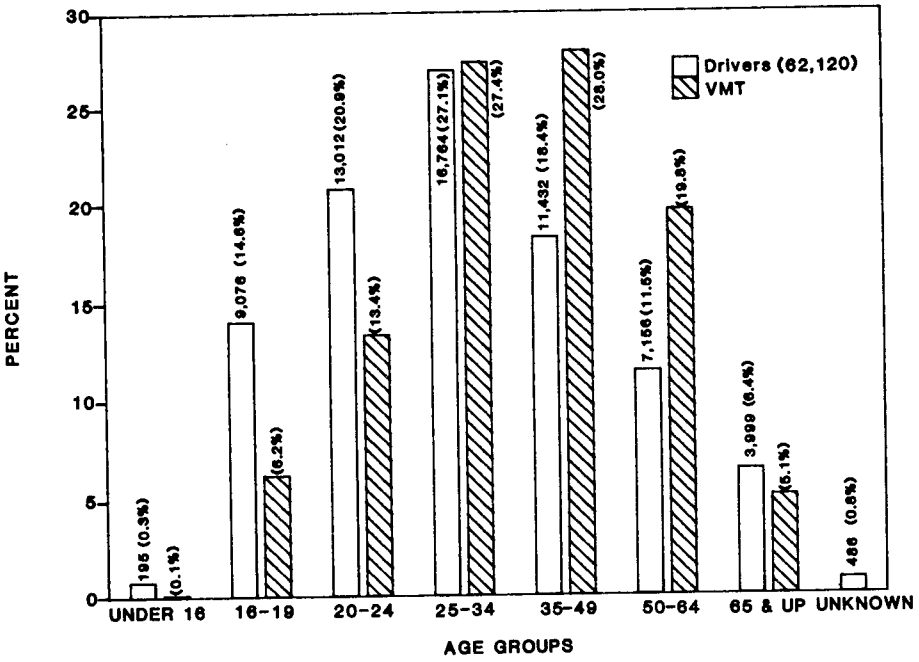
	15 and Under		16-19		20-24		25-34		35-49	
	Number	%	Number	%	Number	%	Number	%	Number	%
Vehicle Type										
Passenger Car	198	41.2	6,244	71.0	8,174	62.8	9,633	57.5	6,296	55.1
Motorcycle	128	26.6	744	8.5	1,503	11.6	1,684	10.0	558	4.9
Moped, Mini Bike, etc.	48	10.0	26	0.3	18	0.1	20	0.1	10	0.1
Light Trucks	70	14.6	1,313	14.9	2,161	16.6	3,048	18.2	2,244	19.6
Medium Trucks	2	0.4	72	0.8	159	1.2	254	1.5	209	1.8
Heavy Trucks	1	0.2	57	0.6	504	3.9	1,409	8.4	1,538	13.5
Unknown	5	1.0	46	0.5	86	0.7	112	0.7	70	0.6
Other	29	6.0	288	3.3	407	3.1	604	3.6	507	4.4
Number of Vehicles in Accident										
Single	204	42.4	4,199	47.8	6,096	46.8	6,977	41.6	4,194	36.7
Multiple	277	57.6	4,591	52.2	6,916	53.2	9,787	58.4	7,238	63.3
Total	**481**	**100.0**	**8,790**	**100.0**	**13,012**	**100.0**	**16,764**	**100.0**	**11,432**	**100.0**

TABLE 25 — Continued
AGE OF DRIVERS INVOLVED IN FATAL ACCIDENTS BY VEHICLE TYPE

	50-64		65 and Over		Unknown		Total	
	Number	%	Number	%	Number	%	Number	%
Vehicle Type								
Passenger Car	4,503	62.9	3,244	81.1	114	23.5	38,406	61.8
Motorcycle	113	1.6	29	0.7	4	0.8	4,763	7.7
Moped, Mini Bike, etc.	19	0.3	16	0.4			157	0.3
Light Trucks	1,368	19.1	547	13.7	23	4.7	10,774	17.3
Medium Trucks	144	2.0	24	0.6			864	1.4
Heavy Trucks	726	10.1	40	1.0	6	1.2	4,281	6.9
Unknown	37	0.5	22	0.6	330	67.9	708	1.1
Other	246	3.4	77	1.9	9	1.9	2,167	3.5
Number of Vehicles in Accident								
Single	2,453	34.3	1,176	29.4	79	16.3	25,378	40.9
Multiple	4,703	65.7	2,823	70.6	407	83.7	36,742	59.1
Total	**7,156**	**100.0**	**3,999**	**100.0**	**486**	**100.0**	**62,120**	**100.0**

Figure 40 compares drivers in fatal accidents with Vehicle Miles Traveled (VMT) from the 1977-78 National Personal Transportation Survey, the only available information on driver exposure by age. Young drivers have far more fatal accidents per vehicle mile traveled than do older drivers, although the accident rate also increases for drivers over 65.

FIGURE 40
DRIVERS IN FATAL ACCIDENTS AND ANNUAL VMT BY AGE



Fridays and Saturdays proved to be the worst days for drivers to be on the road (37.1 percent of the 62,120 driver-involvements in fatal accidents) and nighttime hours (8:00 p.m. to 4:00 a.m.) were the worst times (45.1 percent). Again, younger drivers were the most likely to be involved in fatal accidents during those times (Tables 26 and 27).

Table 28 provides data on restraint use by drivers, in single occupant vehicles *only*, similar to data covered in the next chapter on all occupants. The table indicates that only 8.4 percent of the drivers with known restraint use were restrained, less than the 12 percent who use restraints according to the National Accident Sampling System (NASS). The high fatality rate for restrained drivers is a result of the peculiar nature of this subset, in that drivers of single-occupant vehicles are included in FARS *only* if they die or if they cause a fatality in another vehicle or to a nonoccupant.

TABLE 26
NUMBER OF DRIVERS IN FATAL ACCIDENTS BY AGE AND DAY OF WEEK (62,120)

	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Total
14 and Under	41	34	24	19	27	23	27	195
Percent	21.0	17.4	12.3	9.7	13.8	11.8	13.8	100.0
15-19	2,068	1,656	863	936	942	1,052	1,559	9,076
Percent	22.8	18.2	9.5	10.3	10.4	11.6	17.2	100.0
20-24	3,055	2,399	1,300	1,171	1,362	1,646	2,079	13,012
Percent	23.5	18.4	10.0	9.0	10.5	12.6	16.0	100.0
25-34	3,487	2,686	1,794	1,811	1,891	2,301	2,794	16,764
Percent	20.8	16.0	10.7	10.8	11.3	13.7	16.7	100.0
35-49	2,244	1,555	1,337	1,381	1,495	1,541	1,879	11,432
Percent	19.6	13.6	11.7	12.1	13.1	13.5	16.4	100.0
50-64	1,205	953	919	924	914	1,066	1,175	7,156
Percent	16.8	13.3	12.8	12.9	12.8	14.9	16.4	100.0
65 and Over	591	479	539	556	578	591	665	3,999
Percent	14.8	12.0	13.5	13.9	14.5	14.8	16.6	100.0
Unknown	100	77	48	68	67	41	85	486
Percent	20.6	15.8	9.9	14.0	13.8	8.4	17.5	100.0
Total	**12,791**	**9,839**	**6,824**	**6,866**	**7,276**	**8,261**	**10,263**	**62,120**
Percent	**20.6**	**15.8**	**11.0**	**11.1**	**11.7**	**13.3**	**16.5**	**100.0**

TABLE 27
NUMBER OF DRIVERS IN FATAL ACCIDENTS BY AGE AND TIME OF DAY (62,120)

	Time of Day							
	Mid-3:59 a.m.	4:00-7:59 a.m.	8:00-11:59 a.m.	Noon-3:59 p.m.	4:00-7:59 p.m.	8:00-11:59 p.m.	Unknown	Total
14 and Under	13	2	21	61	64	34		195
Percent	6.7	1.0	10.8	31.3	32.8	17.4		100.0
15-19	2,345	624	628	1,200	1,823	2,423	33	9,076
Percent	25.8	6.9	6.9	13.2	20.1	26.7	0.4	100.0
20-24	3,686	1,287	867	1,504	2,497	3,119	52	13,012
Percent	28.3	9.9	6.7	11.6	19.2	24.0	0.4	100.0
25-34	3,725	1,530	1,420	2,164	3,744	4,116	65	16,764
Percent	22.2	9.1	8.5	12.9	22.3	24.6	0.4	100.0
35-49	1,875	1,054	1,261	1,880	2,740	2,594	28	11,432
Percent	16.4	9.2	11.0	16.4	24.0	22.7	0.2	100.0
50-64	708	651	990	1,557	1,886	1,346	18	7,156
Percent	9.9	9.1	13.8	21.8	26.4	18.8	0.3	100.0
65 and Over	125	199	933	1,265	977	489	11	3,999
Percent	3.1	5.0	23.3	31.6	24.4	12.2	0.3	100.0
Unknown	98	52	44	63	105	123	1	486
Percent	20.2	10.7	9.1	13.0	21.6	25.3	0.2	100.0
Total	**12,575**	**5,399**	**6,164**	**9,694**	**13,836**	**14,244**	**208**	**62,120**
Percent	**20.2**	**8.7**	**9.9**	**15.6**	**22.3**	**22.9**	**0.3**	**100.0**

TABLE 28
RESTRAINT USE AND INJURY SEVERITY—DRIVERS IN SINGLE OCCUPANT VEHICLES (36,144)

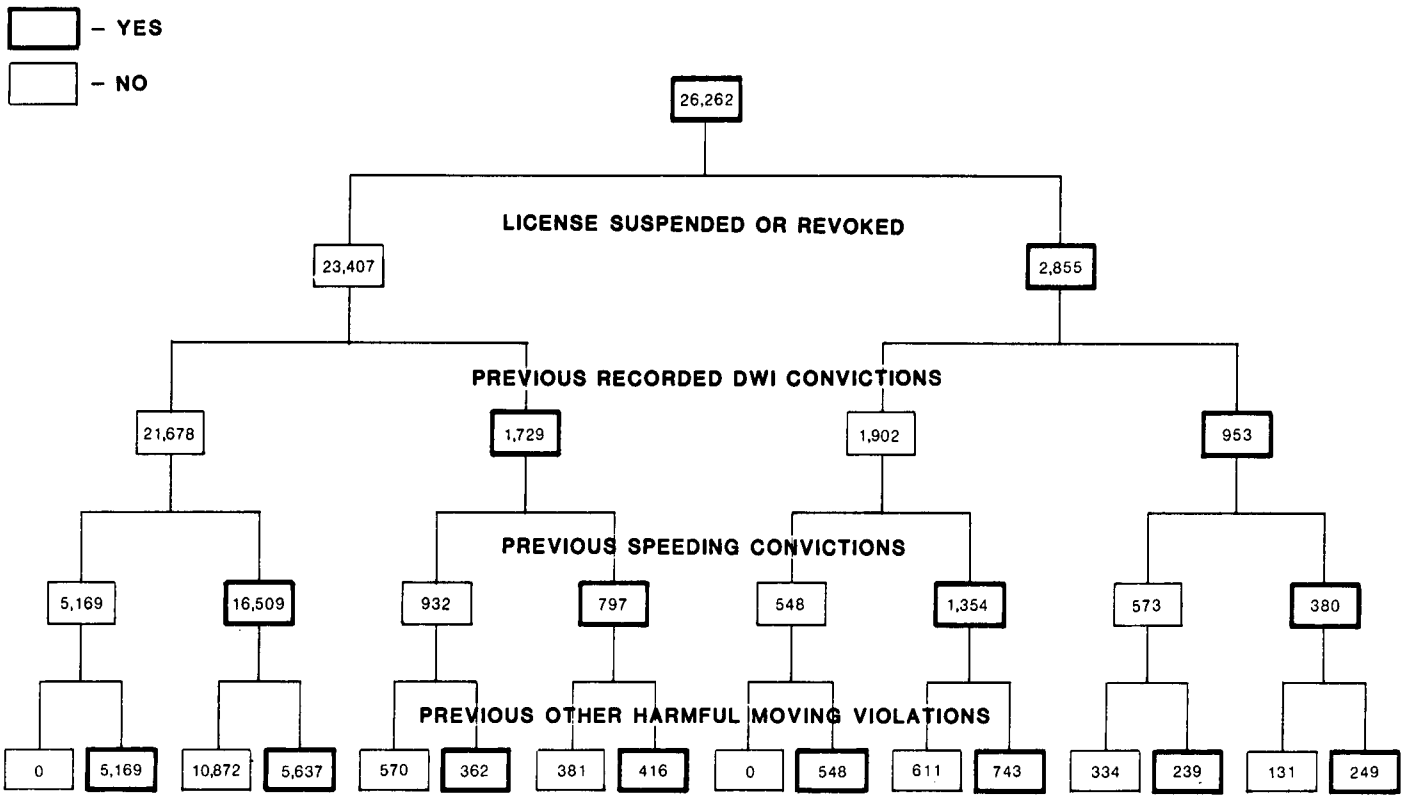
	Restraint Used		Restraint Not Used		Unknown	
	Number	%	Number	%	Number	%
No Injury	423	17.7	6,742	25.8	2,613	34.1
Possible Injury	121	5.1	1,265	4.8	293	3.8
Nonincapacitating Injury	149	6.3	1,866	7.1	623	8.1
Incapacitating Injury	125	5.2	2,030	7.8	501	6.5
Fatal Injury	1,563	65.5	14,116	54.1	3,588	46.9
Unknown	4	0.2	87	0.3	35	0.5
Total	**2,385**	**100.0**	**26,106**	**100.0**	**7,653**	**100.0**

The previous driving records of 62,031 drivers involved in fatal accidents were also tabulated (Table 29). This group excludes drivers who fled the scene, leaving their vehicles at the accident. In determining previous driving records. FARS only counts those offenses that occurred in the three years prior to the 1981 fatal accident. Similar data are illustrated in Figure 41 for those 26,262 drivers who had at least one previous harmful moving violation, demonstrating the frequency of multiple convictions.

TABLE 29
PREVIOUS RECORD **(62,031)**

	None	One	Two	Three	Four	Five or More	Unknown	Total
Accidents								
Licensed	42,544	8,150	1,957	459	115	54	131	53,410
Percent	79.7	15.3	3.7	0.9	0.2	0.1	0.2	100.0
Unlicensed	4,146	894	273	87	29	14	741	6,184
Percent	67.0	14.5	4.4	1.4	0.5	0.2	12.0	100.0
Unknown	34	16	4	1			2,382	2,437
Percent	1.4	0.7	0.2	0.0			97.7	100.0
Total	**46,724**	**9,060**	**2,234**	**547**	**144**	**68**	**3,254**	**62,031**
Percent	**75.3**	**14.6**	**3.6**	**0.9**	**0.2**	**0.1**	**5.2**	**100.0**
Suspensions & Revocations								
Licensed	49,963	2,395	619	193	56	53	131	53,410
Percent	93.5	4.5	1.2	0.4	0.1	0.1	0.2	100.0
Unlicensed	3,602	1,107	424	163	69	78	741	6,184
Percent	58.2	17.9	6.9	2.6	1.1	1.3	12.0	100.0
Unknown	43	6	6				2,382	2,437
Percent	1.8	0.2	0.2				97.7	100.0
Total	**53,608**	**3,508**	**1,049**	**356**	**125**	**131**	**3,254**	**62,031**
Percent	**86.4**	**5.7**	**1.7**	**0.6**	**0.2**	**0.2**	**5.2**	**100.0**
Driving while Intoxicated Convictions								
Licensed	51,550	1,501	195	24	6	1	133	53,410
Percent	96.5	2.8	0.4	0.0	0.0	0.0	0.2	100.0
Unlicensed	4,490	675	205	47	17	9	741	6,184
Percent	72.6	10.9	3.3	0.8	0.3	0.1	12.0	100.0
Unknown	53	2					2,382	2,437
Percent	2.2	0.1					97.7	100.0
Total	**56,093**	**2,178**	**400**	**71**	**23**	**10**	**3,256**	**62,031**
Percent	**90.4**	**3.5**	**0.6**	**0.1**	**0.0**	**0.0**	**5.2**	**100.0**
Speeding Convictions								
Licensed	35,989	10,265	3,996	1,675	730	621	134	53,410
Percent	67.4	19.2	7.5	3.1	1.4	1.2	0.3	100.0
Unlicensed	3,709	879	390	226	112	127	741	6,184
Percent	60.0	14.2	6.3	3.7	1.8	2.1	12.0	100.0
Unknown	36	8	5	3		3	2,382	2,437
Percent	1.5	0.3	0.2	0.1		0.1	97.7	100.0
Total	**39,734**	**11,152**	**4,391**	**1,904**	**842**	**751**	**3,257**	**62,031**
Percent	**64.1**	**18.0**	**7.1**	**3.1**	**1.4**	**1.2**	**5.3**	**100.0**
Other Moving Violations								
Licensed	41,705	7,950	2,269	806	278	269	133	53,410
Percent	78.1	14.9	4.2	1.5	0.5	0.5	0.2	100.0
Unlicensed	3,664	929	419	216	104	111	741	6,184
Percent	59.2	15.0	6.8	3.5	1.7	1.8	12.0	100.0
Unknown	44	8	2		2		2,381	2,437
Percent	1.8	0.3	0.1		0.1		97.7	100.0
Total	**45,413**	**8,887**	**2,690**	**1,022**	**384**	**380**	**3,255**	**62,031**
Percent	**73.2**	**14.3**	**4.3**	**1.6**	**0.6**	**0.6**	**5.2**	**100.0**

FIGURE 41
INVOLVED DRIVERS WITH AT LEAST ONE OFFENSE



The figure also includes driver license status. A driver was considered licensed if a valid license was held for the vehicle being operated, if no license was required, or if a learner's permit was held. A driver was considered unlicensed if no license was held when one was required, if the license held was not for the type of vehicle being operated, or if the license was suspended, revoked or had expired.

Although most involved drivers had no previous recorded violations, this majority was lowest for speeding violations (64.1 percent). Also, a higher proportion of unlicensed drivers had multiple previous convictions recorded than did their licensed counterparts. Among licensed drivers, the greatest number of previous multiple convictions were, in descending order, for speeding, other harmful moving violations, and accidents, whereas among unlicensed drivers the descending order of previous multiple convictions was for suspensions/revocations, other harmful moving violations, and speeding. More unlicensed drivers had previous recorded convictions for driving while intoxicated (DWI) than did licensed drivers.

Although most well-controlled research studies indicate that alcohol is involved in one-third to one-half of all fatal crashes, because of the subjective and incomplete nature of reports, alcohol tests are known to have been performed on only a little more than a third of all drivers involved in fatal accidents in 1981 (Figure 42).

Blood alcohol concentration (BAC) is measured as a percentage by weight of alcohol in the blood. A positive BAC level (.01 percent and higher) indicates that alcohol was consumed by the person tested.

Chemical tests for alcohol are generally conducted on fatally injured drivers, inasmuch as laws in about half the States require that such a test be performed on all drivers killed in crashes. Nevertheless, only 57 percent of the nation's 28,182 fatally injured drivers were tested for alcohol, and only 19.1 percent of the surviving drivers were tested.

BAC test results were reported in FARS for only 29.8 percent of all drivers. In most States, a driver with a BAC level of at least .10 percent is considered legally intoxicated. More than 52.5 percent of the tested drivers involved in fatal accidents had BAC levels equal to or greater than this, and of these, more than 61 percent were involved in single-vehicle accidents (Figure 42). Another 13.2 percent had less than 0.10 percent BAC. Police reported drinking involvement for 31 percent of all drivers, based on tests and observation.

FIGURE 42
ALCOHOL TEST RESULTS OF ALL DRIVERS INVOLVED IN FATAL ACCIDENTS

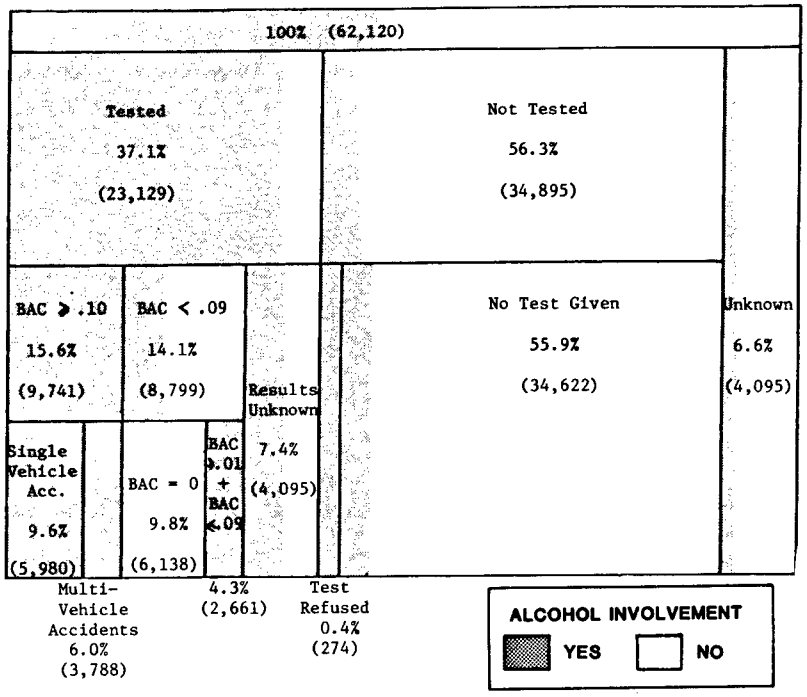
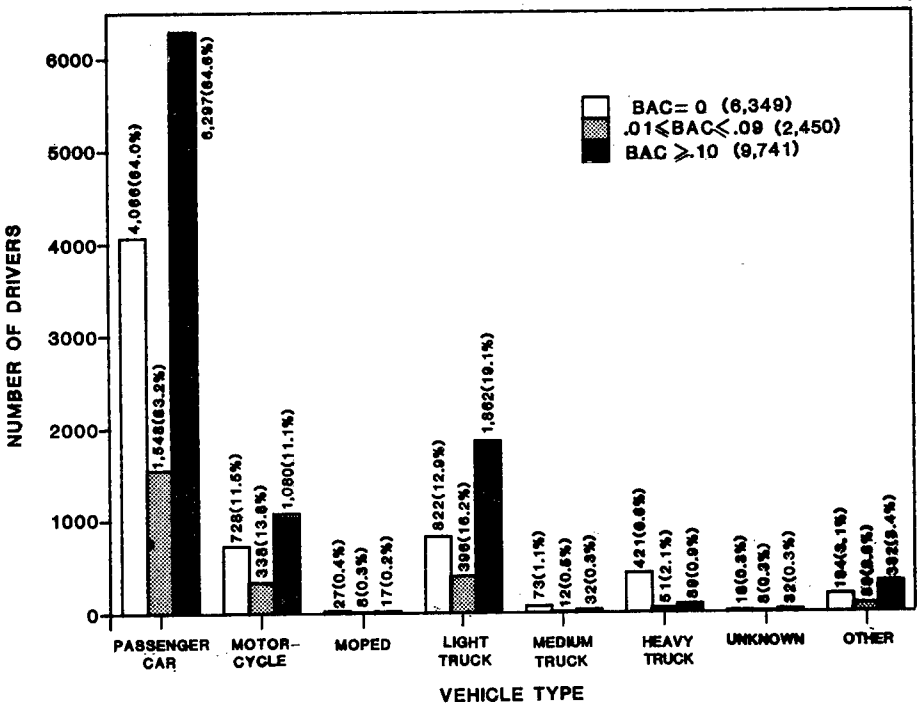


Figure 43 distributes by vehicle type the 18,540 drivers with known BAC test results. Of these drivers, the proportion

FIGURE 43
DRIVERS WITH KNOWN ALCOHOL TEST RESULTS BY VEHICLE TYPE (18,540)



of passenger car drivers who had BAC levels of .10 percent or higher was not as great as that of drivers of light trucks—the vehicle type with the greatest concentration of drivers with BAC of .10 percent or higher.

The magnitude of drunk-driving recidivism and of its consequent dangers is suggested by data on the 1,933 drivers with known BAC test results who were known to have had one or more previous DWI convictions (Figure 44). Not included, however, are the 600 drivers who had known BAC test results but unknown previous DWI conviction records.

A startling four out of every five drivers involved in fatal accidents for whom BAC test results were known and who were also known to have had one or more previous DWI convictions had a BAC higher than or equal to .10 percent at the time of the fatal accident. Although these drivers represented only 7 percent of all involved drivers with known BAC, it suggests strongly that previous DWI convictions do not deter drivers from operating their vehicles again after having consumed enough alcohol to reach a BAC of .10 percent.

It should be noted also that it has been difficult to convict drivers for alcohol involvement because many drivers succeed in evading DWI convictions by pleading guilty to reduced charges. As a result, drunk-driving recidivism among fatal accident-involved drivers with known BAC levels may be considerably higher than 7 percent.

Accident involvements by time-of-day and day-of-the-week for drivers with known BAC levels are depicted in Figure 45. As could be expected, Friday and Saturday nights had the greatest proportions of accident-involved drivers with BAC of .10 percent or higher. Also, during these two nights the greatest proportion of accident involvements was between midnight and 4 a.m. Other nights of the week experienced similar accident frequencies between 8 p.m. and midnight.

FIGURE 44
ALCOHOL TEST RESULTS OF DRIVERS WITH KNOWN RESULTS AND ONE OR MORE PREVIOUS DWI CONVICTIONS

(1933)

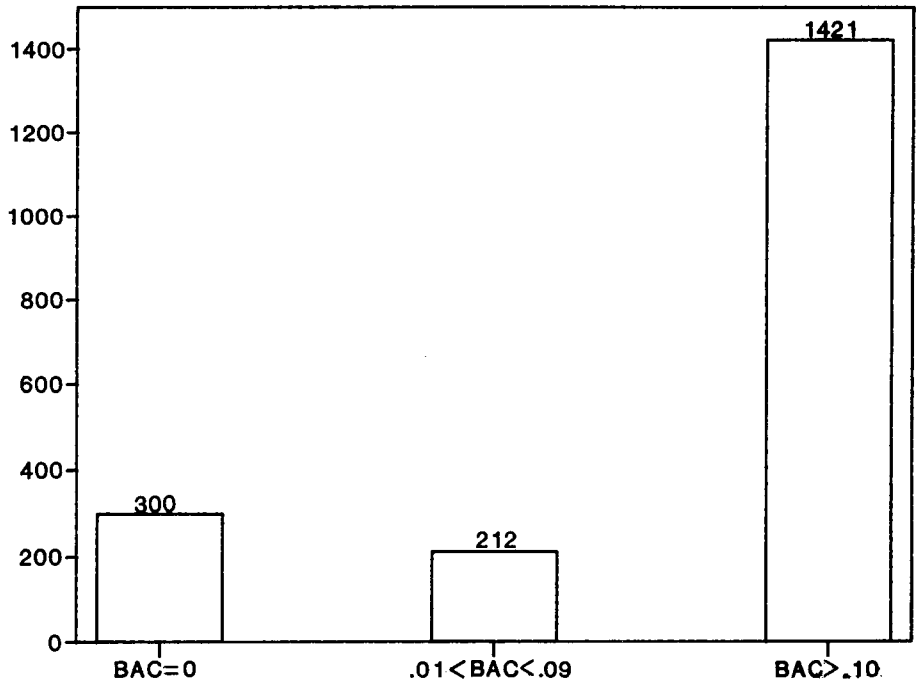
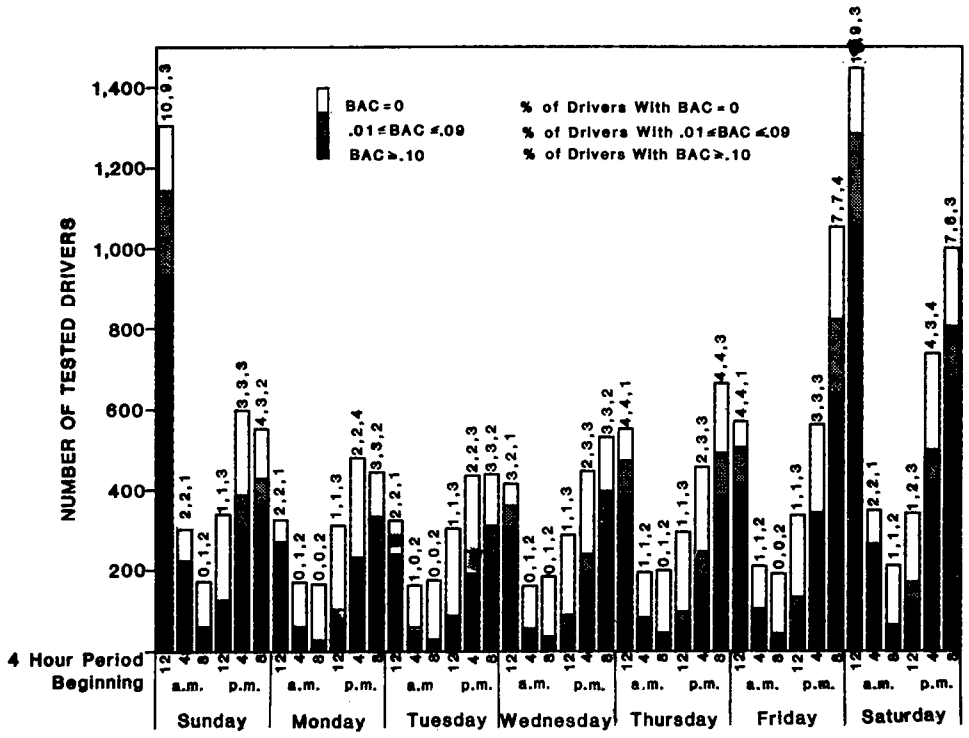


FIGURE 45
ALCOHOL TEST RESULTS BY TIME OF DAY

(18,540)



The age and sex distributions of drivers with known BAC levels are shown in Figure 46. It is immediately apparent that the preponderance of the accident-involved driving population with .10 percent BAC or higher was male and between 20 and 34 years old, with male teenagers and 35–49 year-olds also accounting for large shares. Together these four age groups of males accounted for 79.8 percent of all the fatal accident-involved drivers who had known BAC levels of .10 percent or higher.

Figure 47 illustrates the severity of injuries to drivers with known BAC (greater than 0.01). Fatalities are 73.3 percent, as compared to a 45.4 percent fatality rate for all drivers. That result is caused in part by the routine testing of fatally injured drivers in some localities.

FIGURE 46
DRIVERS WITH KNOWN ALCOHOL TEST RESULTS BY AGE AND SEX

(18,540)

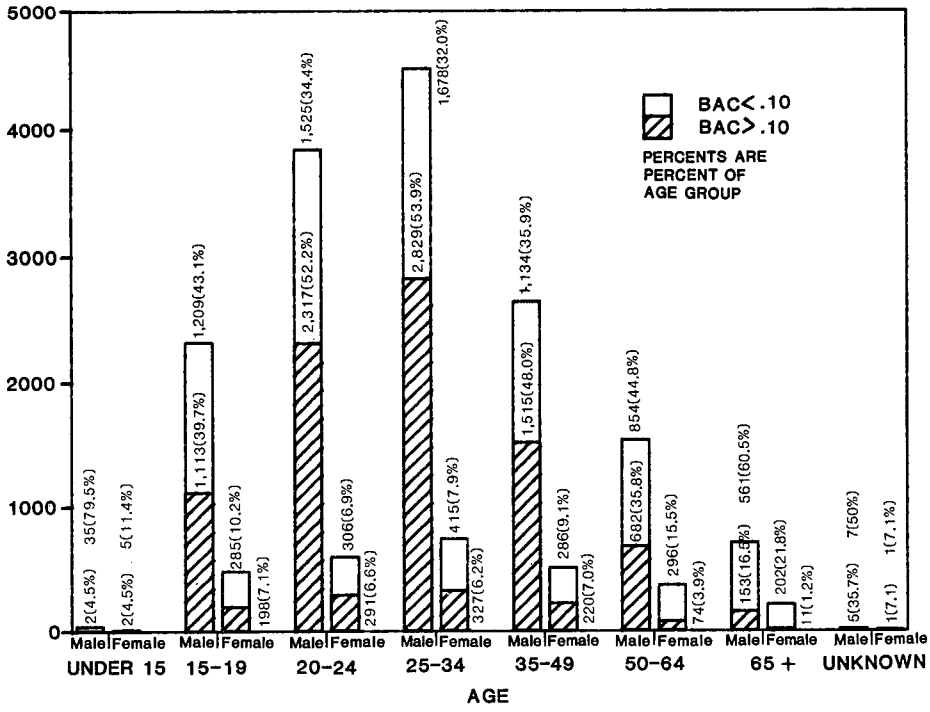
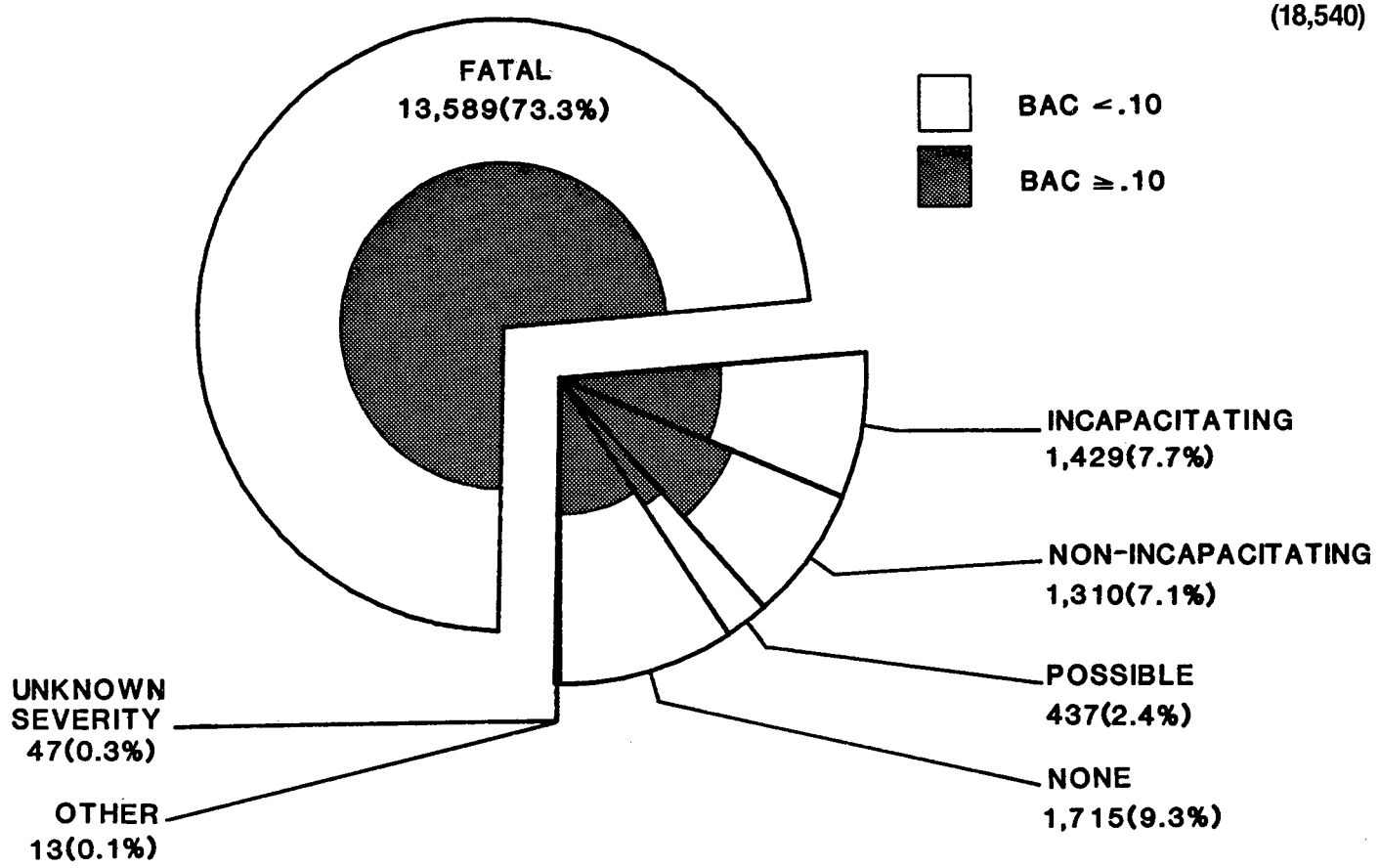
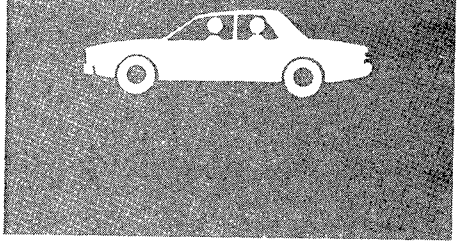


FIGURE 47
DRIVERS BY INJURY SEVERITY & ALCOHOL TEST RESULTS

(18,540)



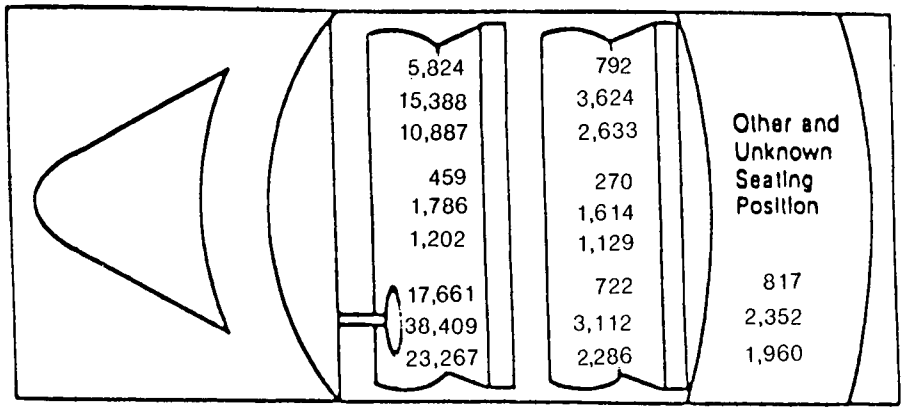
VI. Occupants



Four of every five persons (82.0 percent) killed in traffic accidents in 1981 were occupants of a vehicle. More than two-thirds of these were drivers.

Of the total 40,393 occupants killed, 26,545 (65.7 percent) were occupants of passenger cars (Figure 48). These represented 61.2 percent of all the occupants in those vehicles in which a death occurred and 40.0 percent of all occupants

FIGURE 48
ALL PASSENGER CAR OCCUPANT SEATING POSITIONS



TOTAL

26,545 - Fatalities

66,285 - Occupants

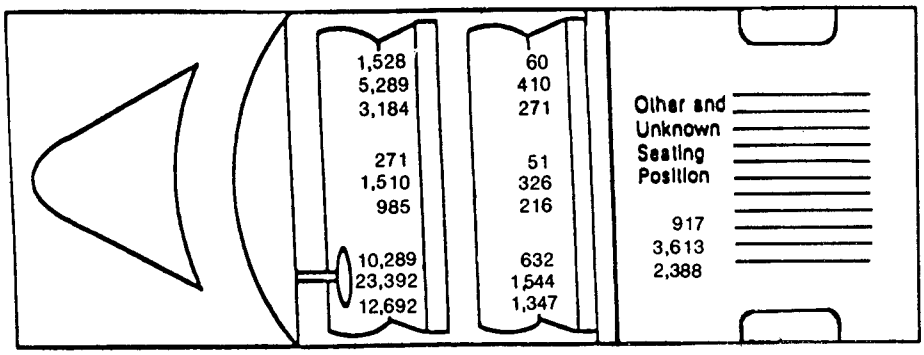
43,364 - Occupants of vehicles in which a fatality occurred

of all vehicles involved in fatal accidents. Almost two-thirds of these (66.5 percent) were seated in what is customarily the driver's position, at the front left. Almost half (46 percent) of the 38,409 occupants of that seating position in *all* passenger cars involved in fatal accidents were killed. In fact, the person in the front left seat of passenger cars was fatally injured 75.0 percent of the time when a fatality occurred in that vehicle. This is probably because that seat was occupied much more often than any other. Although the true frequency distribution of seat position occupancy is not known, seat occupancy distribution for fatal accident-involved passenger cars is known, as reflected in Figure 48 and, for all other vehicles, in Figure 49.

As with passenger cars, more occupants of the front left seat were killed in nonpassenger cars than were occupants of other seating positions (Figure 49). Of the 23,392 occupants of the driver's position in these involved vehicles, 44.4 percent—slightly less than for passenger cars—were killed, and the occupant in the driver position was killed 81.8 percent of the 12,692 times that seat was occupied when at least one fatality occurred in the vehicle.

As in previous years, a relatively small proportion (2.9 percent) of the occupants of passenger cars involved in fatal accidents were known to have used a restraint system at the time of the accident (Table 30). In these tables, manual restraint data may double count automatic restraint data, as some vehicles may have been equipped with both types. Although actual rates of restraint usage are concealed by a large number of "unknowns" in the FARS file (20.6 percent for manual and automatic systems combined), the file does contain the most comprehensive and up-to-date data yet available on restraint usage in fatal accidents. However, three caveats are in order.

FIGURE 49
NON-PASSENGER CAR OCCUPANT SEATING POSITIONS



TOTAL

13,848 - Fatalities

36,084 - Occupants

21,083 - Occupants of vehicles in which a fatality occurred

TABLE 30
RESTRAINT USED BY PASSENGER CAR OCCUPANTS

	Driver		Passenger		Unknown Occupant		Total	
	Number	%	Number	%	Number	%	Number	%
None Used/Not Applicable	28,801	75.0	21,809	78.8	133	71.5	50,743	76.6
Shoulder Belt	53	0.1	35	0.1			88	
Lap Belt	391	1.0	238	0.9			629	0.9
Lap and Shoulder Belts	618	1.6	212	0.8			830	1.3
Child Safety Seat			93	0.3			93	0.1
Manual Restraint Used Type not Specified	163	0.4	100	0.4			263	0.4
Automatic Belt in Use	7	0.0	2	0.0			9	0.0
Automatic Belt not in Use	11	0.0	5	0.0			16	0.0
Non Deployed Airbag	1	0.0					1	0.0
Unknown	8,380	21.8	5,206	18.8	53	28.5	13,639	20.6
Total	**38,425**	**100.0**	**27,700**	**100.0**	**186**	**100.0**	**66,311**	**100.0**

Note: Some double counting of manual and automatic restraint occurs, so individual counts do not add to totals.

First, the cases tabulated are those in which the vehicle became involved in a fatal accident, thus greatly increasing occupants' statistical chances of being killed, regardless of restraint usage. The cases counted are therefore a biased sampling and cannot reflect either restraint effectiveness or usage. In fact, the FARS file contains *only* data on accidents in which a fatality occurred and does not include those in which persons were using restraints and consequently escaped injury or sustained less serious injuries than did non-users. In other words, what is not known is the number of accidents in which occupants were *not* killed *because* they were using restraints.

Because of its greater degree of detailed investigation of accidents of all severity levels, a more reliable guide to restraint usage is the NHTSA's annual National Accident Sampling System (NASS) report. 1979–1980 NASS data indicate that about 12 percent of all occupants in police-reported accidents in which restraint usage or non-usage was known were in fact using restraints. This counters the indication in Table 30 that only 2.9 percent of occupants (1,903) were using restraints.

Second, as noted above, the category labeled "Restraint Use Unknown" comprises a large fraction of the total cases tabulated.

Third, FARS restraint use data is available only if it was reported by or to the police.

Tables 31 and 32 compare the severities of injuries received by drivers and non-driver occupants of passenger cars and their restraint system usage. (This

TABLE 31
INJURY SEVERITY AND RESTRAINT USE BY PASSENGER CAR OCCUPANTS (66,285)

	Restraint Used			No Restraint Used				Unknown			
	Front Seat	Other Seat	Unknown	Front Seat	Other Seat	Unknown	Other	Front Seat	Other Seat	Unknown	Total
DRIVER											
Total	**1,224**		**1**	**28,798**		**3**		**8,377**	**3**		**38,406**
Percent	**72.0**		**7.7**	**67.8**		**0.3**		**73.6**	**0.3**		**57.9**
No Injury	353		1	5,797				2,572			8,723
Percent	20.8		7.7	13.6				22.6			13.2
Possible Injury	117			1,390				357			1,864
Percent	6.9			3.3				3.1			2.8
Non-Incapacitating Evident Injury	180			2,971		1		1,064			4,216
Percent	10.6			7.0		0.1		9.3			6.4
Incapacitating Injury	186			4,571				983			5,740
Percent	10.9			10.8				8.6			8.7
Fatal Injury	381			13,932		1		3,342	1		17,657
Percent	22.4			32.8		0.1		29.4	0.1		26.6
Unknown	7			137		1		59	2		206
Percent	0.4			0.3		0.1		0.5	0.2		0.3
PASSENGER											
Total	**476**	**190**	**12**	**13,702**	**7,188**	**870**	**49**	**3,006**	**878**	**1,322**	**27,693**
Percent	**28.0**	**100.0**	**92.3**	**32.2**	**100.0**	**86.6**	**100.0**	**26.4**	**94.0**	**100.0**	**41.8**
No Injury	85	45	1	1,665	1,050	11		540	46	296	3,739
Percent	5.0	23.7	7.7	3.9	14.6	1.1		4.7	4.9	22.4	5.6
Possible Injury	47	33	1	874	660	38		202	97	129	2,081
Percent	2.8	17.4	7.7	2.1	9.2	3.8		1.8	10.4	9.8	3.1
Non-Incapacitating Evident Injury	87	40	3	2,244	1,521	158	1	559	271	337	5,221
Percent	5.1	21.1	23.1	5.3	21.2	15.7	2.0	4.9	29.0	25.5	7.9
Incapacitating Injury	114	26	4	3,733	2,306	344	2	653	198	316	7,696
Percent	6.7	13.7	30.8	8.8	32.1	34.2	4.1	5.7	21.2	23.9	11.6
Fatal Injury	140	44	3	5,110	1,601	308	46	1,039	249	228	8,768
Percent	8.2	23.2	23.1	12.0	22.3	30.6	93.9	9.1	26.7	17.2	13.2
Unknown	3	2		76	50	11		13	17	16	188
Percent	0.2	1.1		0.2	0.7	1.1		0.1	1.8	1.2	0.3
UNKNOWN OCCUPANTS											
Total					**1**	**132**				**53**	**185**
Percent					**0.0**	**13.1**				**5.7**	**0.3**
No Injury										2	2
Percent										0.2	0.0
Non-Incapacitating Evident Injury						5				5	10
Percent						0.5				0.5	0.0
Incapacitating Injury						39				14	53
Percent						3.9				1.5	0.1
Fatal Injury					1	87				32	120
Percent					0.0	8.7				3.4	0.2

TABLE 31 — Continued
INJURY SEVERITY AND RESTRAINT USE BY PASSENGER CAR OCCUPANTS (66,285)

	Restraint Used			No Restraint Used				Unknown			
	Front Seat	Other Seat	Unknown	Front Seat	Other Seat	Unknown	Other	Front Seat	Other Seat	Unknown	Total
Unknown						1					1
Percent						0.1					0.0
ALL OCCUPANTS											
Total	**1,700**	**190**	**13**	**42,500**	**7,189**	**1,005**	**49**	**11,383**	**1,322**	**934**	**66,285**
Percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
No Injury	438	45	2	7,462	1,050	11		3,112	296	48	12,464
Percent	25.8	23.7	15.4	17.6	14.6	1.1		27.3	22.4	5.1	18.8
Possible Injury	164	33	1	2,264	660	38		559	129	97	3,945
Percent	9.6	17.4	7.7	5.3	9.2	3.8		4.9	9.8	10.4	6.0
Non-Incapacitating Evident Injury	267	40	3	5,215	1,521	164	1	1,623	337	276	9,447
Percent	15.7	21.1	23.1	12.3	21.2	16.3	2.0	14.3	25.5	29.6	14.3
Incapacitating Injury	300	26	4	8,304	2,306	383	2	1,636	316	212	13,489
Percent	17.6	13.7	30.8	19.5	32.1	38.1	4.1	14.4	23.9	22.7	20.4
Fatal Injury	521	44	3	19,042	1,602	396	46	4,381	228	282	26,545
Percent	30.6	23.2	23.1	44.8	22.3	39.4	93.9	38.5	17.2	30.2	40.0
Unknown	10	2		213	50	13		72	16	19	395
Percent	0.6	1.1		0.5	0.7	1.3		0.6	1.2	2.0	0.6

table excludes the 49 occupants recorded as riding on vehicle exteriors.) Three-quarters of all occupants in fatal accidents were reported as not using restraints. Of these, 63.2 percent were killed or received incapacitating injuries. Of the 2.8 percent known to have used restraint systems, 47.1 percent were killed or received incapacitating injuries, down from just over 60 percent in 1980. (It should be remembered again that this does not reflect on restraint system effectiveness in reducing injuries because *only* fatal accidents, i.e., those in which people were killed, were counted.) These data are summarized in Figure 50, showing injury severity and re-

TABLE 32
RESTRAINT USE AND INJURY SEVERITY — DRIVERS OF SINGLE OCCUPANT PASSENGER CARS (20,699)

	Restraint Used		Restraint not Used		Unknown	
	Number	%	Number	%	Number	%
No Injury	212	33.4	3,438	22.2	1,511	33.0
Possible Injury	60	9.4	618	4.0	166	3.6
Nonincapacitating Injury	70	11.0	1,048	6.8	387	8.4
Incapacitating Injury	58	9.1	1,274	8.2	344	7.5
Fatal Injury	232	36.5	9,044	58.4	2,158	47.1
Unknown	3	0.5	58	0.4	18	0.4
Total	**635**	**100.0**	**15,480**	**100.0**	**4,584**	**100.0**

FIGURE 50a
INJURY SEVERITY OF RESTRAINED PASSENGER CAR OCCUPANTS IN FATAL ACCIDENTS

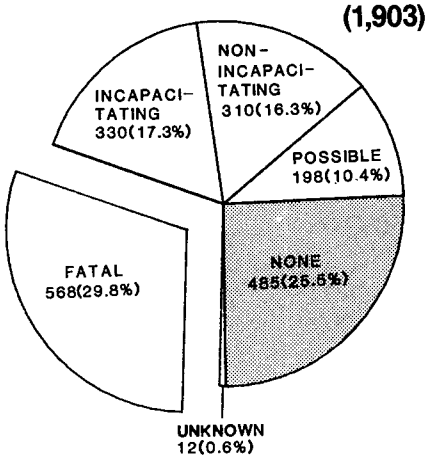


FIGURE 50b
INJURY SEVERITY OF UNRESTRAINED PASSENGER CAR OCCUPANTS IN FATAL ACCIDENTS

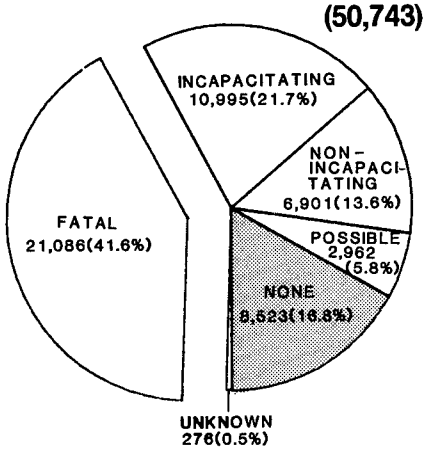
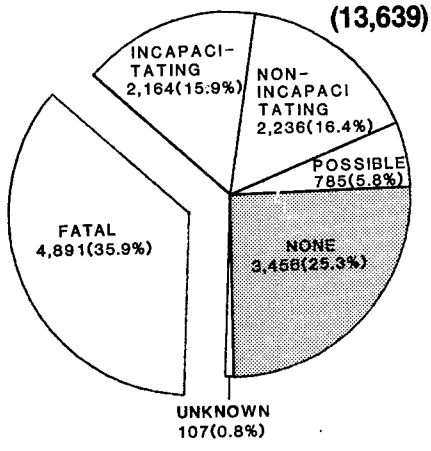


FIGURE 50c
INJURY SEVERITY OF PASSENGER CAR OCCUPANTS WITH UNKNOWN RESTRAINT IN FATAL ACCIDENTS



straint usage. Of restrained occupants, 29.8 percent were fatally injured, compared to 41.6 percent of unrestrained occupants. A quarter of the restrained occupants were not injured, compared to 16.7 percent of the unrestrained.

Restraint usage by passenger car occupants is distributed by age groups in Table 33. The 153 occupants aged 4 years old or less who "used" a manual restraint system include 93 in child safety seats and 60 using other types of restraints, both numbers gratifyingly increased from 1980 levels (55 and 40 respectively) despite the drop in total passenger involvements.

A major motive behind development and deployment of restraint systems and efforts to promote their use has been to prevent ejection from vehicular passenger compartments during a crash and to reduce resulting injury severities. Although the numbers are small, Table 34 does show that the number of occupants who did not use a restraint system and were either totally or partially ejected (6,513 or 9.8 percent of all occupants) is more than 132 times greater than the 49 occupants (0.07 percent) who did use a restraint system. This table does not reflect correct use of child safety seats. Also, as noted previously, the rate of unknown usage is high and should be

TABLE 33
PASSENGER CAR OCCUPANT RESTRAINT USE BY AGE (66,285)

	4 or Less		5-14		15 or More		Unknown		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%
Restraint Used	153	8.0	70	3.7	1,669	87.7	11	0.6	1,903	100.00
No Restraint Used	1,339	2.6	2,656	5.2	46,315	91.3	433	0.9	50,743	100.0
Unknown	330	2.4	634	4.6	12,379	90.8	296	2.2	13,639	100.0
Total	**1,822**	**2.7**	**3,360**	**5.1**	**60,363**	**91.1**	**740**	**1.1**	**66,285**	**100.0**

TABLE 34
PASSENGER CAR OCCUPANTS BY EJECTION, RESTRAINT, AND IMPACT POINT (66,285)

Principal Impact	Total		Not Ejected		Totally Ejected		Partially Ejected		Unknown	
Restraint not Used										
Frontal	27,655	41.7	25,390	43.9	1,750	25.8	434	37.8	81	18.2
Right Side	5,973	9.0	5,086	8.8	730	10.7	135	11.8	22	4.9
Rear	2,295	3.5	1,991	3.4	267	3.9	32	2.8	5	1.1
Left Side	5,288	8.0	4,631	8.0	518	7.6	118	10.3	21	4.7
Top	2,514	3.8	1,663	2.9	723	10.6	112	9.8	16	3.6
Undercarriage	346	0.5	286	0.5	47	0.7	8	0.7	5	1.1
Under Ride	129	0.2	111	0.2	13	0.2	5	0.4		
Non-Collision	3,337	5.0	1,796	3.1	1,379	20.3	132	11.5	30	6.7
Unknown	3,206	4.8	3,088	5.3	96	1.4	14	1.2	8	1.8
Total	**50,743**	**76.6**	**44,042**	**76.1**	**5,523**	**81.3**	**990**	**86.2**	**188**	**42.2**
Restraint Used										
Frontal	1,088	1.6	1,068	1.8	10	0.1	6	0.5	4	0.9
Right Side	206	0.3	197	0.3	5	0.1	2	0.2	2	0.4
Rear	125	0.2	123	0.2	1	0.0	1	0.1		
Left Side	200	0.3	198	0.3	1	0.0	1	0.1		
Top	54	0.1	47	0.1	6	0.1	1	0.1		
Undercarriage	15	0.0	13	0.0	2	0.0				
Under Ride	2	0.0	2	0.0						
Non-Collision	80	0.1	68	0.1	5	0.1	7	0.6		
Unknown	133	0.2	131	0.2	1	0.0			1	0.2
Total	**1,903**	**2.9**	**1,847**	**3.2**	**31**	**0.5**	**18**	**1.6**	**7**	**1.6**
Restraint Use Unknown										
Frontal	8,186	12.3	7,570	13.1	438	6.4	64	5.6	114	25.6
Right Side	1,718	2.6	1,493	2.6	167	2.5	24	2.1	34	7.6
Rear	820	1.2	728	1.3	74	1.1	7	0.6	11	2.5
Left Side	1,465	2.2	1,293	2.2	123	1.8	14	1.2	35	7.9
Top	247	0.4	191	0.3	43	0.6	7	0.6	6	1.3
Undercarriage	306	0.5	222	0.4	79	1.2	2	0.2	3	0.7
Under Ride	64	0.1	57	0.1	5	0.1	2	0.2		
Non-Collision	673	1.0	341	0.6	295	4.3	18	1.6	19	4.3
Unknown	160	0.2	114	0.2	16	0.2	2	0.2	28	6.3
Total	**13,639**	**20.6**	**12,009**	**20.7**	**1,240**	**18.3**	**140**	**12.2**	**250**	**56.2**
Total	**66,285**	**100.0**	**57,898**	**100.0**	**6,794**	**100.0**	**1,148**	**100.0**	**445**	**100.0**

kept in mind when examining the data.

Table 35 examines the 1,903 passenger car occupants known to have used restraint systems in terms of the principal point of impact sustained in the fatal accident. Of these occupants, 97.1 percent were not ejected from the vehicle. Table 36 includes the vehicle types associated with ejection. Fully 34.9 percent of those killed in light trucks (2,140 occupants) and 34.4 percent of those in heavy trucks (826 occupants) were partially or fully ejected.

Table 37 describes restraint use for nonpassenger car occupants, other than motorcyclists. Heavy truck occupants were most likely to be restrained.

TABLE 35
EJECTION AND IMPACT POINT BY RESTRAINT TYPE FOR RESTRAINED PASSENGERS

Principal Impact	Not Ejected	Totally Ejected	Partially Ejected	Unknown	Total
Shoulder Belt					
Total	**86**		**1**	**1**	**88**
Frontal	57		1	1	59
Right Side	6				6
Rear	13				13
Left Side	2				2
Top	3				3
Unknown	2				2
Other	3				3
Lap Belt					
Total	**611**	**8**	**8**	**2**	**629**
Frontal	367	3	3	1	374
Right Side	63			1	64
Rear	33	1			34
Left Side	68	1	1		70
Top	20	1	1		22
Undercarriage	5	1			6
Under Ride	1				1
Unknown	32				32
Other	22	1	3		26
Lap and Shoulder Belts					
Total	**807**	**12**	**7**	**4**	**830**
Frontal	445	5	2	2	454
Right Side	87	2	2	1	92
Rear	45		1		46
Left Side	91				91
Top	18	1			19
Undercarriage	7	1			8
Under Ride	1				1
Unknown	89			1	90
Other	24	3	2		29
Child Safety Seat					
Total	**88**	**4**	**1**		**93**
Frontal	52				52
Right Side	10	2			12
Rear	11				11
Left Side	6				6
Top	1	1			2
Unknown	6	1			7
Other	2		1		3
Manual Restraint Used - Type not Specified					
Total	**255**	**7**	**1**		**263**
Frontal	147	2			149
Right Side	31	1			32
Rear	21				21
Left Side	31				31
Top	5	3			8
Undercarriage	1				1
Unknown	2				2
Other	17	1	1		19
Automatic Belt in Use					
Total	**9**				**9**
Frontal	6				6
Rear	2				2
Left Side	1				1
Total	**1,847**	**31**	**18**	**7**	**1,903**

Note: Double counting of manual and automatic restraints causes discrepancy with totals.

TABLE 36
NUMBER OF OCCUPANTS AND OCCUPANT FATALITIES BY EJECTION AND VEHICLE TYPE (96,269)

	Not Ejected		Totally Ejected		Partially Ejected		Unknown		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Passenger Cars										
Total	**57,898**	**70.3**	**6,794**	**61.2**	**1,148**	**69.5**	**445**	**37.3**	**66,285**	**68.9**
Fatalities	20,474	24.9	4,987	45.0	920	55.8	164	13.7	26,545	27.6
Light Trucks										
Total	**14,977**	**18.2**	**2,773**	**24.9**	**346**	**20.9**	**143**	**12.0**	**18,239**	**18.9**
Fatalities	3,932	4.8	1,844	16.6	296	17.9	57	4.8	6,129	6.4
Medium Trucks										
Total	**1,034**	**1.3**	**119**	**1.1**	**12**	**0.7**	**1**	**0.1**	**1,166**	**1.2**
Fatalities	145	0.2	81	0.7	9	0.5			235	0.2
Heavy Trucks										
Total	**4,546**	**5.5**	**313**	**2.8**	**71**	**4.3**	**8**	**0.7**	**4,938**	**5.1**
Fatalities	585	0.7	246	2.2	62	3.8	3	0.3	896	0.9
Special Vehicles										
Total	**663**	**0.8**	**106**	**1.0**	**6**	**0.4**	**6**	**0.5**	**781**	**0.8**
Fatalities	186	0.2	74	0.7	4	0.2	2	0.2	266	0.3
Buses										
Total	**968**	**1.2**	**38**	**0.3**	**1**	**0.1**	**2**	**0.2**	**1,009**	**1.0**
Fatalities	41	0.0	12	0.1	1	0.1	2	0.2	56	0.1
Unknown										
Total	**532**	**0.6**	**88**	**0.8**	**9**	**0.5**	**578**	**48.4**	**1,207**	**1.3**
Fatalities	166	0.2	61	0.5	7	0.4	211	17.7	445	0.5
Other										
Total	**1,700**	**2.0**	**874**	**7.9**	**59**	**3.6**	**11**	**0.9**	**2,644**	**2.7**
Fatalities	388	0.5	517	4.6	39	2.4	3	0.3	947	1.0
Total	**82,318**	**100.0**	**11,105**	**100.0**	**1,653**	**100.0**	**1,194**	**100.0**	**96,269**	**100.0**

TABLE 37
RESTRAINT USE BY VEHICLE TYPE FOR NONPASSENGER CAR OCCUPANTS AND FATALITIES (27,984)

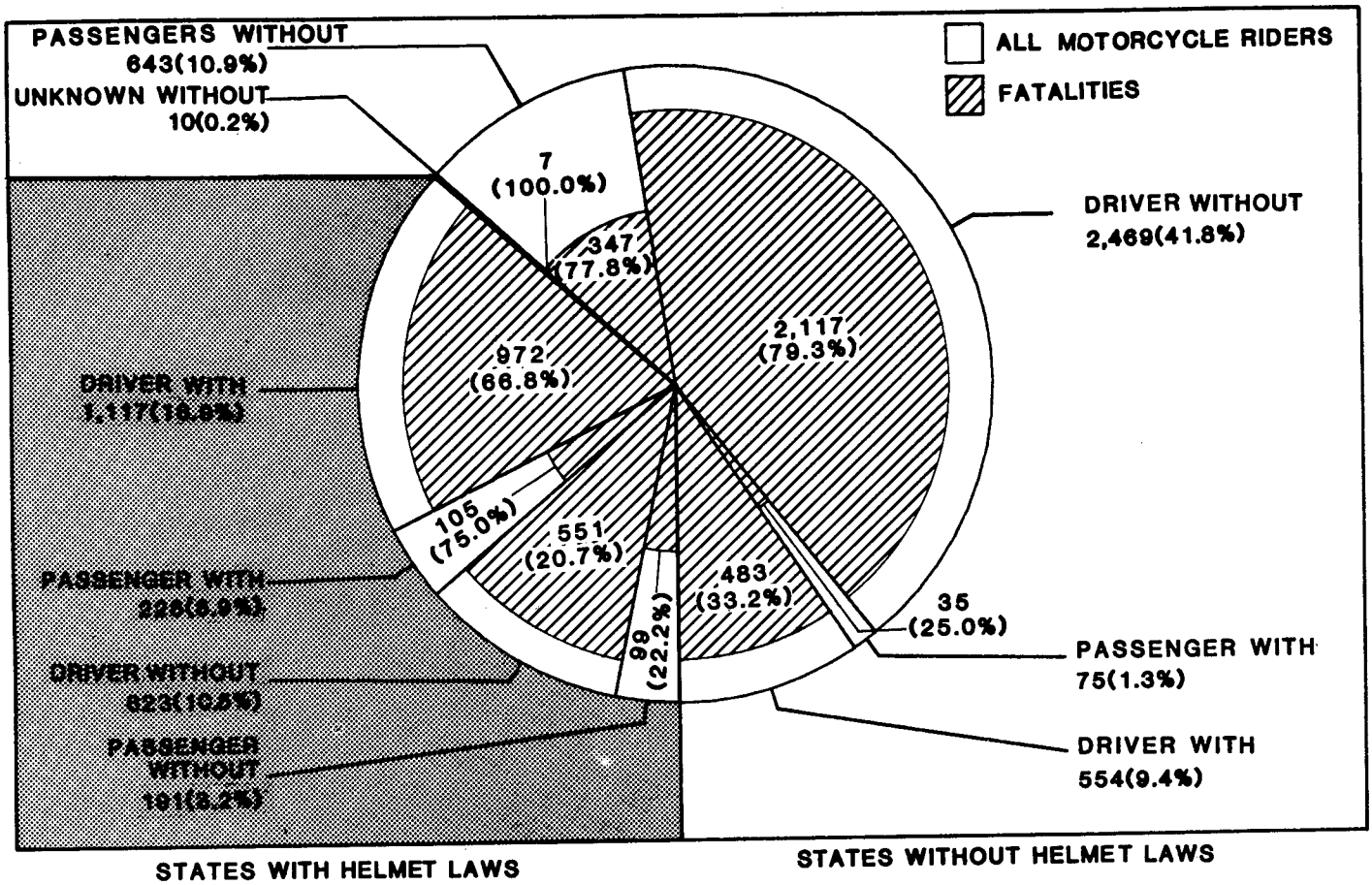
	Light Trucks	Medium Trucks	Heavy Trucks	Special Vehicles	Buses	Unknown	Other
Restraint not Used							
Total	**14,220**	**953**	**1,733**	**592**	**813**	**554**	**2,121**
Percent	78.0	81.7	75.6	75.8	80.6	45.9	80.2
Fatalities	5,013	205	739	207	49	202	774
Percent	27.5	17.6	15.0	26.5	4.9	16.7	29.3
Restraint Used							
Total	**292**	**19**	**257**	**35**	**47**	**22**	**105**
Percent	1.6	1.6	5.2	4.5	4.7	1.8	4.0
Fatalities	53	2	11	16	1	3	28
Percent	0.3	0.2	0.2	2.0	0.1	0.2	1.1
Restraint Use Unknown							
Total	**3,727**	**194**	**948**	**152**	**149**	**597**	**418**
Percent	20.4	16.6	19.2	19.5	14.8	49.5	15.8
Fatalities	1,063	28	146	41	6	212	145
Percent	5.8	2.4	3.0	5.2	0.6	17.6	5.5
Other							
Total				**2**		**34**	
Percent				0.3		2.8	
Fatalities				2		28	
Percent				0.3		2.3	
Total	**18,239**	**1,166**	**2,938**	**781**	**1,009**	**1,207**	**2,644**
Percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Motorcycle helmet usage and effectiveness in fatal accidents are depicted specifically in Figure 51. The right side of the figure presents statistics on fatal motorcycle accidents in States with no mandatory helmet-use laws, plus those accidents in States where mandatory laws do not apply to riders 18 years old or older when the accidents resulted in the death of such riders (2,957 fatal accidents involving 3,041 motorcycles and 2,989 motorcyclists killed). The left side of the figure pertains only to States with mandatory helmet use laws and to riders under 18 years old in those States where laws are limited to such riders (1,763 fatal accidents involving 1,810 motorcycles and 1,727 motorcyclists killed). This figure does not include mopeds, minibikes or other types of motorized cycles other than those specifically identified as "motorcycles."

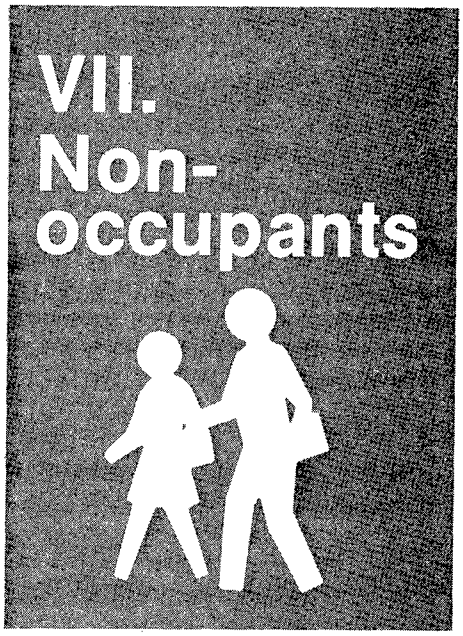
Fatal motorcycle accidents in areas where mandatory helmet use did not apply resulted in the deaths of a 0.6 percent greater proportion of all involved motorcyclists than was the case in which such laws did apply. However, it should again be noted that FARS data are grossly biased and do not reflect the effectiveness of such laws because FARS does not count motorcycle accidents in which helmet usage saved the life of a rider. In fact, another study sponsored by NHTSA[1] has found that helmetless motorcycle riders receive injuries to the head or neck almost twice as often as do helmeted riders, and these data are confirmed by the National Accident Sampling System (NASS) (23.3 percent of helmetless riders, compared to 10.3 percent of helmeted riders).

Even in States that do have helmet-use laws, 37.7 percent of the riders involved in fatal accidents were not using helmets at the time of the accident. In states with no such helmet-use laws, 83.2 percent were not using helmets.

FIGURE 51
MOTORCYCLE HELMET USAGE (5,910)



[1] *Summary of Results*, "Motorcycle Accident Factors Study"—Prepared under contract to the National Center for Statistics and Analysis, NHTSA, by the University of Southern California, September 1980.



Nonoccupants accounted for 8,875 deaths in 1981—18.0 percent of all traffic fatalities. Of these, 88.3 percent (7,836) were pedestrians, and 10.5 percent (935) were pedalcyclists. The others include occupants of parked vehicles and persons riding on animals or animal-drawn conveyances.

The age distributions of occupants and nonoccupants in fatal accidents are quite dissimilar (Table 38). More than two-thirds (71.8 percent) of all involved occupants, whether killed or not, were in the three age groups comprising the 15–44 year-olds, while nonoccupants were more evenly distributed and exceeded occupant percentages in every age group except those three. The same was true for fatal victims. The most notable age group of nonoccupants killed is that of persons 65 or more years old. A relatively larger proportion of these persons were killed than their involvement rate would suggest, and both involvement and fatality rates were far greater for nonoccupants than for the equivalent occupant age group.

TABLE 38
DISTRIBUTION OF NONOCCUPANTS AND OCCUPANTS BY AGE (112,403)

	Nonoccupants				Occupants			
	All Involved		Fatalities		All Involved		Fatalities	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Less or Equal to 4	409	4.1	361	4.1	2,389	2.3	633	1.6
5-14	1,501	15.0	1,310	14.8	4,858	4.7	1,077	2.7
15-24	2,052	20.5	1,734	19.5	39,419	38.5	15,064	37.3
25-34	1,501	15.0	1,305	14.7	22,902	22.4	9,405	23.3
35-44	866	8.6	743	8.4	11,182	10.9	4,382	10.8
45-54	809	8.1	726	8.2	7,622	7.4	3,116	7.7
55-64	821	8.2	745	8.4	6,019	5.9	2,777	6.9
65 and Over	1,741	17.4	1,675	18.9	6,318	6.2	3,623	9.0
Unknown	334	3.3	276	3.1	1,660	1.6	316	0.8
Total	**10,034**	**100.0**	**8,875**	**100.0**	**102,369**	**100.0**	**40,393**	**100.0**

Figure 52 distributes nonoccupant deaths among component groups—pedestrians, pedalcyclists, and other nonoccupants—by land use. Almost twice as many pedestrians and a quarter more pedalcyclists were killed in urban areas as in rural areas.

About 70 percent of the nonoccupant deaths occurred away from intersections on the roadway, in a crosswalk, or in a parking lane. Table 39 distributes these deaths among pedestrians, pedalcyclists, and other nonoccupants by pre-school, school, and post-school age groups and by accident location, as illustrated in Figure 53.

FIGURE 52
NONOCCUPANT FATALITIES BY LAND USE

(8,875)

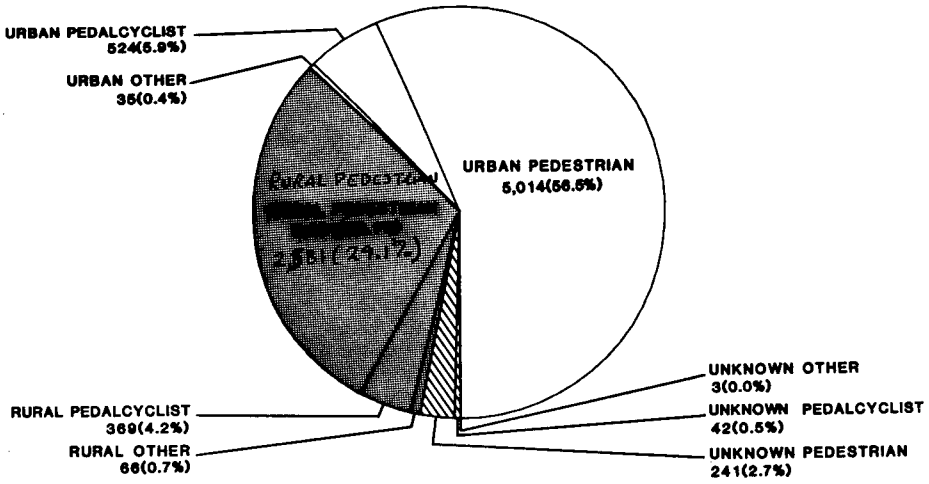


TABLE 39
NONOCCUPANT FATALITIES BY LOCATION AND AGE (8,875)

		Pedestrian				Pedalcyclist				Other Nonoccupant			
Location	Total	0-4	5-17	> 17	Unknown	0-4	5-17	> 17	Unknown	0-4	5-17	> 17	Unknown
Intersection													
In Crosswalk	481	10	61	389	4		8	8				1	
Percent	5.4	3.0	5.1	6.4	1.6		1.5	2.2				1.5	
Sidewalk, Median, Island	74	4	16	47	3		2	2					
Percent	0.8	1.2	1.3	0.8	1.2		0.4	0.6					
On Roadway	1,027	26	130	657	20	8	118	59	4		2	3	
Percent	11.6	7.9	10.8	10.9	7.8	28.6	22.3	16.4	21.1		6.5	4.5	
Unknown	40	1	8	25	3	1		1				1	
Percent	0.5	0.3	0.7	0.4	1.2	3.6		0.3				1.5	
Non-Intersection													
In Crosswalk	91	1	12	75	2		1						
Percent	1.0	0.3	1.0	1.2	0.8		0.2						
Sidewalk, Median, Island	157	7	25	112	1	1	5	1		2	1	2	
Percent	1.8	2.1	2.1	1.9	0.4	3.6	0.9	0.3		50.0	3.2	3.0	
Bike Path	1							1					
Percent	0.0							0.3					
On Road Shoulder	453	5	63	304	7		15	15	1	1	7	35	
Percent	5.1	1.5	5.2	5.0	2.7		2.8	4.2	5.3	25.0	22.6	52.2	
Outside Trafficway	87	1	16	55			2				3	10	
Percent	1.0	0.3	1.3	0.9			0.4				9.7	14.9	
On Roadway	6,268	271	857	4,312	157	18	352	261	7	1	18	14	
Percent	70.6	82.4	71.4	71.3	61.6	64.3	66.5	72.7	36.8	25.0	58.1	20.9	
Parking Lane	20	1	2	16	1								
Percent	0.2	0.3	0.2	0.3	0.4								
Unknown	44		10	28	3		1	1				1	
Percent	0.5		0.8	0.5	1.2		0.2	0.3				1.5	
Unknown Location	132	2	1	31	54		25	10	7				2
Percent	1.5	0.6	0.1	0.5	21.2		4.7	2.8	36.8				100.0
Total	**8,875**	**329**	**1,201**	**6,051**	**255**	**28**	**529**	**359**	**19**	**4**	**31**	**67**	**2**
Percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

FIGURE 53a
NONOCCUPANT FATALITIES BY LOCATION
(Intersection)

(1,622)

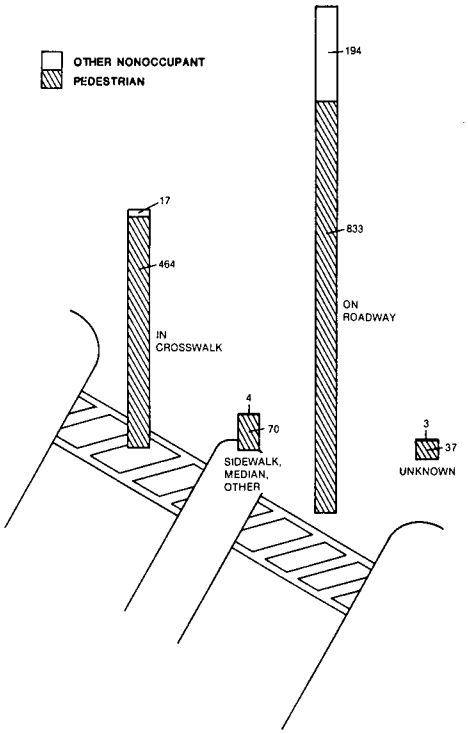
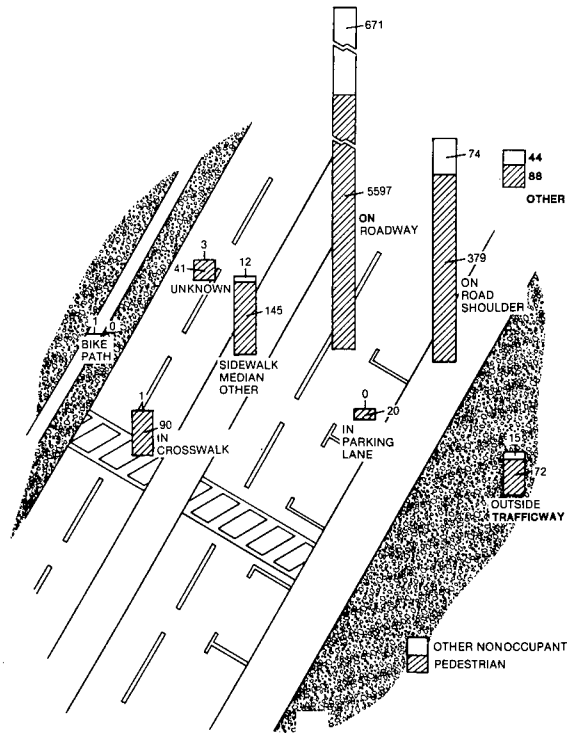


FIGURE 53b
NONOCCUPANT FATALITIES BY LOCATION
(Non-intersection)

(7,253)



Pedestrians

A total of 8,562 pedestrians were involved in fatal accidents in 1981. Of these, 90.8 percent (7,836) were killed.

In more than one-third of the 6,546 fatal accidents involving pedestrians above the age of 15, the pedestrians were either judged by investigating police to have been drinking alcohol or had a positive BAC test result (Figure 54a). Almost half (47.9 percent) of all pedestrian fatalities occurred during the night hours (Figure 54b).

The youngest pedestrians were killed more often away from an intersection and on the roadway than were those in any other age group, as reflected in Table 40. The greatest percentage of deaths both at intersections and on the roadway were to 5-9 year-olds. Those with the greatest proportion of off-roadway, non-intersection fatalities were 10-17 years old.

FIGURE 54a
DRINKING INVOLVEMENT IN FATAL PEDESTRIAN ACCIDENTS

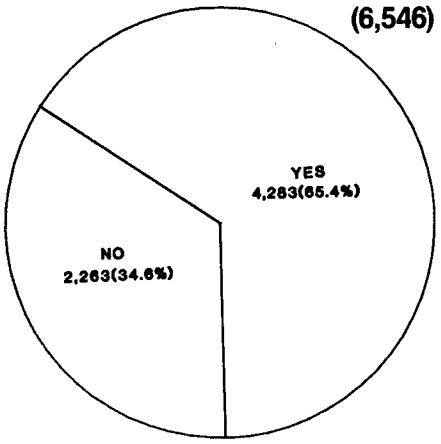


FIGURE 54b
TIME OF DAY OF PEDESTRIAN FATALITIES

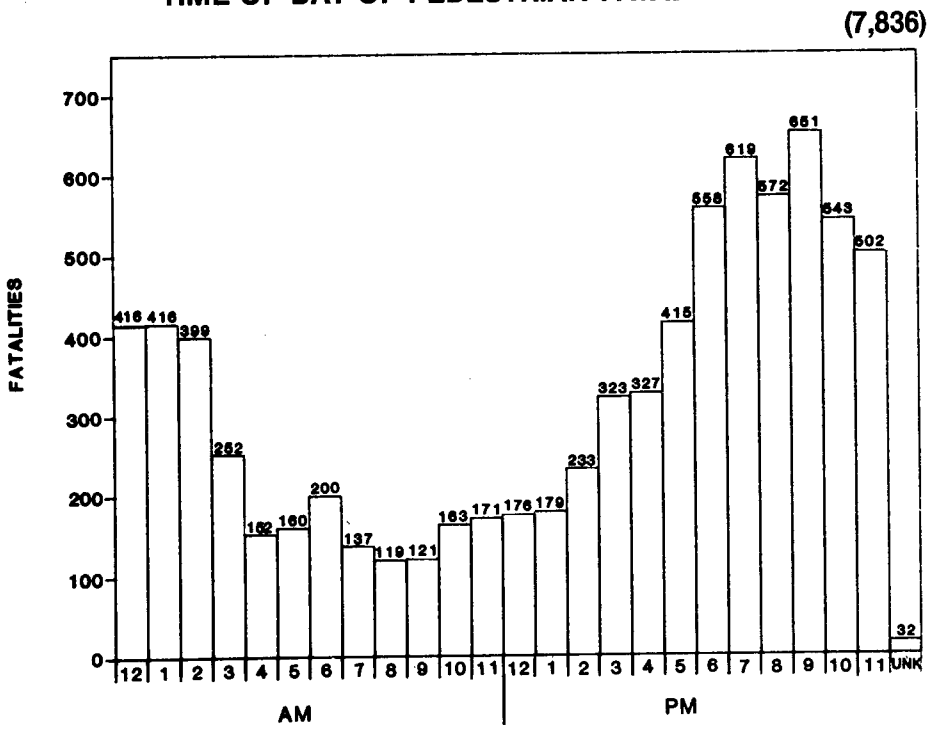


TABLE 40
PEDESTRIAN FATALITIES BY AGE AND LOCATION

	Intersection, Crosswalk, Roadway	Intersection, Sidewalk, Median, etc.	Intersection, Unknown	Non-Intersection, Crosswalk, Roadway, Parking Lane	Non-Intersection, Sidewalk, Other, Bike Path, Shoulder, Outside Trafficway	Non-Intersection, Unknown	Other	Total
Under 5	36	4	1	273	13		2	329
5-9	99	5	5	418	19	3		549
10-17	92	11	3	453	85	7	1	652
18-44	309	17	8	2,364	292	19	22	3,031
45-64	247	14	7	1,006	115	4	2	1,395
65 and Over	490	16	10	1,033	64	5	7	1,625
Unknown	24	3	3	160	8	3	54	255
Total	**1,297**	**70**	**37**	**5,707**	**596**	**41**	**88**	**7,836**

Of the 3,013 pedestrians killed who had known BAC test results, 413 were under 20 years old, and 31.0 percent had a BAC higher than or equal to .10 percent (Figure 55). Overall, 72.6 percent of these pedestrians were male; 51.3 percent of the males had BAC levels higher than or equal to .10 percent.

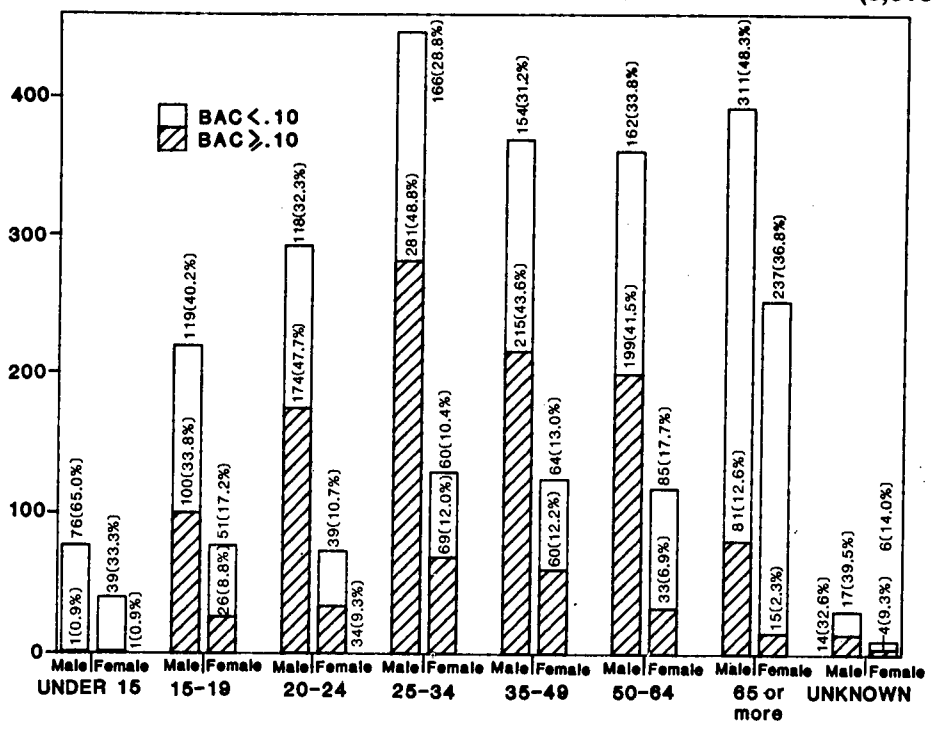
Pedalcyclists

A total of 1,008 pedalcyclists were involved in 923 fatal accidents in 1981. Of these, 935 (92.8 percent) were killed and four out of five of those killed (79.1 percent) were male.

Although only 15.3 percent of all fatal accidents occurred on local streets, 24.4 percent of those involving a pedalcyclist were on such roadways (Figure 56a). About 73 percent of pedalcyclist deaths occurred during the hours between 4 a.m. and 8 p.m. (Figure 56b).

FIGURE 55
PEDESTRIAN FATALITIES WITH KNOWN ALCOHOL TEST RESULTS BY AGE AND SEX

(3,013)



Note: 2 Pedestrians of Unknown Sex and Age
1 with BAC≥.10 , 1 with BAC>.10

FIGURE 56a
FATAL ACCIDENTS INVOLVING PEDALCYCLISTS BY ROADWAY FUNCTION CLASS

(923)

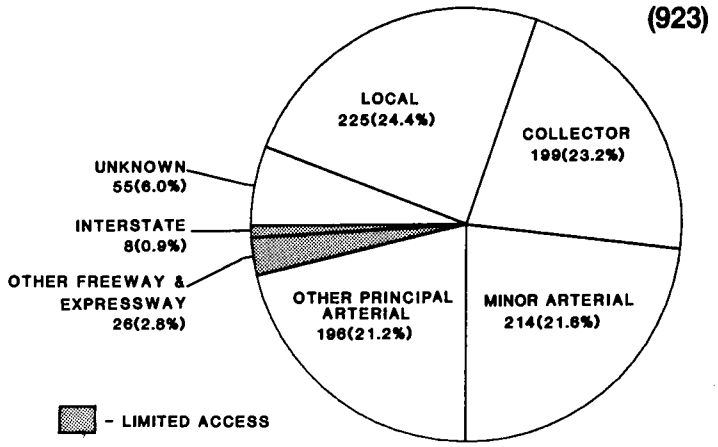


FIGURE 56b
TIME OF DAY OF PEDALCYCLIST FATALITIES

(923)

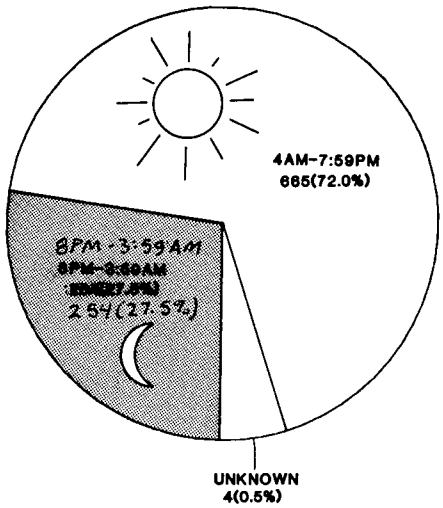


Table 41 distributes pedalcyclist fatalities by location and age: 18 of the 28 pre-school age pedalcyclists killed in traffic accidents were killed away from intersections, and only 22.6 percent of all pedalcyclist fatalities occurred at an intersection.

Other Nonoccupants

There were 104 other nonoccupants killed in 1981. These are nearly all occupants of vehicles not in transport, but also include riders of animals and animal-drawn conveyances. Figure 57 illustrates that 33.3 percent of the time these accidents occurred on limited access roadways. Table 42 indicates most of them (59 percent) were on the shoulder or (31.7 percent) in the parking lane.

TABLE 41
PEDALCYCLIST FATALITIES BY AGE AND LOCATION

	Intersection, Crosswalk, Roadway	Intersection, Sidewalk, Median, etc.	Intersection, Unknown	Non-Intersection, Crosswalk, Roadway, Parking Lane	Non-Intersection, Sidewalk, Other, Bike Path, Shoulder, Outside Trafficway	Non-Intersection, Unknown	Other	Total
Under 5	8		1	18	1			28
5-9	45			92	7	1	8	153
10-17	81	2		261	15		17	376
18-44	47			183	16	1	8	255
45-64	8			49	1		1	59
65 and Over	12	2	1	29			1	45
Unknown	4			7	1		7	19
Total	**205**	**4**	**2**	**639**	**41**	**2**	**42**	**935**

FIGURE 57
FATAL ACCIDENTS INVOLVING OTHER NONOCCUPANTS BY ROADWAY FUNCTION CLASS (225)

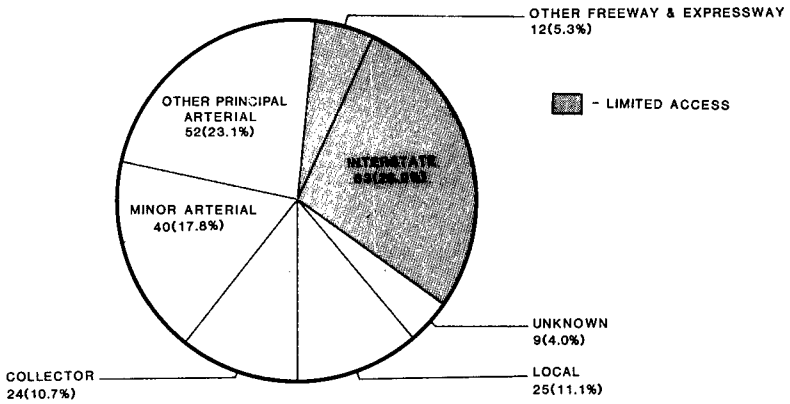
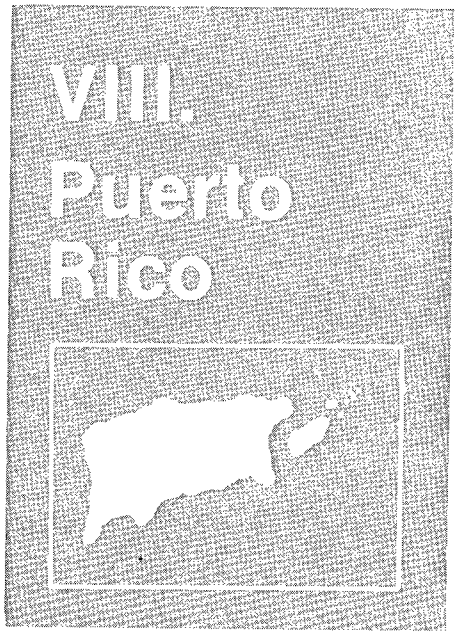


TABLE 42
FATALITIES BY AGE AND LOCATION FOR OTHER NONOCCUPANTS

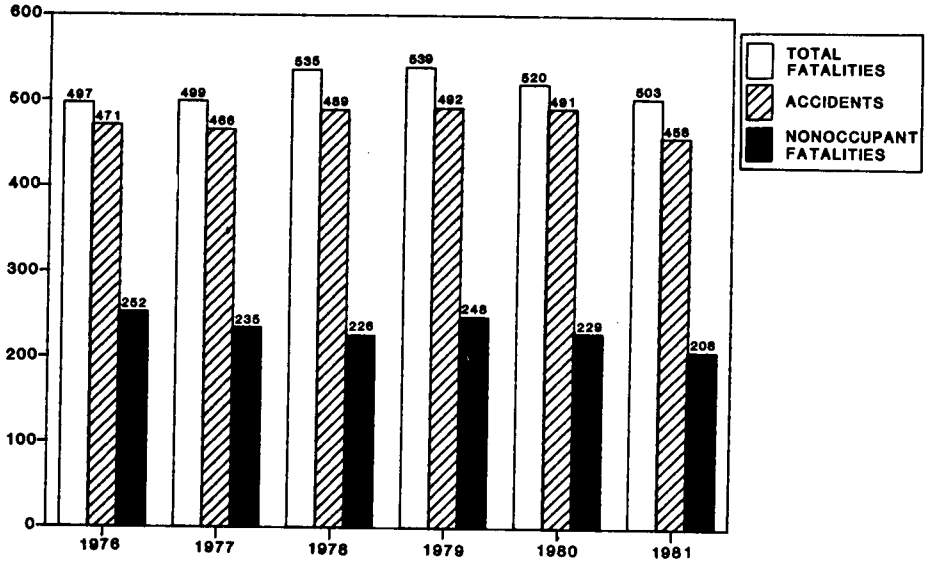
	Intersection, Crosswalk, Roadway	Intersection, Unknown	Non-Intersection, Crosswalk, Roadway, Parking Lane	Non-Intersection, Sidewalk, Other, Bike Path, Shoulder, Outside Trafficway	Non-Intersection, Unknown	Other	Total
Under 5			1	3			4
5-9			9	2			11
10-17	2		9	9			20
18-44	2		9	33	1		45
45-64	1	1	3	12			17
65 and Over	1		2	2			5
Unknown						2	2
Total	**6**	**1**	**33**	**61**	**1**	**2**	**104**



The fatal accident experience in Puerto Rico is treated separately in this report to conform to the practice of other national statistics systems. In summary, the figures and tables in this chapter show that the pattern of fatal accidents in Puerto Rico differs from the national pattern in some respects and in other respects may be indicative of changing patterns of vehicular usage in Puerto Rico during recent years.

- 458 fatal accidents occurred in Puerto Rico in 1981, a decrease of 6.7 percent from 1980 (Figure 58).

FIGURE 58
FATALITIES AND FATAL ACCIDENTS FOR 1976 TO 1981
(PUERTO RICO)



- 503 persons were killed, 41.4 percent of them nonoccupants, down from 44.0 percent in 1980.
- 81.7 percent of all fatal victims were males. They greatly outnumbered females in all age groups except the 4-and-under group, in which they were evenly divided (Figure 59).
- 73.3 percent of the vehicles involved in fatal accidents were passenger cars, down from 74.7 percent a year ago. The next largest group was light trucks (Table 43).
- 33.9 percent of the occupants of involved passenger cars were killed (Table 43), compared to 28.8 percent in 1980.
- 20.3 percent of the drivers were reported to have been drinking alcohol, and most drivers held valid driver's licenses (Table 44).
- 208 nonoccupants were killed, down from 223 in 1980. As with national statistics, most of these occurred on the roadway and away from intersections (Table 45).

FIGURE 59
FATALITIES BY AGE AND SEX (PUERTO RICO)

(503)

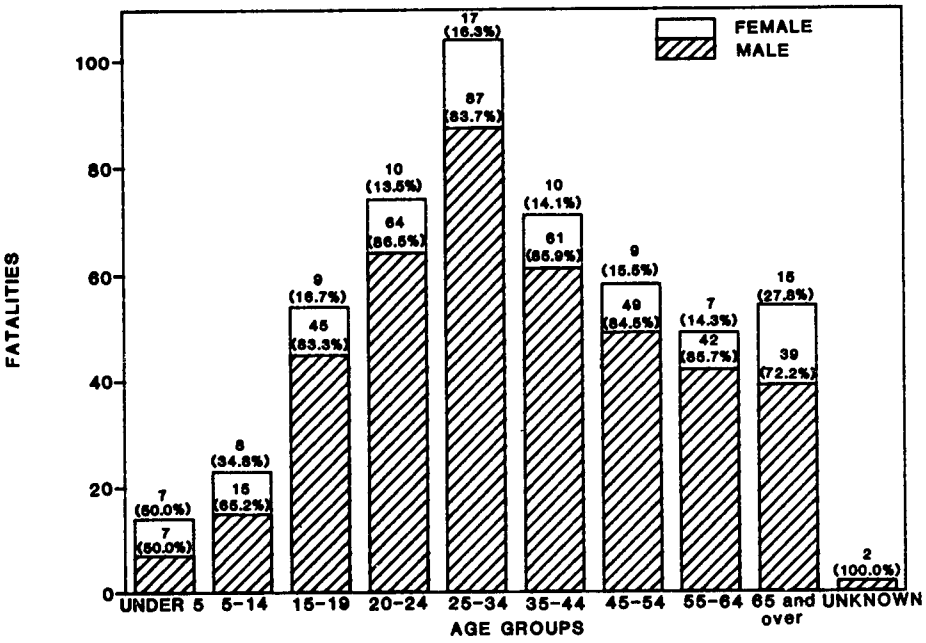


TABLE 43
NUMBER OF VEHICLES, OCCUPANTS AND OCCUPANT FATALITIES BY VEHICLE TYPE (PUERTO RICO)

	Passenger Cars	Motor-cycles	Light Trucks	Medium Trucks	Heavy Trucks	Buses	Special Vehicles	Unknown Type Truck	Unknown	Total
Vehicle	409	32	50	3	7	24	4	28	1	558
Percent	73.3	5.7	9.0	0.5	1.3	4.3	0.7	5.0	0.2	100.0
Occupants	646	38	94	3	8	41	5	35	1	871
Percent	74.2	4.4	10.8	0.3	0.9	4.7	0.6	4.0	0.1	100.0
Fatalities	219	32	22			14	2	6		295
Percent	74.2	10.9	7.5			4.8	0.7	2.0		100.0

TABLE 44
DRIVERS BY AGE, DRINKING INVOLVEMENT, LICENSE STATUS (PUERTO RICO) (552)

		Age Groups							
	Total	14 and Under	15-19	20-24	25-34	35-49	50-64	65 and Over	Unknown
Drinking Not Involved									
Total	**440**	**2**	**39**	**92**	**138**	**119**	**37**	**10**	**3**
Percent	100.0	.5	8.9	20.9	31.4	27.0	8.4	2.3	0.7
Licensed	366		21	74	121	105	36	9	
Percent	100.0		5.7	20.2	33.1	28.7	9.8	2.5	
Suspended License	8			2	2	3	1		
Percent	100.0			25.0	25.0	37.5	12.5		
Other	66	2	18	16	15	11		1	3
Percent	100.0	3.0	27.3	24.2	22.7	16.7		1.5	4.5
Drinking Involved									
Total	**112**		**4**	**33**	**36**	**30**	**7**	**2**	
Percent	100.0		3.6	29.5	32.1	26.8	6.3	1.8	
Licensed	94		2	24	33	26	7	2	
Percent	100.0		2.1	25.5	35.1	27.7	7.4	2.1	
Suspended License	1					1			
Percent	100.0					100.0			
Expired License	1			1					
Percent	100.0			100.0					
Other	16		2	8	3	3			
Percent	100.0		12.5	50.0	18.8	18.8			
Total	**552**	**2**	**43**	**125**	**174**	**149**	**44**	**12**	**3**
Percent	**100.0**	**0.4**	**7.8**	**22.6**	**31.5**	**27.0**	**8.0**	**2.2**	**0.5**

TABLE 45
NONOCCUPANT FATALITIES BY LOCATION (PUERTO RICO)

	Pedestrian		Pedalcyclist		Other Non-Occupant		Total	
Location	No.	%	No.	%	No.	%	No.	%
Intersection								
In Crosswalk	2	1.0					2	1.0
Sidewalk, Median, Island	4	2.1					4	1.9
On Roadway	17	8.7	5	45.5			22	10.6
Non-Intersection								
Crosswalk	1	0.5					1	0.5
Sidewalk, Median, Island	25	12.8	1	9.1	1	50.0	27	13.0
On Road Shoulder	18	9.2	2	18.2			20	9.6
Outside Trafficway	1	0.5					1	0.5
On Roadway	123	63.1	3	27.3	1	50.0	127	61.1
Unknown	4	2.1					4	1.9
Total	**195**	**100.0**	**11**	**100.0**	**2**	**100.0**	**208**	**100.0**

- 21.9 percent of the pedestrians involved in fatal accidents were reported to have been drinking alcohol, down from 27.3 percent in 1981 (Figure 60); 20.2 percent of the involved drivers were reported to have been drinking, a rate virtually unchanged from the previous year.
- More than half of the fatal accidents involving nonoccupants occurred during the daytime (Figure 61).
- 21.9 percent of the 215 pedestrians involved in fatal accidents were less than 25 years old (Figure 62).

FIGURE 60
NONOCCUPANT FATAL ACCIDENTS BY DRINKING INVOLVEMENT (PUERTO RICO) (229)

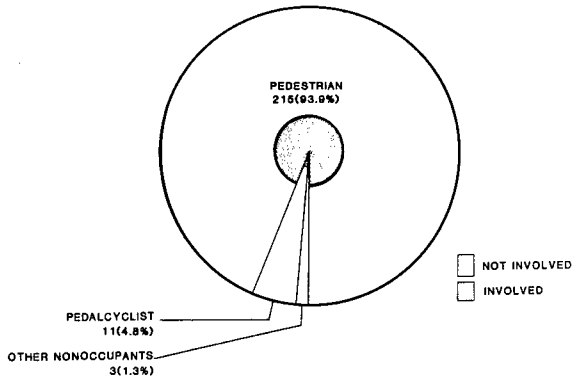


FIGURE 61
NONOCCUPANT FATAL ACCIDENTS BY TIME OF DAY (PUERTO RICO) (229)

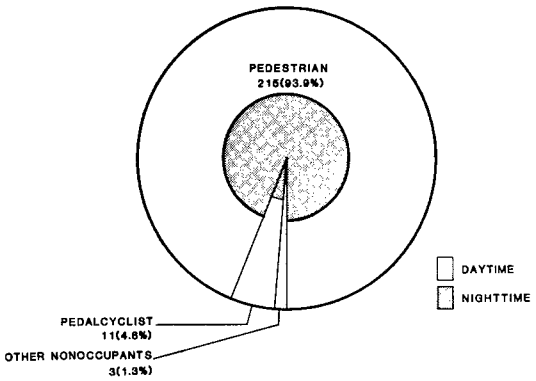
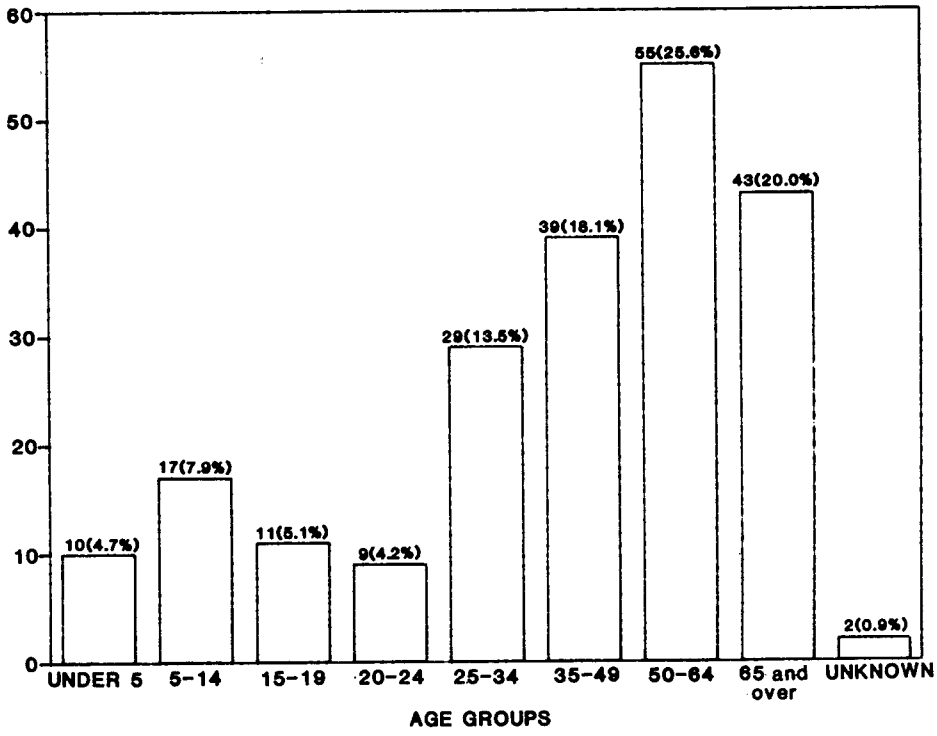


FIGURE 62
AGE DISTRIBUTION OF PEDESTRIANS IN FATAL ACCIDENTS (PUERTO RICO) (215)



IX. Selected Comparisons, 1975–1981

Motor vehicle accidents account for a huge loss of life in America. The public and private sectors are constantly striving to reduce the annual toll of fatalities by improving vehicle designs, increasing driver performance, educating individuals on highway safety and building safer roads. Obviously, each of these countermeasures involves costs, all of which will eventually be paid in the marketplace. Therefore, it is imperative that all countermeasure programs are directed in areas which will provide a substantive safety payoff—e.g., reduced fatalities. The purpose of this section is to present comparisons of certain components of the motor vehicle fatality popuation.

The fatality comparisons are shown for the period 1975–1981 and serve two basic purposes. First, they illustrate the magnitude of a specific component of the fatality population. Second, the 7-year trend demonstrates how the magnitude is changing. Both of these serve to indicate the need for countermeasure research.

In this report occupant fatalities, and especially passenger car occupant fatalities, will be emphasized. Subsequent reports will expand the comparisons.

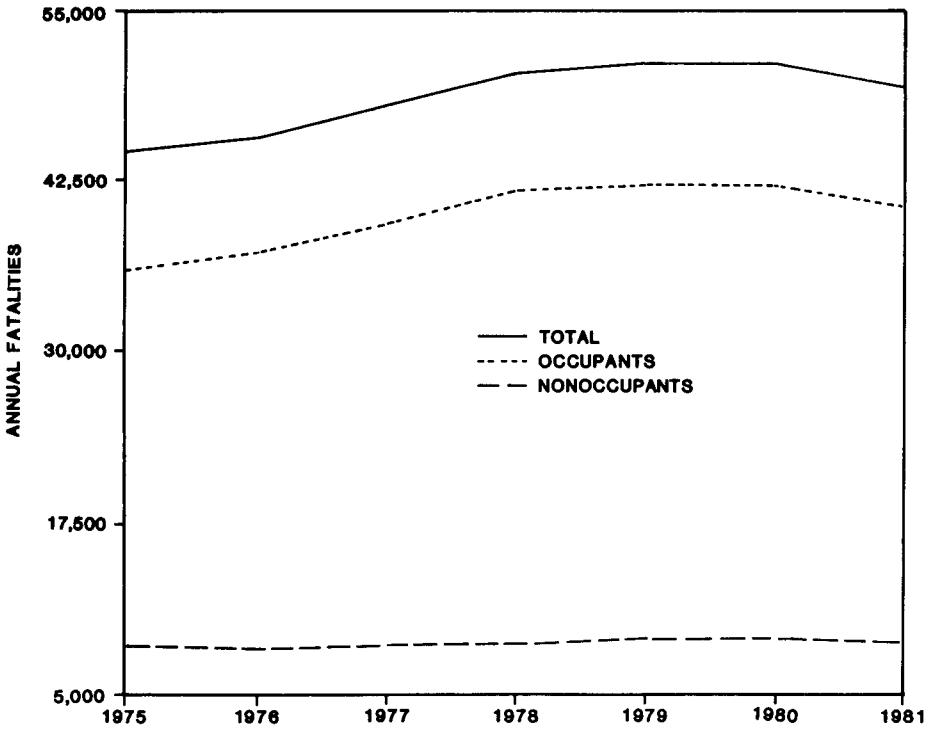
Occupant Fatalities

In 1981, the U.S. experienced a 3.5 percent reduction in motor vehicle fatalities compared to 1980. Figure 63 illustrates the annual fatality trend for total occupant and nonoccupant fatalities. One obvious question which arises from this figure is the reason for the rather constant increase in total fatalities and occupant fatalities from 1975 through 1978, followed by a smaller increase in 1979, no increase in 1980, and a decrease in 1981.

In order to enhance the understanding of these fatality trends, it is helpful to disaggregate them further. Figure 64 illustrates the 1975–1981 fatality trend for occupants of passenger cars, while Figure 65 presents this trend for occupants of light trucks/vans, heavy trucks and motorcycles.

The rather significant increase in passenger car occupant fatalities occurring between 1975 and 1978 experienced a reversal in recent years, with the 1981 total only 2.4 percent above the 1975 level. Similarly, the light truck/van fatalities grew at a very large rate between

FIGURE 63
YEARLY FATALITIES FOR OCCUPANTS AND NONOCCUPANTS



1975 and 1979, with a modest increase in 1980 and a significant reduction in 1981. Although their absolute numbers are small compared to other vehicle types, heavy truck fatalities grew at a dramatic rate, with 1979 resulting in over 50 percent greater fatalities than 1975. The last 2 years, 1980 and 1981, have shown reductions with 1981 being about 18 percent less than the peak year of 1979. Motorcycle fatalities have grown at a very large rate with the 1980 fatalities being 61 percent greater than those which occurred in 1975. The 1981 fatalities have decreased somewhat but are still almost 53 percent greater than those of 1975.

Passenger Car Occupant Fatalities

The constant goal of safety researchers is to develop an understanding of the reasons for these year-to-year changes in fatalities. Optimally, comprehension of the reasons for fatality changes from month-to-month (or even day-to-day) would be desirable. Although many different explanations exist for the year-to-year changes, researchers agree that the major sources are: 1) the vehicle, 2) the driver, and 3) the environment. It is beyond the scope of this discussion to go into detail on each of these sources, but relating fatality counts to some characterization of these sources can provide insight into understanding their fluctuations.

The third source, environment, is one which has an extensive contribution to the number of fatalities. Many factors are included in the definition of the environment. One that is used extensively is the number of vehicle miles driven on the nation's highways. Obviously, if driving is reduced, the opportunity for accidents is reduced and hence, fewer fatalities will occur. The Federal Highway Administration (FHWA) publishes estimates of total vehicle miles driven by various classes of passenger vehicles. Estimates of vehicle miles driven by passenger cars are available for 1975–1980 from FHWA. Also, FHWA has made a preliminary estimate of total motor vehicle miles. Using the 1980 to 1981 ratio of total vehicle miles, an estimate of 1981 passenger car vehicle miles can be obtained.

Figure 66 illustrates the ratio of passenger car occupant fatalities to passenger car vehicle miles. This trend is notably different from the passenger car occupant fatality trend. Over the period 1975–1981, passenger car occupant fa-

FIGURE 64
YEARLY FATALITIES IN PASSENGER CARS

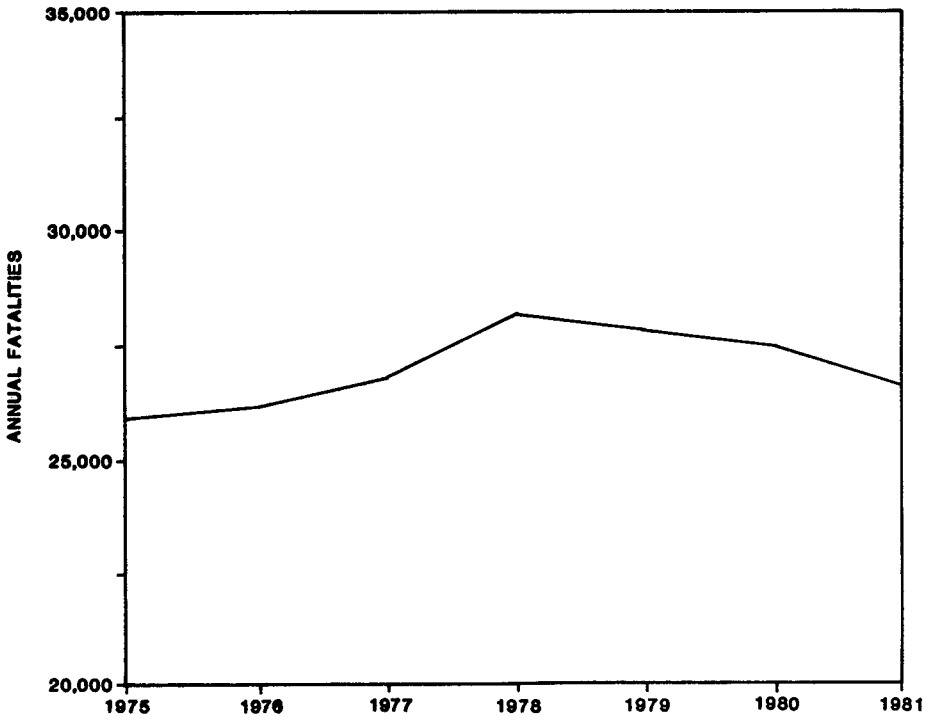
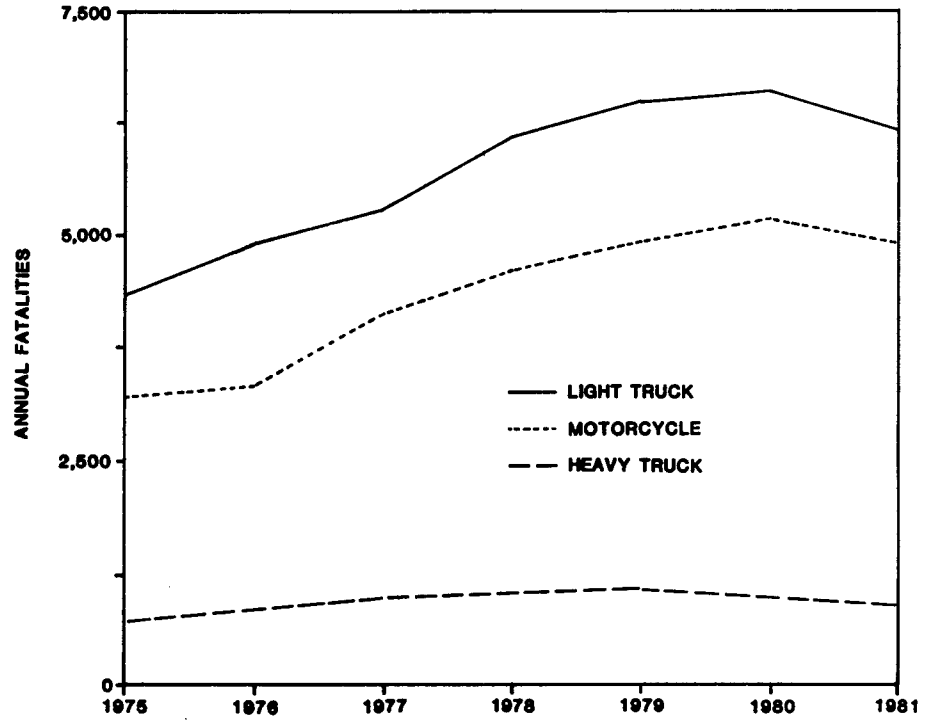


FIGURE 65
YEARLY FATALITIES IN OTHER VEHICLE TYPES



talities have grown at a lower rate than have passenger car vehicle miles, with the 1981 ratio of fatalities per vehicle mile over 7 percent less than the 1975 rate. Perhaps most significant is that the rate was reduced over 5 percent between 1980 and 1981, the largest year-to-year change.

The underlying reasons for the rate change cannot be isolated, although it is possible to speculate on some of the possibilities:

- Vehicles are becoming more crashworthy. That is, given an accident of a specific severity, the risk of fatality is being reduced. This is precisely the objective of the NHTSA's occupant crash protection standards.
- Fewer accidents are occurring for a given amount of vehicle miles. This could occur due to improved crash avoidance of the vehicles, better driving skills in the driving population, improved roadways, reduced speed and less use of alcohol.
- Increased belt usage. Previous NHTSA studies indicate that seat belts, where they are used, reduce the risk of fatality by 50–60 percent compared to unrestrained occupants.
- Changes in the driver demographics. It has been recognized that a major component of the highway fatality problem is due to the young driver.

Driver Age and Passenger Car Fatalities

In order to analyze the role of driver age in passenger car fatalities, FARS data for 1975 through 1981 along with information on the age distribution of driver licenses was utilized. The license information is from FHWA for 1975–1980 and for 1981 it is assumed that the 1980 distribution remains.

Table 46 presents the number of passenger car occupant fatalities which occurred in 1975–1981 in vehicles driven by drivers in various age categories.

Dividing the fatalities in each age group by the number of drivers in that age group results in a fatality rate dependent upon driver age. If these rates are nominally equal among driver age groups, the implication is that driver age does not significantly affect the risk of fatality in passenger car crashes.

Table 47 presents the occupant fatalities in Table 46 divided by the appropriate number of drivers in each of the 49 cells. (The under 15 age group is not applicable.)

FIGURE 66
RATIO OF PASSENGER CAR OCCUPANT FATALITIES TO VEHICLE MILES

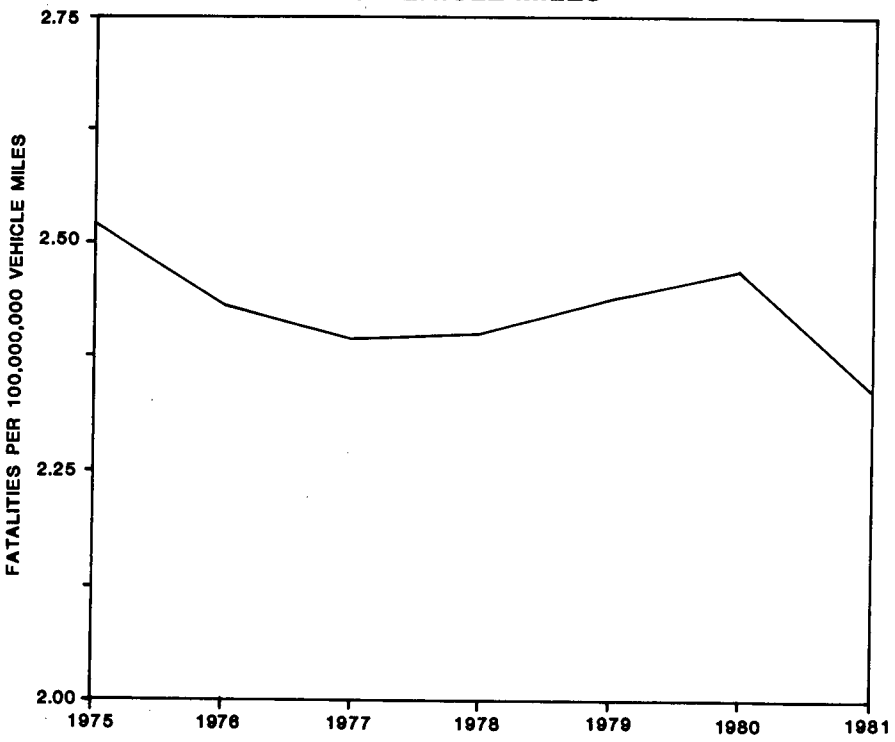


TABLE 46
PASSENGER CAR OCCUPANT FATALITIES (ALL AGES) IN VEHICLES DRIVEN BY DRIVERS IN VARIOUS AGE GROUPS, 1975-1981

	Driver Age Group							
Year	<15	15-24	25-34	35-44	45-54	55-64	65+	Total
1975	36	10,791	5,352	2,647	2,268	1,970	2,697	25,761
1976	41	11,114	5,255	2,560	2,260	2,008	2,757	25,995
1977	43	11,527	5,422	2,640	2,252	2,047	2,677	26,608
1978	56	11,921	6,078	2,816	2,252	2,029	2,786	27,938
1979	61	11,683	6,306	2,854	2,103	1,999	2,630	27,636
1980	62	11,185	6,273	2,923	2,250	1,935	2,625	27,253
1981	48	10,167	6,324	2,977	2,103	2,011	2,709	26,339

TABLE 47
RATIO OF PASSENGER CAR OCCUPANT FATALITIES (ALL AGES) IN VEHICLES DRIVEN BY DRIVERS IN VARIOUS AGE GROUPS TO NUMBER OF DRIVERS IN THAT AGE GROUP, 1975-1981

	Driver Age Group						
Year	15-24	25-34	35-44	45-54	55-64	65 and Over	Total
1975	.370	.178	.124	.110	.122	.219	.199
1976	.372	.165	.116	.110	.120	.212	.194
1977	.379	.163	.115	.109	.120	.196	.193
1978	.382	.177	.120	.108	.115	.196	.197
1979	.377	.182	.119	.100	.113	.180	.193
1980	.358	.174	.119	.110	.108	.170	.187
1981	.326	.175	.120	.103	.112	.175	.180

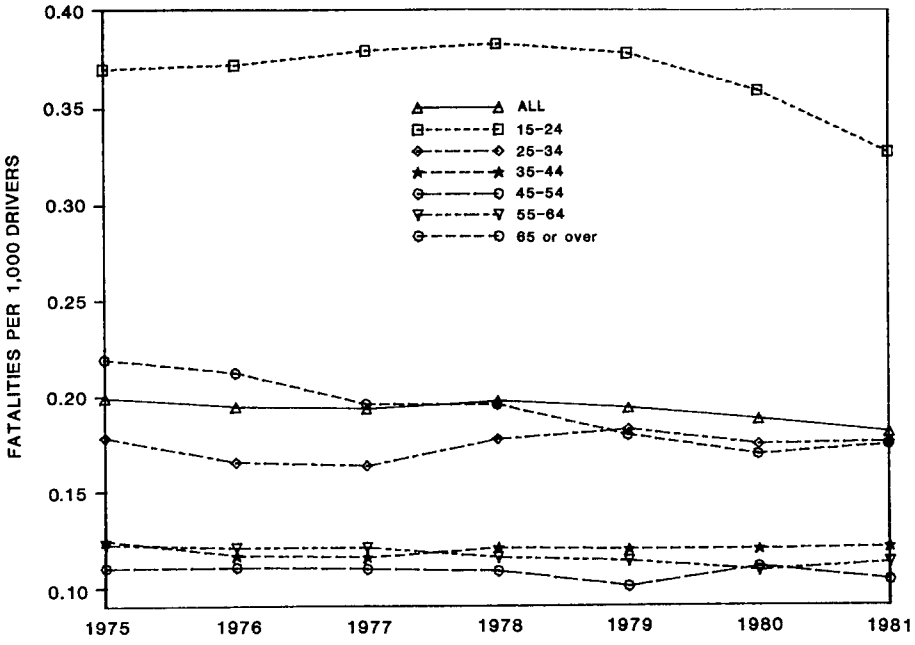
These ratios are illustrated on Figure 67. As Table 47 and Figure 67 illustrate, young drivers 15–24 have a fatality per driver ratio greater than the other age groups. Additionally, from the FHWA data, they constitute a substantial portion of the drivers—ranging from 22.6 percent in 1975 to 21.5 percent in 1981.

Although the fatality per driver ratio for each group does vary somewhat, the year-to-year changes through 1979 are not significant. If these ratios are assumed constant, the total fatalities in any year could be predicted by multiplying the ratio for each age group by the number of drivers in that age group. Beginning in 1980 and especially in 1981, however, this ratio dropped dramatically for the youngest age group—a 13.5 percent drop in 1981 compared to 1979. Inasmuch as these drivers have the largest absolute ratio, this drop has a significant effect on the total ratio.

Of the three factors discussed earlier—driver, vehicle and environment—it is not possible to state the contribution of each to the reduction in this ratio from 1979-1981. It could be that young drivers are becoming much more cautious, more wear seat belts and more drive large vehicles. A more likely rationale, however, is the reduction in miles driven has the most dramatic effect on the young age group. The result of this is less disposable income in this age group, which can be associated with less driving. by these young drivers as well as less use of alcohol when driving.

Although it is beyond the scope of this discussion, the economic recession

FIGURE 67
FATALITY RATE FOR VARIOUS DRIVER AGE GROUPS



X. Classification

Accident, 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 Accidents, a manual developed by the National Safety Council's Committee on Motor Vehicle Traffic Accident Classification and approved as the national standard by the American National Standards Institute (ANSI).* The standard was developed to engender uniformity in the classification and use of accident data. As such it applies to *all* accidents, whether or not they result in death. In part because FARS counts *only* fatal accidents (and only those where death occurs within 30 days of the accident), its counts are not always comparable with ANSI classification counts.

However, the following sections summarize 1981 FARS data as distributed among ANSI classifications where applicable. Paragraph numbers cited for each section are those used in the ANSI manual.

Persons 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 but non-incapacitating injury
- Incapacitating injury
- Fatal injury

The level of injury severity used is that which prevailed at the scene of the accident, with one significant exception—fatalities. Using ANSI manual criteria, injuries are considered fatal if they result in death anytime within 12 months of the accident. FARS uses instead the 30-day rule (see Chapter I) to conform with international counting systems. Expansion of the 30-day rule to 12 months results in a count of only 2 percent more fatalities and significantly sacrifices timeliness of reporting. Using the 12-month rule adopted by ANSI, full fatality counts would not be available until at least a full year after the end of the base year in which the counted accidents occurred.

Personal involvements in FARS-counted accidents in 1981 were distributed among the ANSI injury-severity classifications as follows:

• No Injury	21,102
• Possible Injury	6,778
• Non-Incapacitating	14,688
• Incapacitating	17,935
• Fatal	49,268
• Unknown Severity	485
• Died Prior to Accident	12
• Unknown	499
• Total	112,403

Vehicles by Damage Severity (ANSI 3.2)

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

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

These classifications usually are applied only to vehicles involved in non-injury accidents because injury to a person is considered more severe than property damage. Nevertheless, vehicle involvements in FARS-counted accidents are also coded according to ANSI damage classifications. In 1981, this resulted in the following distribution of involved vehicles:

• No damage	2,047
• Other damage	6,716
• Functional damage	8,597
• Disabling damage	44,338
• Unknown	968
• Total	62,666

Accidents by Injury Severity (ANSI 3.3)

Using ANSI groupings, accidents are classified according to the most severe personal injury sustained in them, as described in 3.1. Using this method of classification, all 43,979 accidents in FARS are, by definition, fatal.

*Manual on Classification of Motor Vehicle Traffic Accidents, National Safety Council, Third Edition, Chicago. ANSI D16.1-1976 (revision of D16.1-1970) November, 1976.

Accidents by Damage Severity (ANSI 3.4)

Accidents are also classified according to the most severe vehicle damage sustained, as in 3.2 above. Using ANSI classifications, the 1981 accidents counted in FARS had the following distribution of most severe vehicle damage:

- No damage 1,661
- Other damage 4,237
- Functional damage 4,178
- Disabling damage 32,364
- Unknown damage 1,539
- Total 43,979

Accidents by Number of Involved Vehicles (ANSI 3.5)

Accidents can also be classified by the number of motor vehicles in transport which were involved. Noncontact vehicles, such as one which forced another off the road but was not itself involved in an impact, are not counted as accident-involved. The 43,979 fatal accidents in 1981, as illustrated in Figure 19, were classified as follows:

- 1 vehicle 26,492
- 2 vehicles 15,318
- 3 vehicles 1,574
- 4 vehicles 266
- 5 vehicles 56
- 6 vehicles 16
- 7 vehicles 8
- 8 or more vehicles 10
- Unknown number 240

Accidents by First Harmful Event (ANSI 3.6)

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 accident statistics reporting. The categories are mutually exclusive. The frequency of 1981 FARS-counted accidents, as shown in Figure 11, was distributed among first harmful events as follows:

- Noncollision overturn 4,236
- Other noncollision 662
- Collision with pedestrian 7,281
- Collision with motor vehicle in transport 16,331
- Collision with parked vehicle 862
- Collision with railway vehicle 519
- Collision with pedalcycle 900
- Collision with animal 94
- Collision with fixed object 12,860
- Collision with other object 182
- Unknown 52
- Total 43,979

Accidents by Location (ANSI 3.7)

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

On on-roadway accident is (1) an event in which the initial point of contact between colliding units in the first harmful event is within that part of the trafficway designed, improved and ordinarily used for motor vehicle traffic or (2) a noncollision in which the vehicle involved was partly or entirely on the roadway at the time of the first harmful event. All other accidents are off-roadway. FARS accidents in 1981, as illustrated in Figure 17, occurred:

- On-roadway 26,263
- Off-roadway 17,330
- Unknown 386
- Total 43,979

Junction related locations include four mutually exclusive categories. Intersection-related accidents 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. Following are 1981 FARS data distributed among the four ANSI categories, as shown in Figures 16a and 16b:

- At intersection 8,832
- Driveway access 1,459
- Intersection-related 1,463
- Non-junction 31,961
- Unknown 264
- Total 43,979

ANSI uses "class trafficway" to describe the administrative class of the roadway where an accident occurred. In 1981 FARS coding, class trafficway was replaced by "functional class," as shown in Figure 15.

Class of trafficway is divided between two mutually exclusive categories:

- Fully controlled access highway
- Other

All Interstate Highways and other freeways and expressways coded in FARS data are considered fully controlled. The results, summarized from Figure 15:

- Fully controlled 5,306
- Other 36,743
- Unknown 1,930
- Total 43,979

Land Use is classified by ANSI as urban or rural, based on urban area boundaries approved by the Federal Highway Administration. As shown in Figure 13, 1981 fatal accidents were distributed as follows:

- Urban 18,911
- Rural 24,022
- Unknown 1,046
- Total 43,979

Accidents are also classified by governmental jurisdiction. Tables 9 to 11 and Figure 10 distribute 1981 fatalities by State. County and city jurisdictions were also 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.

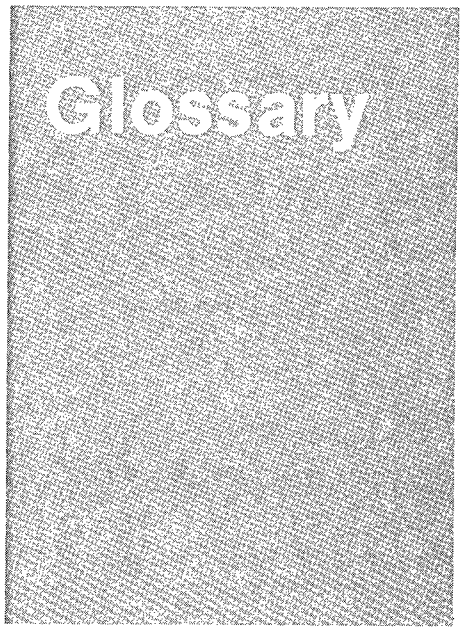
Motor Vehicle Classifications (ANSI 3.8)

ANSI specifies eight mutually exclusive categories for classifying motor vehicles involved in accidents:

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

Categories used in FARS, although more detailed, are compatible with these ANSI specifications. Appendix B describes all vehicle body types coded in FARS. Summarized according to ANSI definitions, the following vehicle involvements were counted in 1981 FARS accidents:

- Automobile 38,725
- Motorcycle 4,931
- Bus 341
- Light Truck 10,884
- Single Unit Truck 1,226
- Truck Tractor 104
- Truck Combination 3,875
- Other (including unknown & unknown truck) 2,580
- Total 62,666



Alcohol Involvement—an accident is considered to have had alcohol involved if there was a positive blood alcohol test result on one of the involved persons (drivers or nonoccupants), or if the investigation indicated that drinking was involved, whether there was a supporting alcohol test or not.

Automatic (Passive) Restraint System—describes any restraint system that required no action on the part of the driver or passengers to be operable, e.g., air bags or passive belts.

Body Type—refers to the individual types of motor vehicles coded in the FARS file, as listed in Appendix B.

Buses—unless otherwise noted, includes school bus, cross country bus, transit bus, and other and unknown type bus.

Driver—is an occupant of a vehicle who is in actual 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 Accident—the FARS definition of a fatal accident is one that involves a motor vehicle in transport on a trafficway and at least one person dies within 30 days of the accident as a result of the accident.

First Harmful Event—is the first event during an accident that caused injury or property damage, and is broadly grouped into noncollision, collision with an object not fixed, and collision with a fixed object.

Fixed Objects—are objects attached to the terrain or stationary objects intentionally placed for a particular purpose.

Gross Vehicle Weight (GVW)—is the maximum rated capacity of a vehicle and includes the weight of the base vehicle, all added equipment, driver and passengers, and all property loaded into or on the vehicle.

Heavy Truck—includes the following: (1) single unit truck with GVW greater than 26,000 lbs., (2) tractor-trailer combination, (3) truck with cargo trailer(s), and (4) truck-tractor pulling no trailer. (See Appendix B.)

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

Land Use—designates the accident location as urban or rural. Classifications used are those of the Federal Highway Administration.

Light Truck—includes pickups, vans, and truck based stationwagons. (See Appendix B.)

Manner of Collision—only applies to accidents in which the first harmful event was a collision between two motor vehicles in transport and is described as one of the following:

Angle—refers to those 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—refers to a collision between the rear of one vehicle and the front of another vehicle.

Rear-to-rear—refers to a collision between the rear of one vehicle and the rear of another.

Sideswipe—refers to a collision between two vehicles in which the sides of *both* vehicles sustained minimal engagements.

Other—refers to unknown data in the FARS file.

Manual (Active) Restraint System—describes the type of manual restraint system used at the time of the accident as shoulder belt, lap belt, lap and shoulder belt, child safety seat or motorcycle helmets for motorcycle riders.

Medium Truck—is any single unit truck with a GVW between 10,000 and 26,000 lbs., or unknown GVW. (See Appendix B.)

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

Most Harmful Event—represents the event during an accident 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 persons. For the purposes of this report, the following are not included unless otherwise noted: motorscooters, minibikes, and mopeds. (See Appendix B.)

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

Noncollision—a class of accidents in which the first harmful event does not involve a collision with a fixed object or

a nonfixed object. This includes overturn, fire/explosion, gas inhalation, fell from vehicle and injured in vehicle.

Nonoccupant—is any person who is not an occupant of a motor vehicle in transport and consists of the following persons: (1) pedestrians, (2) pedalcyclists, (3) occupants of a non-traffic unit vehicle (e.g., parked motor vehicle), and (4) other types such as skateboard riders, persons riding on an animal, persons riding in animal-drawn conveyance, etc.

Objects Not Fixed—are objects that are movable or moving but are not motor vehicles, pedestrians, pedalcyclists, animals, or trains.

Occupant—is 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 on to the vehicle).

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

Passenger Car—for the purposes of this report, refers to any of the following types of motor vehicles: (1) convertible; (2) 2-door sedan, hardtop or coupe; (3) 4-door sedan or hardtop; (4) 3 or 5 door hatchback coupe; (5) automobile with pickup body; (6) stationwagon; and (7) other and unknown type passenger cars (e.g., gocarts).

Pedalcyclist—is a person on a vehicle which is operated solely by pedals.

Pedestrian—is any person not in or upon a motor vehicle or other road vehicle.

Principal Impact Point—represents the impact that is judged to have produced the greatest personal injury or property damage. Impacts resulting in personal injury take precedence over damage impacts.

Roadway—is that part of a trafficway used for motor vehicle travel or, where various classes of motor vehicle travel are segregated, that part of a trafficway used by a particular class.

Roadway Function Class—a code, based on the classifications used by the Federal Highway Administration, describing the role of the highway in the region.

Interstate—A 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—Limited access facilities not on the Interstate System, with full grade separation.

Other Principal Arterial—Major streets or highways with grade crossings, serving high volume traffic corridors that connect major generators of travel.

Minor Arterials—Streets and highways serving a connecting function between less concentrated traffic generating areas such as neighborhood shopping centers and schools, with a predominant function of movement of through traffic.

Collectors—Streets providing direct access to neighborhoods as well as direct access to abutting land.

Local Streets and Roads—Streets whose primary purpose is providing direct access to abutting land, with little or no through traffic.

School Bus—refers to a specific type of vehicle which, independent of ownership or usage at the time of the accident, is primarily designed for transporting children to and from school.

School Bus Related Accident—any accident in which a vehicle of body type school bus or vehicle used as a school bus but not necessarily of school bus body type is directly or indirectly involved, such as an accident involving children alighting from a school bus. The vehicle itself does not have to be a traffic unit in the accident.

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) firetruck; (9) on/off road vehicle; and (10) other special vehicle.

Trafficway—is any land way open to the public as a matter of right or custom for moving persons or property from one place to another, and it consists of the entire width between property lines or other boundaries.

Vehicle Type—refers to 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, light trucks, medium trucks and heavy trucks. Also used, but to a lesser extent are the buses and special vehicle groups. See the definitions of each of the vehicle types elsewhere in this glossary.

APPENDIX A

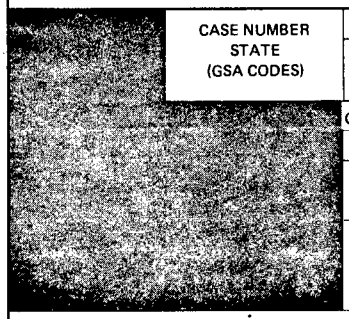
STATE CASE NO. _____

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Form Approved
O.M.B. No. 004R-5634

FATAL ACCIDENT REPORTING SYSTEM (1981)
–ACCIDENT LEVEL–

This report is authorized by the Highway Safety Act of 1966, P.L. 89-564. While the law does not require you to respond, the State is obligated under the terms of a grant of funds to defray the expense of reporting this information to cooperate in or to make the results of this survey comprehensive, accurate and timely.



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

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

TRANSACTION CODE [7][8]
11–Original Submission
12–Update or Change
1

CARD NO. [9] 1

CITY [14][15][16][17]

COUNTY [18][19][20]

DATE — MONTH [21][22] DAY [23][24] YEAR [25][26]
8 1

TIME [27][28][29][30]
Military Time
9999–Unknown

Number of Vehicle Forms Submitted [31][32]

Number of Person Forms Submitted [33][34]

Number of Vehicles Involved in Accident [35][36]

LAND USE [37]
1–Urban
2–Rural
9–Unknown

ROADWAY FUNCTION CLASS [38]
1–Principal Arterial - Interstate
2–Principal Arterial - Other Urban Freeways and Expressways
3–Principal Arterial - Other
4–Minor Arterial
5–Urban Collector
6–Major Rural Collector
7–Minor Rural Collector
8–Local Road or Street
9–Unknown

TA-1 CLASS [39]
1–Interstate
2–Other Federal Aid Primary
3–Federal Aid Secondary
4–Federal Aid Urban Arterials
5–Federal Aid Urban Collectors
6–Non-Federal Aid Arterials
7–Non-Federal Aid Collectors
8–Non-Federal Aid Local
9–Unknown

SPECIAL JURISDICTION [40]
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 [41][42]

NON-COLLISION
01–Overturn
02–Fire/Explosion
03–Immersion
04–Gas Inhalation
05–Fell from Vehicle
06–Injured in Vehicle
07–Other Non-Collision

COLLISION WITH
08–Pedestrian
09–Pedalcycle
10–Railway Train
11–Animal
12–Motor Vehicle in Transport
13–Motor Vehicle in Other Roadway
14–Parked Motor Vehicle
15–Other Type Non-Motorist
16–Other Object (Not Fixed)

COLLISION WITH FIXED OBJECT
18–Building
19–Culvert/Ditch
20–Curb or Wall
21–Divider
22–Embankment
23–Fence
24–Guard Rail
25–Light Support
26–Sign Post
27–Tree/Shrubbery
28–Utility Pole
29–Other Poles/Support
30–Impact Attenuator
31–Other Fixed Object
32–Bridge or Overpass (Passing Under)
33–Bridge or Overpass (Passing Over)
99–Unknown

MANNER OF COLLISION [43]
0–Not Collision with 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 [44]
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 [45]
1–On Roadway
2–Shoulder
3–Median
4–Roadside
5–Outside Right-of-Way
6–Off Roadway–Location Unknown
7–In Parking Lane
9–Unknown

ROADWAY FLOW [46]
1–Divided Highway, Median Strip
2–Divided Highway, Guardrail
3–Divided Highway, Other Barrier or Barrier Type Unknown
4–Not Physically Divided
5–One Way Trafficway
9–Unknown

NUMBER OF TRAVEL LANES [47]
Actual Value Except:
7–Seven or more lanes
9–Unknown

SPEED LIMIT [48][49]
Actual Miles Per Hour Except:
99–Unknown

ROADWAY ALIGNMENT [50]
1–Straight
2–Curve
9–Unknown

ROADWAY PROFILE [51]
1–Level
2–Grade
9–Unknown

ROADWAY SURFACE TYPE [52]
1–Concrete
2–Blacktop (Bituminous)
3–Brick or Block
4–Slag, Gravel or Stone
5–Dirt
8–Other
9–Unknown

ROADWAY SURFACE CONDITION [53]
1–Dry
2–Wet
3–Snow or Slush
4–Ice
5–Sand, Dirt, Oil
8–Other
9–Unknown

TRAFFIC CONTROLS [54][55]
00–No Controls
01–Flashing Traffic Signal
02–On Colors Traffic Signal
03–Stop Sign
04–Yield Sign
05–Physically Controlled RR Crossing
06–Stop Sign for RR Crossing
07–Other RR Crossing
08–School Zone Sign
09–Traffic Controls Not Functioning
10–Pedestrian Signal
98–Other
99–Unknown

LIGHT CONDITION [56]
1–Daylight
2–Dark
3–Dark but lighted
4–Dawn
5–Dusk
9–Unknown

ATMOSPHERIC CONDITIONS [57]
1–Normal
2–Rain
3–Sleet
4–Snow
5–Fog
8–Other: Smog, Smoke, Blowing Sand or Dust
9–Unknown

HIT AND RUN [58]
0–No Hit and Run
1–Hit Motor Vehicle
2–Hit Non-Motorist
3–Left Scene

CONSTRUCTION/MAINTENANCE ZONE [59]
0–None
1–Construction
2–Maintenance
3–Construction or Maintenance

NOTIFICATION TIME EMS [60][61][62][63]
Military Time Except:
0000–Not Notified
9999–Unknown

ARRIVAL TIME EMS [64][65][66][67]
Military Time Except:
0000–Not Notified
9999–Unknown

SCHOOL BUS RELATED [68]
0–No
1–Yes

RELATED FACTORS [69][70] [71][72] [73][74]
See Instruction Manual "Related Factors–ACCIDENT LEVEL"

RAIL GRADE CROSSING IDENTIFIER [75][76][77][78][79][80][81]
(See Instruction Manual)

CARD NO. [9] 2

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

HS Form 214 (Rev. 9/80)

*U. S. GOVERNMENT PRINTING OFFICE: 1980–330-498

STATE CASE NO._____

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Form Approved
O.M.B. No. 004R-5634

FATAL ACCIDENT REPORTING SYSTEM (1981) —VEHICLE-DRIVER LEVEL—

This report is authorized by the Highway Safety Act of 1966, P.L. 89-564. While the law does not require you to respond, the State is obligated under the terms of a grant of funds to defray the expense of reporting this information to cooperate in or to make the results of this survey comprehensive, accurate and timely.

CASE NUMBER STATE (GSA CODES) 1 2

CONSECUTIVE NUMBER 3 4 5 6

TRANSACTION CODE 7
21—Original Submission
22—Update or Change

CARD NO. 8 = 2

VEHICLE NUMBER (Assigned by Analyst) 9 = 1 | 10 11

[redacted]

VEHICLE MAKE (See Instruction Manual) 14 15

VEHICLE MODEL (See Instruction Manual) 16 17

BODY TYPE (See Instruction Manual) 18 19

MODEL YEAR 20 21
Actual Value except
99—Unknown

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—No Registration Not Applicable
93—Multiple State Reg., in State
94—Multiple State Reg., Out-of-State
95—U.S. Government Tags
96—Military Vehicle
97—Foreign Countries
99—Unknown

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

JACK KNIFE 42
0—Not an Articulated Vehicle
1—No
2—Yes

[redacted]

TOWED TRAILING UNIT 43
0—No
1—Yes

SPECIAL USE 44
0—No Special Use
1—Taxi
2—Vehicle Used as School Bus
3—Vehicle Used as other Bus
4—Military
5—Police
6—Ambulance
9—Unknown

EMERGENCY USE 45
0—No
1—Yes

IMPACT POINT—INITIAL 46 47
00—Non-Collision
01—12—Clock Points
13—Top
14—Undercarriage
15—Under Ride
99—Unknown

IMPACT POINT—PRINCIPAL 48 49
00—Non-Collision
01-12—Clock Points
13—Top
14—Undercarriage
15—Under Ride
99—Unknown

EXTENT OF DEFORMATION 50
0—None
2—Other (Minor)
4—Functional (Moderate)
6—Disabling (Severe)
9—Unknown

VEHICLE ROLE 51
0—Non-Collision
1—Striking
2—Struck
3—Both
9—Unknown

MANNER OF LEAVING SCENE 52
1—Driven
2—Towed Away
3—Abandoned
9—Unknown

FIRE OCCURRENCE 53
0—No Fire
1—Fire Occurred in Vehicle During Accident

NUMBER OF OCCUPANTS 54 55
Actual Value if Total Known
97—Unknown—Only Injured Reported
99—Unknown

RELATED FACTORS 56 57 58 59
See Instruction Manual "Related Factors—VEHICLE LEVEL"

MOST HARMFUL EVENT 60 61

NON-COLLISION
01—Overturn
02—Fire/Explosion
03—Immersion
04—Gas Inhalation
05—Fell from Vehicle
06—Injured in Vehicle
07—Other Non-Collision

COLLISION WITH
08—Pedestrian
09—Pedalcycle
10—Railway Train
11—Animal
12—Motor Vehicle in Transport
13—Motor Vehicle in Other Roadway
14—Parked Motor Vehicle
15—Other Type Non-Motorist
16—Other Object (Not Fixed)

COLLISION WITH FIXED OBJECT
18—Building
19—Culvert/Ditch
20—Curb or Wall
21—Divider
22—Embankment
23—Fence
24—Guard Rail
25—Light Support
26—Sign Post
27—Tree/Shrubbery
28—Utility Pole
29—Other Poles/Support
30—Impact Attenuator
31—Other Fixed Object
32—Bridge or Overpass (Passing Under)
33—Bridge or Overpass (Passing Over)
99—Unknown

Card No. 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

LICENSE STATUS 17
0—No License Required
1—No License, License Required
2—Licensed, but not for this type of vehicle
3—Valid License for this type of vehicle
4—Suspended License
5—Revoked License
6—Expired License
7—Learner's Permit
9—Unknown

COMPLIANCE WITH LICENSE RESTRICTIONS 18
0—No Restrictions
1—Restrictions Complied With
2—Restrictions Not Complied With
3—Restrictions, Compliance Unknown
9—Unknown

DRIVER TRAINING 19
0—None
1—High School
2—Commercial
3—School Bus
4—Traffic School
5—Two or more Types
6—Training, Type Unknown
9—Unknown

VIOLATIONS CHARGED 20
0—No
1—Yes
2—Pending
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 33 34
Mo. Yr.
00—No Record
99—Unknown

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

RELATED FACTORS 39 40 41 42 43 44
See Instruction Manual, "Related Factors—DRIVER LEVEL"

HS Form 214A (Rev. 9/80)

STATE CASE NO. _____

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Form Approved
O.M.B. No. 004R-5634

FATAL ACCIDENT REPORTING SYSTEM (1981) –PERSON LEVEL–

This report is authorized by the Highway Safety Act of 1966, P.L. 89-564. While the law does not require you to respond, the State is obligated under the terms of a grant of funds to defray the expense of reporting this information to cooperate in or to make the results of this survey comprehensive, accurate and timely.

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

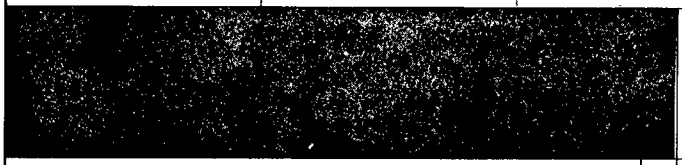
CONSECUTIVE NUMBER [3][4][5][6]

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]



AGE [14][15]
Actual Value
00–Up to One Year
97–Ninety-Seven Years or Older
99–Unknown

SEX [16]
1–Male
2–Female
9–Unknown

PERSON TYPE [17]
1–Driver
2–Passenger
3–Non-Motorist: Pedestrian
4–Non-Motorist: Pedalcyclist
5–Non-Motorist: Occupant of Non Traffic Unit Vehicle
8–Non-Motorist: Other or Unknown
9–Occupant: Unknown Type

SEATING POSITION [18][19]
00–Non-Motorist
01–Front Seat - Left Side (Driver's Side)
02–Front Seat - Middle
03–Front Seat - Right Side
04–Second Seat - Left Side
05–Second Seat - Middle
06–Second Seat - Right Side
07–Third Seat - Left Side
08–Third Seat - Middle
09–Third Seat - Right Side
10–Front Seat - Other
11–Second Seat - Other
12–Third Seat - Other
13–Other Passengers
14–Sleeper Section of Cab (Truck)
15–Riding on Vehicle Exterior
99–Unknown

MANUAL (ACTIVE) RESTRAINT SYSTEM – USE [20]
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 [21]
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 [22][23]
00–Not Applicable - Vehicle Occupant
01–Intersection - In Crosswalk
02–Intersection - Sidewalk, Median, Island, Shoulder, Other
03–Intersection - On Roadway
04–Intersection - Unknown
05–Non-Intersection - In Crosswalk
06–Non-Intersection - Sidewalk, Median, Island, Other
07–Non-Intersection - Bike Path
08–Non-Intersection - On Road Shoulder
09–Non-Intersection - Outside Trafficway
10–Non-Intersection - On Roadway
11–Non-Intersection - In Parking Lane
12–Non-Intersection - Unknown
99–Unknown

EJECTION [24]
0–Not Ejected
1–Totally Ejected
2–Partially Ejected
9–Unknown

EXTRICATION [25]
0–Not Extricated
1–Extricated
9–Unknown

ALCOHOL INVOLVEMENT [26]
0–No
1–Yes

ALCOHOL TEST RESULT [27][28]
Actual Value (Decimal Implied before First Digit) (0.xx)
95–Test Refused
96–None Given
97–AC Test Performed, Results Unknown
99–Unknown

INJURY SEVERITY [29]
0–O
1–C
2–B
3–A
4–K
5–Injured, Severity Unknown
6–Died Prior to Accident
9–Unknown

TAKEN TO HOSPITAL OR TREATMENT FACILITY [30]
0–No
1–Yes
9–Unknown

DEATH DATE [31][32][33][34][35][36]
000000–Not Applicable
999999–Unknown
MONTH DAY YEAR

RELATED FACTORS [37][38] [39][40] [41][42]
See Instruction Manual
"Related Factors–PERSON LEVEL"

HS Form 214B (Rev. 9/80)

GPO : 1980 O - 330-570

APPENDIX B—1981 Vehicles Involved, Occupants and Fatalities by Body Type

Vehicle Type	Number of Vehicles Involved	Number of Occupants	Number of Occupant Fatalities	Number of Fatal Accidents
Convertible	380	614	304	273
2-Door Sedan, Hardtop, Coupe	23,106	39,010	16,078	14,050
4-Door Sedan, Hardtop	9,256	16,104	6,137	5,276
Hatchback	838	1,415	708	629
Auto with Pickup Body	285	421	171	151
Stationwagon	2,807	5,288	1,871	1,603
Other Auto	30	35	29	28
Unknown Type Auto	2,023	3,398	1,247	1,101
Motorcycle	4,774	5,910	4,716	4,505
Moped	105	121	106	104
Other Motorcycle	40	55	40	38
Unknown Motorcycle	12	14	12	12
School Bus	110	272	12	7
Cross Country	48	231	6	5
Transit Bus	149	309	23	13
Other Bus	20	142	11	8
Unknown Bus Type	14	55	4	2
Snowmobile	28	35	28	27
Farm Equipment	168	228	112	108
Dune/Swamp Buggy	25	52	25	24
Construction Equipment	51	56	23	23
Ambulance	16	39	5	5
Large Limousine	1	1	1	1
Campers/Motor Homes	107	306	63	44
Fire Truck	29	64	9	9
On/Off Road Vehicle	1,184	2,311	867	788
Other Special Vehicle	16	18	9	9
Pickup	8,765	14,218	5,091	4,677
Van	1,983	3,728	956	842
Truck Based Stationwagon	136	293	82	71
Single Unit Truck (Low GVW)	425	594	129	116
Single Unit Truck (Med GVW)	148	187	32	30
Single Unit Truck (Unk. GVW)	315	385	74	69
Single Unit Truck (Hi GVW)	338	382	57	55
Two-Unit Truck	3,721	4,243	781	725
Multi-Unit Truck	154	183	34	30
Truck-Tractor	104	130	24	22
Unknown Type Truck	231	315	71	65
Unknown Type	724	1,207	445	391
Total	**62,666**	**102,369**	**40,393**	**35,348**

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