A DEPARTMENT OF PUBLIC SAFETY

1998

Minnesota Motor Vehicle CRASH FACTS

MINNESOTA MOTOR VEHICLE CRASH FACTS 1998

A summary of crashes occurring on Minnesota roadways based on crash reports submitted to the Minnesota Department of Public Safety by investigating police officers and drivers

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MINNESOTA DEPARTMENT OF PUBLIC SAFETY

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Traffic crashes are the most preventable cause of death. In 1997, there were almost 42,000 traffic deaths in the country, compared to about 31,000 suicides and 23,000 murders. Traffic crashes are also the biggest cause of severe and permanent injuries, including dismemberment, disfiguration, adult-onset epilepsy, severe brain injury, paraplegia, and quadriplegia. Crashes, and the death and injury they produce, are preventable; they do not have to happen. They come from drinking and driving, from speeding, from aggressive driving, from carelessness and inattention. Often, the tragedy of a crash that occurs due to these unnecessary causes is magnified because a person does not take the trouble to fasten his or her seat belt.

There are so many problems and so much suffering in the world that young people can help to combat, it is all the more tragic to see a young life ended prematurely or a young person permanently disabled because of a traffic crash. Last year, 90 15-to-19-years-olds died and over 8,000 sustained injuries in crashes; 36 of the deaths were due to alcohol. Eighty-six 20-to-24-year-olds died, and 5,700 sustained injuries in crashes; 60 of those deaths were alcohol-related. Fewer than 20% of those killed in these age groups wore seat belts. If they had used their belts, they probably would have survived. An unbelted person in a high-speed crash becomes a projectile -- the person's head becomes like the end of a battering ram -- and severe injury, if not death, is almost a certainty.

Evidence indicates that alcohol use and drinking and driving are increasing among young people. Arrests of teenagers for impaired driving increased over 20% each of the last three years. Arrests of 20-to-24-year-olds increased 7% last year. There were 650 deaths in 1998. That's the highest number since 1981. Forty-two percent (273) of the deaths were alcohol-related. That's the highest number and percentage since 1989. The mission of the Department of Public Safety is to do everything possible to reduce threats to public safety. We will continue to vigorously enforce the laws against impaired driving, speeding, and the laws requiring seat belt use, but our resources are limited. Ultimately, the individual citizen has to take responsibility for his or her own life and health. As Commissioner of Public Safety, I urge you to do all you can to avoid being a statistic in this annual report. Buckle up, don't drink and drive, obey the speed limit, and be courteous to other drivers. Your life and your health depend on your actions.

Sincerely,

Charlie Weaver
Commissioner

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DEFINITIONS

Accident -- See motor vehicle crash.

Alcohol Concentration -- The level of alcohol in a person's body as measured by blood, breath, or urine.

Alcohol-Related Fatal Crash -- A crash that results in one or more deaths and in which the investigating officer suspected alcohol involvement or in which the results of an alcohol concentration test were positive for any driver, pedestrian, or bicyclist involved in the crash.

Alcohol-Related Fatality -- A death resulting from an alcohol-related crash.

Alcohol-Related Injury Crash -- A non-fatal crash in which one or more persons are injured and in which the investigating officer suspected alcohol involvement for any driver, pedestrian, or bicyclist involved in the crash. (Since only the officer's perception is used in this definition, alcohol-related injury crashes and injuries are probably underestimated.)

Alcohol-Related Injury -- A non-fatal injury resulting from an alcohol-related crash.

Alcohol-Related Property Damage Crash -- A crash in which no one is killed or injured and the investigating officer suspected alcohol involvement for any driver, pedestrian, or bicyclist involved in the crash.

Bicycle Crash -- A motor vehicle crash involving one or more bicycles.

Child Safety Seats -- Safety devices designed to fit in motor vehicles that keep children securely in place. The seats are required by law for children under four years of age.

Crash -- See motor vehicle crash.

Driver -- The occupant of a motor vehicle who is in actual physical control of the vehicle in transit or, for an out-of-control vehicle, the occupant who was in control before control was lost.

Economic Loss -- An approximation of the costs associated with crashes, based upon current National Safety Council estimates of the loss to society for each fatality, injury, and property damage crash.

Fatal Crash -- A motor vehicle crash on a public traffic-way in which at least one person dies unintentionally as a result of the crash. The death must occur within 30 days of the crash.

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

Injury Severity

Fatal Injury -- An injury that results in an unintentional death within 30 days of the crash.

Severe or Incapacitating Injury -- An injury (other than fatal) that prevents the injured person from walking, driving or normally continuing the activities he or she was capable of performing before the injury occurred. Includes severe lacerations, broken or distorted limbs, skull fracture, crushed chest, internal injuries, unconsciousness, etc. Hospitalization is usually required.

Moderate/Non-Incapacitating injury -- An injury (other than fatal or severe) that is evident to the officer at the scene of the crash. Includes abrasions, minor lacerations, bleeding, etc. May require medical treatment, but hospitalization is usually not required.

Minor or Possible Injury -- An injury (other than fatal, severe, or moderate) that is reported by a person involved in the crash. Includes complaint of physical pain when no cause is evident, momentary unconsciousness, limping, nausea, hysteria, etc.

Motorcycle -- A two-wheeled or three-wheeled motor vehicle having one or more riding saddles and having an engine of more than 50 cc. If it has a 50 cc or smaller engine, it is classified as a motorized bicycle or motorscooter/motorbike.

Motorcycle Crash -- A motor vehicle crash involving one or more motorcycles.

Motor Vehicle -- A self-propelled vehicle, including attached trailers and semitrailers designed for use with such vehicles.

Motor Vehicle Crash -- A crash that involves a motor vehicle in transport on a public traffic-way in Minnesota and results in injury, death, or at least $1,00.00 in property damage.

Occupant -- Any person who is in or on a vehicle, including the driver, passenger, and persons riding on the outside of the vehicle.

Occupant Restraints -- Protective devices used in motor vehicles to keep the driver and passengers in their seats and prevent them from being ejected from the motor vehicle in a crash. Restraint devices include lap belts, lap/shoulder harness combinations, air bags, and child safety seats.

Passenger -- Any occupant of a motor vehicle other than the driver.

Pedestrian -- Any person not in or on a motor vehicle or other vehicle (e.g., a bicycle).

Pedestrian Crash -- A motor vehicle crash involving one or more pedestrians.

Restraint Usage -- An occupant's use of available vehicle restraints including lap belt, lap/shoulder combination harness, or child safety seats.

Rural -- Having a population of under 5,000.

School Bus Crash -- A crash involving one or more school buses. The school bus must collide with another vehicle, or pedestrian, or object, for the crash to be classified as a school bus crash.

Trafficway -- Any land way open to the public as a matter of right or custom for moving persons or property from one place to another.

Train/Motor Vehicle Crash -- A motor vehicle crash involving a motor vehicle in transport and a railway train. Presently, the only crashes classified as train crashes are those in which the first harmful event is collision with a train.

Truck Crash -- A motor vehicle crash involving one or more vehicles of the following types: (1) 2-axle, 6-tire single unit truck or stepvan, (2) 3-or-more-axle single unit truck, (3) single-unit truck with trailer, (4) truck tractor with no trailer, (5) truck tractor with semi-trailer, (6) truck tractor with double trailers, (7) truck tractor with triple trailers, (8) heavy truck of other or unknown type. Pickup trucks and vans are not counted as trucks.

Urban -- Having a population of 5,000 or more.

INTRODUCTION

At the end of the 1998 calendar year, 3,526,041 people held Minnesota driver licenses and 3,903,334 motor vehicles were registered in the state. Vehicles traveled over 48.5 billion miles on public roadways in the state. There were 92,926 traffic crashes; 650 people died and 45,115 people were injured in those crashes. This report provides a statistical summary of those crashes.

The purpose of *Crash Facts* is to provide summary statistical information about the crashes reported to the state each year. The term "crash" is used in preference to "accident." The latter term suggests there is a random, unavoidable quality about the events in question. In fact, though, the experience of the last two decades strongly demonstrates that advances in engineering and technology, coupled with changes in public policy and individual human behavior, can dramatically reduce the number and severity of traffic crashes.

Cost of Traffic Crashes

The necessity of getting from one place to another and the efficiency of motor vehicles for this purpose result in significant costs to society. The National Safety Council reports that accidents (from all causes) are the leading cause of death among persons aged 1 to 34 and the fifth leading cause of death among all persons (*Accident Facts, 1997 Edition,* p. 10).

It is possible to estimate economic costs of traffic crashes, although the results can vary depending on definitions and estimating procedures. Many states use the National Safety Council's economic cost figures, the most recent of which are based on 1997 data. Based on those, the total economic loss from 1998 traffic crashes in Minnesota was $1,620,664,600 a figure that is calculated as follows:

Cost of Motor Vehicle Crashes in 1998

650	deaths	@$980,000	=$637,700,000
3,409	severe injuries	@ $42,800	=$145,905,200
16,189	moderate injuries	@ $14,400	=$233,121,600
25,517	minor injuries	@ $8,200	=$209,239,400
61,781	property damage crashes	@ $6,400	=$395,398,400
		Total =	$1,620,664,600

Factors Affecting Traffic Crashes

Many factors may contribute to even a single crash. A domestic quarrel may lead to driver distraction, which together with wet, slippery pavement and high traffic congestion at an intersection causes a traffic crash. Public policy cannot address the infinite number of individual causes imaginable.

There are a more limited number of factors that significantly affect the aggregate of traffic crashes. These can be organized into logical groups, such as human behavior factors or vehicle safety factors. The following paragraphs outline some of the factors most frequently thought to affect crash incidence and severity.

Vehicle Safety Factors: Engineering and design standards for vehicle performance can help prevent crashes from occurring. When there is a crash, vehicles designed for safety can increase survivability. For example, the design of windshield glass and the location and durability of gas tanks can increase safety. The "passenger packaging" inside a vehicle can reduce injury severity through means such as padded dashboards and collapsible steering wheel columns. Passenger protection systems in vehicles (airbags, safety belts, etc.), if used, can eliminate injuries or reduce their severity.

Behavior factors: For all crashes, the driver behaviors police cite most often as contributing factors are, in order of frequency, driver inattention or distraction, failure to yield right of way, and illegal or unsafe speed. In fatal crashes, illegal or unsafe speed is cited most often, followed by physical impairment (usually by alcohol). Reducing these behaviors would reduce crashes. When there is a crash, using safety equipment will reduce severity. Motorcyclists and bicyclists should wear helmets. Vehicle occupants should use safety belts. Infants and toddlers should always be placed in child safety seats.

Roadway characteristics: Limited access highways carry about a fifth of the traffic volume in Minnesota, yet account for only about a twelfth of fatal accidents. They are built to high roadway engineering standards and are very safe, relatively speaking. In general, roadway characteristics conducive to safety include wide lanes, clearly visible striping, flared guardrails, wide shoulders of good quality, shoulders and roadsides free of obstacles, well-located crash attenuation devices, well-planned use of traffic signals, and effective communication to roadway users through clear and visible signing.

Environmental factors: Weather conditions affect crash incidence and severity. Clear dry roads are conducive to high speeds; consequently, fatal crashes have a pronounced seasonal variation, peaking in the warm summer months and falling in the winter months. The total number of crashes is driven by the incidence of the less serious property damage crashes, which tend to have a reverse seasonal variation, peaking in the winter months.

Volume of traffic, or vehicle miles traveled (VMT), is a predictor of crash incidence. All other things being equal, as VMT increases, so will traffic crashes. The relationship may not be simple, however; after a point, increasing congestion leads to reduced speeds, changing the proportion of crashes that occur at different severity levels.

The quality and availability of emergency medical services might be classified as an environmental factor. The first hour after a traumatic episode, such as a traffic crash, has been called the "golden hour." Victims who receive emergency services within that time have markedly improved chances of survival.

The age structure of the population has a strong effect on crash incidence, although it is not generally thought about since demographic changes are so gradual. In Minnesota, about one in eight teenage drivers are involved in crashes each year. The involvement rate drops off for successive age groups. For example, it is about 1 in 25 for drivers in their forties. The aging of the baby boom has reduced crash incidence.

Historical Perspective

In 1966, there were 53,041 traffic fatalities in the country, or 5.7 for every hundred million miles of travel. In Minnesota in 1968, there were 1,060 traffic fatalities, or 5.3 per hundred million miles of travel. Those were the worst years. Since then, both the rate and the number of fatalities have declined in a fairly steady pattern. Last year, there were 41,480 traffic fatalities throughout the country and 650 in Minnesota. The respective rates per hundred million miles of travel were 1.6 and 1.3. A dramatic benefit has been achieved.

The benefit is in large part the result of conscious decision-making on traffic safety issues. The National Highway Traffic Safety Administration (originally called the National Safety Bureau) was established in the US Department of Transportation in 1967. Since then it has promoted, and Congress has passed, legislation mandating the manufacture of safer cars. At the same time, the federal interstate highway system has expanded, contributing to a safer roadway environment.

Simultaneously there has been an effort to change human behavior factors. Minnesota has been a leader among the states in the development of innovative drunk driving countermeasures. The Legislature made significant amendments to the DWI law in 1971, 1976, 1978, and in almost every year of the 1980s. It also passed the child passenger protection law in 1981, and the mandatory seat belt law in 1986. It subsequently amended those laws, closing loopholes, broadening their scope, and strengthening penalties.

The benefits of action in these areas are clear. The graph shown in Figure 1 is one illustration.

It shows a steady increase in the number of drivers and vehicles, but a steady decrease in the fatality rate per hundred million miles of travel.

Legislative requirement

Minnesota Motor Vehicle Crash Facts is produced annually by the Office of Traffic Safety, Minnesota Department of Public Safety, in accordance with state law. Minnesota Statutes, Section 169.10, requires that traffic crashes be reported to the Department. Section 169.10 then requires the Department to ". . . tabulate . . . all accident reports . . . and publish annually . . . statistical information based thereon as to the number and circumstances of traffic accidents."

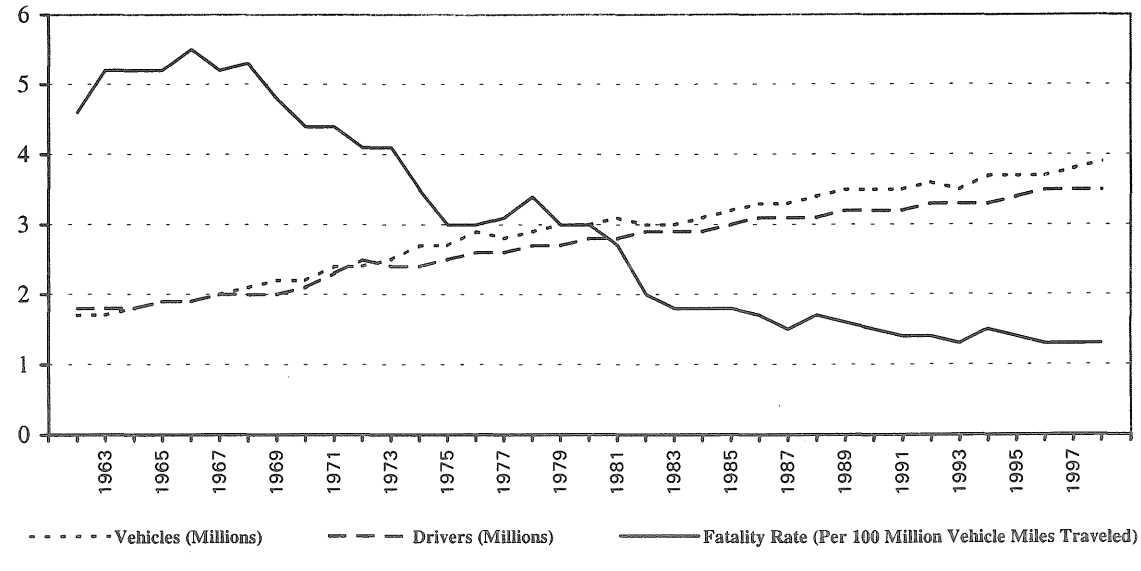
Section 169.09 specifies that a driver involved in an accident that results in injury to or death of any person or total property damage of $1,000 or more must submit a report within ten days of the crash. The law enforcement officer who investigates the crash must also submit a report within ten days.

The minimum dollar amount for crashes involving only property damage has changed over the years. The first minimum was set at $50 in 1939. It was raised to $100 in 1965, to $300 on 8-1-77, and then to $500 on 8-1-81. The current minimum of $1,000 took effect August 1, 1994.

Crash Facts is divided into nine sections. The first presents information on the aggregate of all crashes reported to the state during the preceding calendar year. The remaining eight sections focus on specific areas of interest to policy makers and the public. Section II deals with alcohol-related crashes. Section III is about the use of safety equipment by occupants of vehicles required to be equipped with passenger protection systems, including child safety seats and safety belts. The following five sections focus on crashes that involved motorcycles (section IV), trucks (section V), pedestrians (section VI), bicycles (section VII), and school buses (section VIII). The final section (IX) summarizes information on collisions between motor vehicles and trains.

FIGURE 1

Vehicles, Drivers, and Fatality Rate, 1962-1998



I: ALL CRASHES

Overview of 1998 Crash Facts

Over the last 10 years, licensed drivers in Minnesota increased about 37,000 per year, to about 3.5 million at the end of 1998. Registered motor vehicles are a little more numerous and increasing slightly faster. In the last 10 years, they increased about 44,000 per year, to 3.9 million at the end of 1998. More drivers and more vehicles result in more miles driven in the state: almost 1.1 billion more per year since 1989, to 48.5 billion last year. That is almost 14,000 miles per licensed driver per year.

There is a cost associated with such enormous numbers. In 1998, there were 92,926 traffic crashes reported to the state; 575 were fatal crashes in which 650 people died. There were 30,571 injury crashes where no one died but one or more people sustained injuries. In all, 45,115 people sustained injuries (including those who were injured, but not killed, in the fatal crashes). Finally, there were 61,780 "property damage only crashes" in which there was at least $1,000 in property damage but no one was killed or injured. As it happens, 1998 had the lowest number of property damage crashes since 1966. The nice weather probably helps to explain this, as will be commented on more below.

WHO is involved?

Young drivers, and males

Drivers of all ages are in crashes, but young drivers especially are involved. This relationship between age and crash involvement is exceedingly strong. One in ten licensed teenage drivers was in a *reported* crash in 1998, compared 1 in 29 licensed 45-to-49 year-olds, and 1 in 48 licensed drivers aged 85 or more. How many crashes occur that should be reported, but are not, is unknown. Of course, young people may have better vision and faster reflexes, so it is probably not "youngness" itself that is completely responsible. The inexperience of the young probably goes hand in hand with reduced judgement and increased risk-taking. Males are also over-involved. For example, last year there were 47% more male than female drivers in crashes. (However, studies show that this difference is eliminated when allowance is made for how much males drive compared to how much females drive.)

Victims are young, or old

Crashes kill and injure people at every age, but, again, the young are over-involved. This is because they get into so many crashes. Fifteen-to-twenty-four-year-olds made up 27% (176) of those killed and 31% (14,120) of those injured last year. The elderly are also over-involved among the fatalities, but not because they get into so many crashes. Instead, when they are in a crash, their frailty makes them more likely to die. There were 31 people aged 85 or more who died in crashes last year, but that was one person out of about 2,500 in that age group in the state's population, compared to one out of about 3,500 teenagers, and one out of almost 5,000 people aged 45 to 49.

WHY crashes occur: the "contributing factors"

Overall, the contributing factors police cite the most are, in rank order: driver inattention or distraction, failure to yield right of way, illegal or unsafe speed, and following too closely. There are some twenty other factors police may cite, but those are mentioned much less often. Contributing factors vary some based on how severe the crash was, how many vehicles there were, and the age of the drivers.

In fatal crashes, speed is the biggest factor

In 1998 fatal crashes, speed was cited most often, playing a role in 142 of the fatal crashes, followed by inattention or distraction, cited in 134, then physical impairment, cited in 123, and then failure to yield right-of-way, cited in 109. (Note that multiple factors may be cited in a single crash, such that the sum of the crashes involving the different factors will exceed the total number of crashes.) Physical impairment by alcohol or other drugs is involved much more often than the figures above indicate since it is often an antecedent condition to the more immediate factors police show on the report. For example, last year, out of 369 drivers who died and were tested, 151 (41%) tested positive for alcohol.

Single vehicle crashes: Young drivers speed, seniors are inattentive

One-third of the crashes last year involved just one motor vehicle "in transport." In these crashes, "illegal or unsafe speed" is cited most for young drivers (for about 20 to 25% of drivers in their teens and twenties). Driver inattention or distraction is a problem for all ages, but is cited somewhat more frequently as drivers get older.

Multiple-vehicle crashes: young drivers follow too closely, while seniors fail to yield

Two-thirds of last year's crashes involved two or more vehicles. Driver inattention or distraction is cited about one-fourth of the time for drivers of all ages in these crashes. In addition, young drivers are more likely to follow too closely, while seniors are more likely to fail to yield the right of way.

WHERE crashes occur

Good conditions may lead to bad crashes

If traffic is heavy and slow moving, or if weather or road conditions require slow speeds, crashes will be less severe. The fatal crashes tend to occur when

conditions are good. Last year, urban areas (5,000 or more population) had 69% of non-fatal crashes, while rural areas accounted for exactly the same proportion (69%) of fatal crashes. Statistically, the interstate highways are very safe. They carry almost one-fourth of all traffic in the state, yet account for about one-tenth of both fatal and non-fatal crashes. The fatal crashes mostly occur on the big "trunk highways" and "county-state aid highways." Non-fatal crashes occur on those highways as well, and are also numerous on local streets in urban areas. Also, 80% (461) of last year's fatal crashes occurred on dry road surfaces. That's up from 70% in 1997.

WHEN crashes occur

Seasonal variation

The summer months frequently have the most fatal crashes. In 1998, September, then July, then October, and then August were highest. The winter months frequently have the most non-fatal crashes. In 1998, January, then December, then October, and then November were highest.

Rush Hour, plus late night for fatal crashes

Non-fatal traffic crashes appear to follow the volume of traffic. They have a slight peak between 7:00 and 8:00 in the morning, and then are most numerous between 5:00 and 6:00 in the evening. Over the last two decades, fatal crashes have changed from a pattern in which they were by far most numerous during the late night to a pattern that is more like the one for non-fatal crashes. In 1998, however, there was some reversal in this pattern of change: 19% of fatal crashes occurred between 10:00 PM and 2:00 AM -- which is up from 14% in 1997.

1998 Holidays less safe than 1997

Increased travelling on holidays makes them a special concern. Holiday periods do tend to have more fatal crashes than comparable non-holiday periods. The 1997 year was safer than usual in this respect, with 38 deaths over the six major holiday periods, while 1998 returned to about average, with 56 deaths over the six holiday periods.

WHAT MADE 1998 A BAD YEAR?

Traffic deaths declined during many of the last twenty years. Even when the total number of deaths did not go down, the fatality rate per hundred million vehicle miles traveled usually did. In 1981, for example, there were 763 deaths, with a fatality rate of 2.67. In 1997, there were 600 deaths, with a rate of 1.28. Then, last year, total deaths went up to 650 (the highest since 1981) and the rate also went up, to 1.34. Why did Minnesota fail, in 1998, to continue the generally good trend of the last two decades? Trends in crash statistics are complex, but one stark statistic that leaps out is that alcohol-related deaths increased 53%, from 178 in 1997 to 273 in 1998.

15-to-24 year-olds and pedestrians

The most striking increase occurred among 15-to-24 year-olds. In 1997, 125 in that age group died, and 37% of those deaths were alcohol-related. Last year, 175 in that age group died and 55% were alcohol-related. In 1997, also, 58 pedestrians died, and 11 of them tested positive for alcohol. In 1998, 56 pedestrians died; 22 tested positive, and another was believed to have been drinking, though no test was performed.

More drivers in the age group at greatest risk for impaired driving

Arrest statistics suggest that drivers who turn 21 and can legally buy alcohol are most likely to drive while impaired. The children of the baby boomers are beginning to enter this at-risk age. In 1998, 20-to-24 year-olds increased 3.8% in licensed drivers, and increased 7% in DWI arrests.

Waning of moral commitment to norms against impaired driving

In addition, it is possible that the level of commitment to the moral value of not drinking and driving has begun to wane among young drivers. There were 2,847 arrests of teenagers for impaired driving last year. While this is still low compared to the total for drivers 20 to 44, arrests of teenagers increased 26% in 1996, 28% in 1997, and 21% in 1998.

Milder weather may make impaired drivers more susceptible to fatal crashes

The fatality increase last year might not be due solely to increased impaired driving. For example, the trend of increased DWI arrests of 15-to-24 year olds existed in 1997 as well as in 1998, yet 1997 had the lowest number (178) and lowest percentage (30%) of alcohol related fatalities in probably three decades. It is possible that the mild weather conditions, which helped to reduce nonfatal crashes to the lowest number since 1982, also acted to make the drinking drivers who were out there more likely to drive at higher speeds and thus to get into fatal crashes.

Seat belt use stays steady, or may have decreased

Safety belt use was also low among young persons. As shown in section III, 15% of 203 vehicle occupants who died used safety belts in 1998, compared to 29% of 175 occupants who died in 1997.

TABLE 1.01

CRASH, FATALITY, AND INJURY SUMMARY, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Traffic Crashes	105,996	99,236	101,419	96,808	100,907	99,701	96,022	105,332	98,625	92,926
Persons Killed	605	568	531	581	538	644	597	576	600	650
Persons Injured	45,404	44,634	42,748	43,249	44,987	46,403	47,161	48,963	46,064	45,115
Registered Motor Vehicles (Millions of Vehicles)	3.46	3.52	3.51	3.55	3.48	3.67	3.68	3.70	3.77	3.90
Licensed Drivers[1] (Millions of Drivers)	3.16	3.18	3.22	3.27	3.28	3.34	3.39	3.46	3.49	3.53
Vehicular Miles Traveled (Billions of Miles)	37.6	38.8	39.3	41.3	42.3	43.4	44.1	45.9	46.9	48.5
Fatality Rate Per Hundred Million Vehicle Miles Traveled	1.61	1.47	1.35	1.41	1.27	1.48	1.35	1.26	1.28	1.34
Fatality Rate Per 100,000 Registered Motor Vehicles	17.5	16.1	15.1	16.4	15.5	17.6	16.2	15.6	12.6	16.6
Fatality Rate Per 100,000 Population	13.9	13.0	12.0	13.0	11.9	14.1	13.0	12.4	12.8	13.7[2]
Crash Rate Per Hundred Million Vehicle Miles Traveled	282	256	258	235	239	230	218	230	210	192
Crash Rate Per 100,000 Registered Vehicles	3,060	2,817	2,890	2,730	2,899	2,720	2,606	2,845	2,065	2,380
Crash Rate Per 100,000 Population	2,435	2,268	2,288	2,161	2,234	2,183	2,083	2,261	2,105	1,962[2]

[1] Permits included.

[2] Based on estimated Minnesota population of 4,735,830 as of April 1, 1997.

TABLE 1.02

TRAFFIC CRASH TRENDS
1993 - 1998

	1993	1994	1995	1996	1997	*1993-1997 Average*	1998	%change from 5 Yr Average	Record High	
Total Crashes	**100,907**	**99,701**	**96,022**	**105,332**	**98,626**	**100,118**	**92,926**	**-7.2**	**123,106**	**(1975)**
Fatal Crashes	**477**	**550**	**515**	**503**	**528**	**515**	**575**	**+11.6**	**878**	**(1973)**
Injury Crashes	**30,257**	**31,307**	**31,611**	**33,283**	**31,290**	**31,550**	**30,571**	**-3.1**	**33,686**	**(1978)**
Severe	3,206	3,172	2,967	2,960	2,855	3,032	2,702	-10.9	5,109	(1984)[1]
Moderate	10,503	11,057	11,294	11,745	11,277	11,175	11,391	+1.9	12,326	(1985)[1]
Minor	16,548	17,078	17,350	18,578	17,208	17,352	16,478	=5.0	18,578	(1996)[1]
Property Damage Crashes	**70,173**	**67,844**	**63,896**	**71,546**	**66,808**	**68,053**	**61,780**	**-9.2**	**94,810**	**(1975)**
Total Injuries	**44,987**	**46,403**	**47,161**	**48,963**	**46,064**	**46,715**	**45,115**	**-3.4**	**50,332**	**(1978)**
Severe	4,139	4,105	3,826	3,813	3,673	3,911	3,409	-12.8	6,573	(1984)[1]
Moderate	14,902	15,618	16,053	16,519	15,948	15,808	16,189	+2.4	17,670	(1985)[1]
Minor	25,946	26,680	27,282	28,631	26,443	26,996	25,517	-5.5	28,631	(1996)[1]
Total Fatalities	**538**	**644**	**597**	**576**	**600**	**591**	**650**	**+10.0**	**1,060**	**(1968)**
Pedestrian	47	53	49	46	58	50.6	56	+10.7	157	(1971)
Motor Vehicle/Train[2]	15	17	16	8	6	12.4	11	-11.3	62	(1932)
Bicycle	9	16	5	6	7	8.6	9	+4.7	24	(1977)
Motorcycle	34	43	35	42	24	36	40	+11.1	121	(1980)
All Terrain Vehicle	1	0	2	1	6	2	7	+250.0	9	(1986)
Snowmobile	4	3	7	5	5	4.8	2	-58.3	9	(1984)
Motor Vehicle Occupants	439	519	495	462	488	481	532	+10.6	519	(1994)[1]
Fatality Rate[3]	1.27	1.48	1.35	1.26	1.28	1.33	1.34	+0.8	23.6	(1934)
U.S. Fatality Rate[3]	1.7	1.7	1.7	1.7	1.6	1.7	1.6	-5.8	18.0	(1925)
Minnesota Economic Loss (millions)	$1,397.8	$1,656.6	$1,611.8	1,578.1	$1,456.8	$1,540.2	$1,620.7	+5.2	$1,656.6	(1994)[4]

[1] The available records on which these "record highs" are based only go back to 1984.
[2] Fatalities occurring in motor vehicle/train crashes are included in other categories as well.
[3] Rate is based on 100 million vehicle miles of travel.
[4] Economic loss is a function of health care costs, inflation, and other factors, in addition to trends in traffic crashes.

TABLE 1.03

1998 FATALITIES BY TRAFFIC ROLE, GENDER, AND AGE

Type of Vehicle	Position in Vehicle	Gender	Age 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70 & Older	Total
Car or Truck	Driver	Male	0	28	57	42	34	24	24	51	260
		Female	0	14	21	12	15	9	6	23	100
	Passenger	Male	6	18	21	9	4	4	3	7	72
		Female	3	26	11	4	8	2	4	25	83
	Unknown	Male	2	3	2	1	0	0	0	0	8
		Female	2	2	2	0	1	1	0	1	9
Motorcycle	Operator	Male	0	1	10	12	6	5	1	0	35
		Female	0	0	0	0	1	0	0	0	1
	Passenger	Male	0	0	1	0	0	0	0	0	1
		Female	1	0	0	0	0	2	0	0	3
Motorscooter or Moped	Driver	Male	0	0	0	0	0	1	0	0	1
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	0	0	0	0	0	0	0	0	0
		Female	0	0	0	0	0	0	0	0	0
All Terrain Vehicle	Driver	Male	0	3	0	1	0	0	0	0	4
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	0	0	0	1	0	0	0	0	1
		Female	0	1	0	0	0	0	0	0	1
	Unknown	Female	0	1	0	0	0	0	0	0	1
Snowmobile	Driver	Male	0	1	1	0	0	0	0	0	2
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	0	0	0	0	0	0	0	0	0
		Female	0	0	0	0	0	0	0	0	0
Other Motor Vehicle	Driver	Male	0	0	0	0	1	0	0	2	3
		Female	0	0	0	0	0	0	0	0	0
	Passenger	Male	0	0	0	0	0	0	0	0	0
		Female	0	0	0	0	0	0	0	0	0
	Unknown	Male	0	0	0	0	0	0	0	0	0
		Female	0	0	0	0	0	0	0	0	0
Bicyclist		Male	2	4	1	0	1	0	0	0	8
		Female	0	1	0	0	0	0	0	0	1
Pedestrian		Male	5	4	6	4	11	3	0	4	37
		Female	1	0	4	1	4	3	1	5	19
Total Fatalities		Male	15	62	99	70	57	37	28	64	432
		Female	7	45	38	17	29	17	11	54	218
		Total	22	107	137	87	86	54	39	118	650

Note: The three deaths shown to have occurred in an "other motor vehicle" each occurred to farm equipment operators.

TABLE 1.04

AGE AND GENDER OF PERSONS KILLED OR INJURED IN 1998 CRASHES

	Persons Killed			Persons Injured		
Age Group	Male	Female	Total*	Male	Female	Total*
0 - 4	5	2	7	418	322	750
5 - 9	10	5	15	724	614	1,346
10 - 14	12	5	17	893	834	1,738
15 - 19	50	40	90	3,929	4,473	8,421
20 - 24	63	23	86	2,841	2,839	5,699
25 - 29	36	15	51	2,121	2,119	4,251
30 - 34	30	7	37	1,838	1,865	3,716
35 - 39	40	10	50	1,807	1,970	3,788
40 - 44	25	14	39	1,612	1,669	3,289
45 - 49	32	15	47	1,207	1,395	2,606
50 - 54	19	10	29	905	1,047	1,960
55 - 59	18	7	25	648	764	1,416
60 - 64	14	6	20	475	532	1,009
65 - 69	14	5	19	422	473	897
70 - 74	14	20	34	325	438	764
75 - 79	14	10	24	318	423	742
80 - 84	18	11	29	209	287	497
85 & Older	18	13	31	140	180	321
Not Stated	0	0	0	620	729	1,905
Total	432	218	650	21,452	22,973	45,115

* Some totals do not add across because gender is sometimes not stated on crash report.

FIGURE 1.01
Age and Gender of Persons Killed and Injured, 1998

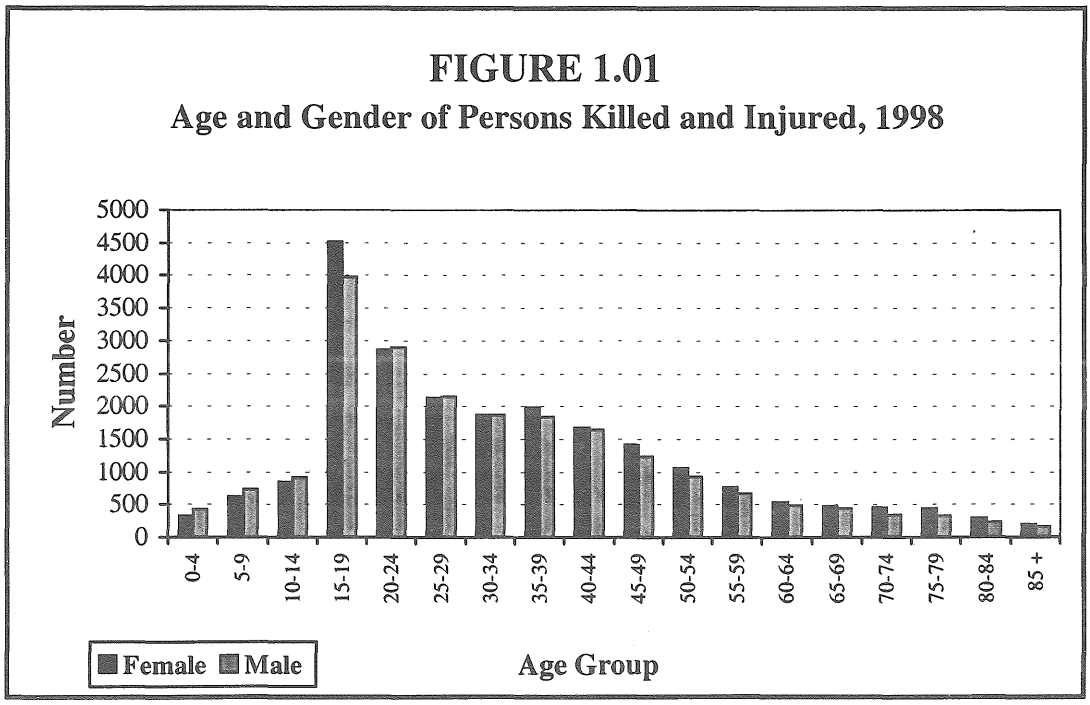


TABLE 1.05

DRIVERS IN 1998 CRASHES BY PHYSICAL CONDITION*

Physical Condition	Drivers in Fatal Crashes	Drivers in Injury Crashes	Drivers in Property Damages Crashes	Drivers in All Crashes
Normal	458	44,953	72,994	118,405
Under the Influence	69	1,920	1,575	3,564
Had Been Drinking	79	1,148	893	2,120
Had Been Using Drugs	4	51	36	91
Asleep	13	331	328	672
Fatigued	2	155	138	295
Ill	4	151	96	251
Other	18	272	246	536
Unknown	260	5,991	30,897	37,148
Total	907	54,972	107,203	163,082

* As noted by police officer on accident report. Pedestrians and bicyclists are not included.

TABLE 1.06

DRIVERS IN 1998 CRASHES BY AGE AND FIRST HARMFUL EVENT IN CRASH

First Harmful Event	Drivers 15-19	Drivers 20-24	Drivers 25-29	Drivers 30-34	Drivers 35-64	Drivers 65-79	Drivers 80 & Older
Collision With:							
Other Motor Vehicle	76.9	78.7	81.5	82.1	82.1	84.9	86.2
Parked Motor Vehicle	3.1	2.5	2.3	2.0	1.9	2.5	4.3
Railroad Train	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Bicycle	0.6	0.7	0.8	0.7	0.9	0.8	0.7
Pedestrian	0.6	0.7	0.8	0.7	0.8	1.0	1.0
Deer	2.0	2.8	2.8	3.8	4.6	3.1	1.3
Other Animal	0.2	0.2	0.3	.3	0.3	0.3	0.0
Fixed Object	9.2	8.7	7.0	6.0	5.1	4.5	4.8
Other Object	0.1	0.2	0.2	0.2	0.2	0.1	0.2
Non-Collision:							
Overturn	5.6	3.7	2.8	2.7	2.5	1.2	0.7
Other Non-Collision	0.3	0.3	0.2	0.3	0.2	0.1	0.1
Other or Unknown	1.4	1.4	1.3	1.1	1.4	1.3	0.7
Total Percent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Drivers	25,703	21,083	17,644	16,464	61,905	9,062	2,592

Percentages are based on the number of crash-involved drivers in each age group. They may not sum to 100% due to rounding. Bicyclists and pedestrians are not included.

TABLE 1.07

AGE AND GENDER OF DRIVERS IN 1998 CRASHES

	Drivers in Fatal Crashes				Drivers in All Crashes			
Age Group	Male	Female	Not Stated	Total	Male	Female	Not Stated	Total
14 & Younger	2	2	0	4	118	47	3	168
15 - 19	74	35	0	109	14,667	10,912	124	25,703
20 - 24	97	29	4	130	12,335	8,559	189	21,083
25 - 29	69	17	0	86	10,429	7,059	156	17,644
30 - 34	62	23	0	85	9,769	6,568	127	16,464
35 - 39	63	22	1	86	10,030	6,911	110	17,051
40 - 44	56	20	1	77	8,520	5,803	95	14,418
45 - 49	51	11	0	62	6,880	4,673	84	11,637
50 - 54	35	11	1	47	5,153	3,279	64	8,496
55 - 59	31	6	0	37	3,670	2,371	35	6,076
60 - 64	26	7	0	33	2,734	1,471	22	4,227
65 - 69	24	4	0	28	2,241	1,238	17	3,496
70 - 74	24	13	0	37	1,737	1,213	16	2,966
75 - 79	20	11	0	31	1,512	1,071	17	2,600
80 - 84	22	7	0	29	898	727	10	1635
85 & Older	17	2	0	19	580	365	12	957
Not Stated	1	1	5	7	1,220	475	6,767	8,462
Total	674	221	12	907	92,493	62,742	7,847	163,082

Most crashes involve more than one driver, causing the total number of drivers to exceed the total number of crashes. (Pedestrians and bicyclists are not shown in this table.)

TABLE 1.08

LICENSED VS. CRASH-INVOLVED DRIVERS BY AGE, 1998

Age Group	Percentage of All Licensed Drivers**	Percentage of Drivers in Fatal Crashes	Injury Crashes	Property Damage Crashes	All Crashes
14 & Younger	0.0	0.4	0.2	0.1	0.1
15 - 19	7.5	12.0	16.6	15.4	15.8
20 - 24	8.6	14.3	13.6	12.6	12.9
25 - 29	9.0	9.5	11.2	10.6	10.8
30 - 34	9.9	9.4	10.3	10.0	10.1
35 - 39	11.5	9.5	10.6	10.4	10.5
40 - 44	11.0	8.5	9.0	8.8	8.8
45 - 49	9.7	6.8	7.0	7.2	7.1
50 - 54	7.7	5.2	5.3	5.2	5.2
55 - 59	6.0	4.1	3.7	3.7	3.7
60 - 64	4.7	3.6	2.6	2.6	2.6
65 - 69	4.1	3.1	2.2	2.1	2.1
70 - 74	3.8	4.1	1.9	1.8	1.8
75 - 79	3.1	3.4	1.7	1.5	1.6
80 - 84	2.1	3.2	1.1	1.0	1.0
85 & Older	1.3	2.1	0.6	0.6	0.6
Not Stated	0.0	0.8	2.4	6.6	5.2
Total Percent*	100.0%	100.0%	100.0%	100.0%	100.0
Total Number**	3,526,041	907	54,972	107,203	163,082

* Percents may not sum to 100% due to rounding.
** Includes drivers with instruction permits.

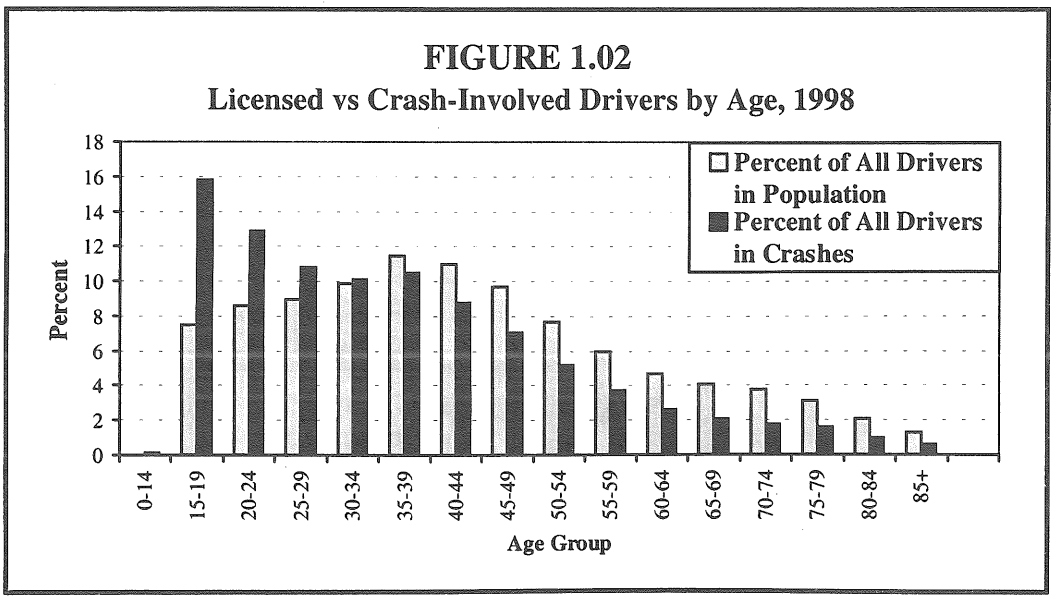


TABLE 1.09

SINGLE-VEHICLE CRASHES:
CONTRIBUTING FACTORS, BY PERCENT, WITHIN DRIVER AGE GROUPS, 1998

Contributing Factors	Drivers 15-19	Drivers 20-24	Drivers 25-29	Drivers 30-34	Drivers 35-64	Drivers 65-79	Drivers 80 & Older
Human Factors							
Illegal/Unsafe Speed	23.5	23.9	21.2	18.3	16.8	8.8	4.8
Driver Inattention/Distraction	18.5	19.4	18.7	20.6	20.3	24.5	26.0
Physical Impairment	5.5	14.0	13.7	13.2	11.9	13.0	13.1
Driver Inexperience	18.4	3.8	2.7	1.9	1.9	0.7	0.3
Improper/Unsafe Lane Use	2.8	3.6	4.5	3.7	3.8	5.0	6.6
Failure to Yield Right of Way	1.7	2.4	2.4	2.6	3.5	4.4	4.2
Unsafe Backing	1.3	0.9	1.6	1.7	1.9	2.3	3.6
Vision Obscured	1.3	1.6	1.8	2.1	2.3	3.6	5.4
Driving Left of Center--Not Passing	1.0	1.3	1.0	1.1	1.0	1.0	1.5
Improper Turn	0.8	0.9	1.0	1.0	1.3	1.3	1.8
Improper Parking/Starting/Stopping	0.5	0.4	0.6	0.7	0.8	2.1	2.4
Disregard for Traffic Control Device	0.7	0.9	1.1	0.7	0.8	1.6	2.1
Improper Passing/Overtaking	0.7	0.6	0.6	0.7	0.6	0.6	0.6
Following Too Closely	0.3	0.3	0.4	0.7	0.7	0.4	0.6
Failure to Use Lights	0.0	0.1	0.1	0.0	0.1	0.0	0.0
Driver on CB Radio or Cell Phone	0.1	0.1	0.2	0.3	0.2	0.1	0.0
Impeding Traffic	0.1	0.1	0.1	0.0	0.1	0.2	0.0
Other Human Factors	2.2	3.2	3.0	2.8	2.4	5.0	8.7
Vehicular Factors							
Skidding	7.4	7.0	6.7	7.9	8.1	6.4	3.3
Defective Equipment	1.3	1.2	1.6	2.1	1.8	1.8	0.9
Other Vehicular Factor	0.8	1.4	1.6	2.2	2.1	2.3	2.7
Miscellaneous Factors							
Weather	7.6	8.3	9.9	10.9	12.0	8.7	6.3
Other	3.6	4.7	5.7	5.1	5.8	6.1	5.1
Total Percent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Contributing Factors Cited	7,168	4,708	3,075	2,466	7,957	973	335
Drivers for Whom There Was "No Clear Contributing Factor"	823	808	718	751	3,172	336	55
Total Number of Drivers	5,590	4,157	2,976	2,680	9,935	1,230	328

Percentages are based on all contributing factors cited within each age group. Zero, one, or two contributing factors may be associated with each driver. The percentages may not sum to 100% due to rounding. Contributing factors for bicyclists and pedestrians are excluded.

For contributing factors in multiple-vehicle crashes, see Table 1.10. For contributing factors in crashes at different levels of severity, see Table 1.19.

TABLE 1.10

MULTIPLE-VEHICLE CRASHES: CONTRIBUTING FACTORS, BY PERCENT, WITHIN DRIVER AGE GROUPS, 1998

Contributing Factors	Drivers 15-19	Drivers 20-24	Drivers 25-29	Drivers 30-34	Drivers 35-64	Drivers 65-79	Drivers 80 & Older
Human Factors							
Driver Inattention or Distraction	26.1	28.0	26.9	26.7	27.3	26.3	25.7
Failure to Yield Right of Way	20.1	17.0	17.0	16.9	19.4	30.9	38.5
Following Too Closely	10.0	12.3	12.0	12.2	10.3	6.0	3.1
Illegal or Unsafe Speed	8.4	9.3	8.9	8.0	6.8	3.0	2.5
Disregard of Traffic Control Device	4.0	5.3	5.5	5.1	4.6	5.8	6.8
Improper or Unsafe Lane Use	3.3	4.4	5.3	4.6	5.0	5.0	3.4
Vision Obscured	2.9	2.5	2.7	2.8	3.2	3.9	3.4
Improper Turn	2.6	2.4	2.4	2.6	3.0	4.3	4.7
Driver Inexperience	7.6	1.5	0.8	0.6	0.5	0.3	0.3
Physical Impairment	0.6	2.0	2.4	2.5	2.4	1.4	1.5
Improper Passing or Overtaking	1.5	1.9	2.0	1.8	1.7	1.5	0.6
Improper Parking, Starting, or Stopping	1.2	1.2	1.3	1.5	1.5	1.6	1.7
Unsafe Backing	0.9	0.7	1.0	1.5	1.5	1.0	1.0
Driving Left of Center (Not Passing)	1.0	1.1	0.9	0.9	1.0	1.0	0.7
Improper or No Signal	0.4	0.3	0.4	0.5	0.6	0.6	0.4
Impeding Traffic	0.2	0.3	0.3	0.2	0.3	0.3	0.2
Failure to Use Lights	0.2	0.2	0.2	0.2	0.2	0.1	0.0
Driver on Cell Phone or CB Radio	0.1	0.1	0.2	0.1	0.1	0.0	0.1
Other Human Factors	0.4	0.6	0.8	0.8	0.9	0.6	1.1
Vehicular Factors							
Skidding	2.5	2.3	2.2	2.4	2.2	1.4	0.7
Defective Equipment	1.0	0.8	0.8	0.7	0.8	0.5	0.3
Other Vehicular Factor	0.3	0.3	0.3	0.4	0.4	0.3	0.1
Miscellaneous Factors							
Weather	3.0	3.2	3.2	4.0	3.6	2.2	1.4
Other	1.7	2.3	2.5	3.2	2.9	2.1	1.4
Total Percent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Contributing Factors Cited							
Drivers for Whom There Was "No Clear Contributing Factor"	6,040	6,309	6,169	6,119	24,614	2,992	537
Total Number of Drivers	20,068	16,871	14,608	13,721	51,757	7,808	2,259

Percentages are based on all contributing factors cited within each age group. Zero, one, or two contributing factors may be associated with each driver. The percentages may not sum to 100% due to rounding. Contributing factors for bicyclists and pedestrians are excluded.

For contributing factors in single-vehicle crashes, see Table 1.09. For contributing factors in crashes at different levels of severity, see Table 1.19.

TABLE 1.11

PEOPLE KILLED OR INJURED IN VARIOUS VEHICLE TYPES, 1998

		Injured			
Vehicle Type	Killed	Severe	Moderate	Minor	Total
Automobile	387	2,112	10,579	17,988	30,679
Pickup Truck	95	417	2,111	2,848	5,376
Van	36	199	1,211	2,277	3,687
Motorhome/Camper	0	3	14	15	32
Taxicab	0	8	29	74	111
Police Vehicle	0	4	42	74	120
Fire Department Vehicle	0	0	1	4	5
School Bus	0	2	50	138	190
Other Bus	0	1	6	50	57
Ambulance	0	1	3	5	9
Military Vehicle	0	1	6	5	12
Snowmobile	2	6	17	12	35
All Terrain Vehicle	7	13	15	3	31
Farm Tractor or Equipment	3	1	15	10	26
Motorcycle*	40	206	522	259	987
Motorscooter/Motorbike*	1	4	12	3	19
Motorized Bicycle (Moped)*	0	0	12	4	16
Hit and Run Vehicle	0	6	99	106	211
Road Maintenance Vehicle	0	3	0	7	10
Single Truck (2-axle, 6-tire)	1	8	48	56	112
Single Truck (3 or more axles)	3	5	25	38	68
Single Truck with Trailer	2	4	12	30	46
Truck Tractor with No Trailer	1	1	3	6	10
Truck Tractor with Semi Trailer	7	10	78	108	196
Truck Tractor with Double Trailers	0	0	3	3	6
Other or Unknown Truck Type	0	0	5	8	13
Other or Unknown Motor Vehicle	0	35	109	187	331
Bicycle	9	125	638	547	1,310
Pedestrian	56	234	524	652	1,410
Total	650	3,409	16,189	25,517	45,115

* On the accident report form, police may show that a vehicle is a "motorcycle," a "motorscooter/motorbike," or a "moped or motorized bicycle." Since 1986, however, the law recognizes just two categories. If the vehicle has an engine capacity of more than 50 cc, it is classified as a motorcycle; if it has 50 cc or smaller engine capacity, it is classified as a motorized bicycle. The term moped is short for motorized pedalcycle, which is the same as motorized bicycle.

TABLE 1.12

DRIVER LICENSE* SUMMARY BY AGE, 1989 - 1998

Age	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
15	14,072	12,832	15,075	16,626	18,047	16,031	20,660	24,783	27,514	24,610
16	41,544	42,885	43,708	45,744	47,600	48,754	52,205	54,657	55,564	50,028
17	49,458	48,496	51,161	50,796	51,688	54,960	57,426	60,864	61,052	60,389
18	56,250	52,070	51,293	54,442	53,894	55,472	58,307	61,788	63,711	64,337
19	63,653	58,230	53,876	53,307	55,417	55,793	57,139	61,058	63,460	66,023
20	62,770	63,375	57,902	54,591	53645	56,765	56,902	58,964	61,875	64,484
Under 21	287,747	277,888	273,015	275,506	280,291	287,775	302,639	322,114	333,176	329,871
15 - 19	224,977	214,513	215,113	220,915	226,646	231,010	245,737	263,150	271,301	265,387
20 - 24	319,048	316,504	312,463	307,139	297,918	290,752	283,027	284,532	291,004	302,019
25 - 29	386,440	372,178	357,464	345,255	336,007	330,676	331,259	330,844	325,020	318,360
30 - 34	393,168	398,645	402,273	404,717	401,155	393,253	381,403	368,340	356,278	347,382
35 - 39	355,869	364,385	371,856	383,109	386,805	396,206	402,366	407,794	407,334	405,914
40 - 44	298,889	316,265	324,986	335,328	342,988	355,845	364,629	373,405	381,214	389,126
45 - 49	229,993	234,494	252,944	266,872	276,715	296,176	313,384	323,114	330,259	340,673
50 - 54	184,310	189,266	197,122	210,453	216,632	225,468	230,114	248,979	260,406	273,059
55 - 59	163,520	164,023	165,779	169,769	173,423	178,920	183,763	191,853	201,963	210,483
60 - 64	160,260	159,799	158,552	157,248	156,044	156,192	156,652	158,537	160,789	165,519
65 - 69	147,857	148,161	148,934	149,867	149,118	148,961	149,004	148,228	146,590	144,903
70 - 74	121,638	122,965	126,115	128,653	128,828	132,442	132,842	134,127	133,750	134,081
75 - 79	89,355	92,378	96,235	98,605	98,970	101,494	103,558	107,144	107,838	108,977
80 - 84	52,667	55,000	58,863	60,829	60,181	65,022	68,506	71,501	71,267	73,848
85 & Older	27,179	29,915	34,455	35,198	32,723	38,158	42,107	44,957	42,757	46,310
Total	3,155,170	3,178,491	3,223,154	3,273,957	3,284,153	3,340,575	3,388,351	3,456,505	3,487,770	3,526,041

* Information provided by Department of Public Safety, Driver and Vehicle Service Division. Counts of licensed drivers include drivers who only hold learner's permits.

TABLE 1.13

MOTOR VEHICLE REGISTRATIONS, 1989 - 1998

Type of Vehicle*	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Passenger Cars	2,583,982	2,642,022	2,638,572	2,670,885	2,615,602	2,728,963	2,709,986	2,707168	2,724,529	2,798,548
Pickups	526,212	528,342	520,339	525,205	511,677	584,044	615,068	640,308	674,547	723,543
Trucks	137,690	140,874	139,263	141,144	144,367	145,413	151,188	156,511	159,939	165,491
Recreational Vehicles	34,805	35,328	35,515	36,290	36,826	37,049	37,775	37,683	37,731	39,034
Motorcycles	123,308	120,081	117,492	116,124	114,548	113,337	113,981	112,551	113,443	118,275
Motorized Bicycles	9,987	9,306	8,703	7,947	7,304	6,752	6,441	6,088	5,784	5,643
School Buses	5,026	5,037	5,109	5,058	5,052	5,168	5,319	5,474	5,788	5,887
Buses	4,217	3,780	3,822	3,804	4,039	4,103	4,282	4,145	4,260	4,648
Van Pool	248	259	264	256	319	300	295	289	291	287
Tax Exempt Vehicles	38,106	37,739	39,727	38,829	40,773	40,263	40,511	31,648	43,533	42,978
Motor Vehicle Subtotal	3,463,581	3,522,768	3,508,806	3,545,542	3,480,507	3,665,392	3,684,846	3,701,865	3,769,845	3,904,334
Trailers	708,693	780,484	754,942	830,527	807,187	894,909	849,482	956,629	897,794	1,028,612
Collectors' Vehicles	66,860	72,031	76,947	82,116	87,405	92,775	97,839	103,030	108,254	114,458
Total Registrations	4,239,134	4,375,283	4,340,695	4,458,185	4,375,099	4,653,076	4,632,167	4,761,524	4,775,893	5,047,404

* Information provided by Department of Public Safety, Driver and Vehicle Services Division.

Minnesota license plates on a vehicle signify that it has been registered with the state and that the owner has paid the registration fee. The vehicle classification used for registration purposes is similar, but not identical, to the vehicle classification (shown in Tables 1.11 and 1.14) police use in reporting accidents. Following are some notes on the registration categories shown above:

- Passenger cars include vans, except for "van pools." A van pool is a van used exclusively for car pooling purposes.
- Pickup trucks are rated three-fourths ton or less.
- Motorcycles have engines exceeding 50 cc; otherwise the vehicle is classified as a motorized bicycle.
- Tax exempt vehicles are vehicles owned by city, county, or state offices. They have license plates but no registration fees are paid on them. (Police and fire department vehicles are tax exempt but are not included since they do not have state license plates and are not registered.)
- Trailers (such as utility trailers pulled by cars, or semi or twin trailers pulled by trucks) are pulled by motorized vehicles and do not themselves have motors.
- Collectors' vehicles must be at least 20 years old and cannot be used for normal transportation purposes. They can only be driven, for example, to car shows.

TABLE 1.14

TYPES OF MOTOR VEHICLES IN 1998 CRASHES

Motor Vehicle Type*	Vehicles in Fatal Crashes	Vehicles in Injury Crashes	Vehicles in Property Damage Crashes	Vehicles in All Crashes
Automobile	507	37,749	73,044	111,300
Pickup Truck	182	8,358	18,360	26,900
Van	66	4,791	9,406	14,263
Motorhome/Camper	2	31	84	117
Taxicab	0	143	272	415
Police Vehicle	4	180	334	518
Fire Department Vehicle	0	11	41	52
School Bus	3	203	584	790
Other Bus	1	91	233	325
Ambulance	0	12	38	50
Military Vehicle	0	14	19	33
Snowmobile	3	31	22	56
All Terrain Vehicle	6	28	9	43
Farm Tractor or Equipment	3	75	96	174
Motorcycle*	45	904	144	1093
Motorscooter/Motorbike*	1	20	4	25
Motorized Bicycle (Moped)*	0	14	1	15
Hit and Run Vehicle	7	1,182	5,437	6,626
Road Maintenance Vehicle	1	35	111	147
Single Truck (2-axle, 6-tire)	11	382	784	1177
Single Truck (3 or more axles)	12	180	328	520
Single Truck with Trailer	7	119	263	389
Truck Tractor with No Trailer	2	48	71	121
Truck Tractor with Semi Trailer	57	696	1,768	2,521
Truck Tractor with Double Trailers	1	15	24	40
Other or Unknown Truck Type	1	32	166	199
Other or Unknown Motor Vehicle	1	532	1,496	2,029
Total**	923	55,876	113,139	169,938

* On the accident report form, police may show that a vehicle is a "motorcycle," a "motorscooter/motorbike," or a "moped or motorized bicycle." Since 1986, however, the law recognizes just two categories. If the vehicle has an engine capacity of more than 50 cc, it is classified as a motorcycle; if it has 50 cc or smaller engine capacity, it is classified as a motorized bicycle. The term moped is short for motorized pedalcycle, which is the same as motorized bicycle.

** Most crashes involve more than one vehicle, causing total vehicles to exceed total crashes. Bicyclists and pedestrians are excluded from this table.

TABLE 1.15

1998 CRASHES FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured	Fatality Rate Per 1,000 Crashes
Collision With:							
Another Motor Vehicle	268	20,208	40,813	61,289	317	32,060	5.2
Parked Motor Vehicle	8	555	4,879	5,442	9	700	1.7
Railroad Train	9	47	52	108	11	64	101.9
Bicycle	9	1,260	70	1,339	9	1,310	6.7
Pedestrian	52	1,284	0	1,336	53	1,370	39.7
Deer	2	358	4,974	5,334	2	412	0.4
Other Animal	0	105	335	440	0	127	0.0
Fixed Object	110	3,491	6,962	10,563	121	4,470	11.5
Other Object	3	49	149	201	3	57	14.9
Non-Collision:							
Overturn	103	2,624	2,099	4,826	113	3,787	23.4
Fire/Explosion	1	1	285	287	2	1	7.0
Submersion	3	20	53	76	3	26	39.5
Other or Unknown	7	569	1,109	1,685	7	731	4.2
Total	575	30,571	61,780	92,926	650	45,115	7.0

TABLE 1.16

1998 "HIT-AND-RUN" CRASHES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Collision With:						
Other Motor Vehicle	1	694	2,279	2,974	1	961
Parked Motor Vehicle	0	46	2,233	2,279	0	51
Railroad Train	0	0	1	1	0	0
Bicycle	1	131	17	149	1	136
Pedestrian	5	192	0	197	5	198
Deer	0	0	3	3	0	0
Other Animal	0	0	2	2	0	0
Fixed Object	0	78	740	818	0	94
Other Object	0	0	10	10	0	0
Non-Collision:						
Overturn	0	12	48	60	0	16
Fire/Explosion	0	0	1	1	0	0
Other or Unknown	0	17	64	81	0	20
Total	7	1170	5,398	6,575	7	1476

TABLE 1.17

1998 CRASHES BY TRAFFIC CONTROL DEVICE

Traffic Control Device	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Not Applicable	395	16,503	32,790	49,688	446	23,717
Traffic Signal	38	7,142	11,569	18,749	41	10,745
Overhead Flashers	5	107	169	281	7	176
Stop Sign-All Approaches	5	535	1,135	1,675	5	754
Other Stop Sign	86	4,259	6,696	11,041	100	6,792
Yield Sign	7	516	904	1427	7	841
Flagman, Officer, or School Patrol	0	46	74	120	0	73
School Bus Stop Arm	0	18	38	56	0	26
School Zone Sign	0	7	15	22	0	9
No Passing Zone	18	246	363	627	21	393
RR Crossing Gate	1	20	34	55	2	27
RR Flashing Lights	1	14	35	50	1	17
RR Crossing Stop Sign	1	18	9	28	1	24
RR Other	5	36	46	87	5	64
Other	8	354	1,840	2,202	9	485
Unknown	5	750	6,063	6,818	5	972
Total	575	30,571	61,780	92,926	650	45,115

TABLE 1.18

1998 CRASHES BY WEATHER CONDITION

Weather Condition	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Clear	329	16,988	32,164	49,481	374	25,040
Cloudy	165	8,363	16,270	24,798	186	12,454
Rain	21	2,383	4,587	6,991	22	3,532
Snow	24	1,520	4,203	5,747	27	2,222
Sleet/Hail/Freezing Rain	10	445	1,062	1,517	12	645
Fog/Smog/Smoke	8	274	524	806	8	419
Blowing Sand/Dust	2	98	304	404	2	154
Severe Crosswinds	1	33	49	83	1	44
Other	1	64	177	242	1	103
Not Stated/Unknown	14	403	2,440	2,857	17	502
Total	575	30,571	61,780	92,926	650	45,115

TABLE 1.19

CONTRIBUTING FACTORS IN 1998 CRASHES

Contributing Factors	Percent of Factors Cited in Crashes by Severity of Crash: Fatal Crashes	Injury Crashes	Property Damage Crashes	Number of Crashes in which the Factor was Cited: Fatal Crashes	Injury Crashes	Property Damage Crashes	Number of People Affected: Killed	Injured
Human Factors								
Driver Inattention/Distraction	14.4	24.9	24.3	134	10,852	16,022	142	16,353
Failure to Yield Right of Way	11.4	16.4	14.6	109	7,337	9,889	124	11,762
Illegal/Unsafe Speed	15.7	11.1	10.1	142	4,862	6,769	163	7,576
Following Too Closely	0.7	6.9	8.3	7	2,855	5,162	7	4,232
Improper/Unsafe Lane Use	4.7	3.4	5.7	45	1,523	3,878	49	2,243
Disregard Traf Contr Device	4.3	5.3	3.0	41	2,410	2,060	49	4,052
Physical Impairment	13.2	5.5	2.7	123	2,486	1,888	137	3,630
Driver Inexperience	2.7	3.6	3.1	26	1,602	2,129	26	2,506
Vision Obscured	1.0	2.7	2.6	9	1,124	1,618	9	1,590
Improper Turn	0.8	1.9	2.9	8	839	1,985	8	1,305
Improper Passing/Overtaking	1.7	1.0	1.8	16	453	1,259	20	726
Unsafe Backing	0.4	0.3	2.1	4	147	1,407	4	203
Improper Parking/Starting/ Stopping	0.6	1.1	1.6	6	469	1,090	7	695
Driving Left of Center (Not Passing)	7.5	1.3	0.9	71	583	580	91	1,022
Pedestrian Violation or Error	3.1	1.0	0.0	29	460	0	29	499
Improper or No Signal	0.2	0.2	0.4	2	92	291	3	134
Impeding Traffic	0.0	0.2	0.2	0	107	148	0	152
Failure to Use Lights	0.1	0.2	0.1	1	89	91	1	140
Driver on CB radio / Cellular phone	0.0	0.1	0.1	0	52	74	0	69
Other Human Factor	1.9	1.4	1.1	18	647	758	18	894
Vehicular Factors								
Skidding	3.1	3.0	3.6	30	1,270	2,349	35	1,835
Defective Equipment	1.2	0.9	1.0	11	430	692	12	661
Other Vehicular Factor	0.4	0.4	0.7	4	196	532	4	255
Miscellaneous Factors								
Weather	3.4	3.8	5.2	22	1,478	3,058	24	2,167
Other	7.4	3.3	3.8	57	1,226	2,149	66	1,723
Total Percent	100.0%	100.0%	100.0%					
Total Contributing Factors	958	45,800	69,579					
Vehicles Where There Was "No Clear Contributing Factor"	344	23,408	41,365					
Total Number of Vehicles	1,004	58,569	113,210					

Zero, one, or two contributing factors may be associated with each vehicle. This causes the number of factors cited to be different from the number of vehicles, the number of crashes, and the number of people affected by the factors. Percentages are based on all factors cited; they do not sum to 100% due to rounding. Bicyclists and pedestrians are considered as vehicles in this table, and factors associated with them are included. For contributing factors by age of drivers, see tables 1.09 and 1.10.

TABLE 1.20

1998 CRASHES BY LIGHT CONDITION

Light Condition	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Daylight	295	20,440	37,911	58,646	329	30,252
Dawn/Dusk	32	1,886	4,493	6,411	34	2,728
Dark/Street Lights On	69	4,763	10,040	14,872	80	7,000
Dark/No Street Lights	164	3,026	6,521	9,711	189	4,530
Other/Unknown	15	456	2,815	3,286	18	605
Total	575	30,571	61,780	92,926	650	45,115

TABLE 1.21

1998 CRASHES BY ROAD SURFACE CONDITION

Road Surface Condition	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Dry	461	22,032	41,196	63,689	526	32,739
Wet	43	4,590	8,903	13,536	45	6,750
Snow/Slush	20	1,174	3,280	4,474	25	1,641
Ice or Packed Snow	31	2,150	5,821	8,002	32	3,110
Other	10	389	643	1042	10	567
Not Stated/Unknown	10	236	1,937	2,183	12	308
Total	575	30,571	61,780	92,926	650	45,115

TABLE 1.22

1998 CRASHES BY ROAD DESIGN

Road Design	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Freeway (Including Ramps)	58	3,042	7,537	10,637	65	4,278
Other Divided Highway	97	4,457	6,508	11,062	108	7,080
One-Way Street	4	895	1,299	2,198	4	1,299
4-6 Lanes Undivided	27	5,902	8,315	14,244	28	8,663
3 Lanes	5	380	603	988	10	570
2-Lane--2-Way	361	13,415	23,114	36,890	411	19,957
Alley/Driveway	2	194	470	666	2	215
Other	16	579	965	1560	17	839
Not Stated/Unknown	5	1,707	12,969	14,681	5	2,214
Total	575	30,571	61,780	92,926	650	45,115

TABLE 1.23

1998 CRASHES BY DIAGRAM

Diagram	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Rear End	36	7,760	12,347	20,143	39	11,715
Sideswipe Passing	6	792	4,572	5,370	6	1,027
Left Turn -- Oncoming Traffic	17	1,919	2,601	4,537	18	3,107
Ran Off Road - Left	92	2,166	2,660	4,918	98	2,994
Right Angle	140	7,424	9,799	17,363	162	11,857
Right Turn -- Cross Street Traffic	2	156	352	510	2	215
Ran Off Road - Right	84	2,776	3,843	6,703	92	3,682
Head On	80	1,186	1,250	2,516	99	2,073
Sideswipe Opposing	14	413	954	1381	16	602
Other / Unknown / Incomplete	104	5,979	23,402	29,485	118	7,843
Total	575	30,571	61,780	92,926	650	45,115

Note: It is known that there is significant error in the "diagram" field on the Police Accident Report. Two specific types of error are most common: First, the field is often left blank. Second, a large proportion (estimated by some traffic engineers to be as high as one-half) of crashes coded as "right-angle" are not right angle crashes, but are some other type of crash--most frequently "left turn into oncoming traffic."

Note 2: A significant error occurred in the columns headed "Fatal Crashes" and "Killed" in Table 1.23 of the 1997 issue of *Crash Facts*: The category "right turn--cross street traffic" should have shown zeroes and the numbers shown in the 6th, 7th, 8th, and 9th rows of those two columns should instead have been shown in the 7th, 8th, 9th, and 10th rows of those two columns. Comparisons of data from the same table for prior or subsequent years should not be made without taking these corrections into account.

TABLE 1.24

1998 CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
100,000 & Over	30	6,562	14,772	21,364	36	9,243
50,000 - 99,999	28	3,194	5,675	8,897	31	4,625
25,000 - 49,999	35	4,540	8,972	13,547	40	6,573
10,000 - 24,999	52	4,529	9,488	14,069	55	6,624
5,000 - 9,999	33	2,073	4,226	6,332	34	3,013
2,500 - 4,999	15	895	2,003	2,913	15	1,336
1,000 - 2,499	16	635	1,434	2,085	16	967
Under 1,000	366	8,143	15,210	23,719	423	12,734
Total	575	30,571	61,780	92,926	650	45,115

TABLE 1.25

1998 CRASHES BY TYPE OF ROADWAY

Type of Roadway	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Urban						
Interstate	27	1,951	5,543	7,521	31	2,661
Trunk Highway	56	5,173	9,831	15,060	63	7,708
County State Aid Highway	49	6,079	10,369	16,497	52	8,914
County Road	5	201	331	537	5	314
Local Street	41	7,494	17,059	24,594	45	10,481
Total	178	20,898	43,133	64,209	196	30,078
Rural						
Interstate	30	583	1,675	2,288	34	922
Trunk Highway	189	4,211	7,943	12,343	216	6,949
County State Aid Highway	126	2,930	4,759	7,815	145	4,375
County Road	14	441	647	1102	18	684
Township Road	25	783	1,154	1,962	27	1,148
Local Street	6	505	1,681	2,192	6	681
Other Road	7	220	789	1016	8	278
Total	397	9,673	18,648	28,718	454	15,037
All Roadways						
Interstate	57	2,534	7,218	9,809	65	3,583
Trunk Highway	245	9,384	17,774	27,403	279	14,657
County State Aid Highway	175	9,009	15,128	24,312	197	13,289
County Road	19	642	978	1639	23	998
Township Road	25	783	1,154	1,962	27	1,148
Local Street	47	7,999	18,740	26,786	51	11,162
Other Road	7	220	788	1015	8	278
Total	575	30,571	61,780	92,926	650	45,115

("Urban" refers to an area having a population of 5,000 or more; "rural" refers to an area of less than 5,000.)

TABLE 1.26

1998 COUNTY CRASH REPORT

County	1998 Crashes: Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Average Crashes 1993-1997	Number Killed 1998	Average Killed 1993-1997	Number Injured 1998	Average Injured 1993-1997
Aitkin	6	103	219	328	283	6	4	138	148
Anoka	28	1,760	2,830	4,618	4,949	31	21	2,681	2,661
Becker	9	140	252	401	419	11	9	213	260
Beltrami	5	217	538	760	772	5	8	329	318
Benton	10	261	360	631	730	11	8	442	405
Big Stone	2	27	50	79	101	2	1	38	35
Blue Earth	11	367	853	1,231	1,471	19	10	533	621
Brown	0	117	289	406	490	0	4	170	240
Carlton	5	152	259	416	426	6	5	238	226
Carver	8	342	620	970	1,118	9	11	516	564
Cass	6	176	290	472	426	6	10	275	259
Chippewa	3	56	95	154	218	3	5	89	127
Chisago	10	246	545	801	705	10	8	409	322
Clay	8	258	673	939	1,200	10	6	403	451
Clearwater	5	55	52	112	101	7	4	84	56
Cook	1	63	84	148	149	1	1	87	66
Cottonwood	3	67	112	182	165	3	3	101	96
Crow Wing	17	377	717	1,111	1,176	18	11	602	602
Dakota	24	1,682	3,436	5,142	5,200	26	22	2,506	2,534
Dodge	5	87	146	238	264	6	4	167	130
Douglas	4	246	579	829	915	4	7	357	371
Faribault	1	68	91	160	208	1	3	98	103
Fillmore	6	97	215	318	334	6	4	149	158
Freeborn	2	191	519	712	736	3	6	297	307
Goodhue	12	291	720	1,023	1,108	12	8	429	499
Grant	1	29	67	97	105	1	0	43	47
Hennepin	65	8,591	18,411	27,067	28,730	70	58	12,247	13,038
Houston	3	115	228	346	326	3	3	181	146
Hubbard	4	99	114	217	254	5	4	154	165
Isanti	3	206	386	595	546	3	6	344	286

TABLE 1.26 CONTINUED

1998 COUNTY CRASH REPORT

County	1998 Crashes: Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Average Crashes 1993-1997	Number Killed 1998	Average Killed 1993-1997	Number Injured 1998	Average Injured 1993-1997
Itasca	6	252	473	731	733	7	8	377	391
Jackson	4	53	130	187	220	5	4	83	104
Kanabec	4	75	148	227	226	4	3	127	138
Kandiyohi	6	335	467	808	868	7	11	513	492
Kittson	1	16	82	99	89	1	1	27	32
Koochiching	0	80	99	179	236	0	4	130	126
Lac Qui Parle	1	35	42	78	97	1	2	60	49
Lake	2	42	143	187	229	2	2	73	93
Lake of The Woods	1	13	26	40	61	2	2	26	29
Le Sueur	8	153	300	461	503	8	5	262	217
Lincoln	1	30	69	100	99	1	1	34	34
Lyon	1	129	262	392	499	1	7	205	211
Mcleod	6	212	414	632	679	6	9	351	334
Mahnomen	0	27	30	57	75	0	4	43	71
Marshall	3	32	60	95	116	4	2	50	63
Martin	4	112	229	345	413	5	5	177	185
Meeker	4	129	163	296	334	4	4	202	191
Mille Lacs	7	152	242	401	410	9	5	256	252
Morrison	6	184	287	477	526	6	9	274	280
Mower	5	187	437	629	713	7	4	272	288
Murray	0	41	70	111	120	0	3	65	50
Nicollet	3	111	305	419	481	4	4	179	193
Nobles	5	106	250	361	452	7	2	192	180
Norman	0	30	52	82	118	0	2	45	65
Olmsted	16	776	1,420	2,212	2,375	19	12	1,123	1,110
Otter Tail	4	313	591	908	946	4	11	498	459
Pennington	2	115	126	243	266	2	3	167	162
Pine	8	200	382	590	526	8	5	313	287
Pipestone	4	49	118	171	145	5	2	73	60
Polk	5	137	278	420	554	6	5	226	274

TABLE 1.26 CONTINUED

1998 COUNTY CRASH REPORT

County	1998 Crashes: Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Average Crashes 1993-1997	Number Killed 1998	Average Killed 1993-1997	Number Injured 1998	Average Injured 1993-1997
Pope	3	42	97	142	146	3	3	74	61
Ramsey	23	3,814	9,039	12,876	14,021	26	26	5,233	5,711
Red Lake	2	19	38	59	66	2	2	25	29
Redwood	3	77	108	188	254	3	4	113	150
Renville	7	77	121	205	262	12	5	121	132
Rice	9	378	665	1,052	1,054	10	8	584	499
Rock	3	57	154	214	238	3	1	93	92
Roseau	0	51	125	176	210	0	4	69	95
St. Louis	26	1,085	1,649	2,760	3,248	28	27	1,598	1,643
Scott	17	419	808	1,244	1,415	21	13	651	686
Sherburne	13	339	596	948	866	16	10	521	451
Sibley	1	57	135	193	253	1	5	91	109
Stearns	18	972	1,364	2,354	2,882	20	17	1,446	1,476
Steele	8	155	537	700	782	10	7	221	304
Stevens	2	46	87	135	137	2	1	62	60
Swift	1	46	68	115	139	1	3	68	73
Todd	5	140	302	447	410	5	4	204	187
Traverse	0	11	23	34	45	0	1	16	27
Wabasha	6	110	255	371	359	6	4	158	176
Wadena	4	82	159	245	260	5	3	129	122
Waseca	3	94	170	267	312	3	4	138	130
Washington	11	903	1,979	2,893	2,975	11	13	1,326	1,347
Watonwan	1	39	94	134	171	1	2	65	82
Wilkin	2	45	103	150	204	2	2	62	100
Winona	8	317	781	1,106	1,144	11	8	434	455
Wright	11	523	778	1,312	1,368	11	17	779	765
Yellow Medicine	4	61	100	165	153	4	2	91	85
Total	575	30,571	61,780	92,926	100,118	650	591	45,115	46,716

TABLE 1.27

1998 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Afton	1	14	26	41	1	26
Albert Lea	0	105	297	402	0	155
Alexandria	0	109	246	355	0	152
Andover	2	112	136	250	2	175
Anoka	2	144	315	461	2	200
Apple Valley	0	148	286	434	0	229
Arden Hills	0	93	264	357	0	116
Aurora	0	4	18	22	0	7
Austin	1	108	272	381	1	152
Baxter	0	46	93	139	0	72
Bayport	0	8	18	26	0	12
Belle Plaine	1	13	38	52	1	21
Bemidji	1	104	293	398	1	155
Benson	0	10	19	29	0	12
Big Lake	0	18	43	61	0	27
Blaine	1	309	458	768	1	506
Bloomington	6	752	1,655	2,413	6	1,078
Blue Earth	0	12	19	31	0	14
Brainerd	1	135	340	476	1	199
Breckenridge	1	12	46	59	1	16
Brooklyn Center	2	274	456	732	2	400
Brooklyn Park	3	401	547	951	3	592
Buffalo	1	52	113	166	1	79
Burnsville	2	341	632	975	2	526
Byron	1	8	14	23	1	15
Caledonia	0	11	28	39	0	17
Cambridge	0	60	130	190	0	107
Cannon Falls	0	10	44	54	0	11
Champlin	0	59	108	167	0	89
Chanhassen	1	77	195	273	1	125
Chaska	0	61	157	218	0	83
Chisholm	0	12	28	40	0	22
Circle Pines	0	13	22	35	0	16
Cloquet	2	55	66	123	2	87
Cold Spring	0	8	27	35	0	10
Columbia Heights	1	109	153	263	1	157
Coon Rapids	4	454	687	1,145	6	657
Corcoran	3	21	33	57	3	32
Cottage Grove	3	106	220	329	3	168
Crookston	0	28	70	98	0	48
Crystal	0	112	151	263	0	167
Dayton	1	21	53	75	1	31
Deephaven	0	4	10	14	0	6
Delano	0	24	25	49	0	39
Detroit Lakes	0	48	75	123	0	71
Dilworth	1	8	11	20	1	9
Duluth	4	464	502	970	4	669
Eagan	3	292	669	964	4	419
East Bethel	1	58	60	119	1	97

TABLE 1.27 CONTINUED

1998 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
East Grand Forks	1	26	79	106	1	37
Eden Prairie	1	262	648	911	1	362
Edina	0	244	566	810	0	327
Elk River	2	106	198	306	2	166
Ely	0	8	33	41	0	10
Eveleth	0	13	35	48	0	15
Excelsior	0	18	45	63	0	19
Fairmont	0	65	137	202	0	88
Falcon Heights	0	23	52	75	0	29
Faribault	2	170	279	451	2	249
Farmington	0	26	67	93	0	36
Fergus Falls	1	79	208	288	1	114
Forest Lake	1	60	144	205	1	82
Fridley	3	227	325	555	3	341
Gilbert	0	7	23	30	0	9
Glencoe	0	23	53	76	0	36
Glenwood	0	8	25	33	0	14
Golden Valley	4	177	398	579	4	228
Goodview	0	9	16	25	0	14
Grand Rapids	0	80	198	278	0	109
Granite Falls	0	5	26	31	0	5
Ham Lake	1	52	117	170	1	88
Hastings	1	94	206	301	1	138
Hermantown	2	45	65	112	3	77
Hibbing	3	123	219	345	4	189
Hopkins	0	109	167	276	0	147
Hoyt Lakes	0	5	12	17	0	8
Hugo	0	19	51	70	0	29
Hutchinson	1	68	160	229	1	97
Independence	1	23	49	73	1	37
International Falls	0	45	48	93	0	71
Inver Grove Heights	3	142	289	434	3	200
Jackson	0	14	28	42	0	17
Jordan	0	15	35	50	0	30
Kasson	0	7	24	31	0	10
La Crescent	1	16	59	76	1	20
Lake City	0	20	62	82	0	28
Lake Elmo	0	61	86	147	0	84
Lakeville	0	146	298	444	0	235
Lauderdale	0	12	39	51	0	14
Le Sueur	0	10	38	48	0	15
Lindstrom	0	16	36	52	0	21
Lino Lakes	5	55	135	195	5	88
Litchfield	0	34	58	92	0	45
Little Canada	3	99	243	345	3	130
Little Falls	1	47	89	137	1	66
Long Prairie	0	20	17	37	0	21
Luverne	0	19	56	75	0	24
Mahtomedi	0	15	30	45	0	19

TABLE 1.27 CONTINUED

1998 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Mankato	2	263	596	861	2	377
Maple Grove	4	181	374	559	4	254
Maplewood	4	304	538	846	5	421
Marshall	0	60	122	182	0	100
Medina	0	30	80	110	0	50
Melrose	0	13	16	29	0	23
Mendota Heights	1	78	169	248	1	106
Minneapolis	21	4,197	9,200	13,418	25	6,020
Minnetonka	1	264	576	841	2	348
Minnetrista	2	27	61	90	2	40
Montevideo	0	22	48	70	0	28
Monticello	0	58	105	163	0	83
Moorhead	2	154	442	598	3	211
Mora	0	20	35	55	0	30
Morris	0	25	60	85	0	32
Mound	0	36	47	83	0	44
Mounds View	0	44	106	150	0	66
Mountain Iron	1	23	38	62	1	35
New Brighton	0	104	243	347	0	127
New Hope	0	81	107	188	0	113
Newport	1	71	156	228	1	104
New Prague	0	16	32	48	0	25
New Ulm	0	58	165	223	0	76
North Branch	0	45	93	138	0	77
Northfield	0	46	119	165	0	76
North Mankato	0	28	90	118	0	40
North Oaks	0	17	23	40	0	24
North St. Paul	0	54	116	170	0	76
Oakdale	0	98	181	279	0	152
Oak Park Heights	1	15	46	62	1	21
Olivia	0	8	27	35	0	13
Orono	1	47	125	173	1	76
Ortonville	0	13	18	31	0	15
Osseo	0	27	55	82	0	37
Otsego	0	6	12	18	0	7
Owatonna	1	95	319	415	1	128
Park Rapids	0	11	22	33	0	16
Pine City	0	19	46	65	0	29
Pipestone	0	15	56	71	0	21
Plainview	0	4	21	25	0	5
Plymouth	3	256	683	942	3	352
Princeton	0	31	53	84	0	43
Prior Lake	1	47	53	101	2	82
Proctor	0	7	16	23	0	10
Ramsey	2	65	138	205	2	111
Red Wing	2	98	295	395	2	148
Redwood Falls	0	20	49	69	0	37
Richfield	2	366	728	1,096	2	534
Robbinsdale	2	83	147	232	2	109
Rochester	6	572	1,058	1,636	7	804

TABLE 1.27 CONTINUED

1998 CRASHES IN CITIES OF 2,500 OR MORE POPULATION

City	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Rockford	1	11	23	35	1	19
Roseau	0	7	32	39	0	7
Rosemount	2	55	113	170	2	77
Roseville	2	279	738	1,019	2	420
St. Anthony	0	25	62	87	0	28
St. Charles	0	8	16	24	0	9
St. Cloud	3	582	637	1,222	4	871
St. Francis	0	20	23	43	0	36
St. James	0	8	31	39	0	8
St. Joseph	0	11	23	34	0	13
St. Louis Park	3	260	633	896	3	377
St. Michael	0	25	34	59	0	41
St. Paul	11	2,424	5,862	8,297	13	3,293
St. Paul Park	0	8	34	42	0	9
St. Peter	0	24	90	114	0	41
Sartell	0	13	26	39	0	16
Sauk Centre	0	21	66	87	0	30
Sauk Rapids	0	60	98	158	0	82
Savage	3	77	186	266	3	117
Shakopee	5	103	196	304	6	151
Shoreview	1	97	248	346	1	151
Shorewood	0	28	60	88	0	37
Silver Bay	0	5	10	15	0	19
Sleepy Eye	0	7	55	62	0	12
South St. Paul	1	89	247	337	1	122
Spring Lake Park	0	49	74	123	0	65
Spring Valley	0	12	26	38	0	16
Staples	0	11	35	46	0	14
Stewartville	0	14	20	34	0	16
Stillwater	0	67	201	268	0	89
Thief River Falls	1	84	85	170	1	117
Two Harbors	0	8	41	49	0	12
Vadnais Heights	2	74	184	260	2	93
Victoria	0	21	30	51	0	37
Virginia	2	65	106	173	2	93
Waconia	0	21	36	57	0	31
Wadena	0	34	76	110	0	58
Waite Park	0	64	141	205	0	103
Waseca	0	36	72	108	0	54
Wayzata	1	46	128	175	1	66
Wells	0	6	8	14	0	11
West St. Paul	2	111	172	285	2	145
White Bear Lake	0	165	333	498	0	240
Willmar	0	180	309	489	0	270
Windom	1	29	68	98	1	36
Winona	2	170	468	640	2	225
Woodbury	2	176	345	523	2	275
Worthington	0	58	143	201	0	89

TABLE 1.28

1998 CRASHES BY TIME AND DAY

Hour Beginning	Total Crashes	Fatal Crashes	Sunday All	Sunday Fatal	Monday All	Monday Fatal	Tuesday All	Tuesday Fatal	Wednesday All	Wednesday Fatal	Thursday All	Thursday Fatal	Friday All	Friday Fatal	Saturday All	Saturday Fatal
Midnight	1,333	22	321	5	131	5	103	0	120	2	129	2	185	5	344	3
1:00	1,711	28	467	10	115	1	112	2	141	2	196	3	229	3	451	7
2:00	946	23	243	7	72	1	80	0	78	1	102	4	116	5	255	5
3:00	629	12	167	5	50	0	50	0	48	2	52	1	90	0	172	4
4:00	563	6	130	3	58	2	52	0	68	1	63	0	75	0	117	0
5:00	951	9	105	1	162	0	140	1	128	2	124	1	142	0	150	4
6:00	2,073	16	134	3	387	3	415	1	328	1	352	3	321	2	136	3
7:00	4,447	19	165	4	790	1	971	1	787	1	755	4	763	5	216	3
8:00	3,955	24	216	2	672	4	779	4	690	3	599	2	696	4	303	5
9:00	3,113	21	320	1	458	5	501	0	461	2	398	3	545	7	430	3
10:00	3,324	25	465	4	454	5	492	4	412	2	417	3	529	2	555	5
11:00	4,119	36	519	4	552	5	594	7	526	5	522	3	757	9	649	3
Noon	4,668	26	582	4	648	5	620	5	627	5	645	1	861	3	685	3
1:00	4,667	30	566	7	659	2	622	2	668	6	622	4	880	3	650	6
2:00	5,242	22	565	5	775	8	735	0	743	0	750	1	990	5	684	3
3:00	6,786	35	588	2	1,000	4	1,049	7	1,086	6	1,022	8	1,355	5	686	3
4:00	6,686	21	555	1	1,030	2	1,084	2	1,057	3	1,093	3	1,262	7	605	3
5:00	7,451	31	603	5	1,097	2	1,200	3	1,331	4	1,225	2	1,370	7	625	8
6:00	5,263	25	640	1	677	2	698	3	818	5	810	4	958	6	662	4
7:00	3,836	27	553	4	484	2	477	1	541	5	562	4	691	6	528	5
8:00	3,057	26	428	2	405	2	357	4	443	5	477	4	487	2	460	7
9:00	2,977	26	352	4	403	2	344	3	397	2	457	4	549	5	475	6
10:00	2,561	33	297	3	287	4	268	4	306	3	370	4	555	10	478	5
11:00	2,250	27	217	3	210	3	206	2	231	2	300	2	554	9	532	6
Unknown	10,318	5	1,380	1	1,606	0	1,444	1	1,570	0	1,697	1	1,340	0	1,282	2
Total	92,926	575	10,578	91	13,182	70	13,393	57	13,605	70	13,739	71	16,300	110	12,130	106

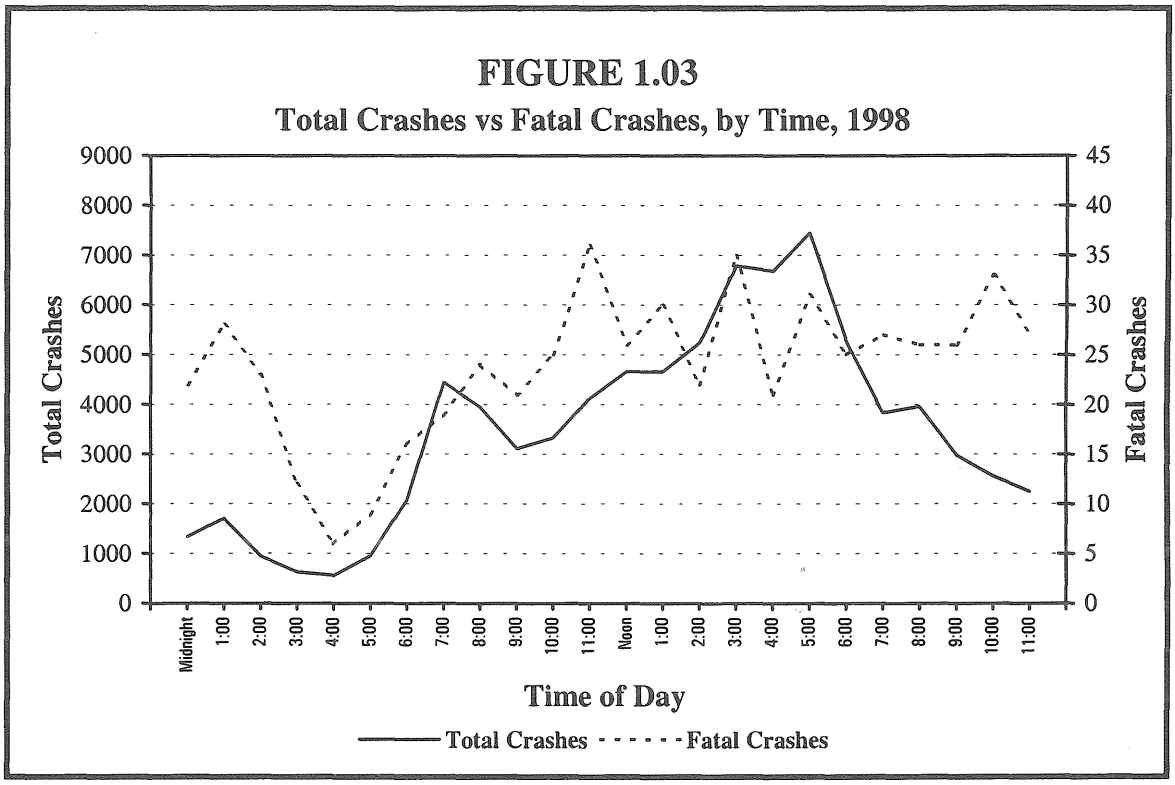


TABLE 1.29

1998 CRASHES, FATALITIES, AND INJURIES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	34	2,608	7,002	9,644	39	3,742
February	30	1,750	3,852	5,632	31	2,565
March	38	2,190	4,910	7,138	43	3,284
April	44	2,196	3,807	6,047	51	3,277
May	45	2,763	4,684	7,492	51	4,146
June	51	2,792	5,102	7,945	56	4,174
July	60	2,813	4,728	7,601	70	4,247
August	55	2,819	4,682	7,556	63	4,196
September	69	2,693	4,657	7,419	76	3,968
October	57	2,682	5,946	8,685	64	3,983
November	44	2,449	5,924	8,417	50	3,521
December	48	2,816	6,486	9,350	56	4,012
Total	575	30,571	61,780	92,926	650	45,115

TABLE 1.30

HOLIDAY CRASH SUMMARY, 1994 - 1998

Holiday Period	Year	Hours*	Fatal Crashes	Personal Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Memorial Day	1994	78	7	258	398	663	8	431
(For 1998, the holiday	1995	78	7	312	470	789	9	507
period was 6 PM Fri.,	1996	78	9	208	330	547	13	346
May 22 - midnight	1997	78	4	223	353	580	4	357
Monday, May 25.)	1998	78	6	214	356	576	8	332
July 4th	1994	78	5	283	444	732	6	468
(For 1998, the holiday	1995	102	13	365	532	910	20	588
period was 6 PM Thu,	1996	102	13	389	554	956	17	649
July 2 - midnight	1997	78	3	228	390	621	3	358
Sunday, July 5.)	1998	78	8	287	432	727	10	473
Labor Day	1994	78	6	267	441	714	6	435
(For 1998, the holiday	1995	78	4	248	343	595	5	413
period was 6 PM Fri.,	1996	78	10	243	365	618	12	395
Sep 4 - midnight	1997	78	6	264	364	634	6	455
Monday, Sep. 7.)	1998	78	7	212	344	563	10	360
Thanksgiving	1994	102	12	383	1,018	1,413	18	584
(For 1998, the holiday	1995	102	8	360	896	1,264	9	579
period was 6 PM Wed.,	1996	102	7	345	998	1,350	8	537
Nov. 25 - midnight	1997	102	7	307	652	966	7	474
Sunday, Nov. 29.)	1998	102	11	292	637	940	17	447
Christmas	1994	78	6	164	357	527	6	255
(For 1998, the holiday	1995	78	5	166	364	535	6	260
period was 6 PM Thur,	1996	30	1	80	281	362	1	123
Dec 24 - midnight	1997	102	4	293	625	922	7	455
Sunday, Dec. 27.)	1998	78	6	227	514	747	8	365
New Year's	1994/95	78	3	193	476	672	4	286
(For 1998-99, the	1995/96	78	13	392	1,017	1,422	18	646
holiday period was	1996/97	30	1	95	220	316	1	141
6 PM Thur., Dec. 31	1997/98	102	10	362	872	1,244	11	528
- midnight Sunday,	1998/99	78	2	296	937	1,235	3	419
Jan 3, 1999.)								

* Holiday period hours vary depending on the day of the week on which the holiday falls.

II. ALCOHOL - RELATED CRASHES

The prominent role of alcohol in traffic crashes has long been recognized. This section focuses on alcohol-related crashes, injuries, and fatalities. Several clarifying issues should be noted:

1. A crash is classified as alcohol-related or not.
Though individual drivers and victims come first to mind, it is the event of the motor vehicle crash that is classified as alcohol-related or not. Once a crash is so classified, then anyone who died or was injured in the crash is classified as an alcohol-related death or injury. Thus, for example, the number of alcohol-related fatalities is always greater than or equal to the number of alcohol-related fatal crashes.

2. Data on alcohol tests performed is only available for some drivers in fatal crashes.
For the approximately 800 to 900 drivers involved in fatal crashes in Minnesota each year, much effort is made to obtain results for any alcohol tests that were performed. Thus, for fatal crashes, the crash is classified as alcohol-related or not on the basis of chemical test data, when available, or on the basis of the investigating officer's reported perception, when the test results are not available. The figures that result can tell us how many fatal crashes were known or perceived to be alcohol-related. But every year there will be some crashes that were alcohol-related but no test was performed and the officer made no report of suspected alcohol involvement.

The National Highway Traffic Safety Administration (NHTSA) developed a statistical technique to estimate alcohol involvement for fatal crashes where data are missing. Their estimates (shown in Tables 2.01 and 2.05) of alcohol-related fatalities for Minnesota have consistently ranged from two to four percentage points higher than the estimates based on known information.

For non-fatal crashes, only the investigating officer's reported perception of possible alcohol involvement is used as a basis to classify the crash as alcohol-related or not. Evidence from fatal crashes suggests that using only officers' perceptions will produce quite conservative estimates of the extent of alcohol involvement.

3. Alcohol-related crashes are usually, but not always, due to impaired driving.
Again, while it comes first to mind, intoxicated driving is not always involved in alcohol-related crashes, though it usually is. If a drinking pedestrian or bicyclist is involved in a crash, the crash will also be classified as alcohol related. In 1998, 23 pedestrians and one bicyclist killed tested positive for alcohol. Also it may be the case that in a collision between a sober and a drinking driver, the sober driver was at fault in causing the crash. Though this occurs, experts believe it is almost always the drinking driver who is at fault in crashes classified as alcohol-related. Lastly, sometimes a crash is classified as alcohol-related even though the drinking driver (or pedestrian or bicyclist) had a low alcohol concentration. Again, this occurs, but is infrequent. In 1998, 406 drivers died; 369 were tested; 18 had alcohol concentrations from .01 to .04; 11 were from .05 to .09, and the remaining 122 were over .10%.

1998: Deaths "soar;" injuries and crashes decline
In 1997, alcohol-related deaths had dropped to 178, or 30% of the total -- the lowest number and percent on record (since 1984), and probably the lowest in more than three decades. In 1998, there were 95 more alcohol-related deaths -- 273, or 42% of the total. Alcohol-related injuries declined 2% (the same amount as for total injuries) and total alcohol-related crashes also declined 2% (compared to 6% for all crashes).

Arrests increase 2% overall, but more among young
There were 30,892 incidents leading to DWI arrest (see definitions on p. 37) in 1998. That's up an average of 2% across all age groups. However the children of "baby boomers" are entering the age of greatest risk for impaired driving, and arrests have increased fastest among the young. Last year, 2,847 15-to-19 year-olds and 6,019 20-to-24 year-olds were arrested. Over the last three years, arrests of 15-to-19 year olds increased 26%, 28%, and 21%; arrests of 20-to-24 year-olds increased 2%, 3%, and 7%.

Mild winter and fall may have contributed to increase
The demographic structure of the population changes gradually. Attitude change, for better or worse, is probably gradual as well. Yet alcohol-related deaths went from the lowest on record in 1997 to the highest in ten years in 1998. It is likely that good weather conditions in 1998 made drinking drivers more susceptible to fatal crashes. The first three and last three months of 1998 were mild and had little snowfall. They also had 81% more alcohol-related deaths than the same six months in 1997. In contrast, the middle six months had 37% more alcohol-related deaths than the same months in 1997.

TABLE 2.01

IMPAIRED DRIVING FATALITY SUMMARY, 1980 - 1998

	Alcohol Concentration Test Results on Fatally Injured Drivers Only									All Traffic Fatalities				
	Drivers Killed			Results on Drivers Tested							Alcohol-Related Fatalities			
	Total	Tested for Alcohol		Negative for alcohol		.01 to .09 alcohol		.10 or higher alcohol		Total	Known *		Estimated *	
Year		number	% of total	number	% of tested	number	% of tested	number	% of tested		number	% of total	number	% of total
1980	519	337	65	103	31	37	11	197	58	863				
1981	437	288	66	110	38	28	10	150	52	763				
1982	321	232	72	106	46	14	6	112	48	581			317	55
1983	345	258	75	113	44	28	11	117	45	558			307	55
1984	383	318	83	133	42	36	11	149	47	584	305	52	326	56
1985	372	295	79	156	53	31	10	108	37	610	261	43	283	46
1986	347	281	81	143	51	24	8	114	41	572	264	46	278	49
1987	297	265	89	132	50	18	7	115	43	530	224	42	240	45
1988	361	313	87	163	52	32	10	118	38	615	277	45	289	47
1989	368	313	85	158	51	26	8	129	41	605	275	45	291	48
1990	334	260	78	129	50	23	9	108	41	568	235	41	254	45
1991	327	242	74	135	56	22	9	85	35	531	212	40	231	43
1992	344	237	69	135	57	13	5	89	38	581	229	39	237	41
1993	355	283	80	174	61	19	7	90	32	538	196	36	212	39
1994	377	303	80	183	60	23	8	97	32	644	226	35	244	38
1995	383	343	90	198	58	30	9	115	34	597	246	41	265	44
1996	359	314	87	209	67	22	7	83	26	576	205	36	218	38
1997	384	345	90	226	66	19	6	100	29	600	178	30	193	32
1998	406	369	91	218	59	29	8	122	33	650	273	42	NA	NA

* The difference between "known" and "estimated" alcohol-related traffic fatalities is explained in some detail on page 39. In brief, a traffic death is categorized as a known alcohol-related fatality if data collected make it appear that any driver, pedestrian, or bicyclist involved in the crash had any amount of alcohol in his or her system. Reliable data to indicate presence of alcohol are sometimes not available, however. Therefore, statisticians at the National Highway Traffic Safety Administration developed a complex procedure to impute likely blood alcohol concentration (BAC) levels to drivers, pedestrians, and bicyclists in fatal crashes when actual BAC data are not available. The column showing the "estimated" number has the effect of adding (to the "known" number) those deaths that occurred in crashes where the imputation procedure assigned a positive BAC level to a driver, pedestrian, or bicyclist in the crash. The estimated number thus will probably always be higher (and closer to reality) than the known number. The estimated number is available beginning with calendar year 1982. It is not available until late in the year following the calendar year for which this report is produced, and so is not reported for the latest calendar year.

DEFINING DWI ARRESTS

The Department of Public Safety has several divisions. One, the Bureau of Criminal Apprehension (BCA), compiles statistics annually on crimes and arrests in the state. Another division, the Office of Traffic Safety, compiles traffic crash statistics and produces this "Crash Facts" report annually. Beginning in the 1970s, the Office of Traffic Safety obtained DWI arrest statistics from the BCA and reported them here. When the 1997 Crash Facts book was being compiled, it was learned that the BCA defines "arrests" more in the sense of *offenses reported* than in the sense of the single act of taking a person into custody. However, one episode of impaired driving often involves more than one criminal offense. For example, a drunken driver who gets in a crash and injures two people will likely be charged with at least three criminal offenses: driving while impaired, plus two counts of criminal vehicular operation resulting in injury. The additional criminal offenses have especially become more numerous in the last decade. (For example, in 1989, the Legislature made alcohol test refusal a crime for certain categories of repeat offenders. Then, in 1992, refusal became a crime for all persons stopped for DWI.) In short, currently, an officer will report that that the person arrested committed one, two, three, or even more DWI offenses. Following established conventions, the BCA counts each offense reported as an arrest.

For 1997, the Office of Traffic Safety requested special reports on DWI arrests, where "arrest" was defined as a taking into custody of a person for having committed one or more criminal offenses, at least one of which was covered under the criminal DWI statutes. The 1997 Crash Facts book then reported DWI arrests, defined in this new sense, for the years 1992 through 1997. This created confusion. Starting this year, arrests counted in the two different ways are both reported. Column (2) in Table 2.02 shows the arrest numbers compiled by the BCA. Columns (3) through (7) of Table 2.02, and all of Table 2.03, are based on the new special reports created at request of the Office of Traffic Safety.

Table 2.02

DWI ARRESTS: OFFENSES REPORTED AND INCIDENTS

Year	Arrests (Defined as Offenses Reported)	Arrests (Defined as Incidents Involving One or More DWI Offenses)				
		Total	Male		Female	
			number	percent	number	percent
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1985	35,383	33,620	28,567	85.0	5,053	15.0
1986	36,390	34,394	29,069	84.5	5,325	15.5
1987	34,664	32,725	27,520	84.1	5,205	15.9
1988	32,627	30,591	25,720	84.1	4,871	15.9
1989	34,562	32,299	27,011	83.6	5,288	16.4
1990	37,261	32,758	27,223	83.1	5,535	16.9
1991	33,574	31,397	26,103	83.1	5,294	16.9
1992	31,973	27,511	22,510	81.8	5,001	18.2
1993	32,518	27,712	22,686	81.9	5,026	18.1
1994	32,391	27,635	22,602	81.8	5,033	18.2
1995	33,355	27,339	22,295	81.6	5,044	18.4
1996	38,925	28,962	23,656	81.7	5,306	18.3
1997	42,523	30,168	24,319	80.6	5,849	19.4
1998	44,078	30,892	24,764	80.2	6,128	19.8

TABLE 2.03

DWI ARRESTS BY AGE, 1985 - 1998

	Under 21								All Ages												
Year	0-14	15	16	17	18	19	20	Total	0-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+	Total
1985	7	23	165	423	1,049	1,765	1,911	5,343	7	3,425	9,696	7,219	4,659	3,079	1,979	1,263	882	667	384	360	33,620
1986	7	24	241	517	1,095	1,726	1,880	5,490	7	3,603	9,679	7,759	4,734	3,153	1,991	1,219	827	609	388	425	34,394
1987	8	10	192	454	1,016	1,298	1,608	4,586	8	2,970	8,802	7,623	4,834	3,168	1,994	1,239	797	568	343	379	32,725
1988	4	14	148	462	982	1,142	1,202	3,954	4	2,748	7,382	7,284	4,809	3,061	1,967	1,289	746	530	388	383	30,591
1989	7	21	161	411	1,012	1,211	1,341	4,164	7	2,816	7,579	7,655	5,177	3,342	2,266	1,345	842	546	362	362	32,299
1990	3	11	146	397	879	1,175	1,336	3,947	3	2,608	7,473	7,560	5,623	3,580	2,340	1,351	893	534	388	405	32,758
1991	5	11	117	276	681	1,001	1,234	3,325	5	2,086	6,995	6,824	5,843	3,842	2,533	1,276	807	462	351	373	31,397
1992	2	5	117	236	518	752	937	2,567	2	1,628	6,246	5,624	5,192	3,499	2,182	1,322	752	461	316	287	27,511
1993	5	9	85	209	472	679	783	2,242	5	1,454	5,871	5,477	5,331	3,971	2,368	1,386	807	474	264	304	27,712
1994	5	15	96	219	504	602	725	2,166	5	1,436	5,406	5,198	5,348	3,968	2,654	1,641	824	519	319	317	27,635
1995	6	19	91	203	496	657	737	2,209	6	1,466	5,334	4,970	5,205	4,061	2,742	1,577	879	497	297	305	27,339
1996	7	13	134	313	605	776	762	2,610	7	1,841	5,435	5,270	5,081	4,467	2,937	1,804	943	530	306	341	28,962
1997	11	32	153	417	814	943	1,027	3,397	11	2,359	5,623	5,322	4,812	4,578	3,145	1,983	1,086	588	311	350	30,168
1998	10	33	213	483	943	1,175	1,163	4,020	10	2,847	6,019	5,096	4,461	4,715	3,319	2,057	1,086	616	316	350	30,892

* In this table, the term "arrest" is used in the sense of "incident." For example, in 1998, there were 30,892 times when a police officer stopped and arrested a person for an incident of driving while impaired. The incident may have included more than one offense under the different statutes making it a crime to operate a motor vehicle while impaired by alcohol or by various other substances.

"ALCOHOL - RELATED"

The term "alcohol-related" requires explanation. If data show that any motor vehicle driver, pedestrian, or bicyclist in a traffic crash had any amount of alcohol in their system, then the crash is classified as alcohol related, and anyone who died or was injured in the crash is classified as an alcohol-related fatality or injury. For non-fatal crashes, the reporting officer's perception is the only information entered in the database. If the officer indicates on the Police Accident Report that the "apparent physical condition" was "had been drinking," or "under the influence," then the crash is classified as alcohol-related. This is a conservative measure. Officers base their perceptions on physical observation, or on the results of tests performed on the blood, breath, or urine of the person. If the accident was not discovered till hours after it occurred, or if a person in the accident was taken to a hospital, the officer may have to indicate that the apparent physical condition was "unknown." For fatal crashes, the officer's perception is again used as data, but special effort is also made to obtain the results of alcohol tests performed. If the results for any driver, pedestrian or bicyclist are positive, then the crash is also classified as alcohol related.

The procedure described above is the basis for most of the information in this section.. However, there is a problem when data are missing. As noted, officers sometimes indicate "unknown" for the "apparent physical condition." Also, while alcohol testing is high (about 80% or higher) for killed drivers, it is not as good for surviving drivers. Completeness of data collection also varies from year to year, making comparisons over several years unreliable. To address the problem of missing data, a procedure was developed that classifies a driver, pedestrian, or bicyclist on whom actual alcohol test data are missing into one of three categories: (1) negative, (2) .01 to .09, or (3) .10 or higher. If a person is classified into the second or third category, then the crash is classified as alcohol-related. The classification (based on other characteristics of the crash, such as driver age, time of day, and so on) involves a sophisticated statistical procedure, which of course is still subject to error. The procedure was developed by Mr. Terry Klein, currently Chief of the Mathematical Analysis section of the National Center for Statistics and Analysis of the National Highway Traffic Safety Administration. It is especially valuable since it is consistent over years. Results from this procedure were provided by NHTSA and are used in the tables (2.01 and 2.05) that show alcohol-related fatalities across several years.

TABLE 2.04

AGE OF PERSONS KILLED AND INJURED IN ALL CRASHES AND IN ALCOHOL - RELATED CRASHES, 1998

	Killed		Injured	
Age	All	Alcohol-Related[1]	All	Alchol-Related[2]
0 - 4	7	2	750	40
5 - 9	15	3	1,346	54
10 - 14	17	5	1,738	66
15 - 19	90	36	8,421	780
20 - 24	86	60	5,699	973
25 - 29	51	31	4,251	599
30 - 34	37	20	3,716	509
35 - 39	50	29	3,788	474
40 - 44	39	22	3,289	401
45 - 49	47	23	2,606	237
50 - 54	29	9	1,960	146
55 - 59	25	10	1,416	85
60 - 64	20	3	1,009	72
65 - 69	19	6	897	48
70 - 74	34	4	764	21
75 - 79	24	6	742	31
80 - 84	29	1	497	9
85 & Older	31	3	321	9
Not Stated	0	0	1,905	207
Total *	650	273	45,115	4,761

1 Based on alcohol test results plus officer's perception of alcohol as noted on accident report.

2 Based only on officer's perception of alcohol as noted on accident report.

* In 1998, 28 of the 273 alcohol-related traffic deaths were pedestrians, 23 of whom had been drinking (and for 7 out of these 23 cases, the motor vehicle driver also had been drinking). Two more alcohol-related deaths occurred to bicyclists, one of whom had been drinking.

TABLE 2.05

1998 ALCOHOL - RELATED FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY TRAFFIC ROLE

Traffic Role	Killed	Tested	Alcohol Concentration (.00)	(.01 - .09)	(.10 or more)
Car or Truck Driver	150	147	18	27	102
Car or Truck Passenger	62	44	12	8	24
Motorcycle Driver	22	21	1	2	18
Snowmobile Driver	1	1	0	0	1
ATV Driver	1	1	0	0	1
ATV passenger	1	1	0	0	1
Pedestrian	28	25	3	2	20
Bicyclist	2	1	0	0	1
Other/Unknown	6	2	2	0	0
Total	273	243	36	39	168

TABLE 2.06

PERCENT OF DEATHS, INJURIES, AND PROPERTY DAMAGE CRASHES DETERMINED TO BE ALCOHOL - RELATED, 1989- 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Deaths* (Known)	45%	41%	40%	39%	36%	35%	41%	36%	30%	42%
(Estimated)	48%	45%	43%	41%	39%	38%	44%	38%	32%	NA
Injuries**	15%	15%	13%	13%	12%	11%	11%	11%	11%	11%
Property Damage Crashes**	5%	6%	5%	5%	4%	4%	4%	4%	4%	4%

* Based on alcohol test information plus officer's perception of alcohol noted on accident report. See note above Table 2.03 regarding known and estimated alcohol-related fatalities. Estimated deaths are not available for 1998.
** Based only police officer's perception of alcohol noted on accident report.

TABLE 2.07

FIRST HARMFUL EVENT IN ALCOHOL-RELATED FATAL CRASHES AND ALL FATAL CRASHES, 1998

First Harmful Event	Alcohol-Related Fatal Crashes* Number	Percent	All Fatal Crashes Number	Percent
Collision with:				
Another Motor Vehicle	69	29.5	268	46.6
Parked Motor Vehicle	4	1.7	8	1.4
Railroad Train	1	0.4	9	1.6
Bicycle	2	0.9	9	1.6
Pedestrian	27	11.5	52	9.0
Deer	2	0.9	2	0.3
Other Animal	0	0.0	0	0.0
Fixed Object	62	26.5	110	19.1
Non-Collision:				
Overturn	59	25.2	103	17.9
Fire/Explosion	1	0.4	1	0.2
Submersion	2	0.9	3	0.5
Other/Unknown	5	2.1	10	1.7
Total	234	100.0	575	100.0

* Based on alcohol test information as well as officer's perception of alcohol noted on accident report.

TABLE 2.08

TEST RESULTS OF DRIVERS KILLED, 1989 - 1998

Year	Killed	Tested	Alcohol Concentration* (.00)	(.01 - .09)	(.10 or more)
1989	368	313	158 (50%)	26 (8%)	129 (41%)
1990	334	260	129 (50%)	23 (9%)	108 (42%)
1991	327	242	135 (56%)	22 (9%0	85 (35%)
1992	344	237	135 (57%)	13 (5%)	89 (38%)
1993	355	283	174 (61%)	19 (7%)	90 (32%)
1994	377	303	183 (60%)	23 (8%)	97 (32%)
1995	383	343	198 (58%)	30 (9%)	115 (34%)
1996	359	314	209 (67%)	22 (7%)	83 (26%)
1997	384	345	226 (66%)	19 (5%)	100 (29%)
1998	406	369	218 (59%)	29 (8%)	122 (33%)

* Percentages are based on number of motor vehicle drivers tested.

TABLE 2.09

DRIVERS KILLED WHO TESTED .01 OR HIGHER, 1989 - 1998
("Any Alcohol")

Year	Total	Male		Female		Occurred Between Midnight - 3 AM		Under Legal Age	
1989	155	138	(89%)	17	(11%)	47	(30%)	26	(17%)
1990	131	110	(84%)	21	(16%)	48	(37%)	28	(21%)
1991	107	98	(92%)	9	(8%)	37	(35%)	23	(21%)
1992	102	82	(80%)	20	(20%)	39	(38%)	13	(13%)
1993	109	92	(84%)	17	(16%)	35	(32%)	11	(10%)
1994	120	100	(83%)	20	(17%)	24	(20%)	15	(13%)
1995	145	121	(83%)	24	(17%)	43	(30%)	12	(8%)
1996	105	81	(77%)	24	(23%)	31	(30%)	16	(15%)
1997	119	102	(86%)	17	(14%)	32	(27%)	13	(11%)
1998	151	126	(83%)	25	(17%)	41	(27%)	26	(17%)

TABLE 2.10

DRIVERS KILLED WHO TESTED .10 OR HIGHER, 1989 - 1998
("Over Limit")

Year	Total	Male		Female		Occurred Between Midnight - 3 AM		Under Legal Age	
1989	129	117	(91%)	12	(9%)	42	(33%)	19	(15%)
1990	108	92	(85%)	16	(15%)	42	(39%)	22	(20%)
1991	85	79	(93%)	6	(7%)	30	(35%)	13	(15%)
1992	89	77	(87%)	12	(13%)	36	(40%)	12	(13%)
1993	90	75	(83%)	15	(17%)	32	(36%)	7	(8%)
1994	97	83	(86%)	14	(14%)	20	(21%)	8	(8%)
1995	115	97	(84%)	18	(16%)	38	(33%)	6	(5%)
1996	83	65	(78%)	18	(22%)	25	(30%)	13	(16%)
1997	100	89	(89%)	11	(11%)	32	(32%)	13	(13%)
1998	122	104	(85%)	18	(15%)	36	(30%)	19	(16%)

Figure 2.01

Killed Drivers Tested for Alcohol: Percent over .01 Alcohol Level and Percent over .10 Alcohol Level

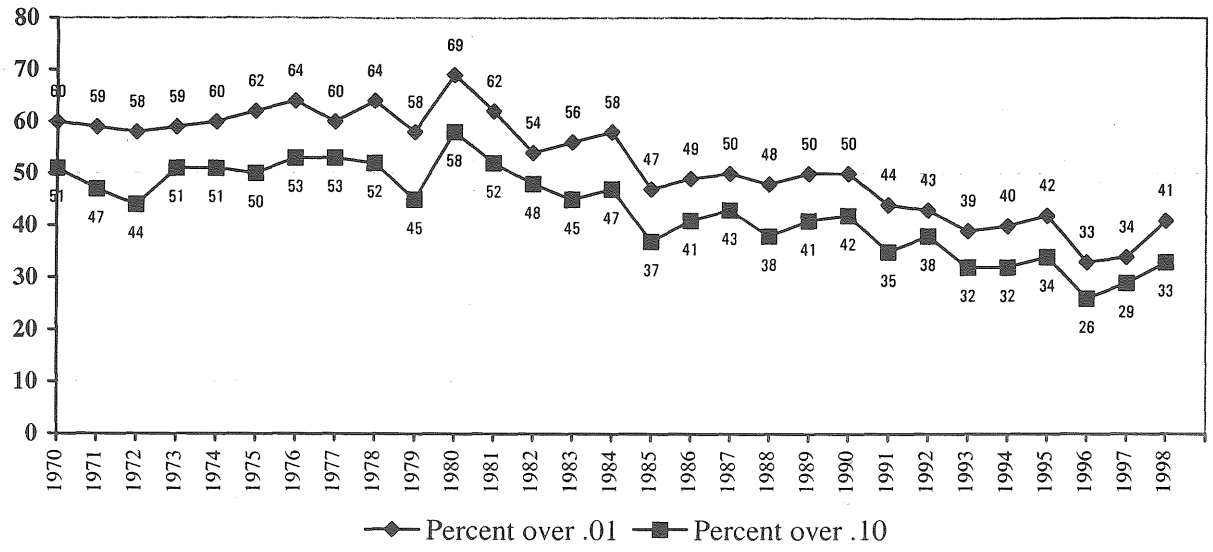


FIGURE 2.02

Percent of Drivers Killed Who Had Been Drinking, by Age, 1998

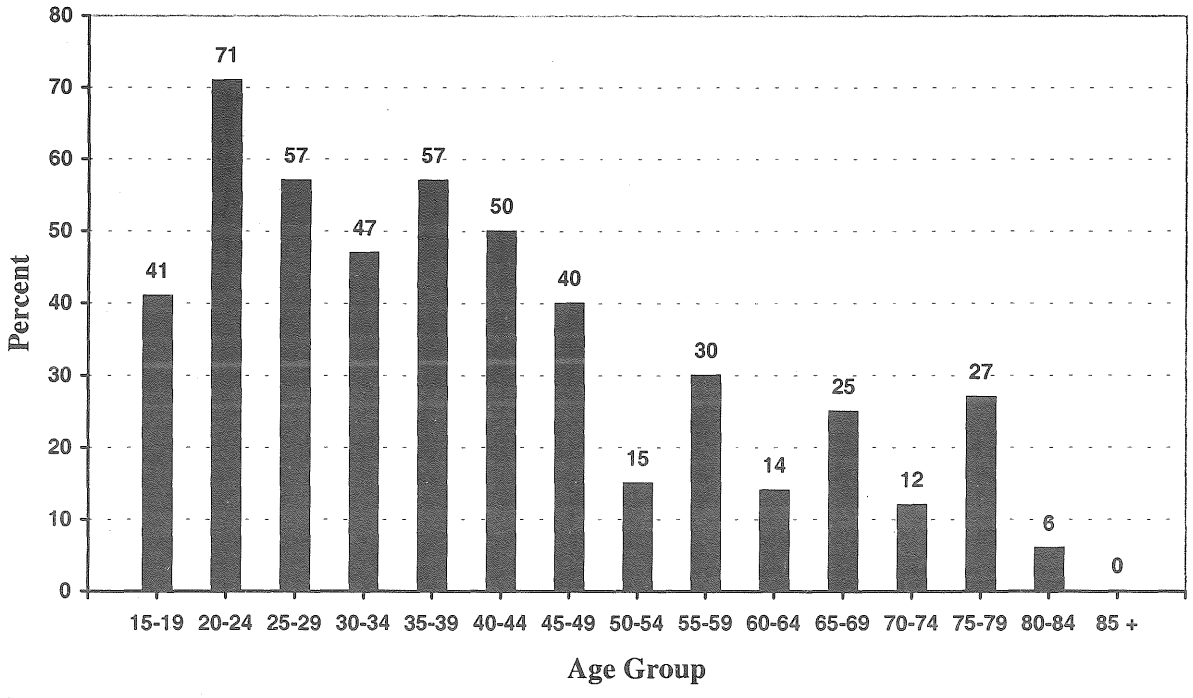


TABLE 2.11

1998 DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY AGE

Age	Killed	Tested	Alcohol Concentration* (.00)		(.01 - .09)		(.10 or more)		Alcohol Concentration .00	.01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
14 & Younger	3	3	2		1		0		2	1	0	0	0	0	0
15	0	0	0		0		0		0	0	0	0	0	0	0
16	7	6	3		1		2		3	1	0	1	1	0	0
17	4	4	4		0		0		4	0	0	0	0	0	0
18	16	14	8		3		3		8	3	0	1	1	1	0
19	17	15	8		0		7		8	0	0	2	4	1	0
20	16	16	7		2		7		7	0	2	2	4	0	1
Under 21	63	58	32		7		19		32	5	2	6	10	2	1
14 & Younger	3	3	2		1		0		2	1	0	0	0	0	0
15 - 19	44	39	23	(59%)	4	(10%)	12	(31%)	23	4	0	4	6	2	0
20 - 24	52	51	15	(29%)	4	(8%)	32	(63%)	15	0	4	8	11	5	8
25 - 29	37	33	14	(42%)	3	(9%)	16	(48%)	14	2	1	3	3	5	5
30 - 34	29	28	15	(54%)	3	(11%)	10	(36%)	15	1	2	2	2	5	1
35 - 39	38	37	16	(43%)	1	(3%)	20	(54%)	16	0	1	3	4	4	9
40 - 44	30	30	15	(50%)	1	(3%)	14	(47%)	15	0	1	3	1	3	7
45 - 49	27	25	15	(60%)	3	(12%)	7	(28%)	15	2	1	1	3	0	3
50 - 54	21	20	17	(85%)	0	(0%)	3	(15%)	17	0	0	0	1	2	0
55 - 59	18	17	12	(71%)	1	(6%)	4	(24%)	12	0	1	0	0	2	2
60 - 64	17	14	12	(86%)	0	(0%)	2	(14%)	12	0	0	0	1	1	0
65 - 69	14	12	9	(75%)	1	(8%)	2	(17%)	9	1	0	1	0	1	0
70 - 74	21	17	15	(88%)	2	(12%)	0	(0%)	15	2	0	0	0	0	0
75 - 79	18	15	11	(73%)	4	(27%)	0	(0%)	11	4	0	0	0	0	0
80 - 84	22	17	16	(94%)	1	(6%)	0	(0%)	16	1	0	0	0	0	0
85 & Older	15	11	11	(100%)	0	(0%)	0	(0%)	11	0	0	0	0	0	0
Total	406	369	218	(59%)	29	(8%)	122	(33%)	218	18	11	25	32	30	35

* Percentages are based on number of motor vehicle drivers tested. They may not add to 100 due to rounding.

TABLE 2.12

1998 ALCOHOL - RELATED CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	13	235	243	491	15	357
February	12	182	209	403	13	273
March	16	191	178	385	20	303
April	13	224	152	389	17	335
May	17	280	176	473	19	427
June	20	258	172	450	24	421
July	18	278	180	476	21	411
August	26	316	184	526	30	462
September	37	314	194	545	41	517
October	24	320	266	610	26	484
November	16	270	239	525	20	385
December	22	266	231	519	27	386
Total	234	3,134	2,424	5,792	273	4,761

TABLE 2.13

1998 ALCOHOL - RELATED CRASHES BY ROADWAY TYPE

Roadway Type	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Urban Interstate	9	214	255	478	11	316
Rural Interstate	6	41	43	90	8	69
Urban Trunk Hwy	20	383	311	714	24	576
Rural Trunk Hwy	59	550	304	913	72	869
County State Aid Hwy	88	988	563	1,639	101	1,523
County Road	11	105	60	176	14	162
Township Road	14	150	78	242	15	238
Local Street	23	677	777	1,477	24	970
Other	4	26	33	63	4	38
Total	234	3,134	2,424	5,792	273	4,761

FIGURE 2.03

1998 Alcohol-Related Crashes by Time of Day

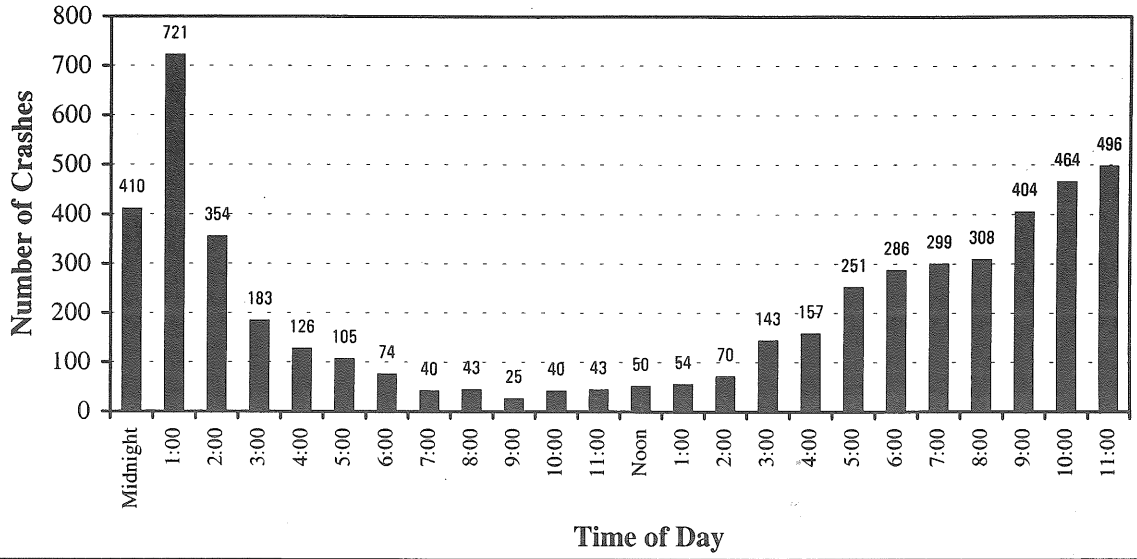


FIGURE 2.04

1998 Alcohol-Related Crashes by Day of Week

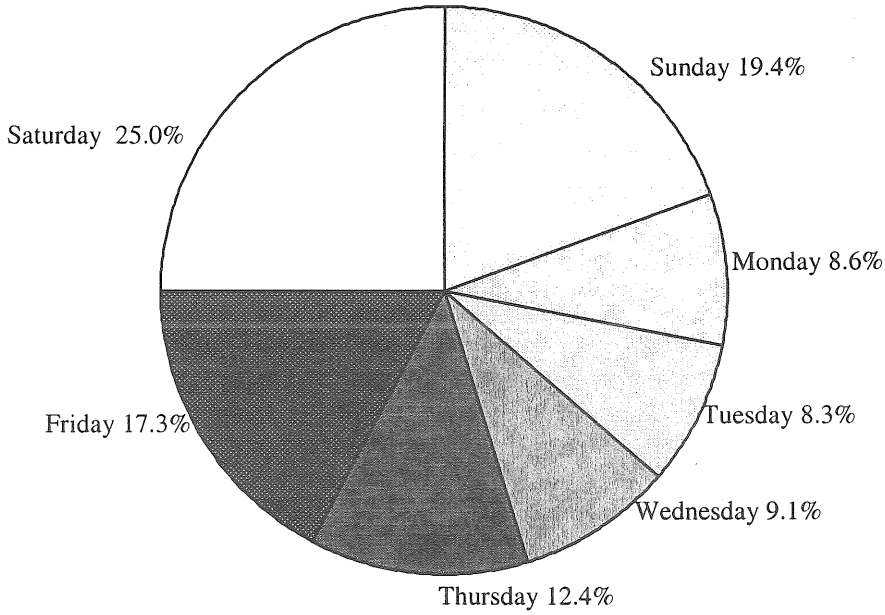


TABLE 2.14

1998 ALCOHOL - RELATED CRASHES BY TIME OF DAY AND DAY OF WEEK

Hour Beginning	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total Crashes	Total Killed	Total Injured
Midnight	108	44	24	37	41	54	102	410	22	307
1:00 AM	216	32	39	46	76	104	208	721	27	578
2:00 AM	96	22	19	12	44	55	106	354	21	261
3:00 AM	54	10	10	7	14	22	66	183	11	144
4:00 AM	48	2	8	8	21	9	30	126	4	114
5:00 AM	33	5	12	4	8	7	36	105	6	70
6:00 AM	30	8	3	2	9	8	14	74	7	65
7:00 AM	13	4	1	3	2	7	10	40	6	27
8:00 AM	10	0	6	2	5	4	16	43	3	30
9:00 AM	4	1	3	0	0	4	13	25	1	20
10:00 AM	4	2	1	3	10	4	16	40	8	25
11:00 AM	11	3	8	3	6	7	5	43	3	39
Noon	6	3	5	10	5	5	16	50	0	44
1:00 PM	8	3	5	10	5	13	10	54	3	34
2:00 PM	8	4	2	8	8	14	26	70	4	78
3:00 PM	21	19	15	12	17	25	34	143	9	148
4:00 PM	20	24	13	15	24	33	28	157	3	146
5:00 PM	36	27	32	36	32	38	50	251	11	234
6:00 PM	30	31	39	28	28	59	71	286	11	244
7:00 PM	41	29	31	39	46	51	62	299	15	286
8:00 PM	48	44	27	33	52	50	54	308	20	252
9:00 PM	44	44	37	44	48	97	90	404	18	343
10:00 PM	47	49	42	48	67	103	108	464	31	360
11:00 PM	31	36	42	57	66	136	128	496	24	439
Unknown	158	51	55	59	84	91	148	646	5	473
Total	1,125	497	479	526	718	1,000	1,447	5,792	273	4,761

III: SAFETY EQUIPMENT USE BY VEHICLE OCCUPANTS IN 1998 CRASHES

Types of safety equipment

The most common type of safety equipment is the safety belt -- a system that usually includes lap and shoulder belts that are operated either automatically or manually. All recent model cars come with driver-side, and usually passenger-side, airbags. Child safety seats are available for children under age four. Other devices, such as booster seats, can be beneficial for young children aged four to eight.

Safety benefits and legislation

Studies estimate that using these safety devices reduces the risk of death and serious injury by 40% to 60%. In view of this, the Minnesota Legislature enacted laws mandating safety equipment use. The Child Passenger Protection Act took effect in 1982, and was amended in 1983 and 1987. It requires children under the age of four to be properly restrained in a federally-approved child car seat. In 1993, the Legislature increased the fine for not using a child car seat from $25 to $50. The state's safety belt law went into effect in 1986 and was amended in 1988 and 1991. It requires all front seat occupants (and children ages four through ten, regardless of seating position) to wear safety belts.

Tables in this section focus on the use of safety equipment by people in crashes who were occupants of vehicles normally equipped with safety equipment (e.g., passenger cars and trucks rather than motorcycles). The data are problematic in that safety equipment use could not be determined by the reporting officer for almost one-fifth of the persons killed or injured. In addition, the accuracy of the remaining data (reported use and non-use) is uncertain. Assuming that reporting behavior does not change radically from year to year, the data can be useful in indicating general trends in usage.

Safety belt use responds to legislation

Observational surveys of safety belt use conducted yearly at random sites in the state provide strong evidence that legislation affects safety-belt wearing behavior -- thus saving lives and preventing injuries. In June 1986, before the first safety belt law took effect, 20% of vehicle occupants used belts. The use rate jumped to 33% after the 1986 law took effect, to 47% after a $10 fine was added in 1988, and to 53% after the fine was increased to $25 in 1991. Educational and special traffic enforcement strategies may also have benefits. After the introduction of *Safe & Sober* (an intensive traffic safety enforcement and public information campaign), the use rate jumped from about 57% in 1994 to 65% in 1995. The *Safe & Sober* program continues, and the use rate remains at about the same level (64%) in 1998. Nevertheless, other states--especially those with primary seat belt laws--have still higher rates.

Occupant fatalities increase sharply

In 1998, 532 people who were occupants of motor vehicles died in crashes. This number represents a 9% increase from the previous year. However, the total number of vehicle occupants injured (40,492) decreased slightly (2%) from 1997. But these figures conceal a very powerful, dramatic, and beneficial trend in evidence since the mid-1980s. Specifically, severe injuries have been "trading off" with moderate and minor injuries. They have steadily declined as the less severe injuries have increased in the decade since the seat belt legislation of the mid-1980s. In 1987, 4,176 motor vehicle occupants suffered severe injuries. In 1998, that number decreased to 2,776. This 1998 total for severe injuries to motor vehicle occupants is the lowest over the period of time (since 1984) for which records are available. This is especially beneficial. By definition, minor (or "possible") and moderate (or "non-incapacitating") injuries do not produce long-term and severe suffering, while severe injuries may often have such impacts, including consequences such as severe and permanent brain damage, paralysis, dismemberment, or epilepsy.

Belt use holds steady

According to the August 1998 observational survey, belt use among front-seat occupants averaged 64% across all of Minnesota. In a way, this is a disappointing result, as this percentage has remained stagnant since 1995. It appears that without a primary seat belt law, the percentage of Minnesotan's who buckle-up may not exceed current levels. This may be especially true in rural Minnesota. In 1998, the percentage of people who buckled-up in the non-metro area was only 56%, as compared to 67% in the seven county metro area.

Airbag update: always wear your seat belt

In 1998, airbag deployment was recorded 2,746 times when the occupant was wearing a seat belt. Fifty-two percent of these incidents resulted in no apparent injury. Airbags deployed 311 times when the occupant was not wearing a seat belt. Only 29% of these cases resulted in no apparent injury. The message is clear: always buckle up!

TABLE 3.01

PERCENT OF FRONT SEAT OCCUPANTS WEARING SAFETY BELTS, BY DATE OF OBSERVATION STUDY

	Old Survey Design									New Survey Design				
	June 1986	Aug 1986	Aug 1987	Aug 1988	Aug 1989	Aug 1990	Aug 1991	Aug 1992	Aug 1993	Aug 1994	Aug 1995	Aug 1996	Aug 1997	Aug 1998
Statewide	**20%**	**33%**	**32%**	**47%**	**44%**	**47%**	**53%**	**51%**	**55%**	**57%**	**65%**	**64%**	**65%**	**64%**
Metro	30	43	40	51	52	54	62	62	59	58	68	67	67	67
Non-Metro	15	26	28	45	40	42	47	46	52	54	56	58	59	56
Road Class														
Major Roads	23	35	35	48	44	49	53	55	57	65	68	68	69	68
Local Roads	17	31	29	46	45	46	52	48	53	54	64	62	63	63
Weather														
Clear	19	32	32	47	44	47	53	52	55					
Other	23	36	41	48	53	50	48	41	52					
Time														
Rush Hour	21	31	30	47	42	47	53	55	59					
Non-Rush	20	34	33	47	44	48	52	51	54					
Day of the Week														
Weekday	19	33	32	45	42	45	51	51	56					
Weekend	21	33	33	52	49	50	56	53	52					
Speed														
20 MPH	14	29	29	35	39	46	47	39	50					
40 MPH	20	32	30	47	46	46	56	58	57					
60 MPH	28	39	41	57	52	53	61	62	61					

The seat belt law, which requires all front seat passengers and all passengers under the age of eleven to wear safety belts, became effective in Minnesota on August 1, 1986. Only the use of shoulder belts could be observed in the observation studies. The June 1986 survey was conducted prior to the implementation of this law; all other studies were conducted after the law went into effect. The August 1988 study was conducted after the amendment adding a $10.00 fine went into effect. The August 1991 study was conducted after an amendment increasing the fine to $25.00 went into effect.

The usage rate is not a simple ratio of the number of persons observed belted to the total number of people observed. It is, instead, the ratio of estimated time on the road that front seat occupants are using safety belts to the total estimated time on the road for these occupants.

* A new survey design was initiated in August 1994. The new survey design uses different sites and is not strictly comparable to the prior design.

TABLE 3.02

MOTOR VEHICLE OCCUPANTS KILLED OR INJURED BY EJECTION STATUS AND INJURY SEVERITY, 1998

	Killed		Severe Injury		Moderate Injury		Minor Injury		Total Persons Killed or Injured	
Ejection Status	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Not Ejected	311	1.0	1,949	6.6	10,779	36.4	16,586	56.0	29,625	100.0
Partly Ejected	26	15.5	44	26.2	69	41.1	29	17.3	168	100.0
Ejected	118	16.5	233	32.6	248	34.6	117	16.3	716	100.0
Not Stated	77	0.7	550	5.2	3,074	29.2	6,814	64.8	10,515	100.0
Total	532	1.3	2,776	6.8	14,170	34.5	23,546	57.4	41,024	100.0

TABLE 3.03

MOTOR VEHICLE OCCUPANTS KILLED OR INJURED, BY AGE AND SEVERITY OF INJURY, 1998

		Injured			
Age Group	Killed	Severe	Moderate	Minor	Total
0 – 4	6	23	214	430	667
5 - 9	7	46	325	541	912
10 - 14	11	71	441	638	1,150
15 - 19	80	565	3,332	3,997	7,894
20 - 24	71	378	1,953	2,897	5,228
25 - 29	43	255	1,318	2,314	3,887
30 - 34	30	211	1,113	2,026	3,350
35 - 39	38	237	1,067	2,106	3,410
40 - 44	31	195	937	1,791	2,923
45 - 49	31	151	718	1,497	2,366
50 - 54	19	141	545	1,069	1,755
55 - 59	21	92	433	798	1323
60 - 64	19	56	303	587	946
65 - 69	18	62	293	499	854
70 - 74	29	56	250	420	726
75 - 79	22	78	269	364	711
80 - 84	27	47	168	257	472
85 & Older	29	46	106	153	305
Not Stated	0	66	385	1,162	1,613
Total	532	2,776	14,170	23,546	40,492

FIGURE 3.01

Safety Equipment Use Among Motor Vehicle Occupants Killed and Injured, by Age, 1998

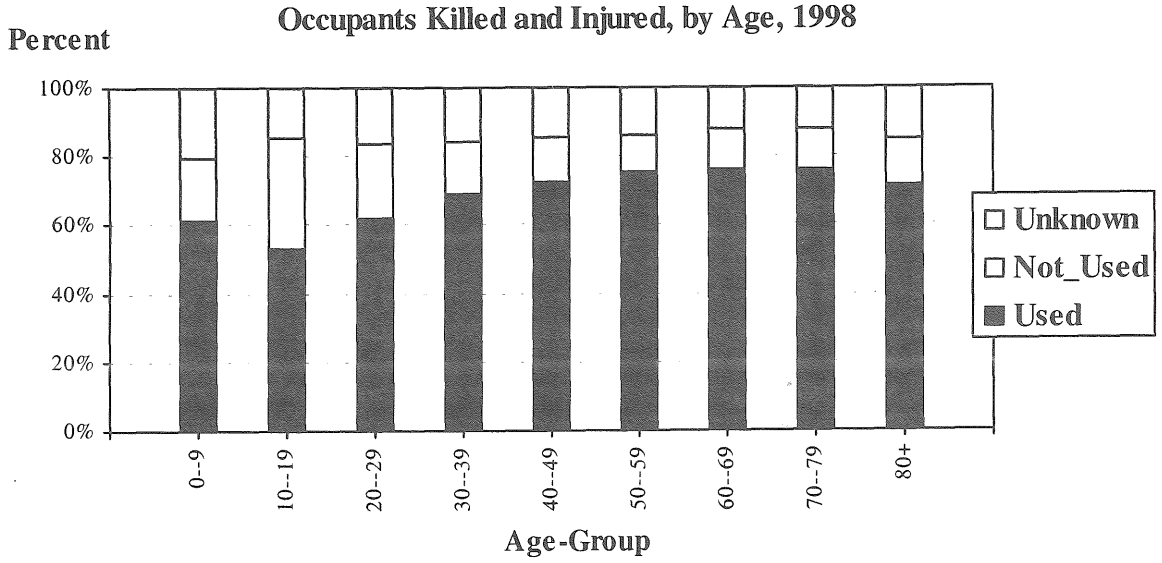


TABLE 3.04

SAFETY EQUIPMENT USE BY VEHICLE OCCUPANTS, BY GENDER AND INJURY SEVERITY, 1998

	Killed			Injured						
				Severe		Moderate		Minor		
	Female	Male	Total	Female	Male	Female	Male	Female	Male	Total
Used	71	90	161	730	486	4,721	3,681	9,636	6,797	26,078
Not Used	84	175	259	411	589	1,544	2,138	1,494	1,659	7,842
Unknown	37	75	112	241	311	930	1,093	1,799	1,705	6,572
Total	192	340	532	1,382	1,386	7,195	6,912	12,929	10,161	40,492

Note: Gender was not reported for 527 persons injured (mostly those with minor injuries), causing the "Total" to be 527 greater than the sum of the "severe," "moderate," and "minor" injury columns.

TABLE 3.05

SAFETY EQUIPMENT USE BY VEHICLE OCCUPANTS KILLED OR INJURED, BY AGE AND INJURY SEVERITY, 1998

Age Group	Restraint Use	Killed		Injured							
				Severe		Moderate		Minor		Total	
		#	%	#	%	#	%	#	%	#	%
0 – 3	Used	1	20.0	8	53.3	91	58.0	190	64.2	289	61.8
Years	Not Used	2	40.0	5	33.3	35	22.3	31	10.5	71	15.2
	Unknown	2	40.0	2	13.3	31	19.7	75	25.3	108	23.0
	Subtotal	5	100.0	15	100.0	157	100.0	296	100.0	468	100.0
4 - 10	Used	3	30.0	27	42.2	270	60.6	488	64.8	785	62.2
Years	Not Used	4	40.0	23	35.9	92	20.6	133	17.7	248	19.6
	Unknown	3	30.0	14	21.9	84	18.8	132	17.5	230	18.2
	Subtotal	10	100.0	64	100.0	446	100.0	753	100.0	1,263	100.0
11 - 19	Used	16	18.0	188	30.0	1,797	48.4	2,775	60.9	4,760	53.5
Years	Not Used	51	57.3	322	51.5	1,423	38.4	1,099	24.1	2,844	32.0
	Unknown	22	24.7	116	18.5	489	13.2	683	15.0	1,288	14.5
	Subtotal	89	100.0	626	100.0	3,709	100.0	4,557	100.0	8,892	100.0
20 - 29	Used	15	13.2	229	36.2	1,819	55.6	3,642	69.9	5,690	62.4
Years	Not Used	68	59.6	263	41.5	933	28.5	778	14.9	1,974	21.7
	Unknown	31	27.2	141	22.3	519	15.9	791	15.2	1,451	15.9
	Subtotal	114	100.0	633	100.0	3,271	100.0	5,211	100.0	9,115	100.0
30 - 39	Used	19	27.9	197	44.0	1,402	64.3	3,077	74.5	4,676	69.2
Years	Not Used	38	55.9	154	34.4	459	21.1	418	10.1	1,031	15.2
	Unknown	11	16.2	97	21.6	319	14.6	637	15.4	1,053	15.6
	Subtotal	68	100.0	448	100.0	2,180	100.0	4,132	100.0	6,760	100.0
40 - 49	Used	22	35.5	181	52.3	1,134	68.5	2,531	77.0	3,846	72.7
Years	Not Used	30	48.4	90	26.0	295	17.8	281	8.5	666	12.6
	Unknown	10	16.1	75	21.7	226	13.7	476	14.5	777	14.7
	Subtotal	62	100.0	346	100.0	1,655	100.0	3,288	100.0	5,289	100.0
50 - 59	Used	18	45.0	151	64.8	696	71.2	1,491	79.9	2,338	76.0
Years	Not Used	14	35.0	52	22.3	153	15.6	107	5.7	312	10.1
	Unknown	8	20.0	30	12.9	129	13.2	269	14.4	428	13.9
	Subtotal	40	100.0	233	100.0	978	100.0	1,867	100.0	3,078	100.0
60 - 69	Used	16	43.2	73	61.9	445	74.7	861	79.3	1,379	76.6
Years	Not Used	16	43.2	27	22.9	85	14.3	90	8.3	202	11.2
	Unknown	5	13.6	18	15.2	66	11.0	135	12.4	219	12.2
	Subtotal	37	100.0	118	100.0	596	100.0	1,086	100.0	1,800	100.0
70 &	Used	51	47.7	139	61.2	599	75.5	936	78.4	1,674	75.6
Older	Not Used	36	33.6	43	19.0	106	13.4	103	8.6	252	11.4
	Unknown	20	18.7	45	19.8	88	11.1	155	13.0	288	13.0
	Subtotal	107	100.0	227	100.0	793	100.0	1,194	100.0	2,214	100.0
Age	Used	0	0.0	24	36.4	153	39.7	464	39.9	641	39.7
Not	Not Used	0	0.0	21	31.8	104	27.0	117	10.1	242	15.0
Stated	Unknown	0	0.0	21	31.8	128	33.3	581	50.0	730	45.3
	Subtotal	0	0.0	66	100.0	385	100.0	1,162	100.0	1,613	100.0
All	Used	161	30.3	1,217	43.8	8,046	59.3	16,455	69.9	26,078	64.4
Ages	Not Used	259	48.7	1,000	36.1	3,685	26.0	3,157	13.4	7,842	19.4
	Unknown	112	21.0	559	20.1	2,079	14.7	3,934	16.7	6,572	16.2
	Total	532	100.0	2,776	100.0	14,170	100.0	23,546	100.0	40,492	100.0

(Persons aged 0 through 3 and 4 through 10 years old are categorized in separate groups because Minnesota law makes special provisions for these age groups. Percentages may not sum to 100.0% due to rounding.)

TABLE 3.06

PERCENT OF INJURED OR KILLED MOTOR VEHICLE OCCUPANTS WHO USED SAFETY EQUIPMENT, BY INJURY SEVERITY AND YEAR, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Killed										
Used	20.5	20.9	24.4	27.5	32.1	25.4	27.1	30.3	37.5	30.3
Not Used	63.8	65.9	57.0	58.5	52.6	56.3	48.3	52.6	45.9	48.7
Unknown	15.7	13.2	18.5	14.0	15.3	18.3	24.6	17.1	16.6	21.0
Injured										
Severe Injuries										
Used	31.6	32.6	35.7	36.6	40.7	43.0	41.7	44.8	45.4	43.8
Not Used	47.9	48.4	40.7	41.7	37.4	37.6	37.2	35.9	35.2	36.0
Unknown	20.5	18.9	23.6	21.7	21.9	19.4	21.1	19.3	19.4	20.1
Moderate Injuries										
Used	39.9	41.1	45.9	48.5	51.8	54.5	55.3	57.5	59.0	59.3
Not Used	40.6	40.2	33.7	34.0	31.9	29.6	28.4	27.4	25.7	26.0
Unknown	19.5	18.7	20.4	17.5	16.3	15.9	16.2	15.1	15.3	14.7
Minor Injuries										
Used	45.5	45.3	54.3	61.4	64.8	65.0	66.8	67.9	69.5	69.9
Not Used	21.9	23.1	19.8	19.9	17.0	16.0	15.2	14.6	13.1	13.4
Unknown	32.6	31.6	25.9	18.8	18.1	19.0	18.0	17.5	17.4	16.7
Total Injured										
Used	42.3	42.7	49.8	55.0	58.7	59.9	61.1	62.9	64.2	64.4
Not Used	30.7	31.2	26.3	26.4	23.5	22.1	21.2	20.3	18.9	19.4
Unknown	27.0	26.1	23.9	18.6	17.9	18.0	17.6	16.8	16.8	16.2

TABLE 3.07

SAFETY EQUIPMENT USE BY MOTOR VEHICLE OCCUPANTS KILLED AND INJURED, BY ROADWAY TYPE, 1998

	Used		Not Used		Unknown		Total	
Roadway Type	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Interstate	2,532	73.2	538	15.6	389	11.2	3,459	100.0
Trunk Highway	9,272	66.7	2,739	19.7	1,889	13.6	13,900	100.0
County State-Aid Highway	7,559	62.4	2,342	19.3	2,219	18.3	12,120	100.0
County Road	467	50.1	314	33.6	152	16.3	933	100.0
Township Road	483	43.4	459	41.3	170	15.3	1,112	100.0
Local Street	5,836	62.6	1,671	17.9	1,819	19.5	9,326	100.0
Other Road	90	51.7	38	21.8	46	26.4	174	100.0
Total	26,239	64.0	8,101	19.7	6,684	16.3	41,024	100.0

TABLE 3.08

SAFETY EQUIPMENT USE BY MOTOR VEHICLE OCCUPANTS KILLED AND INJURED, BY REGION OF THE STATE, 1998

EMS Region	Percent Used	Percent Not Used	Percent Unknown	Number of People
Metropolitan	68.2	14.1	17.7	22,291
Central	61.5	24.1	14.4	5,758
Northeast	61.3	25.2	13.5	2,468
Northwest	48.4	33.1	18.5	1,179
South Central	59.4	27.4	13.2	1,616
Southeast	60.9	24.1	15.0	3,691
Southwest	53.9	30.1	16.0	2,374
West Central	55.5	31.0	13.5	1,647
Statewide	64.0	19.7	16.3	41,024

*The regions of the state are shown in the map at right.

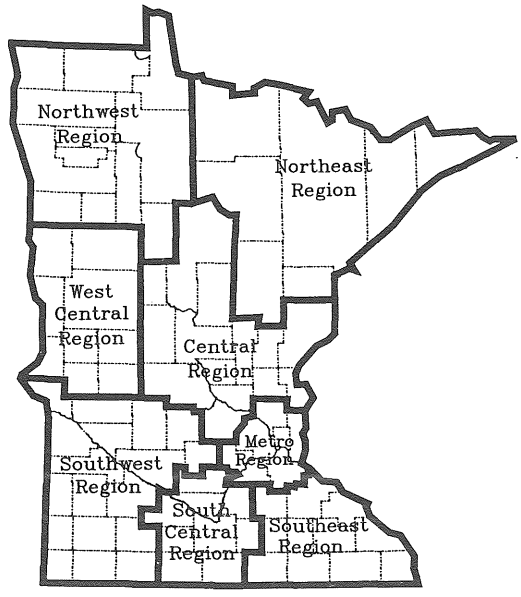


TABLE 3.09

AIRBAG DEPLOYMENTS, 1991 - 1998

		Airbag Deployed		Deployment Not Indicated			
Year	Injury Severity	Belt Used	Belt Not Used	Belt Used	Belt Not Used	Belt Use Unknown	Total
1991	Killed	1	0	98	231	75	405
	Severe Injury	7	4	1,219	1,395	813	3,438
	Moderate Injury	45	6	5,772	4,272	2,588	12,683
	Minor Injury	44	11	11,867	4,342	5,687	21,951
	No Apparent Injury	123	7	67,212	10,851	119,996	198,189
	Total	220	28	86,168	21,091	129,159	236,666
1992	Killed	4	2	129	281	68	484
	Severe Injury	17	4	1,253	1,440	752	3,466
	Moderate Injury	63	11	6,008	4,239	2,193	12,514
	Minor Injury	85	11	13,746	4,471	4,228	22,541
	No Apparent Injury	173	11	74,716	12,008	106,957	193,865
	Total	342	39	95,852	22,439	114,198	232,870
1993	Killed	1	3	140	228	67	439
	Severe Injury	18	9	1,337	1,236	728	3,328
	Moderate Injury	116	15	6,618	4,125	2,122	12,996
	Minor Injury	124	16	15,518	4,093	4,375	24,126
	No Apparent Injury	274	22	85,736	10,508	106,902	203,442
	Total	533	65	109,349	20,190	114,194	244,331
1994	Killed	5	5	127	287	95	519
	Severe Injury	33	5	1,367	1,217	632	3,254
	Moderate Injury	160	16	7,172	3,971	2,133	13,452
	Minor Injury	179	17	15,920	3,949	4,692	24,757
	No Apparent Injury	465	28	95,102	9,189	96,345	201,129
	Total	842	71	119,688	18,613	103,897	243,111
1995	Killed	7	4	127	235	122	495
	Severe Injury	38	14	1,242	1,126	647	3,067
	Moderate Injury	241	46	7,537	3,953	2,281	14,058
	Minor Injury	285	24	16,534	3,817	4,533	25,193
	No Apparent Injury	668	32	93,028	8,393	89,646	191,767
	Total	1,239	120	118,468	17,524	97,229	234,580
1996	Killed	11	8	129	235	79	462
	Severe Injury	67	21	1,298	1,074	590	3,050
	Moderate Injury	356	62	7,964	3,897	2,188	14,467
	Minor Injury	401	47	17,699	3,851	4,653	26,651
	No Apparent Injury	973	51	103,909	8,574	98,418	211,925
	Total	1,808	189	130,999	17,631	105,928	256,555
1997	Killed	12	15	171	209	81	488
	Severe Injury	73	30	1,273	1,012	576	2,964
	Moderate Injury	443	63	7,785	3,524	2,140	13,955
	Minor Injury	457	44	16,549	3,164	4,250	24,464
	No Apparent Injury	1,142	66	98,069	7,600	89,634	196,511
	Total	2,127	218	123,847	15,509	96,681	238,382
1998	Killed	17	8	144	251	112	532
	Severe Injury	88	26	1,129	974	559	2,776
	Moderate Injury	565	113	7,841	3,572	2,079	14,170
	Minor Injury	640	75	15,815	3,082	3,934	23,546
	No Apparent Injury	1,436	89	93,842	7,044	83,677	186,088
	Total	2,746	311	118,771	14,923	90,361	227,112

Note: "Belt use" is used as a shorthand term for safety restraint use. Safety restraint devices are normally lap and shoulder belts, but they can also be child safety seats or booster seats.

IV: MOTORCYCLE CRASHES

Motorcycle crashes increase
In 1998, there were 1,065 crashes that involved at least one motorcycle. This number represents almost a 10% increase from the previous year. Motorcycle crashes had been declining steadily throughout the 1990's. In fact, the average number of motorcycle crashes per year from 1990 through 1997 was 1,301. The warm weather in 1998 may have been a factor in preventing a continuing decline in the number of motorcycle crashes. In the 1998 calendar months of January, February, March, November, and December there were more than 3 times as many motorcycle crashes in 1998 as there were in the same calendar months of 1997.

Fatalities and injuries also increase
In 1998, there were 40 motorcyclists killed in traffic crashes. This number is a big jump from the record low recorded in 1997 when there were only 24 recorded fatalities. However, 40 deaths are close to the 1990's average in Minnesota. In the time period of 1990 through 1996, there was an average of 39 motorcyclist fatalities per year. Motorcyclist injuries also increased in 1998. There were 987 injuries, which represents an 8% jump. However, 987 injuries are actually lower than the average in the 1990's, as Minnesota averaged 1,219 injuries per year.

Greater crash severity
When a motorcycle is involved in a traffic crash, the chances of a severe injury are greatly increased. In fact, for every 100 motorcycle crashes in 1998, 3.8 of them were fatal crashes. For all crashes in 1998, 0.6 of every 100 were fatal. Also, in 1998, 83% of motorcycle crashes resulted in a non-fatal injury. This compares with 33% for all types of motor vehicle crashes.

Risk factors: alcohol and no helmet
State law requires that drivers who die in traffic crashes be tested for blood alcohol level. In 1998, 36 motorcycle operators were killed and 35 of them were tested. Twenty of them (57%) tested positive for alcohol. And, 18 of those 20 tested at .10 or greater. A second risk factor is helmet non-use.

Currently, Minnesota does not have a mandatory helmet use law for motorcycle operators. The need for helmet laws may be debatable, but the benefits helmets offer are not: they protect the head in the event of a collision. In 1998, only three of the 40 motorcycle riders killed were known to be wearing a helmet. And, of the 987 motorcyclists injured, only 310 (31%) were recorded as wearing a helmet.

Operator training is essential
In 1998, 51% of all motorcycle crashes did not involve a collision with another vehicle. This may indicate that further training is needed for a large segment of the motorcycle driver population. Indeed, of the 45 motorcycle drivers that were involved in fatal crashes in 1998, 25% of them did not have a driver's license or a valid endorsement to drive a motorcycle.

Young males are most often victims
In 1998, 36 out of the 40 motorcyclists killed, and 805 out of the 987 injured were male. Males account for a full 82% of all motorcyclists killed or injured. Also the victims are young: 64% were under age 40, with 28% concentrated in the 20-29 age group.

Contributing factors:
Speed by motorcyclists
Failing to yield by other vehicles
As noted, about half of motorcycle crashes are single-vehicle crashes. They do not involve another vehicle. In these crashes, the factors that reporting officers cite most often are illegal or unsafe speed (26%), driver inattention or distraction (14%), and driver inexperience (14%). In crashes that do involve another motor vehicle, the reporting officers more often associate contributing factors with the other driver than with the motorcyclist. For the other drivers, failure to yield right of way is cited most commonly (33% of all factors cited), then driver inattention or distraction (27%).

TABLE 4.01

MOTORCYCLE CRASH SUMMARY, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Record High (since 1970)
Total Crashes	**1,748**	**1,735**	**1,461**	**1,361**	**1,245**	**1,381**	**1,126**	**1,131**	**971**	**1,065**	**3,308 (1980)**
Fatal Crashes	37	46	38	29	33	41	32	39	23	41	112 (1980)
Personal Injury Crashes	1,463	1,446	1,198	1,133	1,022	1,151	941	934	821	883	2,728 (1980)
Property Damage Crashes	248	243	225	199	190	189	153	158	127	141	537 (1976)
Persons Killed:											
Motorcyclists	37	50	40	28	34	43	35	42	24	40	121 (1980)
Non-Motorcyclists/Unknown	0	2	0	3	3	0	2	0	1	1	9 (1975)
Persons Injured:											
Motorcyclists	1,617	1,605	1,357	1,288	1,151	1,324	1,063	1,046	916	987	3,359 (1980)
Non-Motorcyclists/Unknown	104	126	104	60	104	66	76	71	65	69	N/A
Licensed Operators	290,000	292,074	296,624	290,722	291,756	293,164	295,849	297,102	298,863	301,992	301,992 (1998)
Registered Motorcycles	123,308	120,081	117,492	116,124	114,548	113,337	113,981	112,551	113,443	118,275	166,151 (1981)
Rates:											
Fatal Motorcycle Crashes Per 100 Motorcycle Crashes	2.1	2.7	2.6	2.1	2.7	3.0	2.8	3.4	2.4	3.8	3.8 (1998)
Fatal Crashes Per 100 Crashes (All Vehicles)	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.8 (1970)

TABLE 4.02

1998 MOTORCYCLE CRASHES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Motorcyclists Killed	Motorcyclists Injured
Collision With:						
Other Motor Vehicle	14	421	82	517	13	470
Parked Motor Vehicle	1	8	24	33	1	6
Bicycle	0	5	0	5	0	3
Pedestrian	0	4	0	4	0	2
Deer	0	31	6	37	0	40
Other Animal	0	13	1	14	0	17
Fixed Object	15	96	1	112	15	104
Other Object	1	7	0	8	1	7
Non-Collision:						
Overturn	8	186	16	210	8	207
Other / Unknown	2	112	11	125	2	131
Total	41	883	141	1,065	40	987

TABLE 4.03

1998 MOTORCYCLE CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Motorcyclists Killed	Motorcyclists Injured
100,000 and Over	4	180	40	224	4	188
50,000 - 99,999	1	78	10	89	1	90
25,000 - 49,999	1	101	16	118	0	107
10,000 - 24,999	4	136	19	159	4	150
5,000 - 9,999	2	53	12	67	2	55
2,500 - 4,999	2	35	7	44	2	40
1,000 - 2,499	0	22	3	25	0	22
Under 1,000	27	278	34	339	27	335
Total	41	883	141	1,065	40	987

TABLE 4.04

1998 MOTORCYCLE CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Motorcyclists Killed	Motorcyclists Injured
January	0	0	0	0	0	0
February	0	3	1	4	0	3
March	0	9	4	13	0	9
April	7	67	13	87	6	78
May	4	137	17	158	4	151
June	2	127	23	152	2	144
July	8	164	27	199	8	190
August	3	162	18	183	3	182
September	8	147	17	172	8	158
October	4	44	16	64	4	49
November	5	16	4	25	5	16
December	0	7	1	8	0	7
Total	41	883	141	1,065	40	987

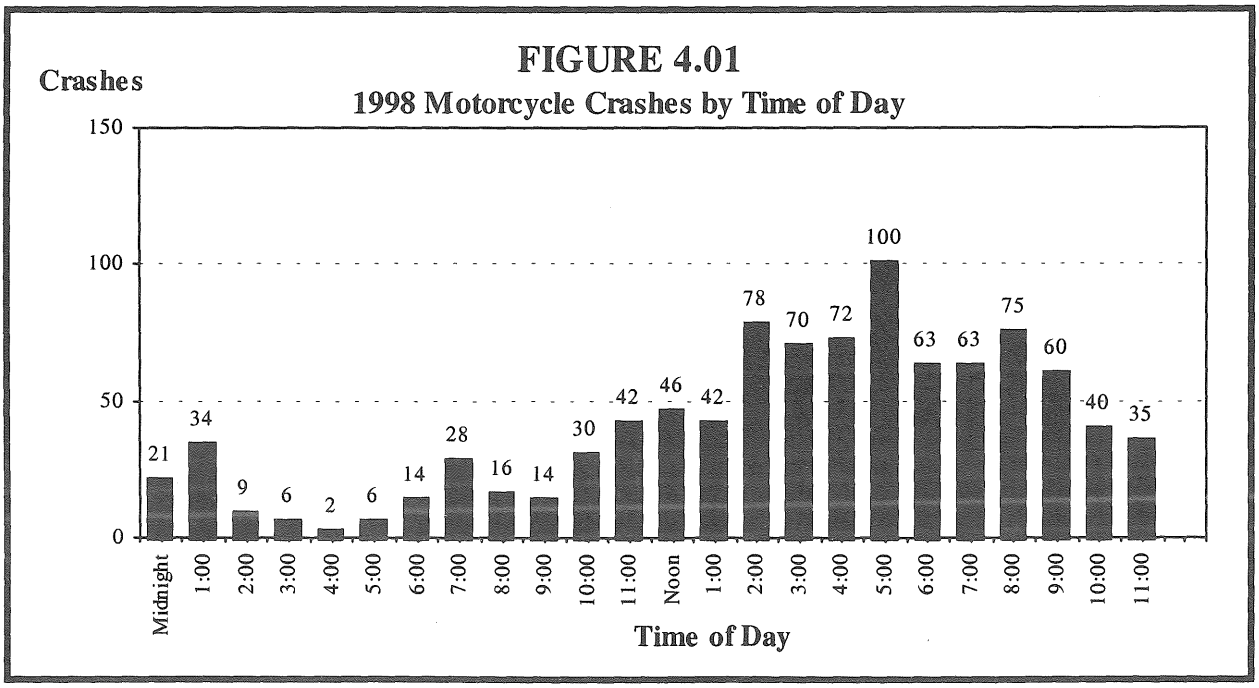


TABLE 4.05

1998 MOTORCYCLE CRASHES BY TIME AND DAY

Hour Beginning	Total Crashes	Fatal Crashes	Sunday All	Sunday Fatal	Monday All	Monday Fatal	Tuesday All	Tuesday Fatal	Wednesday All	Wednesday Fatal	Thursday All	Thursday Fatal	Friday All	Friday Fatal	Saturday All	Saturday Fatal
Midnight	21	1	5	0	6	0	1	0	2	0	1	1	2	0	4	0
1:00	34	3	7	0	2	0	2	0	2	0	5	1	7	1	9	1
2:00	9	1	3	0	2	0	0	0	0	0	0	0	0	0	4	1
3:00	6	2	2	0	0	0	1	0	1	1	0	0	0	0	2	1
4:00	2	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
5:00	6	0	0	0	2	0	0	0	0	0	0	0	2	0	2	0
6:00	14	0	1	0	4	0	2	0	3	0	2	0	2	0	0	0
7:00	28	1	3	1	6	0	5	0	7	0	4	0	1	0	2	0
8:00	16	0	2	0	3	0	0	0	3	0	5	0	1	0	2	0
9:00	14	0	1	0	2	0	0	0	1	0	2	0	3	0	5	0
10:00	30	0	4	0	2	0	0	0	2	0	6	0	6	0	10	0
11:00	42	2	5	1	4	0	4	0	3	0	8	0	10	1	8	0
Noon	46	0	6	0	6	0	3	0	7	0	7	0	7	0	10	0
1:00	42	0	6	0	1	0	4	0	8	0	6	0	2	0	15	0
2:00	78	2	11	0	12	1	10	0	6	0	8	0	18	0	13	1
3:00	70	3	2	0	10	0	10	1	9	0	9	1	16	0	14	1
4:00	72	2	16	1	10	0	10	0	7	0	14	0	6	0	9	1
5:00	100	4	14	1	6	0	15	0	12	1	11	0	22	0	20	2
6:00	63	0	16	0	7	0	11	0	7	0	4	0	8	0	10	0
7:00	63	4	7	2	8	0	8	0	8	0	9	0	11	0	12	2
8:00	75	3	13	1	8	0	12	1	8	0	11	1	14	0	9	0
9:00	60	6	2	0	3	0	9	1	7	1	8	1	16	1	15	2
10:00	40	4	6	0	4	1	3	0	7	0	7	2	7	1	6	0
11:00	35	1	4	1	4	0	2	0	2	0	5	0	8	0	10	0
Not Stated	99	2	20	0	13	0	11	1	16	0	13	0	10	0	16	1
Total	1,065	41	156	8	126	2	123	4	128	3	145	7	179	4	208	13

TABLE 4.06

MOTORCYCLISTS KILLED OR INJURED BY AGE AND GENDER, 1998

	Killed			Injured											
				Severe			Moderate			Minor			Total		
Age Group	M	F	Total	M	F	Total	M	F	Total	M	F	Total*	M	F	Total*
0 – 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 9	0	1	1	0	0	0	1	1	2	0	0	0	1	1	2
10 – 14	0	0	0	2	0	2	0	3	3	0	2	2	2	5	7
15 - 19	1	0	1	11	3	14	40	5	45	18	2	20	69	10	79
20 - 24	7	0	7	23	2	25	79	11	90	36	5	41	138	18	156
25 - 29	4	0	4	20	4	24	60	12	72	25	8	34	105	24	130
30 - 34	4	0	4	22	8	30	54	10	64	30	3	33	106	21	127
35 - 39	8	0	8	24	5	29	51	18	69	31	5	36	106	28	134
40 - 44	4	1	5	27	8	35	42	17	59	27	8	35	96	33	129
45 - 49	2	0	2	18	2	20	38	9	47	15	7	22	71	18	89
50 - 54	4	1	5	10	3	13	34	5	39	14	3	17	58	11	69
55 - 59	1	1	2	5	1	6	18	2	20	8	0	8	31	3	34
60 - 64	1	0	1	2	0	2	7	1	8	3	1	4	12	2	14
65 - 69	0	0	0	3	0	3	0	0	0	2	0	2	5	0	5
70 & Older	0	0	0	0	1	1	0	1	1	2	0	2	2	2	4
Not Stated	0	0	0	2	0	2	1	2	3	0	2	3	3	4	8
Total	36	4	40	169	37	206	425	97	522	211	46	259	805	180	987

* Where columns do not add across to total, gender was not reported on the accident report form.

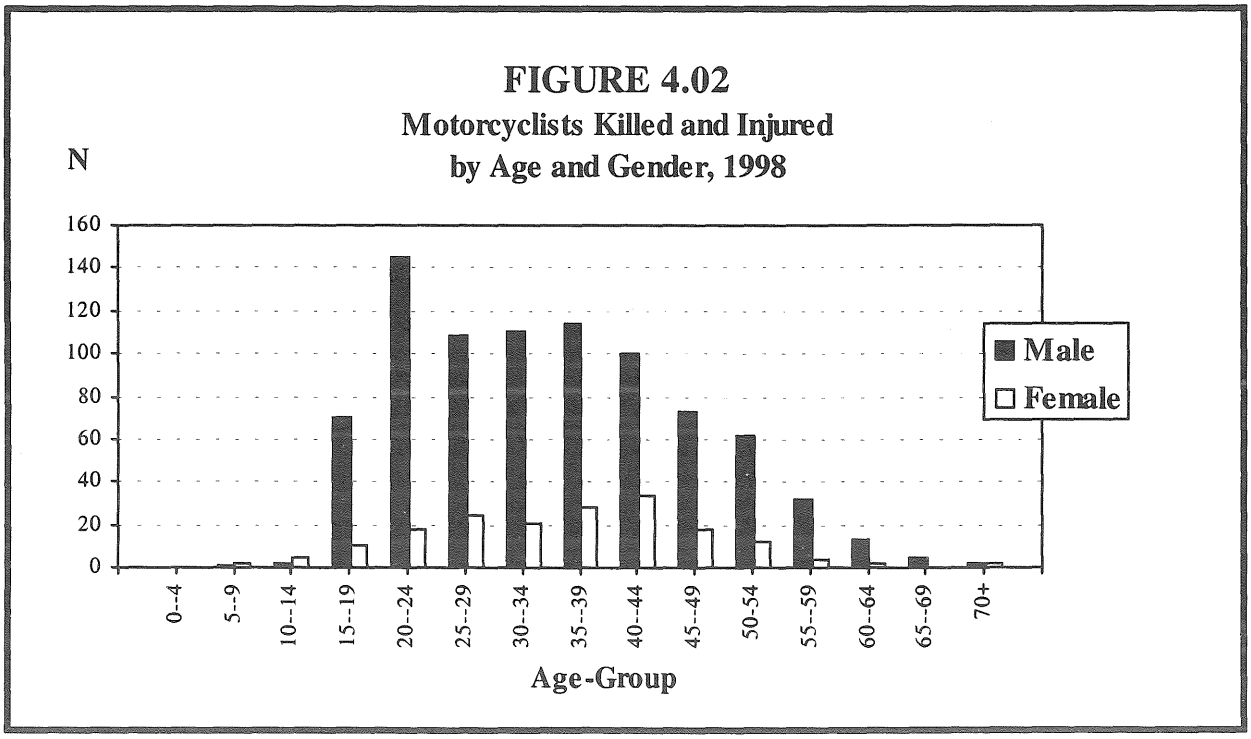


TABLE 4.07

HELMET USE BY MOTORCYCLISTS KILLED OR INJURED, 1991 - 1998

		Helmet Used		Helmet Not Used		Helmet Use Unknown		Total	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Killed									
	1991	11	27.5%	24	60.0%	5	12.5%	40	100.0%
	1992	2	7.1	23	82.1	3	10.7	28	100.0
	1993	2	5.9	30	88.2	2	5.9	34	100.0
	1994	3	7.0	30	69.8	10	23.3	43	100.0
	1995	1	2.9	30	85.7	4	11.4	35	100.0
	1996	9	21.4	29	69.1	4	9.5	42	100.0
	1997	3	12.5	17	70.8	4	16.7	24	100.0
	1998	3	7.5	27	67.5	10	25.0	40	100.0
Injured									
	1991	310	22.8%	594	43.8%	453	33.4%	1,357	100.0%
	1992	349	27.1	678	52.6	261	20.3	1,288	100.0
	1993	298	25.9	599	52.0	254	22.1	1,151	100.0
	1994	375	28.3	641	48.4	308	23.3	1,342	100.0
	1995	279	26.3	544	51.2	240	22.6	1,063	100.0
	1996	269	25.7	546	52.2	231	22.1	1,046	100.0
	1997	225	24.5	470	51.3	221	24.1	916	100.0
	1998	310	31.4	483	48.9	194	19.7	987	100.0

TABLE 4.08

ENDORSEMENT STATUS OF MOTORCYCLE OPERATORS INVOLVED IN FATAL CRASHES, 1986 - 1998

	Valid Endorsement*		Permit Only		Canceled, Suspended, Revoked		No Endorsement		Total** For Year	
Year	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1986	41	64.1%	1	1.6%	7	10.9%	15	23.4%	64	100.0%
1987	33	64.7	1	2.0	10	19.6	7	13.7	51	100.0
1988	32	55.2	3	5.2	9	15.5	13	22.4	58	100.0
1989	22	56.4	0	0.0	8	20.5	9	23.1	39	100.0
1990	25	53.2	2	4.3	9	19.1	11	23.4	47	100.0
1991	28	71.8	1	2.6	4	10.3	5	12.8	39	100.0
1992	17	60.7	0	0.0	5	17.9	4	14.3	28	100.0
1993	21	65.6	1	3.1	4	12.5	4	12.5	32	100.0
1994	33	75.0	0	0.0	3	6.8	7	15.9	44	100.0
1995	21	65.6	0	0.0	5	15.6	6	18.8	32	100.0
1996	27	64.3	0	0.0	4	9.5	9	21.4	42	100.0
1997	21	91.3	0	0.0	0	0.0	2	8.7	23	100.0
1998	34	75.6	1	2.2	4	8.9	6	13.3	45	100.0

* A valid endorsement means that the driver's license has been "endorsed" to permit operation of a motorcycle.
** Rows may not add to total due to the unknown status of some motorcycle operators.

TABLE 4.09

ALCOHOL USE BY MOTORCYCLE DRIVERS, 1986 - 1998

Year	Killed	Tested	Alcohol Concentration* (.00)	(.01 - .09)	(.10 or more)
1986	56	46	16 (35%)	5 (11%)	25 (54%)
1987	45	42	17 (40%)	3 (7%)	22 (52%)
1988	52	45	20 (44%)	8 (18%)	17 (38%)
1989	31	30	9 (30%)	3 (10%)	18 (60%)
1990	43	35	10 (29%)	5 (14%)	20 (57%)
1991	36	30	13 (43%)	3 (10%)	14 (47%)
1992	23	21	10 (48%)	0 (0%)	11 (52%)
1993	29	26	9 (35%)	3 (12%)	14 (54%)
1994	36	27	17 (63%)	2 (7%)	8 (30%)
1995	25	22	7 (32%)	2 (9%)	13 (59%)
1996	38	36	22 (61%)	4 (11%)	10 (28%)
1997	22	19	7 (37%)	3 (16%)	9 (47%)
1998	36	35	15 (43%)	2 (6%)	18 (51%)

*Percentages are based on those motorcycle drivers tested.

TABLE 4.10

1998 MOTORCYCLE DRIVER FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY AGE

Age	Killed	Tested	Alcohol Concentration* (.01 - .09)	(.10 or more)	Alcohol Concentration .00	.01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25 & Over
14 & Younger	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0
19	1	1	0	1	0	0	0	0	1	0	0
20	1	1	0	0	1	0	0	0	0	0	0
Under 21	2	2	0	1	1	0	0	0	1	0	0
14 & Younger	0	0	0	0	0	0	0	0	0	0	0
15 - 19	1	1	0	1	0	0	0	0	1	0	0
20 - 24	6	5	0	1	4	0	0	1	0	0	0
25 - 29	4	4	0	3	1	0	0	1	2	0	0
30 - 34	4	4	0	3	1	0	0	0	0	3	0
35 - 39	8	8	1	6	1	0	1	2	3	1	0
40 - 44	5	5	1	3	1	0	1	0	1	0	2
45 - 49	2	2	0	0	2	0	0	0	0	0	0
50 - 54	4	4	0	0	4	0	0	0	0	0	0
55 - 59	1	1	0	1	0	0	0	0	0	1	0
60 & Older	1	1	0	0	1	0	0	0	0	0	0
Total	36	35	2	18	15	0	2	4	7	5	2

* Percentages are based on those motorcycle drivers tested.

TABLE 4.11

CONTRIBUTING FACTORS IN 1998 MOTORCYCLE CRASHES

	Single Vehicle Crashes		*Multi-Vehicle Crashes*			
	Attributed to Motorcycle Drivers		**Attributed to Motorcycle Drivers**		**Attributed to Other Drivers**	
Contributing Factors	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Human Factors:						
Illegal/Unsafe Speed	141	25.5%	46	13.0%	19	3.5%
Driver Inattention/Distraction	78	14.1	73	20.6	147	26.8
Driver Inexperience	78	14.1	25	7.0	10	1.8
Physical Impairment	54	9.8	16	4.5	8	1.5
Improper/Unsafe Lane Use	19	3.4	18	5.1	27	4.9
Improper Passing / Overtaking	8	1.4	16	4.5	4	0.7
Following Too Closely	7	1.3	43	12.1	27	4.9
Driving Left of Center	6	1.1	4	1.1	7	1.3
Failure to Yield Right of Way	5	0.9	25	7.0	178	32.5
Disregard for Traffic Control Device	5	0.9	7	2.0	18	3.3
Improper Parking/Stopping/ Stopping	5	0.9	5	1.4	8	1.5
Improper Turn	3	0.5	6	1.7	37	6.8
Vision Obscured	2	0.4	9	2.5	15	2.7
Unsafe Backing	0	0.0	1	0.3	5	0.9
Improper or No Signal	0	0.0	3	0.8	5	0.9
Impeding Traffic	0	0.0	1	0.3	2	0.4
Failure to Use Lights	0	0.0	6	1.7	0	0.0
Driver on CB Radio / Phone	0	0.0	0	0.0	1	0.2
Other Human Factor	15	2.7	7	2.0	7	1.3
Vehicular Factors:						
Skidding	41	7.4	12	3.4	2	0.4
Defective Brakes	13	2.3	1	0.3	2	0.4
Other Vehicular Factors	12	2.2	5	1.4	1	0.2
Miscellaneous Factors:						
Weather Conditions	12	2.2	3	0.8	3	0.5
Other	48	8.7	23	6.5	15	2.7
Total	552	100.0%	355	100.0%	548	100.0%
Vehicles for Which There Was "No Clear Contributing Factor"	129		305		163	
Total Number Drivers	513		580		563	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding.

V: TRUCK CRASHES

This section summarizes data on crashes involving trucks. On the crash report form, trucks are identified as any of the following eight types of vehicles: (1) two-axle, six-tire single unit truck or stepvan, (2) three-or-more-axle single unit truck, (3) single-unit truck with trailer, (4) truck tractor with no trailer, (5) truck tractor with semi-trailer, (6) truck tractor with double trailers, (7) truck tractor with triple trailers, (8) heavy truck of other or unknown type. A crash involving any of these vehicles is classified as a truck crash. Pickup trucks and vans are not counted as trucks in this section.

Truck crashes decline slightly
In 1998, there were 4,761 truck crashes. This total represents a 5% decrease from the previous year, and is most likely due to the mild winter weather that Minnesota experienced in 1998. Unfortunately, this decrease took place solely in the Property Damage Crash category, as the number of injury crashes increased by 1% from 1997.

Deaths and injuries remain high
There were 85 fatal crashes involving a truck in 1998, killing 97 people. In addition, 2,031 people were injured. From 1990 through 1997, the average number of deaths and injuries per year were 87 and 1,940 respectively.

Persons killed or injured usually in other vehicles
In a two-vehicle collision, relative vehicle weight is a recognized safety advantage. Of the 97 people killed in truck-involved crashes, only 14 were truck occupants. And, of the 2,031 people injured, only 451 (22%) were truck occupants.

Contributing factors similar for truck and non-truck drivers
Reporting officers indicated they could determine no clear contributing factor for 40% of the truck drivers and for 45% of the other vehicle drivers.

Truck drivers were less likely to be alcohol-impaired than non-truck drivers. For the truck drivers, 7 were reported to have been drinking, and 9 were reported to have been under the influence, compared with 25 and 76, respectively, for the non-truck drivers.

Defective vehicular factors were far more common on trucks than on the other vehicles. Not including "skidding", vehicular factors were reported 272 times compared to just 45 times for the other vehicles. Otherwise, contributing factors were similar for the two groups. Driver inattention or distraction (26% for truck drivers and 24% for non-truck drivers) was the top factor cited for both.

Truck crashes are workday-related
Truck crashes appear about equally distributed across warm-weather and cold-weather months, but they are very strongly tied to the workday. In 1998, Monday through Friday averaged 860 truck crashes per day, compared to just 231 on the average per day for Saturday or Sunday.

Driving conditions
Driving conditions are usually good in Minnesota, and most truck crashes occurred on dry roads in clear weather. However, 19% of the fatal crashes and 28% of the 1,408 injury crashes occurred on road surfaces reported to be wet, or to be covered with snow or slush, or with ice or packed snow.

Truck crashes in rural areas
For this report, rural is defined as an area that has less than 5,000 population. Seventy-five percent of the fatal truck crashes, and 47% of the injury crashes occurred in rural areas. A majority (61%) of the fatal truck crashes occurred on U.S. Trunk or State Trunk Highways.

TABLE 5.01

TRUCK CRASH SUMMARY, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total Crashes	**7,381**	**6,712**	**5,152**	**4,463**	**4,931**	**5,132**	**4,752**	**5,358**	**4,991**	**4,761**
Fatal Crashes	77	70	72	65	63	81	77	60	90	85
Persons Killed	94	83	85	84	77	94	86	79	105	97
Injury Crashes	1,784	1,652	1,250	1,213	1,268	1,369	1,277	1,473	1,389	1,408
Severe	247	225	137	167	148	151	153	176	163	180
Moderate	586	617	477	418	452	481	470	516	505	492
Minor	951	810	636	628	668	737	654	781	721	736
Persons Injured	2,411	2,390	1,762	1,721	1,764	1,902	1,869	2,074	2,042	2,031
Severe	293	285	179	222	198	203	196	217	215	219
Moderate	777	876	667	560	598	630	645	708	721	700
Minor	1,341	1,229	916	939	968	1,069	1,028	1,149	1,106	1,112
Property Damage Crashes	5,520	4,990	3,830	3,185	3,600	3,682	3,398	3,825	3,512	3,268

TABLE 5.02

PERSONS KILLED OR INJURED IN 1998 TRUCK CRASHES BY VEHICLE OCCUPIED

		Injured			
Vehicle Type	Killed	Severe	Moderate	Minor	Total
Automobile	57	105	329	610	1,044
Pickup Truck	13	35	88	115	238
Van	6	23	68	91	182
Police or Fire Department Vehicle	0	0	2	1	3
School Bus	0	0	8	14	22
Snowmobile	0	0	1	0	1
Farm Equipment	2	0	0	2	2
Motorcycle	1	7	6	1	14
Hit and Run Vehicle	0	0	2	2	4
Two-Axle, Six-Tire Single Unit Truck or Stepvan	1	8	48	56	112
Three or More Axle Single Unit Truck	3	5	25	38	68
Single Unit Truck with Trailer	2	4	12	30	46
Truck Tractor with No Trailer	1	1	3	6	10
Truck Tractor with Semi Trailer	7	10	78	108	196
Truck Tractor with Twin Trailers	0	0	3	3	6
Heavy Truck--Other or Unknown Type	0	0	5	8	13
Other or Unknown Vehicle Type	0	8	11	17	36
Bicycle	0	5	4	5	14
Pedestrian	4	8	7	5	20
Total	97	219	700	1,112	2,031

TABLE 5.03

CONTRIBUTING FACTORS IN 1998 TRUCK CRASHES

Contributing Factors	Attributed to Truck Vehicles Number	Attributed to Truck Vehicles Percent	Attributed to Non-Truck Vehicles Number	Attributed to Non-Truck Vehicles Percent
Human Factors				
Driver Inattention/Distraction	1,041	26.2%	786	24.0%
Failure to Yield Right of Way	324	8.1	413	12.6
Following Too Closely	304	7.6	206	6.3
Improper or Unsafe Lane Use	298	7.5	331	10.1
Illegal/Unsafe Speed	296	7.4	314	9.6
Improper Turn	189	4.8	88	2.7
Unsafe Backing	178	4.5	26	0.8
Vision Obscurred	143	3.6	80	2.4
Disregard for Traffic Control Device	93	2.3	85	2.6
Improper Parking, Starting, or Stopping	70	1.8	50	1.5
Improper Passing or Overtaking	62	1.6	150	4.6
Physical Impairment	54	1.4	115	3.5
Driver Inexperience	47	1.2	82	2.5
Driving Left of Center (Not Passing)	30	0.8	73	2.2
Improper/No Signal	26	0.7	21	0.6
Impeding Traffic	11	0.3	9	0.3
Driver on Phone/CB/2-Way Radio	5	0.1	5	0.2
Failure to Use Lights	4	0.1	5	0.2
Pedestrian Error/Violation	0	0.0	9	0.3
Other Human Factors	54	1.4	34	1.0
Vehicular Factors				
Defective Brakes	97	2.4	15	0.5
Skidding	92	2.3	93	2.8
Oversize/Overweight Vehicle	36	0.9	3	0.1
Defective Tire	36	0.9	8	0.2
Defective Lights	11	0.3	7	0.2
Other Vehicular Factor	92	2.3	12	0.4
Miscellaneous Factors				
Weather	190	4.8	159	4.9
Other	194	4.9	95	2.9
Total Contributing Factors Cited	3,977	100%	3,274	100%
Vehicles for Which There Was "No Clear Contributing Factor"	1,975		1,922	
Total Number of Vehicles	4,967		4,301	

Zero, one, or two contributing factors may be associated with each vehicle. This may cause the sum of the factors cited to differ from the number of vehicles. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. Bicyclists and pedestrians are included in the "non-truck vehicles" columns in this table. Human factors with a frequency of less than one-tenth of one percent are merged into the category "other human factors."

TABLE 5.04

AGE OF TRUCK DRIVERS IN 1998 CRASHES

Driver Age	Truck or Truck Tractor	Truck with Semi-Trailer	Truck with Twin Trailer	Truck with Other Trailer	Total
15 – 19	79	15	0	13	107
20 - 24	242	170	2	32	446
25 - 29	271	264	3	51	589
30 - 34	280	348	7	51	686
35 - 39	306	388	5	67	766
40 - 44	211	368	5	55	639
45 - 49	181	312	5	29	527
50 - 54	119	223	7	22	371
55 - 59	98	173	1	33	305
60 - 64	70	104	3	13	190
65 & Older	53	68	1	13	135
Not Stated	22	37	0	1	60
Total*	1,932	2,470	39	380	4,821

* There were 4,967 trucks in crashes in 1998. However, 133 of these were parked vehicles. The driver could not be identified for an additional 13 of these trucks. This table tabulates the ages of drivers for the remaining 4,821 trucks where it was possible to identify a driver.

TABLE 5.05

DRIVERS IN 1998 TRUCK CRASHES BY PHYSICAL CONDITION*

	Truck Driver		Other Driver	
Physical Condition	Number	Percent	Number	Percent
Normal	4,467	92.7%	3,611	88.5%
Under the Influence	9	0.2	76	1.9
Had Been Drinking	7	0.1	25	0.6
Had Been Using Drugs	3	0.1	4	0.1
Asleep	25	0.5	19	0.5
Fatigued	22	0.5	14	0.3
Ill	10	0.2	11	0.3
Other	7	0.1	17	0.4
Unknown	271	5.6	301	7.4
Total **	4,821	100%	4,078	100%

* As noted by police officer on accident report.

** There were 4,967 trucks in crashes in 1998. However, 133 were parked. The driver could not be identified for an additional 13. This table tabulates the apparent physical condition of drivers for the remaining 4,821 trucks where it was possible to identify a driver. Also, there were 4,301 non-truck motor vehicles in 1998 truck crashes. However, 171 of them were parked, and there were 52 more for which a driver could not be identified, leaving 4,078 for which an apparent physical condition was recorded.

TABLE 5.06

1998 TRUCK CRASHES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Collision With:						
Other Motor Vehicle	67	1,096	2,376	3,539	77	1,676
Parked Motor Vehicle	3	40	177	220	3	45
Railroad Train	0	8	10	18	0	9
Bicycle	0	14	0	14	0	14
Pedestrian	4	16	0	20	4	18
Deer	0	7	55	62	0	7
Other Animal	0	0	32	32	0	0
Fixed Object	4	66	313	383	4	70
Other Object	2	10	26	38	2	11
Non-Collision:						
Overturn	4	125	154	283	6	142
Fire or Explosion	0	0	11	11	0	0
Other	1	26	114	141	1	39
Total	85	1,408	3,268	4,761	97	2,031

TABLE 5.07

1998 TRUCK CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	6	148	342	496	6	203
February	8	66	157	231	8	95
March	3	87	231	321	3	124
April	5	92	207	304	6	138
May	7	130	288	425	9	183
June	12	121	313	446	13	161
July	9	129	279	417	10	183
August	7	130	253	390	9	194
September	9	139	268	416	11	201
October	9	155	337	501	11	239
November	7	110	315	432	7	162
December	3	101	278	382	4	148
Total	85	1,408	3,268	4,761	97	2,031

TABLE 5.08

1998 TRUCK CRASHES BY TIME AND DAY

Time of Day	Total	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight - 2:59 AM	83	6	15	12	7	9	16	18
3:00 - 5:59 AM	134	13	19	22	26	18	26	10
6:00 - 8:59 AM	672	18	118	149	127	122	117	21
9:00 - 11:59 AM	979	20	182	179	179	146	227	46
Noon - 2:59 PM	993	37	192	175	173	162	194	60
3:00 - 5:59 PM	917	33	166	168	160	162	185	43
6:00 - 8:59 PM	308	34	50	47	60	47	45	25
9:00 - 11:59 PM	221	25	32	30	37	30	50	17
Unknown	454	18	101	62	104	100	51	18
Total	4,761	204	875	844	873	796	911	258

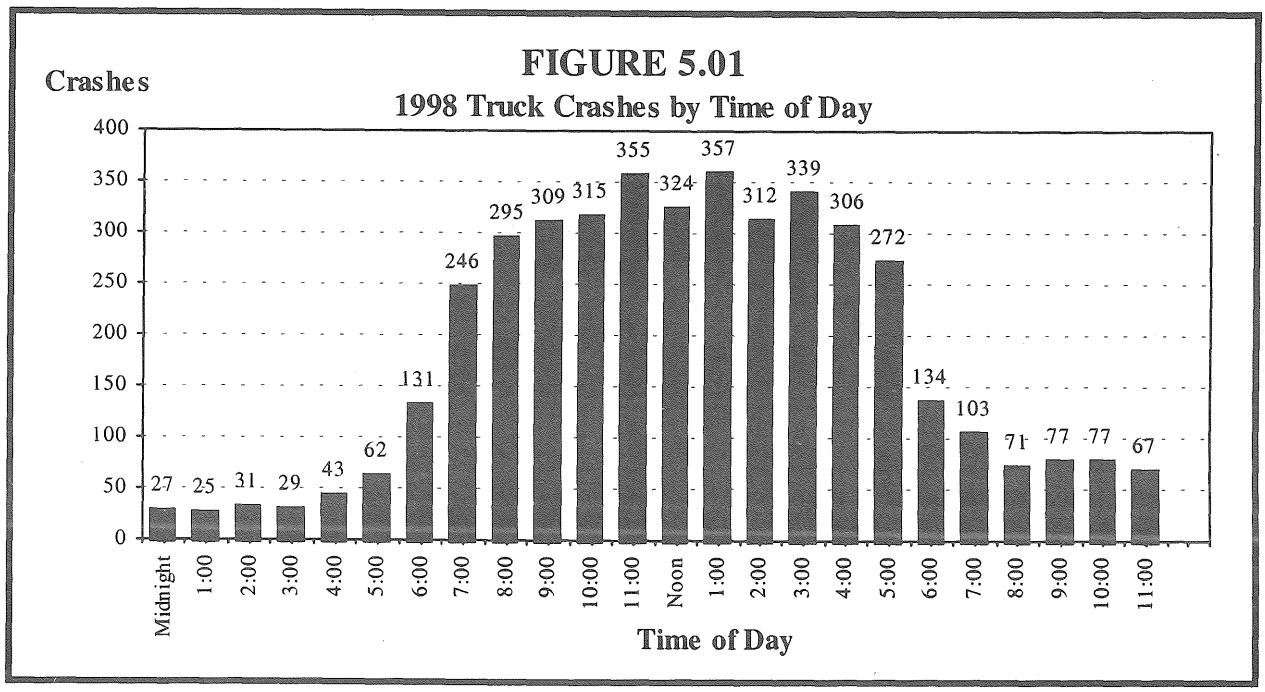


TABLE 5.09

1998 TRUCK CRASHES BY ROAD SURFACE CONDITION

Road Surface Condition	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Dry	69	1,019	2,363	3,451	81	1,462
Wet	7	197	447	651	7	284
Snow or Slush	3	71	144	218	3	105
Ice or Packed Snow	5	109	270	384	5	165
Other	1	10	18	29	1	12
Unknown	0	2	26	28	0	3
Total	85	1,408	3,268	4,761	97	2,031

TABLE 5.10

1998 TRUCK CRASHES BY WEATHER CONDITION

Weather Condition	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Clear	39	752	1,759	2,550	44	1,052
Cloudy	36	386	899	1,321	43	562
Rain	2	111	225	338	2	164
Snow	3	95	241	339	3	144
Sleet/Hail/Freezing Rain	1	16	37	54	1	22
Fog/Smog/Smoke	3	26	28	57	3	54
Blowing Sand/Dust/Snow	0	14	31	45	0	21
Severe Cross Winds	0	6	9	15	0	8
Other	1	0	5	6	1	0
Unknown	0	2	34	36	0	4
Total	85	1,408	3,268	4,761	97	2,031

TABLE 5.11

1998 TRUCK CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
100,000 & Over	4	210	550	764	6	284
50,000 - 99,999	3	145	317	465	3	210
25,000 - 49,999	0	163	465	628	0	226
10,000 - 24,999	6	155	441	602	6	198
5,000 - 9,999	8	79	245	332	8	102
2,500 - 4,999	2	46	144	192	2	64
1,000 - 2,499	2	31	110	143	2	41
Under 1,000	60	579	996	1,635	70	906
Total	85	1,408	3,268	4,761	97	2,031

TABLE 5.12

1998 TRUCK CRASHES BY TYPE OF ROADWAY

Roadway Type	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Interstate Highway	18	275	753	1,046	21	407
US Trunk Highway	22	310	585	917	25	458
State Trunk Highway	30	313	664	1,007	34	489
County State-Aid Highway	11	288	559	858	13	374
County Road	1	19	43	63	1	40
Township Road	0	28	34	62	0	31
Local Street	2	169	593	764	2	226
Other Road	1	6	37	44	1	6
Total	85	1,408	3,268	4,761	97	2,031

VI: PEDESTRIAN CRASHES

This section deals with motor vehicle crashes that injure or kill pedestrians. Prior to 1984, a crash was defined as a pedestrian crash only if the pedestrian was the first "object" struck by a motor vehicle. Beginning in 1984, any crash where a pedestrian is struck and injured is defined as a pedestrian crash.

Pedestrian crashes remain steady
In 1998, there were 1,400 crashes in which a pedestrian was injured or killed by a motor vehicle. This figure represents a slight decrease in the number of pedestrian crashes that occurred in 1997. However, the 1998 total is close to the average number of pedestrian crashes from the previous five-year period. From 1993 through 1997, the average number of pedestrian crashes was 1,409.

Slight decrease in deaths and injuries
The number of pedestrians killed and injured decreased slightly in 1998. Fifty-six pedestrians were killed, a 3% decrease, and 1,410 were injured, a 2% decrease from the previous year. In 1998, four percent of pedestrian crashes resulted in a death, compared to about one-half of one percent for all crashes.

Young people at greater risk
In all pedestrian crashes, persons less than 25 years of age accounted for 44% of the persons killed or injured. The numbers of people injured mostly decreased as age increased. Males were more likely than females to be injured, as male pedestrians outnumbered females as victims by almost 25%. Pedestrian injuries and fatalities were somewhat more numerous in the last four months of the year.

Urban areas and rush-hours
In 1998, 82% of pedestrian crashes occurred in urban areas. However, 25 of the 56 fatalities (45%) occurred in rural areas (defined as less than 5,000 population). In 1998, almost one out of every three pedestrian crashes occurred during the weekday rush hour driving time periods. These time periods are defined as from 6:00-9:00 am, and from 3:00-6:00 pm.

Prior actions of vehicles and pedestrians
Regarding the motor vehicles that were involved in pedestrian crashes in 1998, 54% of them were simply going straight ahead on the roadway prior to the crash. An additional 23% of the motor vehicles involved were making a right or left turn. As might be expected, a high percentage (24%) of the pedestrians involved in a crash were trying to cross a road where there was no crosswalk and no signal. In other words, they were "jaywalking" at the time of the crash.

Contributing factors
For 39% of the motor vehicle drivers in pedestrian crashes, the reporting officer indicated that there had been "no clear contributing factor" to the crash. For those where a factor was cited, two were mentioned much more than the others: driver inattention or distraction (28%), and failure to yield the right of way (24%.).

Pedestrians and alcohol
Of the 56 pedestrians killed, 43 were tested for alcohol. Of those tested, roughly one-half (22 of the 43) tested positive. About 47% had concentrations over the legal driving limit of .10. The 22 pedestrians who tested positive were between the ages of 15 and 54.

TABLE 6.01

PEDESTRIAN CRASH SUMMARY, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Pedestrian Crashes	1,591	1,512	1,338	1,420	1,383	1,409	1,458	1,378	1,419	1,400
Pedestrians Killed	67	65	61	46	47	53	49	46	58	56
Pedestrians Injured	1,578	1,499	1,339	1,424	1,390	1,400	1,471	1,388	1,434	1,410

TABLE 6.02

PEDESTRIANS KILLED OR INJURED BY AGE AND GENDER, 1998

				Injured											
Age	Killed			Severe			Moderate			Minor			Total		
Group	M	F	Total*	M	F	Total*	M	F	Total*	M	F	Total*	M	F	Total*
0 – 4	1	0	1	6	3	9	10	11	22	9	15	27	25	29	58
5 - 9	4	1	5	13	11	24	41	28	71	43	28	72	97	67	167
10 - 14	2	0	2	7	13	21	34	39	75	33	24	59	74	76	155
15 - 19	2	0	2	13	4	17	26	30	58	32	25	57	71	59	132
20 - 24	5	2	7	11	10	21	24	18	43	26	22	50	61	50	114
25 - 29	1	2	3	7	6	13	17	12	29	20	13	34	44	31	76
30 - 34	2	1	3	10	5	15	21	7	28	27	21	50	58	33	93
35 - 39	2	0	2	10	9	19	20	12	32	34	23	59	64	44	110
40 - 44	3	0	3	13	12	25	13	15	28	32	25	57	58	52	110
45 - 49	8	4	12	5	10	15	18	7	26	18	5	24	41	22	65
50 - 54	1	3	4	6	5	12	11	19	30	12	10	23	29	34	65
55 - 59	2	0	2	5	5	10	5	6	11	6	5	13	16	16	34
60 - 64	0	0	0	5	4	9	6	6	12	7	5	12	18	15	33
65 - 69	0	1	1	0	4	4	8	3	11	3	4	7	11	11	22
70 - 74	2	2	4	0	4	4	1	7	8	3	4	7	4	15	19
75 - 79	1	1	2	1	2	3	2	4	6	5	5	11	8	11	20
80 - 84	1	0	1	2	2	4	4	4	8	1	7	8	7	13	20
85 & Older	0	2	2	3	2	5	0	4	4	2	1	3	5	7	12
Not Stated	0	0	0	2	1	4	13	5	22	29	14	79	44	20	105
Total	37	19	56	119	112	234	274	237	524	342	256	652	735	605	1,410

* Where columns do not add across, gender was not stated on accident report.

FIGURE 6.01

Pedestrian Fatalities by Age-Group
1989-1998 Combined

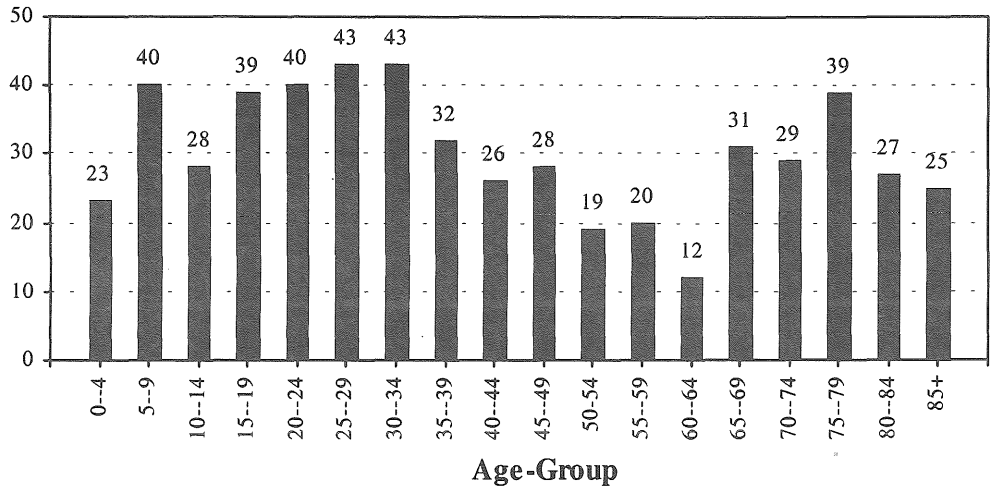


FIGURE 6.02

Pedestrians Killed and Injured
by Age and Gender, 1998

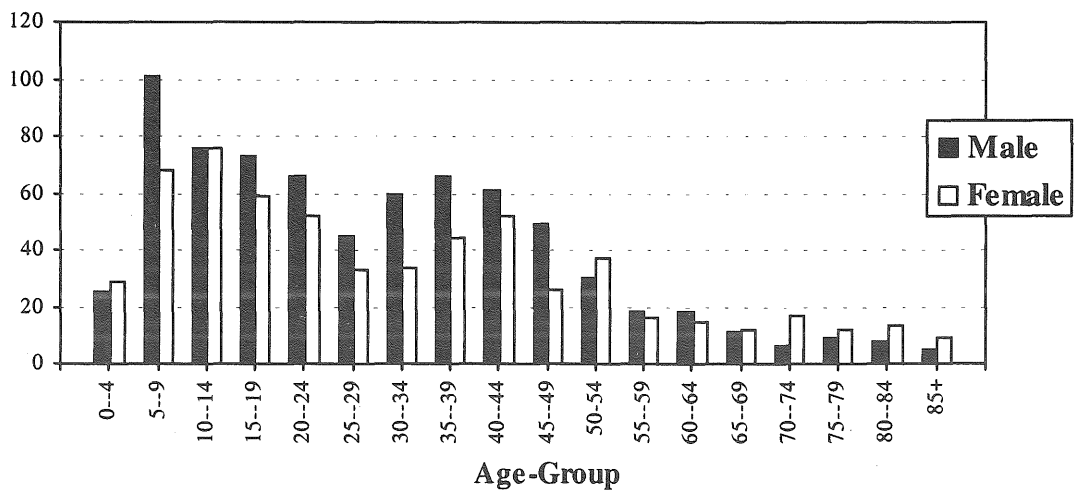


TABLE 6.03

1998 PEDESTRIAN CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Total Crashes	Pedestrians Killed	Pedestrians Injured
January	3	101	104	3	109
February	2	73	75	2	76
March	4	78	82	5	80
April	2	119	121	2	123
May	5	117	122	5	119
June	3	116	119	3	120
July	5	116	121	4	126
August	4	110	114	4	112
September	7	133	140	7	138
October	8	135	143	8	140
November	5	120	125	5	122
December	7	127	134	8	145
Total	55	1,345	1,400	56	1,410

TABLE 6.04

1998 PEDESTRIAN CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Total Crashes	Pedestrians Killed	Pedestrians Injured
100,000 and Over	13	635	648	13	661
50,000 - 99,999	3	99	102	3	103
25,000 - 49,999	5	129	134	6	134
10,000 - 24,999	6	190	196	6	198
5,000 - 9,999	3	71	74	3	73
2,500 - 4,999	1	29	30	1	33
1,000 - 2,499	5	29	34	5	32
Under 1,000	19	163	182	19	176
Total	55	1,345	1,400	56	1,410

TABLE 6.05

1998 PEDESTRIAN CRASHES BY TIME AND DAY

Time of Day	Fatal Crashes	Total Crashes	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight 2:59 AM	6	64	27	1	3	3	6	5	19
3:00 - 5:59 AM	1	15	7	1	2	2	1	1	1
6:00 - 8:59 AM	5	128	3	19	40	21	24	17	4
9:00 - 11:59 AM	4	133	5	19	19	27	22	17	24
Noon - 2:59 PM	5	183	16	22	22	30	34	28	31
3:00 - 5:59 PM	9	352	26	61	50	62	59	58	36
6:00 - 8:59 PM	15	229	26	30	29	31	36	41	36
9:00 - 11:59 PM	10	142	8	19	16	18	17	29	35
Unknown	0	154	18	19	26	28	21	24	18
Total	55	1,400	136	191	207	222	220	220	204

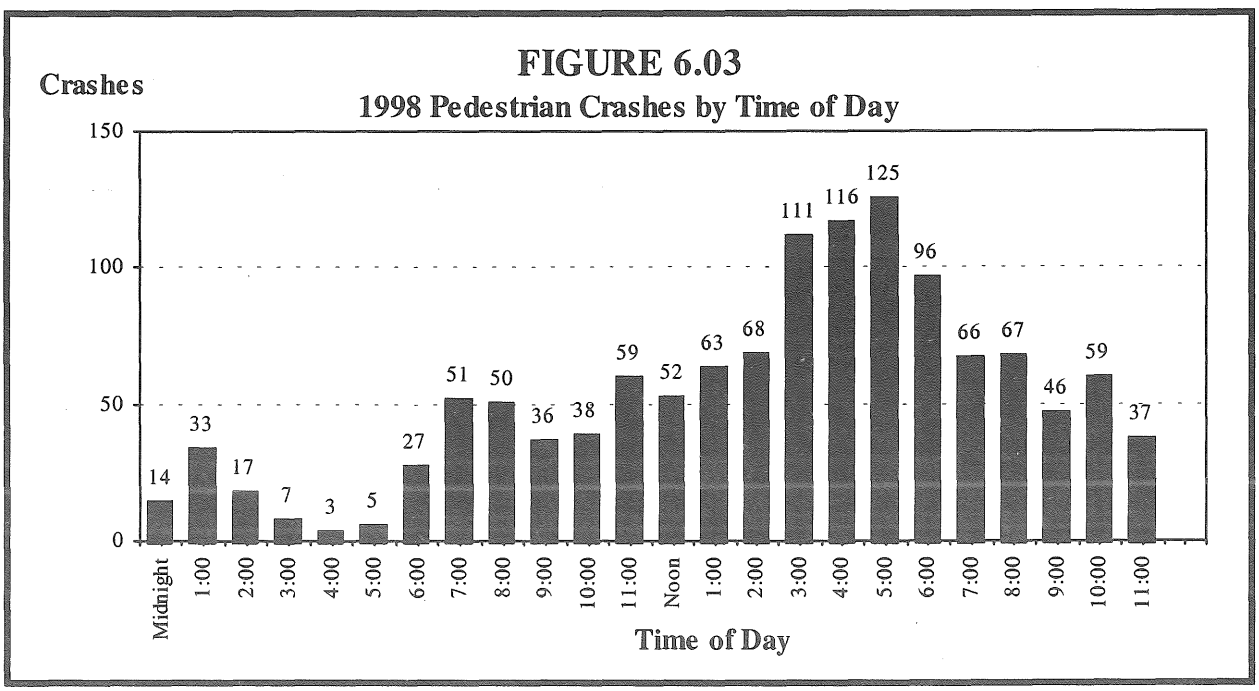


TABLE 6.06

PRIOR ACTION OF VEHICLES IN 1998 PEDESTRIAN CRASHES

Action	Vehicles in Fatal Crashes	Vehicles in Injury Crashes	Vehicles in Total Crashes*
Going Straight	47	749	796
Wrong Way Opposing Traffic	1	7	8
Turning Right on Red	0	25	25
Turning Left on Red	0	4	4
Turning Right	0	132	132
Turning Left	1	203	204
Making U Turn	0	2	2
Starting From Parked	2	26	28
Starting in Traffic	0	24	24
Slowing in Traffic	0	19	19
Parking	0	7	7
Avoiding Object in Road	2	20	22
Changing Lanes	1	8	9
Passing	3	7	10
Backing	0	51	51
All Others	9	101	110
Unknown	1	35	36
Total	67	1,420	1,487

* The number of vehicles in total crashes exceeds the number of crashes because some crashes involved more than one vehicle.

TABLE 6.07

PRIOR ACTION OF PEDESTRIANS KILLED OR INJURED IN 1998

	Pedestrians Killed		Pedestrians Injured	
Action	Number	Percent	Number	Percent
Crossing Road (No Crosswalk and No Signal)	21	37.5%	338	24.0%
Crossing Against Signal	4	7.1	84	6.0
Crossing With Signal	1	1.8	196	13.9
Crossing In Crosswalk (No Signal)	2	3.6	106	7.5
Walking In Road With Traffic	5	8.9	94	6.7
Walking In Road Against Traffic	3	5.4	69	4.9
Standing In Road	4	7.1	85	6.0
Emerging From Front/Behind Parked Vehicle	1	1.8	67	4.7
Child Getting On/Off School Bus	1	1.8	3	0.2
Pushing/Working On Vehicle	0	0.0	10	0.7
Working In Road	0	0.0	9	0.6
Getting On/Off Vehicle	1	1.8	11	0.8
Playing In Road	0	0.0	29	2.1
Not In Road	1	1.8	45	3.2
Other Pedestrian Action	3	5.4	92	6.5
Unknown	9	16.1	172	12.2
Total*	56	100.0%	1,410	100.0%

* Percent totals may not sum to 100% due to rounding.

TABLE 6.08

CONTRIBUTING FACTORS IN 1998 PEDESTRIAN CRASHES

Contributing Factors	Attributed to Motor Vehicle Drivers Number	Percent
Human Factors		
Driver Inattention / Distraction	314	27.6%
Failure to Yield Right of Way	273	24.0
Vision Obscured	110	9.7
Illegal or Unsafe Speed	67	5.9
Disregard for Traffic Control Device	41	3.6
Improper / Unsafe Lane Use	38	3.3
Physical Impairment	35	3.1
Unsafe Backing	27	2.4
Driver Inexperience	26	2.3
Improper Turn	17	1.5
Improper Parking / Starting /Stopping	16	1.4
Improper Passing / Overtaking	10	0.9
Driving Left of Center	10	0.9
Following Too Closely	10	0.9
Impeding Traffic	2	0.2
Improper/No signal	1	0.1
Failure To Use Lights	1	0.1
Other Human Factors	23	2.0
Vehicular Factors		
Skidding	16	1.4
Defective Brakes	7	0.6
Other Vehicular Factors	4	0.4
Miscellaneous Factors		
Weather Conditions	25	2.2
Other	64	5.6
Total Contributing Factors Cited	1,137	100.0%
Vehicles for Which There Was "No Clear Contributing Factor"	587	
Total Number of Drivers	1,487	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding.

TABLE 6.09

PEDESTRIAN FATALITIES' LEVEL OF ALCOHOL CONCENTRATION, 1989 - 1998

Year	Killed	Tested	Alcohol Concentration* (.00)	(.01 - .09)	(.10 or more)
1989	67	42	26 (62%)	4 (10%)	12 (29%)
1990	65	41	25 (61%)	1 (2%)	15 (37%)
1991	61	32	20 (63%)	1 (3%)	11 (34%)
1992	46	24	17 (71%)	1 (4%)	6 (25%)
1993	47	17	9 (53%)	0 (0%)	8 (47%)
1994	53	26	18 (69%)	1 (4%)	7 (27%)
1995	49	38	24 (63%)	2 (5%)	12 (32%)
1996	46	34	23 (68%)	0 (0%)	11 (32%)
1997	58	40	29 (73%)	2 (5%)	9 (23%)
1998	56	43	21 (49%)	2 (5%)	20 (47%)

* The percentage figures shown are based on the number of fatally injured pedestrians who were tested for alcohol concentration. (The law requires testing of all drivers and pedestrians, 16 years of age or older, who die within four hours as a result of a motor vehicle crash.)

TABLE 6.10

1998 PEDESTRIAN FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY AGE

Age Group	Killed	Tested	Alcohol Concentration (.00)	(.01 - .09)	(.10 or more)
14 & Younger	8	2	2	0	0
15 - 19	2	1	0	0	1
20 - 24	7	7	3	1	3
25 - 29	3	2	1	0	1
30 - 34	3	3	1	0	2
35 - 39	2	2	0	0	2
40 - 44	3	3	0	0	3
45 - 49	12	11	4	0	7
50 - 54	4	3	1	1	1
55 - 59	2	2	2	0	0
60 - 64	0	0	0	0	0
65 - 69	1	1	1	0	0
70 - 74	4	2	2	0	0
75 - 79	2	2	2	0	0
80 - 84	1	1	1	0	0
85 & Older	2	1	1	0	0
Total	56	43	21	2	20

TABLE 6.11

1998 PEDESTRIAN FATALITIES' LEVEL OF ALCOHOL CONCENTRATION BY TIME OF DAY

Time of Day	Killed	Tested	Alcohol Concentration (.00)	(.01 - .09)	(.10 or more)
Midnight - 2:59 AM	6	6	1	0	5
3:00 - 5:59 AM	1	1	0	0	1
6:00 - 8:59 AM	5	2	0	1	1
9:00 - 11:59 AM	4	1	1	0	0
Noon - 2:59 PM	4	3	3	0	0
3:00 - 5:59 PM	9	9	6	0	3
6:00 - 8:59 PM	17	13	8	1	4
9:00 - 11:59 PM	10	8	2	0	6
Unknown	0	0	0	0	0
Total	56	43	21	2	20

VII: BICYCLE CRASHES

Bicycles are subject to the same traffic laws as motor vehicles, but bicycle crashes are reported to the Minnesota Department of Public Safety only if they involve collision with a motor vehicle. Therefore, this section represents only a portion of the total number of bicycle crashes.

Data collected before 1984 counted crashes as bicycle crashes only if the bicycle was the first "object" struck by the motor vehicle. Beginning in 1984, all crashes that involved a motor vehicle in transport and a bicycle in any way are reported as bicycle crashes. The number of crashes reported here rose slightly as a result.

Number of bicycle crashes remain high
In the 5-year period from 1993 through 1997, Minnesota averaged 1,362 bicycle crashes per year. In 1998, there were 1,363 crashes recorded.

Fatalities rise, injuries fall in 1998
In 1998, there were 9 bicyclists killed in Minnesota. This number represents a rising trend that has taken place in the past three years. There were 1,310 bicyclist injuries in 1998. This number represents a 3% decline in the number of injuries that occurred in 1997. However, in the 5-year period from 1993 through 1997, Minnesota averaged 1,302 injured bicyclists per year. Thus, the number of injuries recorded in 1998 remains quite high.

Young people at risk
Of all the bicyclists in 1998 who were injured or killed in a bicycle/motor vehicle traffic crash, 58% were less than 20 years of age. This percentage includes 7 out of the 9 bicyclist fatalities.

Warm weather
As expected, bicycle crashes are mostly a warm weather occurrence. In 1998, 7 of the 9 fatalities, 74% of the crashes, and 75% of the injuries occurred in the five-month period of May through September.

Afternoon rush-hour
Bicycle crashes in 1998 were most prevalent in the three-hour time period of 3:00-6:00 p.m. Almost one-third (31%) of all bicycle crashes occurred during this period.

Big cities
As a general rule, traffic crashes involving a bicycle and a motor vehicle occur in high population areas. This rule applied once again in 1998. Almost 40% of all bicycle crashes occurred in cities where the population was over 100,000 people. Only 13% of all bicycle crashes occurred in rural areas. (Less than 5,000 people).

Males injured most often
In 1998, 8 of the 9 bicyclist fatalities, and 72% of bicyclist injuries were male. In other words, males were injured or killed almost three times as often as females (948 to 336).

Actions by bicyclists prior to crash
Bicyclists are supposed to ride with traffic. The most commonly occurring action by bicyclists prior to the crash (for 494, or 36% of the total) was attempting to ride across the trafficway. (However, the prior action was indicated as "other" or "unknown" for almost 40% of the bicyclists.)

Contributing factors
There were two contributing factors for both the bicyclists and the other motor vehicle drivers that were significant in 1998. These were failure to yield the right of way, and driver inattention or distraction. For the bicyclists, two other factors were cited often. These were improper/unsafe lane use, and disregard for traffic control device.

TABLE 7.01

BICYCLE CRASH SUMMARY, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Bicycle Crashes	1,392	1,357	1,208	1,343	1,321	1,436	1,333	1,337	1,384	1,363
Bicyclists Killed	10	8	8	11	9	16	5	6	7	9
Bicyclists Injured	1,353	1,327	1,157	1,249	1,240	1,359	1,283	1,281	1,348	1,310

TABLE 7.02

1998 BICYCLE CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Bicyclists Killed	Bicyclists Injured
January	0	10	1	11	0	10
February	0	14	1	15	0	14
March	0	23	1	24	0	23
April	1	108	10	119	1	109
May	1	191	5	197	1	196
June	1	193	13	207	1	197
July	1	226	8	235	1	233
August	2	218	8	228	2	224
September	2	138	8	148	2	138
October	0	95	9	104	0	99
November	0	36	2	38	0	36
December	1	32	4	37	1	31
Total	9	1,284	70	1,363	9	1,310

FIGURE 7.01

1998 Bicycle Crashes by Time of Day

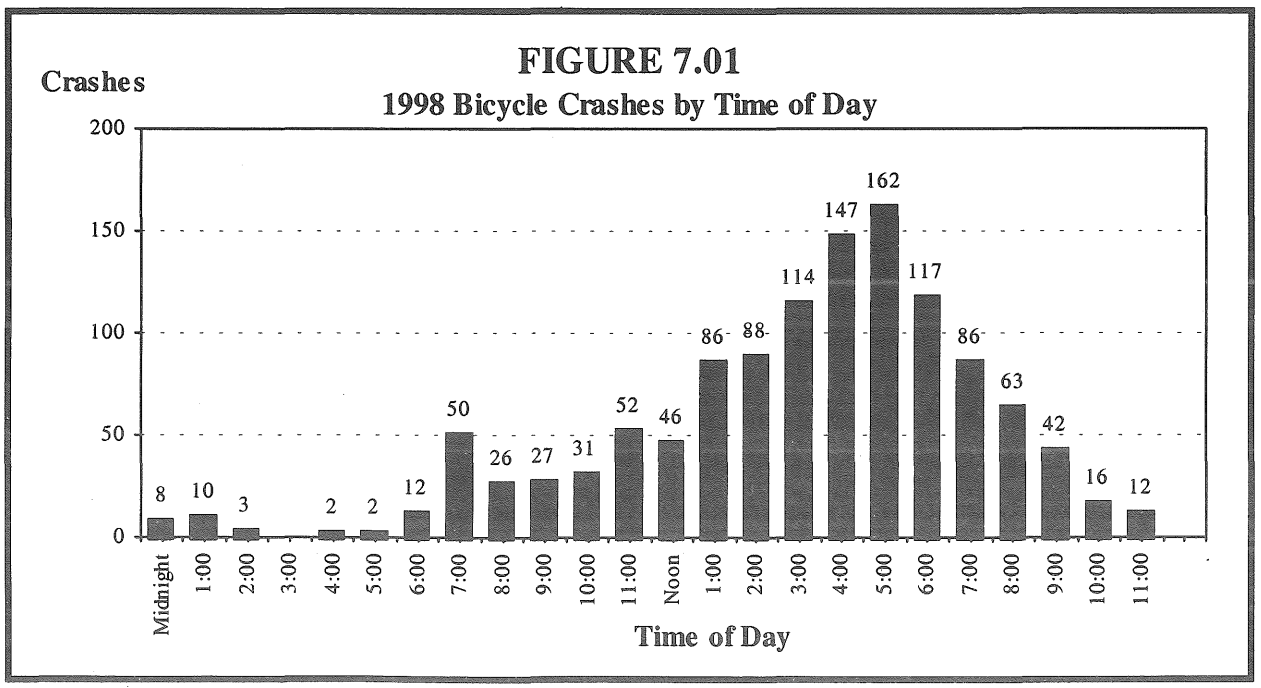


TABLE 7.03

1998 BICYCLE CRASHES BY TIME AND DAY

Time of Day	Total	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight - 2:59 AM	21	4	1	1	3	5	2	5
3:00 - 5:59 AM	4	0	0	2	0	2	0	0
6:00 - 8:59 AM	88	1	15	19	15	21	16	1
9:00 - 11:59 AM	110	10	20	16	18	12	19	15
Noon - 2:59 PM	220	19	39	28	29	30	45	30
3:00 - 5:59 PM	423	32	67	70	81	64	74	35
6:00 - 8:59 PM	266	25	31	52	51	44	37	26
9:00 - 11:59 PM	70	4	8	12	12	13	14	7
Unknown	161	19	23	23	30	32	17	17
Total	1,363	114	204	223	239	223	224	136

TABLE 7.04

1998 BICYCLE CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Bicyclists Killed	Bicyclists Injured
100,000 and Over	1	495	41	537	1	507
50,000 - 99,999	1	109	1	111	1	109
25,000 - 49,999	3	178	10	191	3	185
10,000 - 24,999	3	239	8	250	3	240
5,000 - 9,999	0	93	3	96	0	93
2,500 - 4,999	0	33	3	36	0	33
1,000 - 2,499	0	17	1	18	0	17
Under 1,000	1	120	3	124	1	126
Total	9	1,284	70	1,363	9	1,310

FIGURE 7.02
Bicyclists Killed and Injured by Age and Gender, 1998

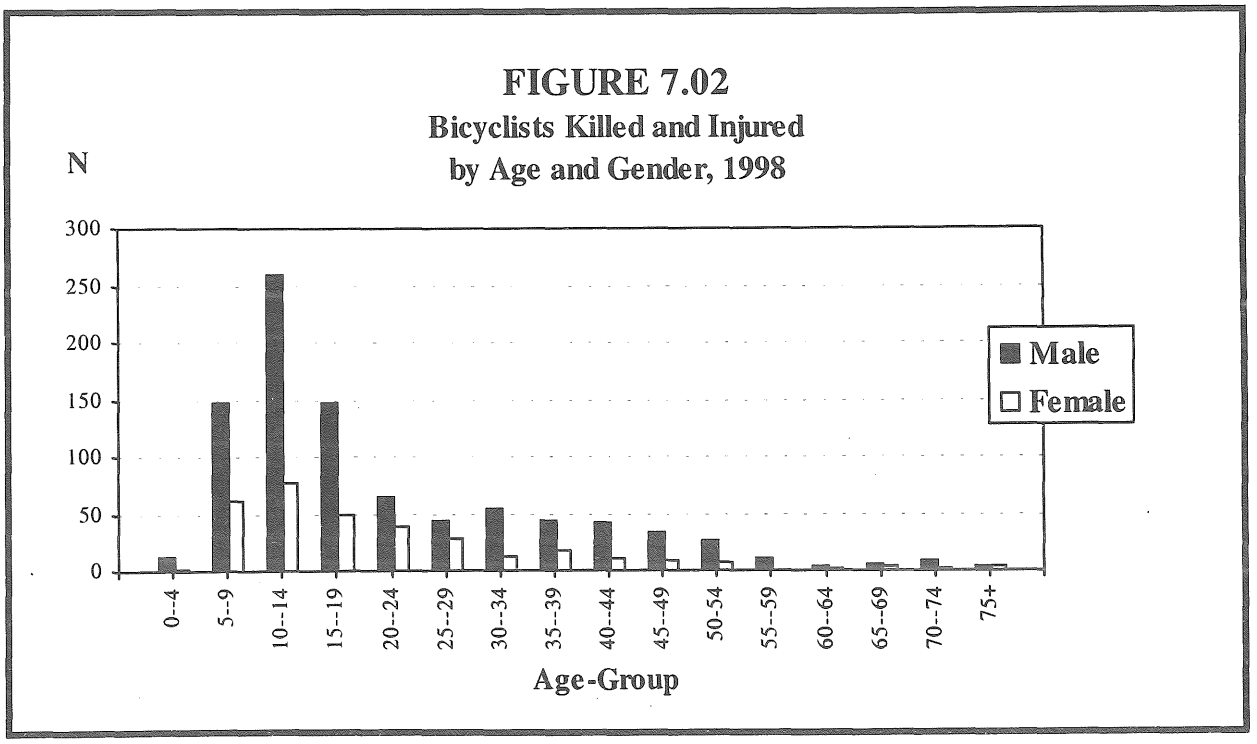


TABLE 7.05

BICYCLISTS KILLED OR INJURED BY AGE AND GENDER, 1998

	Killed			Injured											
				Severe			Moderate			Minor			Total		
Age Group	M	F	Total	M	F	Total*	M	F	Total*	M	F	Total*	M	F	Total*
0 – 4	0	0	0	1	0	1	4	1	5	7	1	9	12	2	15
5 – 9	2	0	2	19	7	26	77	33	110	49	21	73	145	61	209
10 – 14	3	0	3	24	8	32	128	42	170	105	27	134	257	77	336
15 – 19	1	1	2	10	3	13	88	26	114	48	19	72	146	48	199
20 – 24	1	0	1	4	4	8	34	22	56	26	13	41	64	39	105
25 – 29	0	0	0	4	0	4	19	14	33	21	14	36	44	28	73
30 – 34	0	0	0	5	0	5	24	8	33	26	4	31	55	12	69
35 – 39	0	0	0	6	0	6	16	8	24	21	9	30	43	17	60
40 – 44	0	0	0	4	1	5	23	5	29	15	5	21	42	11	55
45 – 49	1	0	1	3	3	6	16	4	20	14	2	16	33	9	42
50 – 54	0	0	0	5	2	7	11	2	13	11	3	14	27	7	34
55 – 59	0	0	0	1	0	1	5	0	5	4	0	4	10	0	10
60 – 64	0	0	0	1	0	1	1	0	1	2	1	3	4	1	5
65 – 69	0	0	0	1	1	2	2	1	3	2	2	4	5	4	9
70 – 74	0	0	0	1	1	2	5	0	5	3	0	3	9	1	10
75 & Older	0	0	0	0	0	0	2	2	4	1	1	2	3	3	6
Not Stated	0	0	0	4	0	6	10	2	13	27	13	54	41	15	73
Total	8	1	9	93	30	125	465	170	638	382	135	547	940	335	1,310

* Where columns do not add across to total, gender was not stated on the accident report.

TABLE 7.06

PRIOR ACTION OF BICYCLISTS INVOLVED IN 1998 CRASHES

Prior Action	Bicyclists In Fatal Crashes	Bicyclists In Injury Crashes	Bicyclists In Property Damage Crashes	Bicyclists In All Crashes*
Riding With Traffic	2	123	7	132
Riding Against Traffic	1	158	2	161
Making Left Turn	0	32	1	33
Making Right Turn	0	11	1	12
Making U Turn	0	2	0	2
Riding Across Road	4	464	26	494
Other/Unknown	2	508	33	543
Total	9	1,298	70	1,377

* The total number of bicyclist actions exceeds the number of bicycle crashes because some crashes involved more than one bicycle.

TABLE 7.07

CONTRIBUTING FACTORS IN 1998 BICYCLE CRASHES

Contributing Factors	Attributed to Bicyclists Number	Attributed to Bicyclists Percent	Attributed to Motor Vehicle Drivers Number	Attributed to Motor Vehicle Drivers Percent
Human Factors				
Failure to Yield Right of Way	221	21.1%	260	29.4%
Driver Inattention/Distraction	197	18.8	288	32.5
Improper / Unsafe Lane Use	117	11.2	19	2.1
Disregard for Traffic Control Device	114	10.9	24	2.7
Driver Inexperience	60	5.7	13	1.5
Vision Obscured	38	3.6	104	11.8
Driving Left of Center	27	2.6	6	0.7
Illegal or Unsafe Speed	23	2.2	24	2.7
Improper Turn	19	1.8	20	2.3
Failure to Use Lights	18	1.7	1	0.1
Physical Impairment	17	1.6	10	1.1
Improper Passing/Overtaking	7	0.7	14	1.6
Following Too Closely	6	0.6	9	1.0
Improper Parking/Starting/Stop.	6	0.6	18	2.0
Impeding Traffic	5	0.5	2	0.2
Unsafe Backing	0	0.0	4	0.5
Other Human Factors	41	3.9	9	1.0
Vehicular Factors				
Defective Brakes	32	3.1	1	0.1
Skidding	4	0.4	6	0.7
Other Vehicular Factors	1	0.1	1	0.1
Miscellaneous Factors				
Weather Conditions	4	0.4	5	0.6
Other	90	8.6	47	5.3
Total	1,047	100.0%	885	100.0%
Vehicles for Which There Was "No Clear Contributing Factor"	371		624	
Total Number of Bicyclists/Drivers	1,377		1,368	

Zero, one, or two contributing factors may be attributed to a single driver or bicyclist. This may cause the sum of the factors cited to differ from the number of drivers or bicyclists. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding.

VIII: SCHOOL BUS CRASHES

As a general rule, school bus travel is very safe. The school bus is usually a large and heavy vehicle that provides good protection for its occupants. However, since buses can carry many passengers, serious crashes could potentially cause many injuries. Crashes included in this section are those in which at least one school bus was physically involved. Note that in some cases, a crash could be seen as involving a school bus, yet not be counted as a school bus crash. For example, one such case would be a crash in which a person gets off the bus, crosses a street, and is struck by another vehicle.

Number of crashes decline
There were 782 school bus crashes in 1998. This number represents a 19% decrease from the previous year when 961 school bus crashes were recorded. The mild winter weather in 1998 may have been a factor in this decline. Traditionally, 3 out of every 4 school bus crashes is a property damage only crash (PDO). Due to the warmer weather during the school year, only 582 of these PDO crashes occurred in 1998, as compared to 746 in 1997.

Three deaths in 1998
In 1998, there were three fatal school bus crashes, which resulted in three deaths. Though still tragic, this is a welcomed decline, as there were 8 and 7 fatalities recorded in 1996 and 1997 respectively. Of the 3 deaths in 1998, one was a school bus passenger who was struck by the bus he was riding after exiting, and the other 2 were occupants of automobiles that collided with school buses.

Number of injuries also drop
There were only 197 school bus related injury crashes in 1998. These crashes resulted in 371 persons being injured. This number represents a 10% drop in the number of injuries from the previous year. Of the 371 total injuries in 1998, 190 were occupants of a school bus, 175 were occupants of other motor vehicles, and 6 were pedestrians.

School year and school day
As expected, school bus crashes in 1998 mainly occurred during the school year. Only 59 (7%) of the crashes occurred during the summer months (June, July, and August).

Of the 782 total school bus crashes, 452 (58%) occurred between 6:00 and 9:00 AM or between 3:00 and 6:00 PM.

Good drivers needed
Eleven percent of school bus crashes in 1998 involved collisions with a parked motor vehicle or a fixed object. This is an indication that a school bus is very difficult to maneuver, and should only be operated by highly trained personnel. Eighty-five percent of the school bus crashes involved a collision with another moving motor vehicle. Less than 2% of the school bus crashes involved a collision with a pedestrian or a bicyclist.

No traffic control device
Many (43%) of the school bus crashes occurred where there was no traffic control device. Forty-seven percent occurred where there was a traffic control device, though only 2% of the crashes occurred when the school bus stop arm was deployed.

Contributing factors
Though there were 782 school bus crashes in 1998, a few involved more than one school bus. In all, there were 790 school buses in crashes. For 52% of the school bus drivers, police showed there was "no clear contributing factor." This compares favorably to the 34% of other motor vehicle drivers for whom there was "no clear contributing factor." For the school bus drivers, the two contributing factors mentioned most often were driver inattention or distraction (29%), and failure to yield the right of way (16%).

TABLE 8.01

SCHOOL BUS CRASH SUMMARY, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total Crashes	828	674	857	741	894	821	898	1,041	961	782
Fatal Crashes	4	5	4	1	3	2	2	6	4	3
Persons Killed	4	6	4	1	3	2	2	8	7	3
Injury Crashes	167	149	181	169	212	210	216	241	211	197
Persons Injured	281	329	383	425	432	401	457	472	408	371
Property Damage Crashes	657	520	672	571	679	609	680	794	746	582
School Buses Involved	834	680	867	756	909	844	906	1,050	979	790

TABLE 8.02

1998 SCHOOL BUS CRASHES BY TIME OF DAY

Time of Day	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Midnight - 2:59 AM	0	0	2	2	0	0
3:00 - 5:59 AM	0	2	2	4	0	3
6:00 - 8:59 AM	0	63	179	242	0	112
9:00 - 11:59 AM	1	20	77	98	1	42
Noon - 2:59 PM	0	26	96	122	0	54
3:00 - 5:59 PM	2	58	150	210	2	120
6:00 - 8:59 PM	0	3	14	17	0	4
9:00 - 11:59 PM	0	2	7	9	0	2
Unknown	0	23	55	78	0	34
Total	3	197	582	782	3	371

TABLE 8.03

1998 SCHOOL BUS CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	0	33	116	149	0	49
February	0	15	60	75	0	23
March	0	36	70	106	0	98
April	0	15	38	53	0	25
May	1	15	50	66	1	27
June	1	9	23	33	1	13
July	0	8	14	22	0	18
August	0	2	2	4	0	2
September	0	19	57	76	0	28
October	0	20	60	80	0	39
November	0	10	51	61	0	26
December	1	15	41	57	1	23
Total	3	197	582	782	3	371

TABLE 8.04

AGE AND GENDER OF PERSONS INJURED IN 1998 SCHOOL BUS CRASHES

Age Group	Total*	In Bus	Pedestrian	In Other Vehicle	Male	Female
0 – 4	1	0	0	1	0	1
5 - 9	53	45	1	7	25	28
10 - 14	54	51	1	2	18	35
15 - 19	46	16	0	30	18	28
20 - 24	24	5	2	17	10	14
25 - 29	26	5	0	21	13	13
30 - 34	24	6	0	18	11	13
35 - 39	23	7	0	16	11	12
40 - 44	29	11	1	17	19	10
45 - 54	29	10	1	18	14	15
55 - 64	15	8	0	7	11	4
65 & Older	11	2	0	9	5	5
Unknown	36	24	0	12	14	12
Total	371	190	6	175	169	190

* There were 12 cases where the gender of the person was not stated.

TABLE 8.05

PERSONS KILLED OR INJURED IN 1998 SCHOOL BUS CRASHES BY POPULATION OF AREA

Population of City or Township	Killed	Injured			
		Severe	Moderate	Minor	Total
100,000 and Over	0	11	31	94	136
50,000 - 99,999	0	2	6	13	21
25,000 - 49,999	1	4	18	17	39
10,000 - 24,999	0	2	20	36	58
5,000 - 9,999	0	2	3	11	16
2,500 - 4,999	0	0	0	2	2
1,000 - 2,499	0	0	1	18	19
Under 1,000	2	5	33	42	80
Total	3	26	112	233	371

TABLE 8.06

1998 SCHOOL BUS CRASHES BY FIRST HARMFUL EVENT

First Harmful Event	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Collision With:						
Other Motor Vehicle	2	178	486	666	2	328
Parked Motor Vehicle	0	3	71	74	0	3
Bicycle	0	3	0	3	0	4
Pedestrian	1	6	0	7	1	6
Deer or Other Animal	0	0	7	7	0	0
Fixed Object	0	4	11	15	0	15
Other Object	0	0	0	0	0	0
Non-collision:						
Overturn	0	1	1	2	0	4
Other/Unknown	0	2	6	8	0	11
Total	3	197	582	782	3	371

TABLE 8.07

1998 SCHOOL BUS CRASHES BY TRAFFIC CONTROL DEVICE

Traffic Control Device	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
Not Applicable	3	93	244	340	3	164
Traffic Signal	0	41	99	140	0	87
Overhead Flashers	0	2	2	4	0	2
Stop Sign--All Approaches	0	5	27	32	0	9
Other Stop Sign	0	33	114	147	0	63
Yield Sign	0	3	13	16	0	4
Officer/Flagperson/ School Patrol	0	0	0	0	0	0
School Bus Stop Arm	0	6	9	15	0	8
School Sign Zone	0	1	1	2	0	1
No Passing Zone	0	2	4	6	0	2
Railroad Crossing Device	0	3	6	9	0	19
Other	0	3	22	25	0	3
Unknown	0	5	41	46	0	9
Total	3	197	582	782	3	371

TABLE 8.08

CONTRIBUTING FACTORS IN 1998 SCHOOL BUS CRASHES

Contributing Factors	Attributed to School Bus Drivers Number	Percent	Attributed to Drivers of Other Vehicles Number	Percent
Human Factors				
Driver Inattention /Distraction	113	29.2%	154	24.4%
Failure to Yield Right of Way	60	15.5	77	12.2
Vision Obscured	24	6.2	11	1.7
Improper / Unsafe Lane Use	22	5.7	21	3.3
Improper Turn	22	5.7	10	1.6
Following Too Closely	21	5.4	55	8.7
Illegal/Unsafe Speed	17	4.4	67	10.6
Unsafe Backing	16	4.1	13	2.1
Disregard for Traffic Control Device	9	2.3	32	5.1
Driver Inexperience	7	1.8	25	4.0
Improper Passing / Overtaking	6	1.6	16	2.5
Improper Parking / Starting / Stopping	5	1.3	12	1.9
Driving Left of Center	3	0.8	7	1.1
Improper or No Signal	3	0.8	1	0.2
Impeding Traffic	1	0.3	1	0.2
Physical Impairment	1	0.3	9	1.4
Pedestrian Violation/Error	0	0.0	3	0.5
Other Human Factors	4	1.0	5	0.8
Vehicular Factors				
Skidding	9	2.3	35	5.5
Defective Brakes	1	0.3	9	1.4
Other Vehicular Factors	1	0.3	2	0.3
Miscellaneous Factors				
Weather Conditions	19	4.9	49	7.8
Other	23	5.9	17	2.7
Total	387	100.0%	631	100.0%
Vehicles for Which There Was "No Clear Contributing Factor"	407		282	
Total Number of Drivers	790		820	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. Bicyclists and pedestrians are included as other drivers in this table.

IX: MOTOR VEHICLE/TRAIN CRASHES

Each crash reported in this section involves a motor vehicle and a train. Train collisions with pedestrians or bicyclists are not counted as traffic crashes for the purpose of this publication.

Statewide, about one-half of one percent of all motor vehicle crashes result in a fatality. In 1998, about 8% of all motor-vehicle/train crashes in Minnesota resulted in a fatality. That's approximately sixteen times the rate for all crashes. Motor vehicle/train crashes may be few in numbers, but they are more likely to be serious. Thus, these types of crashes are a cause for concern.

Number of train crashes fail to decline
Over the years, the number of motor-vehicle/train crashes has been declining. In fact, the lowest number of train crashes ever recorded was in 1997 with 107. This trend did not continue, as there were 108 motor-vehicle/train crashes in 1998. Although not a large increase, the result is disappointing.

Number of fatalities and injuries jump
Also disappointing is the fact that the number of people killed and injured increased from the previous year. Eleven people were killed in train crashes in 1998, compared to only 6 in 1997. And, 64 persons were injured, compared to 46 in the previous year, a 39% increase.

Colder weather is a factor
In 1998, motor vehicle/train crashes were most numerous in the month of January. Almost 20% of the crashes occurred in that month, with 3 people being killed and another 7 injured.

Railroad crossbuck sites remain dangerous
Thirty-seven of the 108 train crashes, including 4 of the 11 fatalities and 29 of the 64 injuries, occurred at a crossing signed by a railroad crossbuck. An additional 19 crashes, including one fatal, occurred at a railroad crossing stop sign. Combined, those two types of traffic control devices were present for 52% of the total number of train crashes.

15-to-29-year-olds injured most often
In 1998, persons from the 15-29 age group accounted for 42% of all persons injured in motor-vehicle/train crashes. Also, 5 out of the 11 fatalities came from this age group.

Rural Areas at Greatest Risk
Motor vehicle crashes involving a train are a predominantly rural phenomenon. (Defined as an area with less than 5,000 population). In 1998, 68% of the total crashes, 83% of the injuries, and all 9 of the fatalities occurred in rural areas.

Contributing Factors
For the motor vehicles involved in train crashes, failure to yield the right of way, driver inattention or distraction, and disregard for traffic control device, were the three most often cited contributing factors listed by officers at the scene. These three accounted for 62% of all contributing factors cited. An additional 10% of the contributing factors were due to obscured vision, and weather. This may help explain why so many motor vehicle/train crashes occur in rural areas, in colder months, and at intersections with no flashing lights or gates.

TABLE 9.01

MOTOR VEHICLE / TRAIN CRASH SUMMARY, 1989 - 1998

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total Crashes	142	116	147	111	128	144	132	124	107	108
Fatal Crashes	11	13	10	7	11	14	15	8	6	9
Persons Killed	15	17	10	9	15	17	16	8	6	11
Injury Crashes	48	35	49	39	45	51	30	45	36	47
Persons Injured	75	67	70	54	63	75	34	50	46	64
Property Damage Crashes	83	68	88	65	72	79	87	71	65	52

TABLE 9.02

1998 MOTOR VEHICLE / TRAIN CRASHES BY MONTH

Month	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
January	2	5	12	19	3	7
February	0	2	2	4	0	2
March	0	5	4	9	0	6
April	0	1	3	4	0	2
May	1	0	3	4	1	0
June	2	2	5	9	3	2
July	1	6	4	11	1	9
August	0	5	7	12	0	9
September	2	6	4	12	2	8
October	0	5	3	8	0	7
November	0	4	3	7	0	5
December	1	6	2	9	1	7
Total	9	47	52	108	11	64

TABLE 9.03

1998 MOTOR VEHICLE / TRAIN CRASHES BY TIME AND DAY

Time of Day	Total	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Midnight - 2:59 AM	4	1	0	0	0	0	1	2
3:00 - 5:59 AM	6	2	0	1	1	1	0	1
6:00 - 8:59 AM	13	1	1	4	3	2	2	0
9:00 - 11:59 AM	18	1	3	0	2	4	7	1
Noon - 2:59 PM	21	3	3	3	2	4	4	2
3:00 - 5:59 PM	20	3	1	3	6	2	4	1
6:00 - 8:59 PM	12	2	2	2	2	2	0	2
9:00 - 11:59 PM	6	1	0	1	2	0	1	1
Unknown	8	1	3	1	2	1	0	0
Total	108	15	13	15	20	16	19	10

TABLE 9.04

1998 MOTOR VEHICLE / TRAIN CRASHES BY TRAFFIC CONTROL DEVICE

Traffic Control Device	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
RR Crossbuck	4	20	13	37	4	29
RR Crossing Stop Sign	1	13	5	19	1	18
RR Flashing Lights	1	5	10	16	1	6
RR Overhead Flashers Plus Gate	1	1	1	3	1	2
RR Overhead Flashers	0	0	3	3	0	0
RR Crossing Gate	1	2	7	10	2	2
Stop Sign	1	2	5	8	2	2
Other	0	3	3	6	0	4
Unknown	0	0	1	1	0	0
Not Applicable	0	1	4	5	0	1
Total	9	47	52	108	11	64

TABLE 9.05

AGE OF PERSONS KILLED OR INJURED IN 1998 MOTOR VEHICLE / TRAIN CRASHES

		Injured			
Age Group	Killed	Severe	Moderate	Minor	Total
0-4	0	1	0	1	2
5-9	0	0	1	0	1
10-14	0	0	0	0	0
15-19	0	2	3	3	8
20-24	1	2	6	2	10
25-29	4	3	3	3	9
30-34	0	1	0	2	3
35-39	1	0	0	4	4
40-44	0	1	2	1	4
45-49	1	1	3	0	4
50-54	0	1	2	3	6
55-59	0	0	4	0	4
60-69	1	1	0	2	3
70-79	2	1	0	1	2
80 & Older	1	0	0	0	0
Not Stated	0	0	1	3	4
Total	11	14	25	25	64

TABLE 9.06

1998 MOTOR VEHICLE / TRAIN CRASHES BY POPULATION OF AREA

Population of City or Township	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes	Killed	Injured
100,000 and Over	0	1	5	6	0	1
50,000 - 99,999	0	1	4	5	0	1
25,000 - 49,999	0	1	9	10	0	1
10,000 - 24,999	0	3	4	7	0	5
5,000 - 9,999	0	2	5	7	0	3
2,500 - 4,999	2	4	1	7	2	5
1,000 - 2,499	0	0	0	0	0	0
Under 1,000	7	35	24	66	9	48
Total	9	47	52	108	11	64

TABLE 9.07

CONTRIBUTING FACTORS IN 1998 MOTOR VEHICLE / TRAIN CRASHES

Contributing Factor	Number	Percent
Human Factors		
Failure to Yield Right of Way	35	23.5%
Driver Inattention / Distraction	32	21.5
Disregard for Traffic Control Device	26	17.4
Illegal or Unsafe Speed	8	5.4
Vision Obscured	8	5.4
Improper Parking/Stopping/Starting	6	4.0
Physical Impairment	6	4.0
Other Human Factor	2	1.3
Improper/Unsafe Lane Use	1	0.7
Impeding Traffic	1	0.7
Vehicular Factors		
Skidding	8	5.4
Defective Brakes	1	0.7
Miscellaneous Factors		
Other	8	5.4
Weather Conditions	7	4.7
Total	149	100.0%
Vehicles for Which There Was "No Clear Contributing Factor"	6	
Number of Drivers	110	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. No contributing factors are cited for train operators.

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