CHAPTER 5

Safety Performance

Summary

This chapter describes the safety of highway and transit facilities across the United States. It looks at the number of fatalities and injuries from several different perspectives. For highway safety, this chapter examines fatalities and injuries on different functional systems, the causes of highway-related fatalities, fatalities and injuries by different vehicle groups, and the distribution of crashes by age of passengers. For transit safety, this chapter examines injuries and fatalities by mode and passenger miles of travel.

This chapter describes safety statistics. It does not describe the various programs used by the U.S. Department of Transportation and its partners to increase highway and transit safety. These programs are examined comprehensively in Chapter 11.

Exhibit 5-1 compares key data in this chapter with corresponding safety measures in the 2000 edition of the C&P report.

Exhibit 5-1	Comparison of Safety Statistics with Those in the 2002 C&P Report		
	2000 Data		
Highway Safety	**2002 C&P Report**	**Revised as of 12/23/04**	**2002 Data**
Number of Fatalities	41,821	41,945	43,005
Fatality Rate per 100,000 People	15.23	14.86	14.93
Fatality Rate per 100 Million VMT	1.5	1.53	1.51
Number of Injuries	3,189,000		2,926,000
Injury Rate per 100,000 People	1,161	1,130	1,016
Injury Rate per 100 Million VMT	102	116	102
Transit Safety			
Number of Fatalities	275		282
Fatalities per 100 Million PMT	0.73		0.66
Number of Injuries	56,535	Not available	19,367*
Injuries per 100 Million PMT	151	Not available	46*
Number of Incidents	62,009	Not available	24,247*
Incidents per 100 Million PMT	165	Not available	57*

* Revised definitions of incidents and injuries since last report.

Highway fatalities increased by 2.5 percent between 2000 (41,945) and 2002 (43,005). Although the number of fatalities has fallen sharply since 1966, when Federal legislation first addressed highway safety, there has been a steady increase in the annual number of fatalities between 1994 and 2002.

In 2002, the fatality rate per 100,000 people was 14.93, up from the 2000 fatality rate of 14.86. The fatality rate per 100 million vehicle miles traveled (VMT) declined from 1.53 in 2000 to 1.51 in 2002.

The number of injuries declined from 3.19 million in 2000 to 2.93 million in 2002. The injury rate per 100,000 people declined from 1,130 in 2000 to 1,016 in 2002, and the injury rate per 100 million VMT dropped from 116 in 2000 to 102 in 2002.

Public transit in the United States has been and continues to be a highly safe mode of transportation, as evidenced by statistics on incidents, injuries, and fatalities as reported by public transportation agencies for the vehicles they operate directly.

In 2002, the Federal Transit Administration (FTA) adjusted its definitions of an incident and an injury, which led to a decrease in reported incidents and injuries. These adjusted definitions preclude a direct comparison of 2002 incident and injury statistics with those for earlier years.

Transit vehicles that share the roadway with nontransit vehicles have historically had a higher number of incidents than transit vehicles that travel on exclusive fixed guideways. This relationship continued in 2002, even with the increase of the incident threshold to $7,500 from $1,000. However, as a result of the increase in the dollar value of the incident threshold, the number of reported incidents per 100 million PMT on all modes declined. The change in the definition of injury led to reductions in the number of injuries reported per 100 million PMT on all modes except commuter rail.

Q. How have FTA's definitions of an incident and an injury been adjusted?

A. The threshold for a reportable safety incident was raised from $1,000 to $7,500. An injury was redefined to be an occurrence that required immediate transportation for medical care away from the scene of the injury. Before 2002, any reported incident or injury was reported to National Transit Database. It was felt that this resulted in the collection of claims-based as opposed to safety-based data.

Fatalities decreased from 292 in 2000 to 282 in 2002, and also fell when adjusted for PMT from 0.69 per 100 million PMT in 2000 to 0.66 per 100 million PMT in 2002.

Highway Safety Performance

This section describes highway safety performance. It looks at fatalities and injuries on highway functional systems, across vehicle types, and among different segments of the population. It also examines the causes and costs of fatal crashes.

Statistics in this section are drawn from the Fatality Analysis Reporting System (FARS). The FARS is maintained by the National Highway Traffic Safety Administration (NHTSA), which has a cooperative agreement with an agency in each State to provide information on all qualifying crashes in that State. Police accident reports, death certificates, and other documents provide data that are tabulated daily and included in the FARS.

The NHTSA publishes an annual Traffic Safety Facts report that comprehensively describes safety characteristics on the surface transportation network.

Overall Fatalities and Injuries

Exhibit 5-2 describes the considerable improvement in highway safety since Federal legislation first addressed the issue in 1966. That year, the fatality rate was 5.50 per 100 million vehicle miles traveled (VMT). By 2002, the fatality rate had declined to 1.51 per 100 million VMT. This sharp decline in the fatality rate occurred even as the number of licensed drivers grew by more than 92 percent.

Exhibit 5-2	*Summary of Fatality and Injury Rates, 1966–2002*							
Year	Fatalities	Resident Population (Thousands)	Fatality Rate per 100,000 Population	Licensed Drivers (Thousands)	Fatality Rate per 100 Million VMT	Injured	Injury Rate per 100,000 Population	Injury Rate per 100 Million VMT
1966	50,894	196,560	25.89	100,998	5.5			
1968	52,725	200,706	26.27	105,410	5.2			
1970	52,627	205,052	25.67	111,543	4.7			
1972	54,589	209,896	26.01	118,414	4.3			
1974	45,196	213,854	21.13	125,427	3.5			
1976	45,523	218,035	20.88	134,036	3.2			
1978	50,331	222,585	22.61	140,844	3.3			
1980	51,091	227,225	22.48	145,295	3.3			
1982	43,945	231,664	18.97	150,234	2.8			
1984	44,257	235,825	18.77	155,424	2.6			
1986	46,087	240,133	19.19	159,486	2.5			
1988	47,087	244,499	19.26	162,854	2.3	3,416,000	1,397	169
1990	44,599	249,439	17.88	167,015	2.1	3,231,000	1,295	151
1992	39,250	254,995	15.39	173,125	1.7	3,070,000	1,204	137
1994	40,716	260,327	15.64	175,403	1.7	3,266,000	1,255	139
1996	42,065	265,229	15.86	179,539	1.7	3,483,000	1,313	140
1998	41,501	270,248	15.36	184,980	1.6	3,192,000	1,181	121
2000	41,945	282,178	14.86	190,625	1.5	3,189,000	1,130	116
2002	43,005	287,974	14.93	194,296	1.5	2,926,000	1,016	102

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA.

The number of traffic deaths also decreased between 1966 and 2002. In 1966, there were 50,894; by 2002, that number had dropped to 43,005. The number of fatalities, however, has not dropped as consistently as the fatality rate. Fatalities reached their highest point in 1972 (54,589), and then declined sharply following the implementation of a national speed limit. Fatalities reached their lowest point in 1992 (39,250), but steadily increased between 1992 and 2002. *Exhibits 5-3* and *5-4* compare the number of fatalities with fatality rates between 1980 and 2002.

Exhibit 5-3 | *Fatalities, 1980–2002*
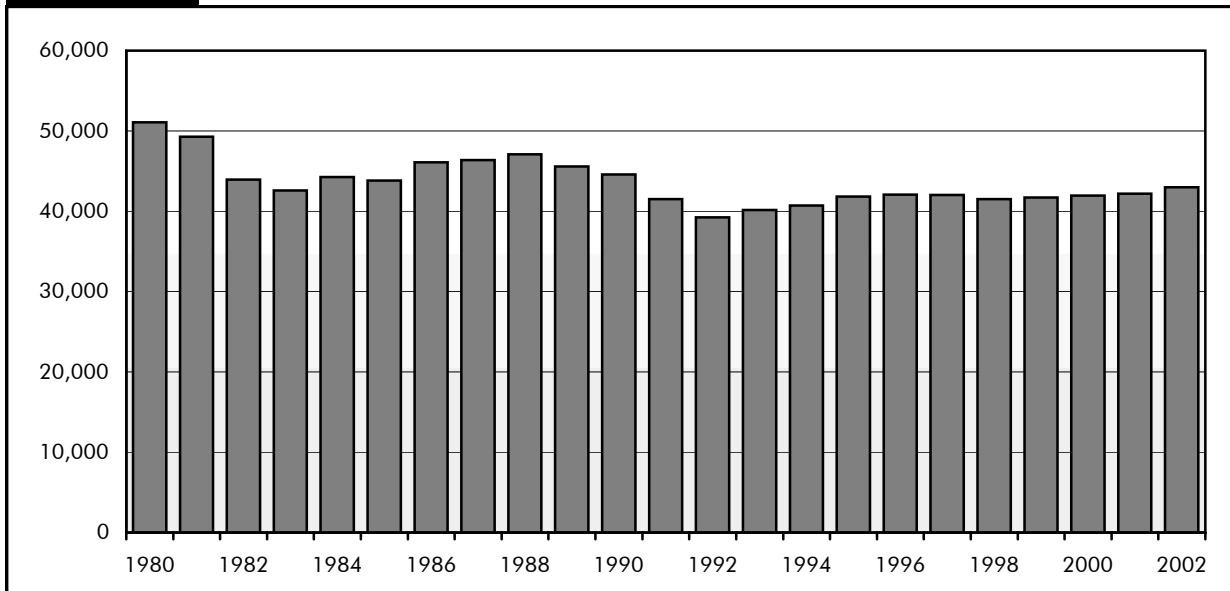
Source: Fatality Analysis Reporting System.

Exhibit 5-4 | *Fatality Rate, 1980–2002*
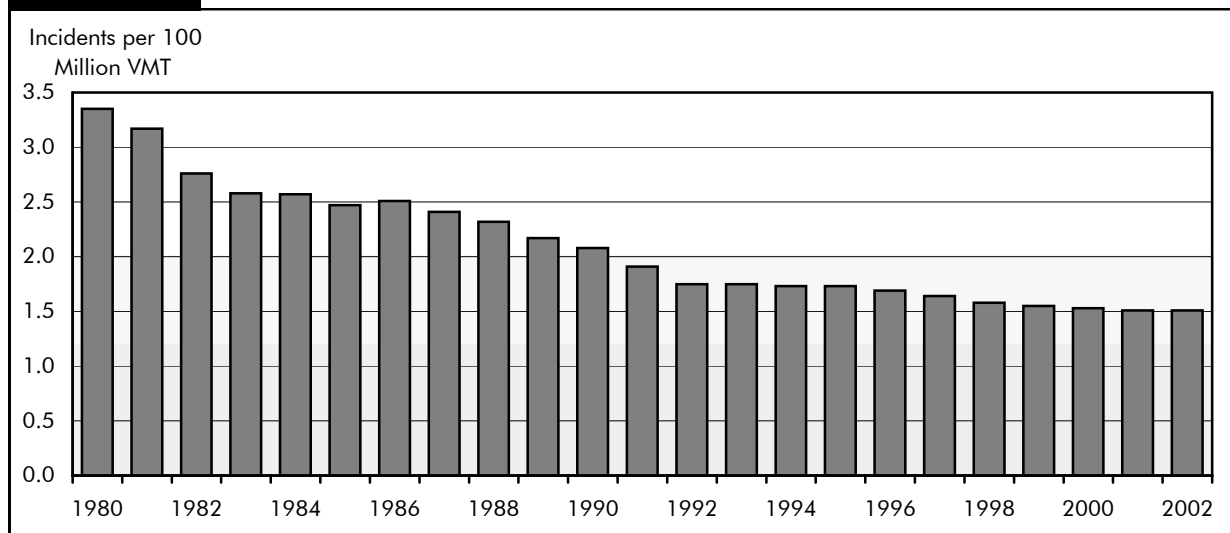
Source: Fatality Analysis Reporting System.

Q. What goal has been set by the Department of Transportation for the national highway fatality rate?

A. The *Department of Transportation Strategic Plan 2003–2008* established a goal to reduce the national highway fatality rate to 1.0 per 100 million VMT by 2008. *Exhibit 5-5* illustrates that much remains to be accomplished if the DOT is to reach this goal. Based on a 2002 VMT level of 2,855.8 billion, achieving the goal in 2002 would have required that fatalities not exceed 28,558. The actual fatality count of 43,005 exceeded that amount by 14,447.

Exhibit 5-5	Progress Toward Achieving the DOT 1.0 Fatality Rate Goal in 2008				
		Fatalities			
Year	**VMT (Millions)**	**At Rate of 1.0 per 100 Million VMT**	**Actual**	**Reduction Required to Achieve 1.0 Rate**	**Actual Fatality Rate**
1993	2,296,378	22,964	40,150	17,186	1.75
1994	2,357,588	23,576	40,716	17,140	1.73
1995	2,422,696	24,227	41,817	17,590	1.73
1996	2,485,848	24,858	42,065	17,207	1.69
1997	2,561,695	25,617	42,013	16,396	1.64
1998	2,631,522	26,315	41,501	15,186	1.58
1999	2,691,056	26,911	41,717	14,806	1.55
2000	2,746,925	27,469	41,945	14,476	1.53
2001	2,797,287	27,973	42,196	14,223	1.51
2002	2,855,756	28,558	43,005	14,447	1.51
2003*	2,879,719	28,797	---	---	---
2004*	2,937,313	29,373	---	---	---
2005*	2,996,060	29,961	---	---	---
2006*	3,055,981	30,560	---	---	---
2007*	3,117,100	31,171	---	---	---
2008*	3,179,442	31,179	---	---	---

*2004 to 2008 VMT based on 2% increase each year from 2003 VMT.

The injury rate also declined between 1988 and 2002, the years for which statistics are available. In 1988, the injury rate was 169 per 100 million VMT; by 2002, the number had dropped to 102 per 100 million VMT (the target in the *FHWA FY 2003 Performance Plan* is 107 per 100 million VMT). The number of injuries also decreased between 1988 and 2002, from 3,416,000 to 2,926,000; however, like the number of fatalities, injuries increased between 1992 and 1996.

Fatalities by Functional Class

Exhibits 5-6 and *5-7* show the number of fatalities and fatality rates by rural and urban functional system between 1994 and 2002. These exhibits are important in describing the recent increase in fatalities and the distinction between fatalities and the fatality rate.

As shown in Exhibit 5-6, the overall number of fatalities grew between 1994 and 2002, largely because of deaths on rural roads. Between 1994 and 2002, the number of fatalities on rural roads grew from 23,841 to 25,896 and accounted for more than 60 percent of total 2002 fatalities. At the same time, the number of

Exhibit 5-6	Fatalities by Functional System, 1994–2002				
Functional System	**1994**	**1996**	**1998**	**2000**	**2002**
Rural Areas (under 5,000 in population)					
Interstate	2,566	2,924	3,105	3,254	3,298
Other Principal Arterial	5,121	5,251	5,378	4,917	4,894
Minor Arterial	4,212	4,184	4,216	4,090	4,467
Major Collector	6,128	5,973	5,840	5,501	6,014
Minor Collector	1,596	1,553	1,753	1,808	2,003
Local	4,152	4,396	4,459	4,414	5,059
Unknown Rural	66	280	434	854	161
Subtotal Rural	**23,841**	**24,561**	**25,185**	**24,838**	**25,896**
Urban Areas (5,000 and over in population)					
Interstate	2,147	2,321	2,283	2,419	2,482
Other Freeway and Expressway	1,919	1,538	1,282	1,364	1,506
Other Principal Arterial	4,960	5,528	5,285	4,948	5,124
Minor Arterial	3,583	3,652	3,335	3,211	3,218
Collector	1,217	1,208	1,037	1,001	1,151
Local	2,921	3,052	2,921	2,912	3,497
Unknown Urban	64	69	76	258	35
Subtotal Urban	**16,811**	**17,368**	**16,219**	**16,113**	**17,013**
Unknown Rural or Urban	64	136	97	994	96
Total Highway Fatalities	**40,716**	**42,065**	**41,501**	**41,945**	**43,005**

Source: Fatality Analysis Reporting System/ National Center for Statistics & Analysis, NHTSA.

Exhibit 5-7	Fatality Rates by Functional System, 1994–2002 (per 100 Million VMT)								
Functional System	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Rural Areas (under 5,000 in population)									
Interstate	1.19	1.19	1.26	1.27	1.23	1.25	1.21	1.15	1.18
Other Principal Arterial	2.47	2.30	2.37	2.36	2.26	2.17	1.98	1.98	1.90
Minor Arterial	2.81	2.88	2.66	2.62	2.54	2.53	2.38	2.44	2.53
Major Collector	3.37	3.34	3.13	2.93	2.87	2.82	2.62	2.78	2.82
Minor Collector	3.29	3.20	3.10	3.29	3.23	3.06	3.14	3.02	3.26
Local	3.96	4.33	4.08	3.94	3.73	3.83	3.47	3.43	3.63
Subtotal Rural	**2.62**	**2.61**	**2.53**	**2.48**	**2.40**	**2.37**	**2.21**	**2.24**	**2.28**
Urban Areas (5,000 and over in population)									
Interstate	0.65	0.64	0.66	0.63	0.61	0.61	0.61	0.63	0.61
Other Freeway and Expressway	1.30	1.19	0.98	0.81	0.77	0.79	0.77	0.78	0.79
Other Principal Arterial	1.36	1.36	1.46	1.41	1.36	1.29	1.24	1.28	1.25
Minor Arterial	1.25	1.27	1.22	1.17	1.08	1.02	0.99	1.02	0.95
Collector	1.01	0.96	0.93	0.89	0.79	0.78	0.74	0.79	0.81
Local	1.46	1.54	1.46	1.43	1.29	1.26	1.24	1.43	1.46
Subtotal Urban	**1.16**	**1.15**	**1.14**	**1.08**	**1.01**	**0.98**	**0.95**	**1.00**	**0.98**
Total Highway Fatality Rate	**1.72**	**1.71**	**1.67**	**1.62**	**1.55**	**1.53**	**1.45**	**1.49**	**1.50**

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA.

fatalities on urban roads increased from 16,811 to 17,013. The fatality rate, however, declined on both rural and urban roads. Although the absolute number of fatalities increased, the fatality rate dropped because the number of VMT significantly increased.

Exhibit 5-7 reveals that fatality rates declined on every urban functional system between 1994 and 2002. Urban Interstate highways were the safest functional system, with a 0.61 fatality rate in 2002. Other freeways and expressways, however, recorded the sharpest decline in fatality rates. The fatality rate for other urban freeways and expressways in 2002 was about 39 percent lower than in 1994.

Fatality rates declined by 13 percent on the rural functional system between 1994 and 2002; however, the fatality rate for rural Interstates has remained more constant. The rural Interstate fatality rate in 2002 was twice that of urban Interstates. Travel speeds tend to be higher on rural Interstates than urban Interstates.

Only a small percentage of crashes are severe enough to kill passengers. *Exhibit 5-8* describes the number of crashes by severity between 1994 and 2002. In 2002, about 69 percent of crashes resulted in property damage only.
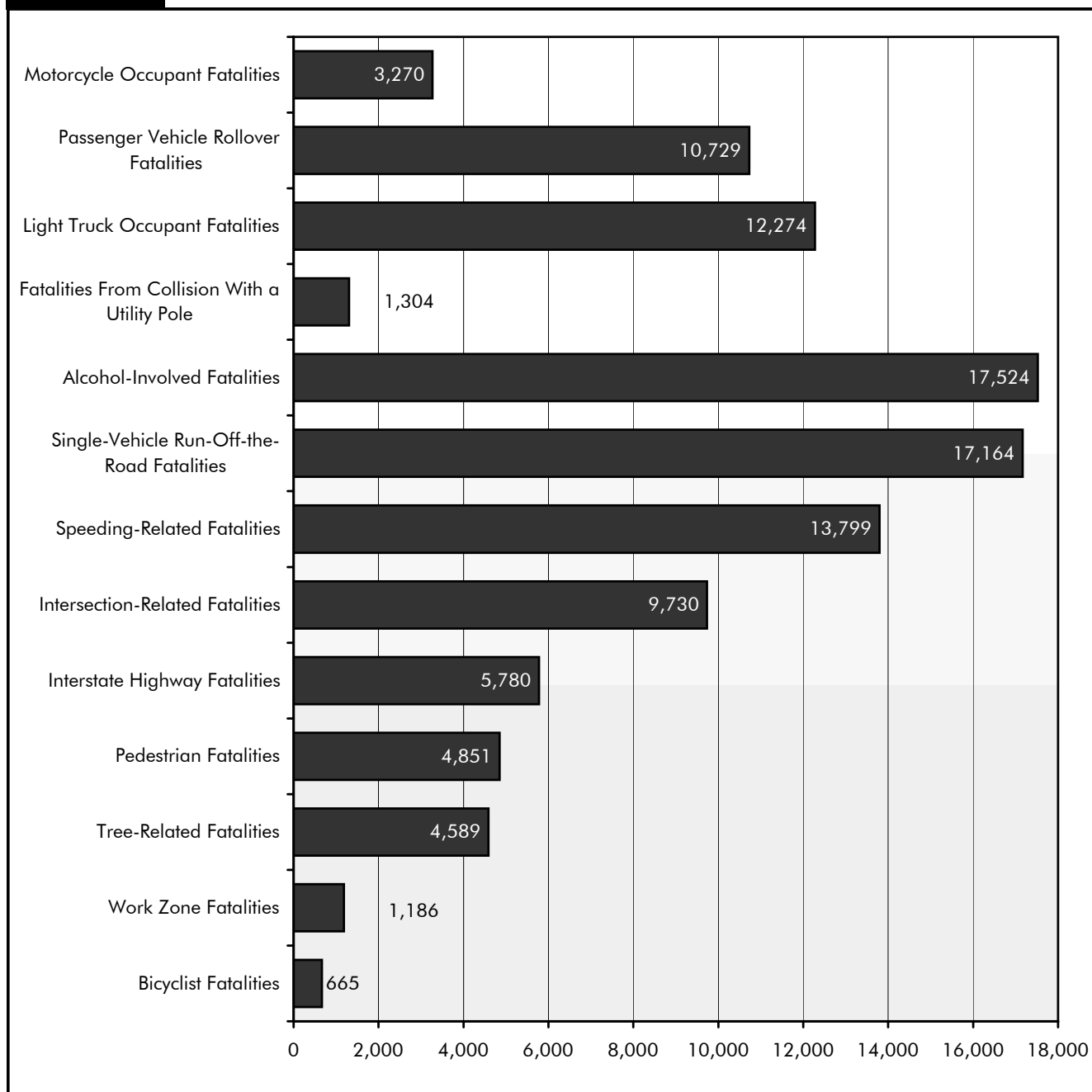
Exhibit 5-8	*Crashes by Severity, 1994–2002*							
	Crash Severity						**Total Crashes**	
	Fatal		**Injury**		**Property Damage Only**			
Year	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
1994	36,254	0.6	2,123,000	32.7	4,336,000	66.8	6,496,000	100.0
1995	37,241	0.6	2,217,000	33.1	4,446,000	66.4	6,699,000	100.0
1996	37,494	0.6	2,238,000	33.1	4,494,000	66.4	6,770,000	100.0
1997	37,324	0.6	2,149,000	32.4	4,438,000	67.0	6,624,000	100.0
1998	37,107	0.6	2,029,000	32.0	4,269,000	67.4	6,335,000	100.0
1999	37,140	0.6	2,054,000	32.7	4,188,000	66.7	6,279,000	100.0
2000	37,526	0.6	2,070,000	32.4	4,286,000	67.0	6,394,000	100.0
2001	37,862	0.6	2,003,000	31.7	4,282,000	67.7	6,323,000	100.0
2002	38,491	0.6	1,929,000	30.5	4,348,000	68.8	6,316,000	100.0

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA.

Types of Highway Fatalities

Exhibit 5-9 displays the types of highway fatalities in 2002. The three most common fatalities were related to alcohol-impaired driving, single-vehicle run-off-the-road crashes, and speeding. Many of the fatalities shown in Exhibit 5-9 involve a combination of factors—speeding and alcohol, for example—so these should not necessarily be viewed in isolation; in other words, the exhibit counts multiple factors.

Exhibit 5-9   *Highway Fatalities by Type, 2002**

Fatality Type	Count
Motorcycle Occupant Fatalities	3,270
Passenger Vehicle Rollover Fatalities	10,729
Light Truck Occupant Fatalities	12,274
Fatalities From Collision With a Utility Pole	1,304
Alcohol-Involved Fatalities	17,524
Single-Vehicle Run-Off-the-Road Fatalities	17,164
Speeding-Related Fatalities	13,799
Intersection-Related Fatalities	9,730
Interstate Highway Fatalities	5,780
Pedestrian Fatalities	4,851
Tree-Related Fatalities	4,589
Work Zone Fatalities	1,186
Bicyclist Fatalities	665

* Some fatalities are listed under more than one source. For example: Some Speeding-Related Fatalities may also be included under Alcohol-Involved Fatalities and/or included in Single-Vehicle Run-Off-the-Road Fatalities.

Alcohol-impaired driving is a serious public safety problem in the United States. The NHTSA estimates that alcohol was involved in 41 percent of fatal crashes and 6 percent of all crashes in 2002. The 17,524 fatalities in 2002 represent an average of one alcohol-related fatality every 30 minutes.

Exhibit 5-10 shows the number of fatalities attributable to alcohol between 1993 and 2002. The number of fatalities dropped from 17,908 in 1993 to 17,524 in 2002, although the pattern of alcohol-related fatalities has been uneven—declining between 1996 and 1999, then increasing between 1999 and 2002.

Exhibit 5-10		Alcohol-Related Fatalities, 1993–2002							
1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
17,908	17,308	17,732	17,749	16,711	16,673	16,572	17,380	17,400	17,524

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA.

There are three main groups involved in alcohol-impaired driving. In 2002, 35 percent of drivers between the ages of 21 and 34 who were involved in fatal crashes had been drinking. Recent studies show that these drivers tend to have much higher levels of intoxication than other age groups. Chronic drunk drivers are another large group. Drivers involved in fatal crashes with a blood alcohol concentration greater than 0.08 grams per deciliter were nine times as likely to have a prior conviction for driving while impaired than sober drivers. Finally, underage drinkers are disproportionately overrepresented in impaired driving statistics. Not only are they relatively new drivers, but also are inexperienced drinkers.

The second largest category of highway fatalities involves single-vehicle run-off-the-road crashes. In 2002, 17,164 fatalities occurred when drivers lost control and ran off the road. (Note that preliminary 2003 figures show a decrease in road-off-the-road-fatalities to 16,546.) Overall roadway departure crashes, including single-vehicle-run-off-the-road, contributed to over 59 percent of all fatalities in 2002.

Another type of highway fatality is related to speeding. In 2002, nearly 14,000 lives were lost in speeding-related crashes. Although much of the public concern about speeding-related crashes focuses on high-speed roadways, speeding is a safety concern on all roads. Almost half of speeding-related fatalities occur on lower functional systems.

Q. What is the distribution of speed-related fatalities among functional systems?

A. About 13 percent of fatalities were on Interstates, 37 percent were on other arterial roads, 24 percent were on collector roads, and 25 percent were on local roads.

The estimated annual economic costs of speed-related crashes exceeded $40.4 billion in 2000. This included $10.3 billion in fatalities, $13.3 billion in injuries, and $3.8 billion in property damage.

For drivers involved in fatal crashes, young males are most likely to speed. The relative proportion of speeding-related crashes to all crashes decreases with increasing driver age. For example, in 2002, 39 percent of male drivers between the ages of 15 and 20 who were involved in fatal crashes were speeding at the time of the crash, while the comparable figure for male drivers between the ages of 35 and 44 was only 20 percent.

Research completed by NHTSA shows the correlation between speeding and alcohol consumption in fatal crashes. In 2002, 27 percent of underage *speeding* drivers involved in fatal crashes were intoxicated. By contrast, only 12 percent of underage *nonspeeding* drivers involved in fatal crashes were intoxicated.

Many speeding crashes also occur during bad weather. Speeding was a factor in 31 percent of the fatal crashes that occurred on dry roads in 2002 and in 33 percent of those that occurred on wet roads. Speeding was a factor in 53 percent of the fatal crashes that occurred when there was snow or slush on the road and in 60 percent of those that occurred on icy roads.

A fourth type of highway fatality occurs at intersections. Over half of the fatalities occurring at intersections are in urban areas, compared with 44 percent that occur in rural areas. Older drivers and pedestrians are particularly at risk at intersections; half of the fatal crashes for drivers aged 80 or older and one-third of the pedestrian deaths among people aged 65 or older occurred at intersections.

Crashes by Vehicle Type

Exhibit 5-11 shows the number of occupant fatalities by vehicle type from 1993 to 2002. The number of occupant fatalities that involved passenger cars decreased from 21,566 in 1993 to 20,569 in 2002. Occupant fatalities involving light and large trucks, motorcycles, and other vehicles all increased during this period. *Exhibit 5-12* presents the number of occupant injuries by vehicle type from 1993 to 2002.

Exhibit 5-11	Fatalities for Vehicle Occupants by Type of Vehicle, 1993–2002					
Type of Vehicle	**1993**	**1995**	**1997**	**1999**	**2000**	**2002**
Passenger Cars	21,566	22,423	22,199	20,862	20,699	20,569
Light Trucks	8,511	9,568	10,249	11,265	11,526	12,274
Large Trucks	605	648	723	759	754	689
Motorcycles	2,449	2,227	2,116	2,483	2,897	3,270
Other & Unknown Vehicles	425	392	420	447	472	573
Total	**33,556**	**35,258**	**35,707**	**35,816**	**36,348**	**37,375**

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA.

Exhibit 5-12	Injuries for Vehicle Occupants by Type of Vehicle, 1993–2002					
Type of Vehicle	**1993**	**1995**	**1997**	**1999**	**2000**	**2002**
Passenger Cars	2,265,000	2,469,000	2,341,000	2,138,000	2,052,000	1,805,000
Light Trucks	601,000	722,000	755,000	847,000	887,000	879,000
Large Trucks	32,000	30,000	31,000	33,000	31,000	26,000
Motorcycles	59,000	57,000	53,000	50,000	58,000	65,000
Buses	17,000	19,000	15,000	22,000	18,000	19,000
Other Vehicles	4,000	4,000	6,000	7,000	10,000	6,000
Total	**2,978,000**	**3,303,000**	**3,201,000**	**3,097,000**	**3,055,000**	**2,800,000**

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA.

The number of occupant fatalities in light trucks increased sharply between 1993 and 2002. Fatalities in these vehicles increased from 8,511 in 1993 to 12,274 in 2002, or an increase of 44 percent. There were 879,000 light truck occupants injured in 2002, up from 601,000 in 1993. Light truck registration also has increased from 57 million in 1993 to 82 million in 2002. There were about 26 million more light trucks on the road in 2002 than in 1993. The number of occupant fatalities in large trucks increased 14 percent, from 605 in 1993 to 689 in 2002. There were 26,000 large truck occupants injured in 2002.

The number of motorcyclists who died in crashes increased 34 percent, from 2,449 in 1993 to 3,270 in 2002. There were 65,000 motorcyclists injured in 2002. *Exhibit 5-13* describes the number of motorcycle occupants killed or injured per registered vehicle between 1993 and 2002. Data for 2002 shows 46 percent of those motorcyclists killed in crashes were not wearing helmets. NHTSA estimates helmets saved the lives of 692 motorcyclists in 2002 and projects that an additional 449 lives could have been saved if all motorcyclists had worn helmets.

Exhibit 5-13	Motorcycle Occupants Killed or Injured per Registered Vehicle, 1993–2002		
Year	Registered Vehicle	Motorcycle Occupants Killed	Motorcycle Occupants Injured
1993	3,977,856	2,449	59,000
1994	3,756,555	2,320	57,000
1995	3,897,191	2,227	57,000
1996	3,871,599	2,161	55,000
1997	3,826,383	2,116	53,000
1998	3,879,450	2,294	49,000
1999	4,152,433	2,483	50,000
2000	4,346,068	2,862	58,000
2001	4,903,056	3,197	60,000
2002	5,004,156	3,270	65,000

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA.

Data from the last 10 years show that the mean age of motorcyclists killed and the mean engine size of motorcycles involved in fatal crashes are increasing. The mean age of motorcyclists killed has increased from 31.3 years in 1993 to 37.9 years in 2002. Similarly, the mean engine size of motorcycles involved in fatal crashes has increased from 820 cc in 1993 to 1,002 cc in 2002. The top age group of motorcyclists killed has shifted from those under 40 to motorcyclists 40 or older in recent years. The proportion of 40 or older motorcyclists killed has increased from 21 percent in 1993 to 45 percent in 2002. Similarly, the increased number of fatalities has been mainly on larger motorcycles (1,001 to 1,500 cc), from 683 in 1993 to 1,252 in 2002.

Motorcycle crashes are frequently speed-related. In 2002, for instance, about 38 percent of all motorcyclists involved in fatal crashes were speeding. Speed was two times more likely to be a factor in fatal motorcycle crashes than in passenger car or light truck crashes. Studies also have shown that alcohol was more likely to have been a factor in motorcycle crashes than passenger car or light truck crashes.

Rollovers

The total number of passenger vehicle occupant fatalities in rollovers has shown a steady increase, from 8,561 in 1993 to 10,729 in 2002 (an increase of 25 percent), with increases in every vehicle category. However, over two-thirds of the increases in passenger vehicle occupant fatalities in rollovers between 1993 and 2002 have occurred in sport utility vehicles (SUVs).

While the number of occupant fatalities in rollovers among passenger cars increased slightly, from 4,648 in 1993 to 4,794 in 2002 (a 3.1 percent increase), the number of occupant fatalities in rollovers among SUVs more than doubled from 934 in 1993 to 2,471 in 2002 (an increase of 165 percent). The number of

occupant fatalities in rollovers among pickups for the same period has shown an increase of 15 percent (from 2,403 in 1993 to 2,755 in 2002) and among vans an increase of 29 percent (from 541 in 1993 to 699 in 2002).

Most of the increases in SUVs resulted from the increase in the number of registered SUVs, indicating the popularity of these vehicles.

Crashes by Age Group

Another important way of examining highway crashes is by demographic segment. *Exhibit 5-14* shows the breakdown of drivers, by age, involved in fatal crashes in 2002.
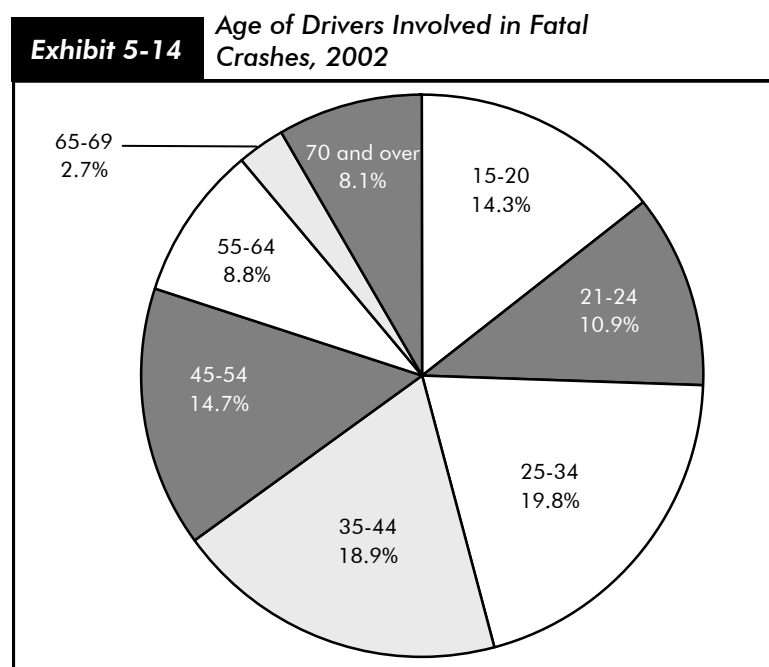
Exhibit 5-14 | *Age of Drivers Involved in Fatal Crashes, 2002*

Source: Fatality Analysis Reporting System / National Center for Statistics & Analysis, NHTSA

Drivers between the ages of 15 and 20 constitute 6.4 percent of the driving population, but 14 percent of total driver fatalities. In 2002, almost 30 percent of the drivers killed in this age group had been drinking. Drivers in the next oldest age category, those between 21 and 24 years, made up 6.8 percent of the driving population and 11 percent of drivers killed.

On the other end of the spectrum, drivers aged 70 or older accounted for 10 percent of the driving population n 2002. This age group accounted for 8 percent of the drivers involved in fatal crashes and 12 percent of the driver fatalities in 2002. Older drivers have a low fatality rate per capita, but a high fatality rate per mile driven. In fact, **drivers over 85 have the highest fatality rate on a per-mile-driven basis of all drivers—over nine times as high as the rate for drivers who are 25 to 69 years old.**

Older drivers tend to take shorter trips. They usually avoid driving during bad weather and at night; in 2002, for instance, most traffic fatalities involving older drivers occurred during the daytime (81 percent). Older drivers involved in fatal crashes also had the lowest proportion of intoxication of all adult drivers. In two-vehicle fatal crashes involving an older driver and a younger driver, the vehicle driven by the older person was more than twice as likely to be the one that was struck.

There were 19.9 million drivers aged 70 or older in 2002, a 28 percent increase from 1993. The proportion of older drivers will continue to increase over the next two decades, presenting the Nation with new public safety challenges.

Transit Safety

Public transit in the United States has been and continues to be a highly safe mode of transportation. This is evidenced by information on three indicators of transit safety—incidents, injuries, and fatalities—collected by the National Transit Database. These data are reported by transit operators for directly operated services and exclude information on purchased (contracted) transit.

In 2002, the definitions of an incident and an injury were revised. Prior to 2002, reportable transit safety incidents included all collisions and any other type of occurrence (e.g., derailment) that resulted in injury or death, or fire or property damage in excess of $1,000. In 2002, this $1,000 damage minimum was raised to $7,500 to align better with the $6,700 threshold adopted by the Federal Railroad Administration in 2003. Property damage includes damages to transit vehicles and facilities as well as to other nontransit vehicles that are involved in the incident. In 2002, the definition of an injury also was revised to be an occurrence that required immediate transportation for medical care away from the scene of the injury. Previously, any event for which the FTA received a claim was classified as an injury. These adjustments to incident and injury definitions have led to a decrease in reported incidents and injuries in 2002. The definition of fatalities has remained the same. Injuries and fatalities include those suffered by riders, as well as those suffered by pedestrians, bicyclists, and people in other vehicles. Injuries and fatalities may occur while traveling on transit or while boarding, alighting, or waiting for transit vehicles to arrive.

Q. What constitutes a fatality on transit?

A. A fatality is a transit-related death confirmed within 30 days of a transit incident, which occurs under the categories of collision, derailment, fire, evacuation, security incident, vehicle leaving the roadway, or not otherwise classified.

Incidents, injuries, and fatalities for directly operated services in absolute terms and per 100 million passenger miles traveled (PMT) for all transit modes combined are provided in *Exhibit 5-15*. Since the definitions of both injuries and incidents were changed in 2002, no direct comparisons can be made with earlier years. Fatalities decreased from 292 in 2000 to 282 in 2002, and also fell when adjusted for PMT from 0.69 per 100 million PMT in 2000 to 0.66 per 100 million PMT in 2002.

Exhibit 5-16 shows annual incident, injury, and fatality rates per 100 million PMT for the five largest transit modes. These rates span the averages for all modes as reported in Exhibit 5-16. Changes in occurrences on bus, heavy rail, and commuter rail modes have the largest effect on the averages reported in Exhibit 5-15. This is because, when combined, these modes account for a very high percentage of PMT, 93 percent in 2002.

Transit vehicles that share the roadway with other nontransit vehicles have historically had a higher number of incidents than transit vehicles that travel on fixed guideways. This relationship continued in 2002, even with the increase of the incident threshold to $7,500. However, consistent with the increase in the dollar value of the incident threshold, the number of reported incidents per 100 million PMT on demand response

Exhibit 5-15	Annual Transit-Related Incidents, Injuries, and Fatalities, 1993–2002: Directly Operated Service Only (Purchased Transportation not Included)

	Incidents		Injuries		Fatalities	
Year	Total	Per 100 Million PMT	Total	Per 100 Million PMT	Total	Per 100 Million PMT
1993	66,233	192	53,057	154	270	0.78
1994	71,429	200	58,794	164	318	0.89
1995	62,938	176	57,589	161	274	0.77
1996	59,709	165	55,643	154	265	0.73
1997	62,009	165	56,535	151	275	0.73
1998	60,367	153	56,369	143	286	0.73
1999	59,781	146	56,416	138	299	0.73
2000	60,638	142	57,457	135	292	0.69
2001	59,041	134	54,842	125	268	0.61
2002 [1]	24,247	57	19,367	46	282	0.66

Note: Includes all modes (Motor Bus, Trolleybus, Heavy Rail, Commuter Rail, Light Rail, Demand Response, Automated Guideway, Vanpool, Cable Car, Ferryboat, Inclined Plane, Jitney) and all incidents, injuries, and fatalities including those not directly associated with the operation of transit vehicles (suicides, personal casualties in parking lots and stations).

[1] Revised definitions of incidents and injuries.

Source: National Transit Database/Safety Management Information Statistics.

Exhibit 5-16	Transit-Related Incidents, Injuries, and Fatalities by Mode: Directly Operated Service Only (Purchased Transportation not Included)

Annual Rates per 100 Million Passenger Miles by Mode, 1993–2002

Incidents	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002 [1]
Bus	277	296	264	252	242	243	232	235	215	76
Heavy Rail	147	150	136	119	126	110	95	92	88	51
Commuter Rail	33	42	38	34	44	30	31	24	25	20
Light Rail	168	170	148	141	115	101	99	99	91	76
Demand Response	766	801	785	964	627	633	757	881	715	225

Injuries	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002 [1]
Bus	233	257	254	248	234	240	232	230	207	66
Heavy Rail	103	109	106	96	102	90	75	78	75	35
Commuter Rail	24	32	31	27	34	21	22	20	16	17
Light Rail	139	142	152	168	106	96	107	100	85	39
Demand Response	511	549	627	662	482	551	646	817	571	173

Fatalities	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bus	0.51	0.65	0.50	0.63	0.65	0.64	0.57	0.51	0.51	0.43
Heavy Rail	0.81	0.80	0.75	0.64	0.64	0.44	0.65	0.56	0.42	0.53
Commuter Rail	1.35	1.52	1.21	1.01	1.13	1.16	1.16	0.99	0.99	1.36
Light Rail	2.13	1.56	1.75	0.63	0.29	2.06	1.43	2.24	1.48	0.92
Demand Response	1.57	1.52	4.04	8.26	3.00	2.07	0.48	3.77	0.42	0.00

Note: includes all incidents, injuries and fatalities including those not directly associated with the operation of transit vehicles (suicides, personal casualties in parking lots and stations).

[1] Definitions of incidents and injuries have been revised.

Source: National Transit Database/Safety Management Information Statistics.

vehicles was 75 percent lower in 2002 than in 2000, and the number on buses 68 percent lower, the number on heavy rail 45 percent lower, the number on commuter rail 14 percent lower, and the number on light rail was 23 percent lower. The most striking effect of the increased dollar value of incident threshold has been to reduce the number of incidents per 100 million PMT reported on buses to 76, the same number as reported for light rail.

The change in the definition of injury also has led to a considerable reduction in the number of injuries reported per 100 million PMT on both bus and demand response vehicles, by 71 percent and 79 percent, respectively, between 2000 and 2002. The number of injuries reported on rail modes also declined considerably as a result of the change in the injury definition. The number of reported injuries per 100 million PMT on heavy rail was 55 percent lower in 2002 than 2000, and the number on light rail was 61 percent lower. The number of injuries reported on commuter rail decreased very slightly as a result of the more stringent definition, from 20 per 100 million PMT in 2000 to 17 per 100 million PMT in 2002.

Although buses have historically had higher incident and injury rates, bus fatality rates have tended to be lower than those on other transit modes. Heavy rail also has had low fatality rates. Fatality rates for commuter and light rail have, on average, been higher than fatality rates for heavy rail. Demand response vehicles have widely fluctuating fatality rates, often well above those for other types of transit services. There were, however, no fatalities on directly operated demand response services in 2002.