



1994

Traffic Collisions in Washington State

Data
Summary &
Highway
Safety
Problem
Analysis

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Introduction

This document identifies and analyzes traffic safety problems and trends in Washington State. Factors which contribute to the occurrence of traffic collisions and resultant fatalities, injuries and property damage are outlined. The analysis is intended to give traffic safety program specialists the information needed to design new countermeasures, monitor their progress and document program outcomes.

Data and analysis are presented in areas such as safety-restraint use, heavy truck collisions, and population segments which are at greatest risk such as drinking drivers, youth, older drivers, pedestrians, pedalcyclists, and motorcyclists. Current year's data is compared to that of recent years for trend identification. Over/under-representation ratios are used to compare collision involvement of various groups relative to their percentage of the population.

Sources of data include traffic collision records (Washington State Patrol), the Fatal Accident Reporting System (Washington Traffic Safety Commission), driver's licensing records (Department of Licensing), vehicle registration records (Department of Licensing), highway/roadway information (Washington State Department of Transportation), and population data (Office of Financial Management).

The collision record system includes all collisions on public trafficways reported to the WSP. The reporting criteria are death, injury, or property damage of \$500 or more. The records include both citizen reports and law enforcement investigation reports. The data elements include information on vehicles, roadways, collision circumstances, and the drivers, passengers, pedestrians, and pedalcyclists involved in collisions. This document uses each of these factors as the unit of analysis at different times. For example, in examining the alcohol-related crash problem, some analyses use collisions, some drivers, and some use victims (killed or injured) as units of analysis.

The resources of the Traffic Record Data Center at the Washington Traffic Safety Commission have been used to analyze and summarize the data.

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Introduction

I. Overview

In Washington State in 1994, 639 persons were killed in traffic crashes, 9.4 percent below the previous 4-year average. The death rate per 100 million miles of travel was 1.34, this equaled the previous record year of 1992. Although the overall number of persons injured has increased, serious injuries have decreased by 20.2 percent from the previous four-year average, and the rate of serious injuries, 11.18 per 100 million miles, has dropped 22.9 percent (Table 1-1).



Table 1-1: Overview of traffic crashes
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total collisions	129,899	123,965	125,565	121,686	132,056	125,818	3.2%
Fatal	574	579	593	603	726	625	-8.2%
Injury	54,782	51,500	51,186	49,048	51,713	50,862	7.7%
Property dmg only	74,543	71,886	73,786	72,035	79,617	74,331	0.3%
Persons killed	639	661	651	683	825	705	-9.4%
Persons injured	81,419	76,332	75,803	72,004	76,064	75,051	8.5%
Serious injury	5,331	5,713	6,531	6,839	7,653	6,684	-20.2%
Evident injury	25,165	24,549	24,246	24,212	25,722	24,682	2.0%
Possible injury	50,923	46,070	45,026	40,953	42,689	43,685	16.6%
Drivers involved	233,099	221,503	224,316	215,989	234,215	224,006	4.1%
Vehicles involved	243,438	231,756	234,938	226,262	245,579	234,634	3.8%
Motor veh. travel*	47,674	46,426	48,644	45,663	44,157	46,223	3.1%
Death rate**	1.34	1.42	1.34	1.50	1.87	1.53	-12.5%
Serious injury rate**	11.18	12.31	13.43	14.98	17.33	14.51	-22.9%
Economic loss +	\$2,126	\$2,094	\$2,122	\$2,118	\$2,372	\$2,177	-2.3%

* In millions of miles.

Source: WSP, WSDOT, Natl Safety Council

**Deaths/injuries per 100 million vehicle miles of travel.

+In \$millions; based on National Safety Council estimates in constant 1994 dollars.

(Death = \$920,000; serious inj = \$46,000; evident inj = \$14,000; possible inj = \$8,800; ppty dmg only = \$6,600.)

The estimated economic loss to the state from traffic-related injury, death, and damage amounted to \$2.126 billion. This value is based on National Safety Council estimates of average costs of traffic collisions and injuries. Components of the estimate include property damage, medical costs, emergency care costs, wage and productivity losses, insurance administration, and legal/court costs. Economic losses (in 1994 constant dollars) have decreased slightly compared to prior years.

Exposure and rates

Motor vehicle travel increased 3.1 percent from the previous four-year average. Motor vehicle registrations were up 3.8 percent, the number of licensed drivers was up 7.2%, and the state's population was up 5.5 percent compared to the four-year average (Table 1-2).

Table 1-2: Travel, registered vehicles, licensed drivers & population
Fatality and collision rates - five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr average	'94 vs prev 4-yr avg
Motor vehicle travel*	47,674	46,426	48,644	45,663	44,157	46,223	3.1%
Motor veh. registration	4,535,415	4,428,944	4,435,259	4,381,757	4,233,854	4,369,954	3.8%
Licensed drivers	3,862,305	3,784,430	3,689,741	3,572,038	3,366,146	3,603,089	7.2%
State's population	5,334,400	5,240,900	5,116,685	5,000,400	4,866,692	5,056,169	5.5%
<i>Fatality rate by:</i>							
Vehicle travel	1.34	1.42	1.34	1.50	1.87	1.53	-12.5%
Motor vehicle reg.	1.41	1.49	1.47	1.56	1.95	1.62	-12.9%
Licensed drivers	1.65	1.75	1.76	1.91	2.45	1.97	-16.0%
Population	1.20	1.26	1.27	1.37	1.70	1.40	-14.4%
<i>Collision rate by:</i>							
Vehicle travel	272.5	267.0	258.1	266.5	289.1	272.7	-0.1%
Motor vehicle reg.	286.4	279.9	283.1	277.7	311.9	288.2	-0.6%
Licensed drivers	336.3	327.6	340.3	340.7	392.3	350.2	-4.0%
Population	243.5	236.5	245.4	243.4	271.3	249.2	-2.3%

* In millions of miles

Source: WSDOT, DOL, OFM

Method used by WSDOT for estimating miles traveled changed for 1993, resulting in lower mileage.

Traffic safety statistics: 1972 to 1994

Exposure statistics, including total licensed drivers, population, vehicle registration and travel, have generally increased annually (average increases have been 1% to 5%). Motor vehicle collisions peaked in 1990 with 132,056 collisions. The annual traffic death total ranged from a low of 639 deaths recorded in 1994 to a high of 1,034 recorded in 1979. The fatality rate was 3.82 in 1972 and 1.34 in 1994 (Table 1-3).

**Table 1-3: Population, vehicle travel and collision summary
1972 - 1994**

year	population	lic. drivers	reg. vehicles	travel*	collisions**	injuries	deaths +	death rate@
1972	3,418,800	2,011,893	2,315,310	22,363	101,002	55,454	855	3.82
1973	3,424,300	2,113,460	2,453,880	23,457	105,515	58,039	776	3.31
1974	3,448,100	2,122,131	2,545,975	22,585	106,242	57,716	761	3.37
1975	3,493,990	2,176,505	2,640,944	24,023	120,635	64,145	771	3.21
1976	3,571,591	2,324,697	2,785,500	25,932	120,864	66,309	825	3.18
1977	3,661,975	2,339,215	2,952,383	27,449	119,058	71,356	927	3.38
1978	3,774,300	2,485,248	3,042,285	29,378	116,923	64,669	1,006	3.42
1979	3,911,200	2,579,368	3,186,898	29,122	118,686	65,399	1,034	3.55
1980	4,132,353	2,662,659	3,293,065	28,696	113,751	61,532	985	3.43
1981	4,250,200	2,732,722	3,408,871	30,346	111,993	61,083	872	2.87
1982	4,264,000	2,774,212	3,313,348	30,353	100,644	54,789	757	2.49
1983	4,285,100	2,867,032	3,372,966	32,275	106,597	58,317	705	2.18
1984	4,328,100	2,973,468	3,459,772	33,344	111,655	61,366	761	2.28
1985	4,384,100	2,980,717	3,546,152	33,978	120,056	63,806	756	2.22
1986	4,419,700	3,029,375	3,651,102	36,416	122,918	66,707	714	1.96
1987	4,481,100	3,156,600	3,833,058	38,520	126,807	67,665	790	2.05
1988	4,565,000	3,264,065	3,896,828	41,698	125,920	72,449	785	1.88
1989	4,660,700	3,350,324	4,084,367	42,696	128,800	73,993	781	1.83
1990	4,866,692	3,366,146	4,233,853	44,157	132,056	76,064	825	1.87
1991	5,000,400	3,572,038	4,381,757	45,663	121,686	72,004	683	1.50
1992	5,116,685	3,689,741	4,435,259	48,664	125,565	75,803	651	1.34
1993	5,240,900	3,784,430	4,428,944	46,426	123,965	71,886	661	1.42
1994	5,334,400	3,862,305	4,535,415	47,674	129,899	81,419	639	1.34

Source: WSP, OFM, DOL, WSDOT

* In millions of vehicle miles traveled.

Method used by WSDOT for estimating miles traveled changed for 1993, resulting in lower mileage.

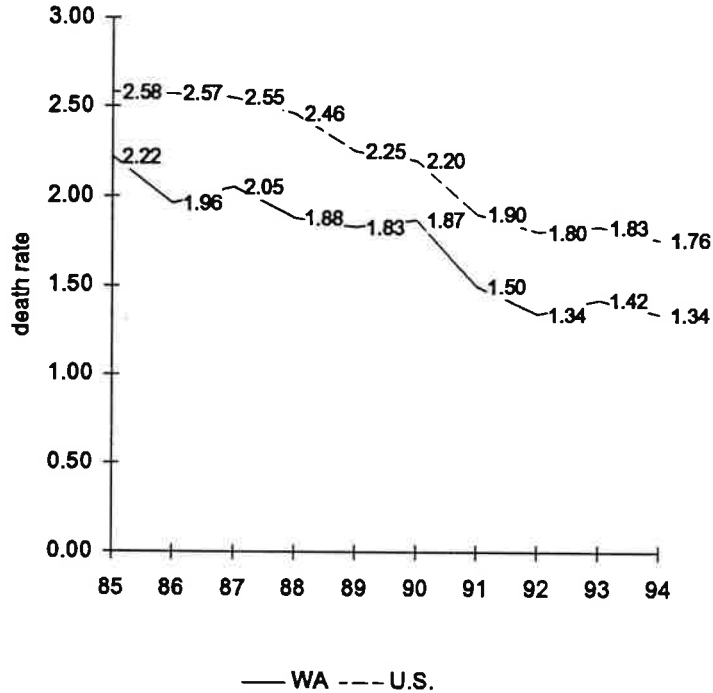
** Minimum damage for a reportable collision was increased from \$100 to \$300 to the property of one person on 7/1/77 and to \$500 on 10/1/87.

+State adopted a 90-day fatal-reporting policy in 1980 and a 30-day fatal-reporting policy in 1989.

@ Traffic deaths per 100 million vehicle miles of travel.

Comparison of the Washington and U.S. traffic fatality rates over the past 10 years are shown in Figure 1-1.

Figure 1-1:
Death rate (deaths per 100M miles)
Ten-year trend - Washington vs U.S.



Source: WSP, Nat'l Safety Council

Persons killed and injured in traffic collisions

Drivers accounted for 346 of Washington's 639 traffic fatalities and 51,497 of the state's 81,419 persons injured in 1994. Pedestrians accounted for the largest number of non-occupant fatalities and injuries (Table 1-4).

Table 1-4: Status of persons killed & injured in collisions
 By injury severity - 1994

status	killed	injury severity			total injured
		serious	evident	possible	
Drivers (no m/cyclists)	346	2,812	14,664	34,021	51,497
Passengers (no m/cylists)	159	1,530	7,571	15,590	24,691
Motorcyclists	35	398	889	391	1,678
Pedestrians	85	394	967	555	1,916
Pedalcyclists	14	195	1,063	349	1,607
Other/unknown	0	2	11	17	30
Total	639	5,331	25,165	50,923	81,419

Source: WSP

The age group of 25-44 years accounted for 221 of Washington's 639 traffic fatalities and 31,744 of the state's 81,419 persons injured in 1994 (Table 1-5).

Table 1-5: Persons killed and Injured in collisions
By age group and sex - 1994

age	population*	killed	death rate*	total injured	serious injury	evident injury	possible injury
0 - 4	406,660	17	0.42	1,577	91	626	860
5 - 9	396,029	15	0.38	2,187	143	936	1,108
10 - 14	384,762	22	0.57	2,976	233	1,278	1,465
15 - 19	335,808	71	2.11	11,983	789	4,369	6,825
20 - 24	366,462	84	2.29	11,395	789	3,725	6,881
25-34	857,927	127	1.48	17,683	1,180	5,193	11,310
35-44	887,728	94	1.06	14,061	897	3,781	9,383
45-54	604,095	75	1.24	8,508	495	2,154	5,859
55-64	391,590	38	0.97	4,031	235	1,093	2,703
65-74	347,779	40	1.15	2,695	197	775	1,723
75 & older	262,060	54	2.06	1,763	174	621	968
Age not stated		2		2,560	108	614	1,838
Males	2,600,485	439	1.69	39,174	3,049	13,995	22,130
Females	2,640,415	200	0.76	41,928	2,274	11,090	28,564
Sex not stated		0		317	8	80	229
Total	5,240,900	639	1.22	81,419	5,331	25,165	50,923

* 1993 population by age (breakdown done biannually by OFM).

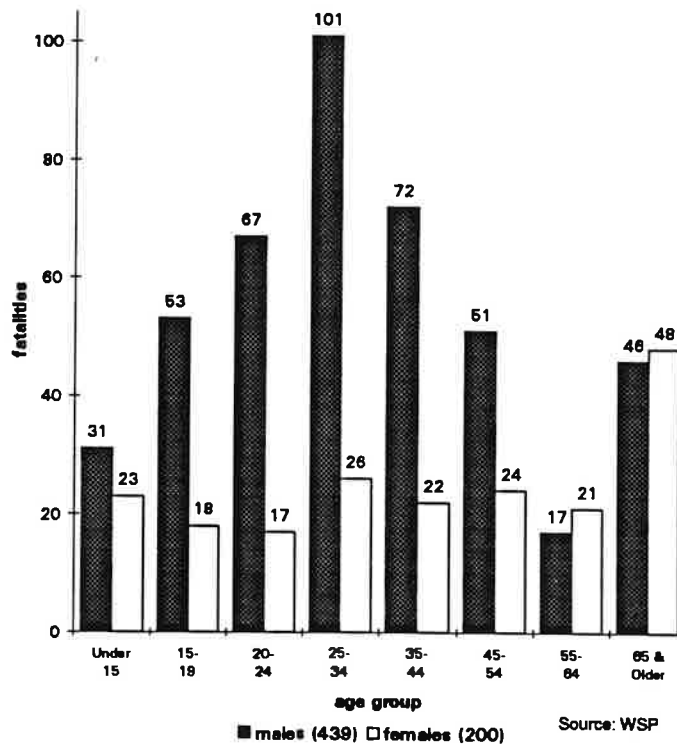
Source: WSP, OFM

**Deaths per 10,000 population.

Males 25-34 years of

age accounted for 101 of the 639 fatalities for 1994, this was 29 % of the total males killed in 1994. For females, the age group with the most fatalities was the 65 and older, with 48 fatalities (Figure 1-2).

Figure 1-2:
Traffic fatalities
By age and sex - 1994



Traffic collisions by month, day of week and hour of day

During 1994, the months recording the greatest number of traffic deaths were August, October and July. The month of February recorded the fewest fatalities (Table 1-6).

Table 1-6: Persons killed and injured in collisions
By month - 1994

	persons		collisions			
	killed	injured	fatal	injury	ppty dmg	total
January	59	5,708	54	3,889	5,736	9,679
February	30	5,983	29	4,058	5,711	9,798
March	46	6,402	40	4,337	5,788	10,165
April	40	6,469	38	4,363	5,474	9,875
May	37	6,625	35	4,400	5,600	10,035
June	53	6,743	46	4,456	5,773	10,275
July	63	6,894	59	4,552	5,800	10,411
August	71	6,945	56	4,661	5,839	10,556
September	60	7,141	53	4,765	6,006	10,824
October	69	7,668	66	5,198	7,120	12,384
November	57	7,593	46	5,098	7,429	12,573
December	54	7,248	52	5,005	8,267	13,324
Total	639	81,419	574	54,782	74,543	129,899

Source: WSP

Nearly half of Washington's fatal collisions occurred on the days of Friday, Saturday and Sunday. The hours with the most fatalities were night-time hours on weekends, and afternoon and night-time hours on weekdays. Of total reported collisions, the majority occurred on weekdays (Table 1-7).

Table 1-7: Collisions by day of week and hour of day - 1994

	total week			Monday - Thursday			Friday - Sunday		
	total	injury	fatal	total	injury	fatal	total	injury	fatal
midnight	2,787	998	33	1,180	410	8	1,607	588	25
1:00 a.m.	2,348	967	25	836	344	6	1,512	623	19
2:00 a.m.	2,200	901	25	780	326	10	1,420	575	15
3:00 a.m.	1,227	478	11	438	160	5	789	318	6
4:00 a.m.	1,025	394	15	462	174	7	563	220	8
5:00 a.m.	1,485	550	8	873	324	1	612	226	7
6:00 a.m.	2,983	1,168	16	2,069	807	11	914	361	5
7:00 a.m.	6,070	2,572	17	4,484	1,901	11	1,586	671	6
8:00 a.m.	5,298	2,081	13	3,658	1,458	8	1,640	623	5
9:00 a.m.	4,632	1,755	21	2,892	1,086	12	1,740	669	9
10:00 a.m.	5,157	2,018	21	2,986	1,162	12	2,171	856	9
11:00 a.m.	6,539	2,674	22	3,789	1,528	13	2,750	1,146	9
noon	7,823	3,315	21	4,462	1,831	11	3,361	1,484	10
1:00 p.m.	8,250	3,379	16	4,524	1,807	8	3,726	1,572	8
2:00 p.m.	9,478	4,096	30	5,651	2,423	14	3,827	1,673	16
3:00 p.m.	10,857	4,789	35	6,738	2,934	21	4,119	1,855	14
4:00 p.m.	11,180	4,999	31	6,954	3,060	14	4,226	1,939	17
5:00 p.m.	11,631	5,255	33	7,584	3,491	18	4,047	1,764	15
6:00 p.m.	8,042	3,569	36	4,769	2,157	18	3,273	1,412	18
7:00 p.m.	5,621	2,520	26	3,117	1,402	11	2,504	1,118	15
8:00 p.m.	4,391	1,875	32	2,387	1,020	16	2,004	855	16
9:00 p.m.	4,097	1,702	31	2,203	908	12	1,894	794	19
10:00 p.m.	3,563	1,445	25	1,783	747	10	1,780	698	15
11:00 p.m.	3,215	1,282	31	1,433	571	15	1,782	711	16
Total	129,899	54,782	574	76,052	32,031	272	53,847	22,751	302

Source: WSP

Traffic collisions during holiday periods

Of the major holiday periods, New Years had the highest per-hour rates for injuries and collisions. In general, other holidays had rates comparable to the rest of the year, with the exception of Labor Day, which had the highest per-hour rate for traffic deaths (Table 1-8).

Table 1-8: Traffic collisions during major holiday periods
Deaths, injuries, collisions per hour - 1994

	number of hours	deaths	injuries	collisions	deaths per hour	injuries per hour	collisions per hour
New Years	18	4	696	1,091	0.22	38.67	60.61
Memorial Day	78	5	694	916	0.06	8.90	11.74
4th of July	78	5	645	851	0.06	8.27	10.91
Labor Day	78	18	820	1,093	0.23	10.51	14.01
Thanksgiving	102	5	989	1,464	0.05	9.70	14.35
Christmas	78	4	527	862	0.05	6.76	11.05
Total holidays	414	37	3,675	5,186	0.09	8.88	12.53
Full year	8,760	639	81,419	129,899	0.07	9.29	14.83

Source: WSP

Traffic collisions & deaths by type of roadway

During 1994, the interstate system recorded the lowest death rate per vehicle miles traveled with 0.54 deaths per 100 million miles. The highest death rate was on "other traffic ways" with a death rate of 3.79. City streets had by far the greatest number of total collisions with 58,669, followed by state highways and county roads. The greatest amount of vehicle travel was on state highways with an estimated 13,963 millions of vehicle miles traveled (Table 1-9).

Table 1-9: Highways, travel and collisions
By type of highway - 1994

type of highway	highway miles	%	miles traveled +	%	collisions	fatalities	death rate *
County roads	41,424	51.9%	9,475	19.9%	24,812	219	2.31
State highways	6,272	7.9%	13,963	29.3%	31,194	231	1.65
City streets	12,465	15.8%	10,918	22.9%	58,669	101	0.93
Interstate system	764	1.0%	12,816	28.9%	14,041	69	0.54
Other traffic ways **	18,877	23.7%	501	1.1%	1,183	19	3.79
Total	79,802	100.0%	47,673	100.0%	129,899	639	1.34

+WSDOT estimate in millions of vehicle miles traveled.

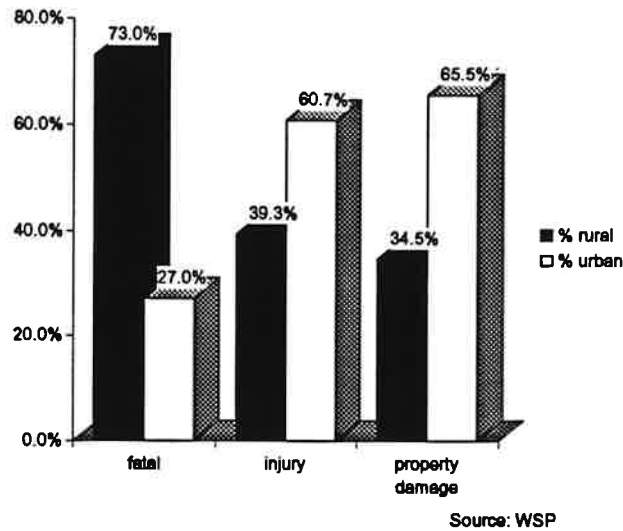
Source: WSP, WSDOT, WTSC

*Fatalities per hundred million vehicle miles

** Includes parks/forest service roads. Does not include all-terrain-vehicle trails.

Figure 1-3 compares collisions in urban and rural areas by severity. Rural areas accounted for 73.0% of all fatal collisions, but for only 39.3% of injury collisions and 34.5% of property-damage-only collisions.

**Figure 1-3:
Rural vs urban collisions
By severity-1994**



Driver age

Drivers under age 30 were over-represented in fatal and total collisions while older drivers were generally under-represented; for example, drivers 16 years of age comprised 0.8% of all licensed drivers in the state in 1994, yet accounted for 1.6% of drivers in fatal collisions, creating an over-representation ratio of 2.0 for involvement in fatal collisions (Table 1-10). Drivers 16-20 comprised 6.5% of licensed drivers, but accounted for 15.6% of total collisions, creating an over-representation ratio of 2.38 for involvement in total collisions (Figure 1-4).

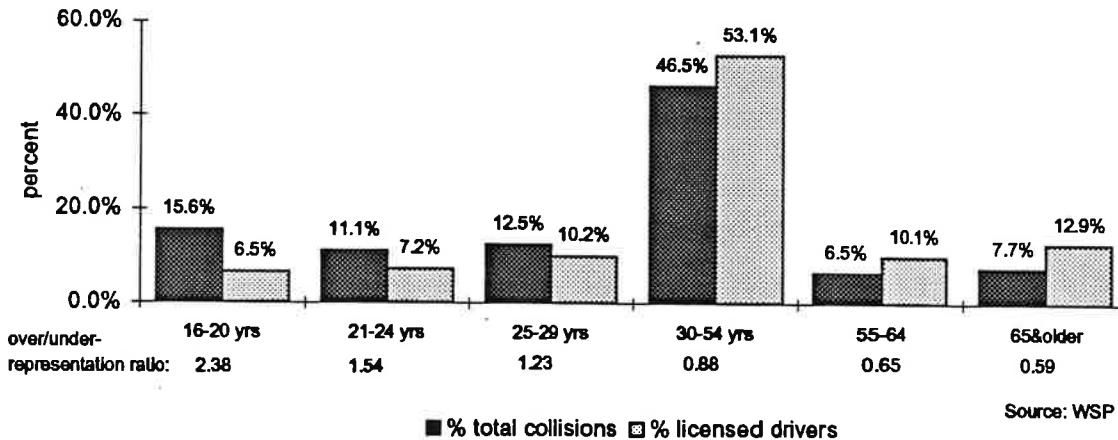
Table 1-10: Driver distribution and collision involvement
By age group - 1994

age	lic drivers	% of lic dvr	total collisions	% of collisions	ratio* of collisions	fatal collisions	% of fatal clns	ratio* of fatal clns
Under 16	-----	-----	569	0.3%	-----	2	0.2%	-----
16	31,434	0.8%	4,073	2.0%	2.5	14	1.6%	2.0
17	47,618	1.2%	6,870	3.4%	2.7	23	2.7%	2.2
18	54,619	1.4%	7,288	3.6%	2.5	21	2.5%	1.7
19	59,675	1.5%	6,883	3.4%	2.2	29	3.4%	2.2
20	59,384	1.5%	6,072	3.0%	1.9	29	3.4%	2.2
21	61,510	1.6%	5,739	2.8%	1.8	17	2.0%	1.3
22	65,016	1.7%	5,518	2.7%	1.6	26	3.1%	1.8
23	74,914	1.9%	5,646	2.8%	1.4	20	2.4%	1.2
24	78,139	2.0%	5,798	2.8%	1.4	31	3.7%	1.8
25-29	392,228	10.2%	25,546	12.5%	1.2	107	12.6%	1.2
30-34	455,380	11.8%	25,126	12.3%	1.0	100	11.8%	1.0
35-39	474,101	12.3%	23,022	11.3%	0.9	94	11.1%	0.9
40-44	448,443	11.6%	20,004	9.8%	0.8	87	10.2%	0.9
45-49	388,235	10.1%	15,723	7.7%	0.8	73	8.6%	0.9
50-54	285,065	7.4%	11,031	5.4%	0.7	57	6.7%	0.9
55-59	209,980	5.4%	7,438	3.6%	0.7	23	2.7%	0.5
60-64	178,282	4.6%	5,909	2.9%	0.6	19	2.2%	0.5
65-69	164,571	4.3%	4,939	2.4%	0.6	15	1.8%	0.4
70 & over	333,711	8.6%	10,696	5.2%	0.6	62	7.3%	0.8

*Over/under ratio of age group in total and fatal collisions.

Source: WSP, DOL

Figure 1-4:
Percent of total collisions & total licensed drivers
By age groups - 1994



Driver violations

Driver violations in traffic collisions are shown in Table 1-11. These violations represent the judgment of police officers as to driver behavior factors that may have contributed to collision occurrences. The majority of violations noted by police include right-of-way violations, excessive speed, following too closely, and inattention. The factors showing the largest increases over prior years include following too closely, improper turning, defective equipment, driver apparently asleep, and under the influence of drugs, although the latter is based on very few cases.

It is likely that many drug related collisions are not reported as such in collision records. The State Toxicologist recently examined blood or urine samples from fatally injured drivers and found 25 percent of the drivers were positive for drug use other than alcohol. The drugs found with greatest frequency were marijuana, cocaine, and amphetamines.

Table 1-11: Contributory driver violations in collisions*
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Failure to yield right of way**	26,583	24,650	25,532	24,492	25,687	25,090	5.9%
Exceeding safe speed	22,626	23,036	20,950	18,941	22,796	21,431	5.6%
Following too closely	16,399	14,972	14,383	12,597	12,058	13,503	21.5%
Driver inattention	15,934	14,310	15,234	16,587	19,118	16,312	-2.3%
Disregarding signs/ signals	8,030	7,481	7,715	7,508	8,160	7,716	4.1%
Driving under the influence	7,983	8,284	9,088	9,331	9,973	9,169	-12.9%
Improper turning - inc. "U" turn	4,242	4,123	3,919	3,670	3,717	3,857	10.0%
Defective equipment	3,909	3,689	3,626	3,348	3,247	3,478	12.4%
Exceeding posted speed	3,712	3,619	3,895	4,004	4,475	3,998	-7.2%
Other violations	2,672	2,605	2,652	2,366	2,428	2,513	6.3%
Over center line	2,156	2,137	2,141	2,041	2,537	2,214	-2.6%
Improper passing	2,074	1,911	1,998	1,919	2,093	1,980	4.7%
Apparently asleep	2,034	1,756	1,856	1,776	1,801	1,797	13.2%
Improper parking location	631	626	619	615	672	633	-0.3%
Failing to signal***	430	424	474	467	586	488	-11.8%
Under influence of drugs	245	168	212	259	234	218	12.3%
Did not dim headlights	226	174	219	208	256	214	5.5%
Total violations	119,886	113,965	114,513	110,129	119,838	114,611	4.6%

* Investigated collisions only

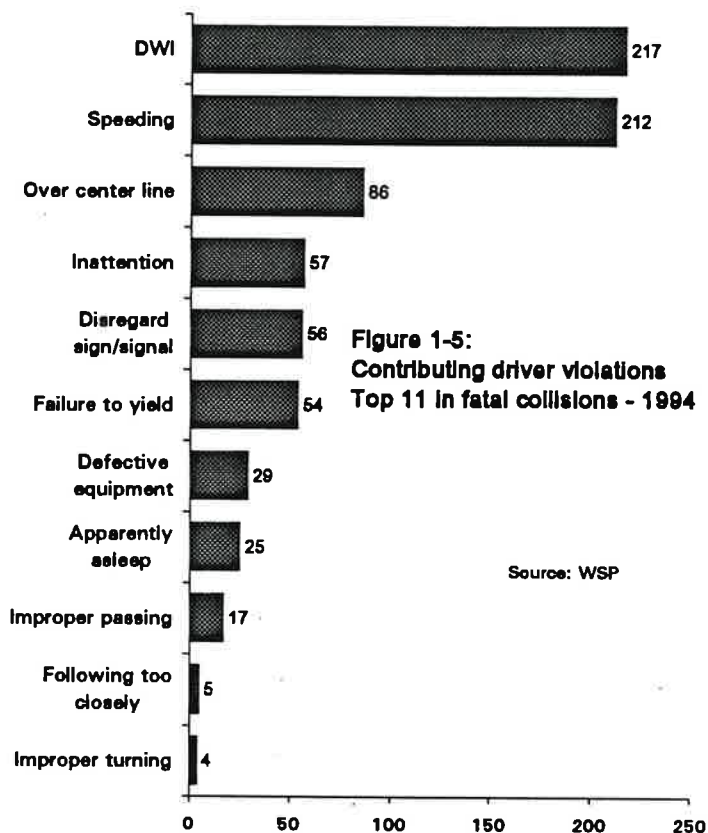
** Includes failure to yield to pedestrians

*** Includes signaling improperly

Source: WSP

Contributing driver violations

In fatal collisions, the leading violations were DUI, speeding, over center line (Figure 1-5).



Vehicle condition

Defective brakes and worn or smooth tires were the leading defects found in investigated collisions in 1994 (Table 1-12).

Table 1-12: Vehicle condition in investigated collisions
Five-year comparison

description	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Defective brakes	1,517	1,382	1,486	1,485	1,682	1,509	0.5%
Worn or smooth tires	1,246	1,288	1,211	1,497	1,948	1,486	-16.2%
Puncture or blowout	348	306	293	309	399	327	6.5%
Defective rear lights	232	228	236	283	305	263	-11.8%
Defective steering	211	230	236	196	272	234	-9.6%
Power failure	196	183	161	186	182	178	10.1%
Defective headlights	103	100	97	121	112	108	-4.2%
Other lights/reflectors	65	67	71	71	97	77	-15.0%
All other defects	1,566	1,289	1,456	1,353	1,319	1,354	15.6%
Total defects	5,484	5,073	5,247	5,501	6,316	5,534	-0.9%
No defects noted	177,091	167,315	168,706	159,398	170,881	166,575	6.3%
Percent with defects	3.1%	3.0%	3.1%	3.5%	3.7%	3.3%	-6.8%

Source: WSP

Exposure by county

King, Pierce and Snohomish Counties registered the highest numbers relating to traffic exposure (Table 1-13).

Table 1-13: Factors indicating traffic exposure
By county - 1994

county	population	licensed drivers *	registered vehicles	miles traveled**
Adams	14,600	11,129	16,142	390.2
Asotin	18,900	13,507	16,214	105.0
Benton	127,000	93,176	108,411	1,120.7
Chelan	58,000	44,349	58,156	602.0
Clallam	62,500	45,968	55,480	458.1
Clark	280,800	204,114	234,689	2,185.2
Columbia	4,150	3,043	4,718	60.7
Cowitz	87,800	63,562	81,875	1,047.9
Douglas	29,300	19,869	23,164	330.2
Ferry	7,000	4,707	4,808	111.6
Franklin	42,900	28,241	48,735	492.8
Garfield	2,350	1,994	2,795	51.8
Grant	62,200	43,329	55,884	821.0
Grays Harbor	67,400	48,124	57,157	647.0
Island	67,900	46,408	50,335	364.6
Jefferson	24,300	18,472	21,466	314.0
King	1,599,500	1,211,861	1,363,049	14,029.2
Kitap	213,200	150,722	172,355	1,407.7
Kititas	29,700	20,701	27,330	667.4
Klickitat	17,700	13,187	16,860	208.0
Lewis	63,800	48,608	65,941	949.6
Lincoln	9,300	6,666	11,607	255.3
Mason	44,300	32,127	40,819	401.5
Okanogan	35,900	27,857	32,717	408.8
Pacific	20,300	15,346	18,069	206.5
Pend Oreille	10,500	7,941	9,529	147.0
Pierce	648,900	437,408	476,761	5,092.1
San Juan	12,100	9,391	12,355	33.7
Skagit	91,000	67,908	92,729	1,052.0
Skamania	9,300	5,407	6,155	93.0
Snohomish	516,500	367,385	434,032	4,380.8
Spokane	392,000	280,000	326,613	3,103.1
Stevens	34,500	23,887	27,977	338.9
Thurston	185,900	138,607	189,493	1,873.3
Wahkiakum	3,600	2,314	2,931	41.1
Walla Walla	52,600	33,105	37,799	407.8
Whatcom	145,000	104,482	125,402	1,307.4
Whitman	39,800	24,602	26,420	370.7
Yakima	202,100	133,291	176,443	1,576.0
Unknown		9,672		
Total	5,334,400	3,862,305	4,535,415	47,673.7

** Estimated by WSDOT - in millions of miles. Source: WSP, DOL, DOT

I / Overview

Table 1-14 shows deaths, injuries, and collisions for Washington counties. Also displayed are rates of persons killed per 100 million vehicle miles traveled. Fatal rates ranged from a low of zero, with no fatalities in Columbia and Skamania Counties, to a high of 5.93 in San Juan County, based upon 2 deaths. Collision rates showed a low of 74.4 collisions per 100 million vehicle miles traveled in Lincoln County and a high of 400.6 in San Juan County .

Table 1-14: Traffic deaths, injuries and miles traveled
By county - 1994

county	miles traveled*	deaths	serious injuries	evident injuries	possible injuries	total injuries	collisions	death rate**	collision rate**
Adams	390.2	9	45	143	82	270	354	2.31	90.7
Asotin	105.0	1	13	54	38	105	236	0.95	224.8
Benton	1,120.7	12	120	471	826	1,417	2,603	1.07	232.3
Chelan	602.0	16	92	382	338	812	1,477	2.66	245.3
Cllalam	458.1	4	71	262	357	690	1,154	0.87	251.9
Clark	2,185.2	27	252	1,199	2,411	3,862	5,884	1.24	269.3
Columbia	60.7	0	3	35	24	62	122	0.00	201.0
Cowlitz	1,047.9	10	91	509	801	1,401	2,299	0.95	219.4
Douglas	330.2	5	39	139	120	298	507	1.51	153.5
Ferry	111.6	2	14	46	31	91	153	1.79	137.1
Franklin	492.8	14	47	209	269	525	860	2.84	174.5
Garfield	51.8	2	2	24	12	38	76	3.86	146.7
Grant	821.0	17	106	364	379	849	1,244	2.07	151.5
Grays Harbor	647.0	7	81	379	444	904	1,666	1.08	257.5
Island	364.6	6	72	193	285	550	820	1.65	224.9
Jefferson	314.0	8	26	111	130	267	436	2.55	138.9
King	14,029.2	113	1,587	7,015	19,492	28,094	46,083	0.81	328.5
Kitsap	1,407.7	23	179	803	1,675	2,657	4,197	1.63	298.1
Kittitas	887.4	12	52	280	285	617	1,219	1.35	137.4
Klickitat	208.0	3	28	106	48	182	357	1.44	171.6
Lewis	949.6	18	124	440	499	1,063	1,884	1.90	198.4
Lincoln	255.3	3	14	67	49	130	190	1.18	74.4
Mason	401.5	10	82	213	416	711	1,003	2.49	249.8
Okanogan	408.8	10	57	215	152	424	775	2.45	189.6
Pacific	206.5	5	21	110	109	240	452	2.42	218.9
Pend Oreille	147.0	5	29	39	55	123	220	3.40	149.7
Pierce	5,092.1	56	575	3,219	7,562	11,356	15,717	1.10	308.7
San Juan	33.7	2	12	44	22	78	135	5.93	400.6
Skagit	1,052.0	19	91	531	730	1,352	2,190	1.81	208.2
Skamania	93.0	0	23	50	54	127	223	0.00	239.8
Snohomish	4,380.8	47	357	2,072	4,774	7,203	11,013	1.07	251.4
Spokane	3,103.1	46	412	2,107	3,860	6,379	9,900	1.48	319.0
Stevens	338.9	8	52	201	178	431	583	2.36	172.0
Thurston	1,873.3	30	192	815	1,567	2,574	4,365	1.60	233.0
Wahkiakum	41.1	2	5	26	17	48	85	4.87	206.8
Walla Walla	407.8	12	28	255	263	546	1,055	2.94	258.7
Whatcom	1,307.4	21	101	705	969	1,775	3,018	1.61	230.8
Whitman	370.7	13	32	206	162	400	730	3.51	196.9
Yakima	1,576.0	41	204	1,126	1,438	2,768	4,614	2.60	292.8
Total**	47,673.7	639	5,331	25,165	50,923	81,419	129,899	1.34	272.5

* In millions of vehicle miles traveled.

Source: WSP, WSDOT

** Traffic deaths/collisions per 100 million vehicle miles traveled.

Of cities of 10,000 population and greater, Bainbridge Island recorded the lowest collision rate with 100.5 collisions per 10,000 population. The city with the highest collision rate was Tukwila, recording 976.2 collisions per 10,000 population. Fifteen cities with a population over 10,000 recorded no traffic deaths for 1994 (Table 1-15).

Table 1-15: Traffic deaths, injuries and collisions*

Cities over 10,000 population - 1994

	population	deaths	injuries	collisions	death rate**	collision rate**
250,000 and over						
Seattle	531,400	25	11,606	20,335	0.47	382.7
100,000 to 250,000						
Spokane	185,600	11	4,018	6,348	0.59	342.0
Tacoma	182,800	14	5,012	7,065	0.77	386.5
50,000 to 100,000						
Bellevue	99,140	2	1,694	2,903	0.20	292.8
Everett	78,240	14	1,508	2,644	1.79	337.9
Federal Way	73,500	7	1,265	1,902	0.95	258.8
Yakima	59,740	5	1,174	2,132	0.84	356.9
Vancouver	59,225	4	1,125	1,934	0.68	326.6
Bellingham	57,020	3	704	1,380	0.53	242.0
25,000 to 50,000						
Kennewick	46,960	1	676	1,275	0.21	271.5
Renton	43,970	6	1,299	2,009	1.36	456.9
Kirkland	41,900	0	786	1,385	0.00	330.5
Kent	41,880	6	1,312	1,964	1.43	469.0
Redmond	39,390	1	471	1,034	0.25	262.5
Olympia	36,740	1	672	1,442	0.27	392.5
Bremerton	35,920	3	694	1,269	0.84	353.3
Richland	35,430	2	395	759	0.56	214.2
Auburn	34,970	6	790	1,273	1.72	364.0
Longview	33,080	0	614	1,015	0.00	306.8
Lynnwood	31,680	3	880	1,341	0.95	423.3
Edmonds	31,100	1	262	495	0.32	159.2
Walla Walla	28,730	2	265	623	0.70	216.8
Burien	27,610	0	430	699	0.00	253.2
Puyallup	26,680	3	516	914	1.12	342.6
Bothell	25,440	2	385	577	0.79	226.8
15,000 to 25,000						
Lacey	24,280	1	477	774	0.41	318.8
Pullman	23,770	1	100	281	0.42	118.2
Wenatchee	23,460	0	248	520	0.00	221.7
Sea Tac	22,800	2	771	1,177	0.88	516.2
Pasco	22,170	4	356	623	1.80	281.0
Des Moines	21,330	3	166	243	1.41	113.9
Mercer Island	21,270	2	162	327	0.94	153.7
Mount Vernon	20,950	1	276	549	0.48	262.1
Mountlake Terrace	19,920	0	224	389	0.00	195.3
Oak Harbor	19,000	0	127	231	0.00	121.6
Port Angeles	18,310	0	234	475	0.00	259.4
Bainbridge Island	17,510	0	81	176	0.00	100.5
Aberdeen	16,750	0	225	578	0.00	345.1
Marysville	15,530	0	242	448	0.00	288.5
10,000 to 15,000						
Tukwila	14,690	3	973	1,434	2.04	976.2
Mukilteo	14,500	0	195	275	0.00	189.7
Ellensburg	12,860	0	50	226	0.00	175.7
Centralia	12,520	1	277	570	0.80	455.3
Anacortes	12,510	1	95	170	0.80	135.9
Moses Lake	12,190	0	187	369	0.00	302.7
Kelso	11,850	2	281	502	1.69	423.6
Sunnyside	11,660	0	102	213	0.00	182.7
Turnwater	11,200	0	186	380	0.00	339.3

*Includes collisions occurring on the interstate system

Source: WSP, OFM

** Deaths/collisions per 10,000 population

II. Drinking Drivers



Collisions where law enforcement reports noted the involvement of drinking drivers are summarized in Tables 2-1 and 2-2. Table 2-1 shows all drinking driver collisions, both DUI drivers and those for whom the extent of impairment was unknown or where the driver was drinking but "ability not impaired" was noted by police. Table 2-2 summarizes collisions involving DUI drivers only. The percentage of all traffic fatalities that involved drinking drivers was 44.0% in 1994, and the percent involving DUI drivers was 38.0%. Impaired drivers continue to account for a substantial portion of traffic fatalities in Washington State.

Table 2-1: Drinking driver* collisions
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total collisions	12,387	12,725	14,113	14,776	15,998	14,403	-14.0%
Number of drinking drivers	12,974	13,341	14,813	15,470	16,760	15,096	-14.1%
Fatal collisions	244	267	278	300	372	304	-19.8%
Injury collisions	6,718	6,981	7,698	8,020	8,667	7,842	-14.3%
Prpty damage only**	5,425	5,477	6,137	6,456	6,959	6,257	-13.3%
Persons killed	281	306	308	335	431	345	-18.6%
Percent of all traffic fatalities	44.0%	46.3%	47.3%	49.0%	52.2%	48.7%	-9.7%
Total injuries	10,557	11,022	12,108	12,575	13,749	12,364	-14.6%
Serious injuries	1,385	1,596	1,938	2,132	2,476	2,036	-32.0%
Evident injuries	4,850	5,083	5,549	5,944	6,486	5,766	-15.9%
Possible injuries	4,322	4,343	4,621	4,499	4,767	4,563	-5.3%
Economic loss in \$millions+	\$464.0	\$500.5	\$531.4	\$571.7	\$689.3	\$573.2	-19.1%

* All drinking drivers, including DUI

Source: WSP, National Safety Council

** Damage over \$500

+ In \$millions; based on National Safety Council estimates in constant 1994 dollars.

Death=\$920,000; serious inj=\$46,000; evident inj=\$14,000; possible inj=\$8,800; ppty dmg only=\$6,600.

Table 2-2: Collisions involving drivers under the influence (DUI)
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total collisions	7,933	8,204	8,990	9,237	9,887	9,080	-12.6%
DUI drivers	7,984	8,283	9,086	9,331	9,973	9,168	-12.9%
Fatal collisions	213	241	243	271	320	269	-20.7%
Injury collisions	4,510	4,747	5,174	5,375	5,604	5,225	-13.7%
Prop. damage only*	3,210	3,216	3,573	3,591	3,963	3,586	-10.5%
Persons killed	243	279	269	304	371	306	-20.5%
% of all traffic fatalities	38.0%	42.2%	41.3%	44.5%	45.0%	43.3%	-12.1%
Total injuries	7,170	7,603	8,267	8,598	9,016	8,371	-14.3%
Serious injuries	1,029	1,213	1,455	1,616	1,801	1,521	-32.4%
Evident injuries	3,435	3,664	3,876	4,203	4,322	4,016	-14.5%
Possible injury	2,706	2,726	2,936	2,779	2,893	2,834	-4.5%

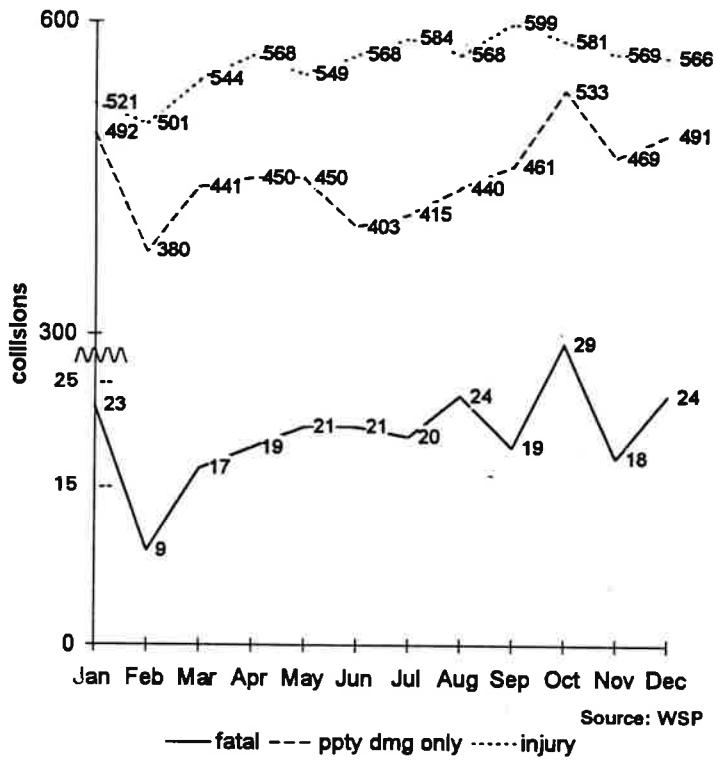
* Minimum damage: \$500

Source: WSP

II / Alcohol Involvement

Drinking driver collisions by month are summarized in Figure 2-1.

Figure 2-1:
Drinking-driver-related collisions
By severity and month - 1994



Persons killed and injured in drinking driver collisions are summarized by vehicle occupant/non-occupant status in Table 2-3.

Table 2-3: Persons killed & injured in drinking driver collision
By status & injury severity - 1994

status	killed	injury severity			total injured
		serious	evident	possible	
Drivers (no m/cyclists)	178	804	3,181	2,650	6,635
Passengers (no m/cyclists)	67	431	1,397	1,573	3,401
Motorcyclists	16	107	159	48	314
Pedestrians	15	30	65	31	126
Pedalcyclists	5	10	38	16	64
Other/unknown	0	3	10	4	17
Total	281	1,385	4,850	4,322	10,557

Source: WSP

Table 2-4 displays the numbers of persons killed and injured in drinking driver collisions by age group and sex. Young adults and males account for the majority of injuries and fatalities.

Table 2-4: Persons killed & injured in drinking-driver collisions
By age group and sex - 1994

age	killed	total injured	serious injury	evident injury	possible injury
0 - 4	8	145	15	64	66
5 - 9	5	166	15	72	79
10 - 14	6	267	30	122	115
15 - 19	24	1,336	175	628	533
20 - 24	40	2,049	282	976	791
25-34	80	2,993	431	1,421	1,141
35-44	55	1,931	252	905	774
45-54	37	829	98	335	396
55-64	10	338	36	136	166
65-74	8	166	15	78	73
75 & older	6	73	11	22	40
Age not stated	2	264	25	91	148
Males	223	6,824	946	3,383	2,495
Females	58	3,696	437	1,449	1,810
Sex not stated	0	37	2	18	17
Total	281	10,557	1,385	4,850	4,322

Source: WSP

Location of drinking-driver collisions

County roads recorded 93 fatal collisions involving drinking drivers followed by state routes and city streets. City streets had a total of 4,429 total collisions involving drinking drivers (Table 2-5).

**Table 2-5: Drinking driver collisions and highway type
By severity - 1994**

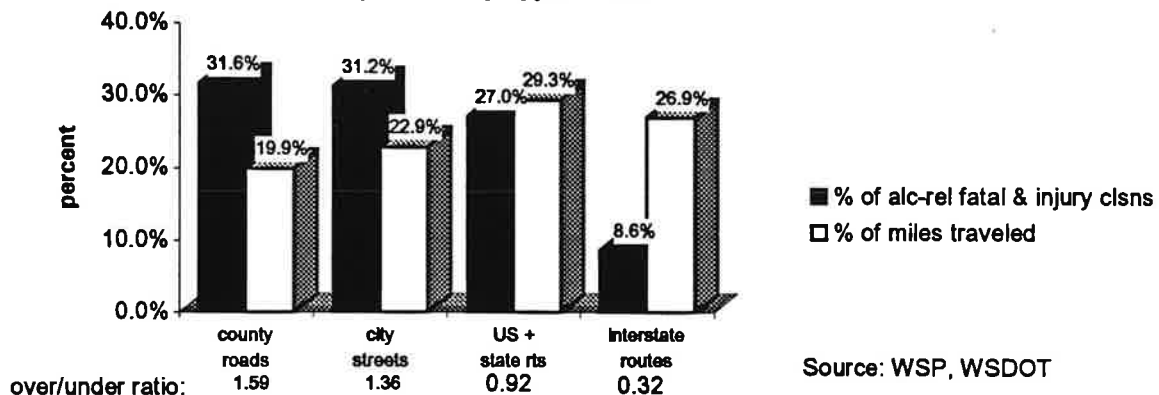
roadway type	fatal collisions	injury collisions	ppty dmg collisions	total collisions	fatal clsns per 1,000 collisions
County roads	93	2,105	1,440	3,638	25.6
State routes - rural	61	1,169	718	1,948	31.3
City streets	35	2,136	2,258	4,429	7.9
Interstate	27	571	450	1,048	25.8
State routes - urban	17	633	487	1,137	15.0
Other traffic ways *	11	104	72	187	58.8
Total	244	6,718	5,425	12,387	19.7

Source: WSP

*Includes parks/forest service roads. Does not include all-terrain-vehicle trails.

Interstate routes accounted for 8.6% of drinking-driver-related fatal and injury collisions as compared to 26.9% of the miles traveled in the state. County roads had 31.6% of the drinking-driver-related fatal and injury collisions and only 19.9% of the miles traveled (Figure 2-2).

**Figure 2-2:
Drinking driver fatal and injury collisions
By roadway type - 1994**



Source: WSP, WSDOT

Table 2-6 presents data on drinking-driver-related single and multiple-vehicle collisions in urban and rural areas (2,500 or more population designates urban). Urban multiple-vehicle collisions and rural single-vehicle collisions accounted for most of Washington State's 1994 drinking-driver-related traffic collisions, with 33.0% and 33.4% of the total. However, rural single-vehicle collisions were much more deadly, with 109 fatal collisions.

Table 2-6: Alcohol-related collisions - 1994
Urban/rural, single/multiple-vehicle by severity*

collisions	urban		rural		total
Single-vehicle					
Fatal	35	0.3%	109	0.9%	144
Injury	943	7.7%	2,386	19.6%	3,329
Prop dmg	949	7.8%	1,575	12.9%	2,524
Total single-veh	1,927	15.8%	4,070	33.4%	5,997
Multiple-vehicle					
Fatal	22	0.2%	60	0.5%	82
Injury	1,998	16.4%	1,229	10.1%	3,227
Prop dmg	1,998	16.4%	882	7.2%	2,880
Total multiple-veh	4,018	33.0%	2,171	17.8%	6,189
Total	5,945	48.8%	6,241	51.2%	12,186

Source: WSP

*Does not include collisions with pedestrians, bicyclists, trains or animals.

Drinking drivers

In fatal collisions, 30.4% of all drivers had been drinking. The percentage of drivers drinking in injury and total collisions was lower, with 9.4% and 8.1% respectively (Table 2-7).

Table 2-7: Sobriety of drivers in collisions
By collision severity - 1994

sobriety of driver	fatal collisions		injury collisions		total collisions	
	count	percentage	count	percentage	count	percentage
Had been drinking - ability impaired	217	26.1%	4,545	6.1%	7,984	5.0%
Had been drinking - ability not impaired	25	3.0%	1,138	1.5%	2,236	1.4%
Had been drinking - sobriety unknown	11	1.3%	1,356	1.8%	2,754	1.7%
Total drivers drinking	253	30.4%	7,039	9.4%	12,974	8.1%
Had not been drinking	578	69.6%	67,853	90.6%	146,542	91.9%
Total drivers with known sobriety	831	100.0%	74,892	100.0%	159,516	100.0%
Sobriety not stated	29	—	27,336	—	73,583	—

Source: WSP

II / Alcohol Involvement

Drinking-driver collisions involving 25-34 year old drivers accounted for the largest percentage of all drinking driver collisions, with 34.0%, while this group represents only 21.9% of the total licensed drivers. The 55 and older group accounted for 6.3% of drinking-driver-related collisions while representing 23.0% of the licensed drivers. The 21-24 year age group had the highest over-representation ratio.

**Figure 2-3:
Percent of all alcohol-related
collisions & licensed drivers
By age group - 1994**

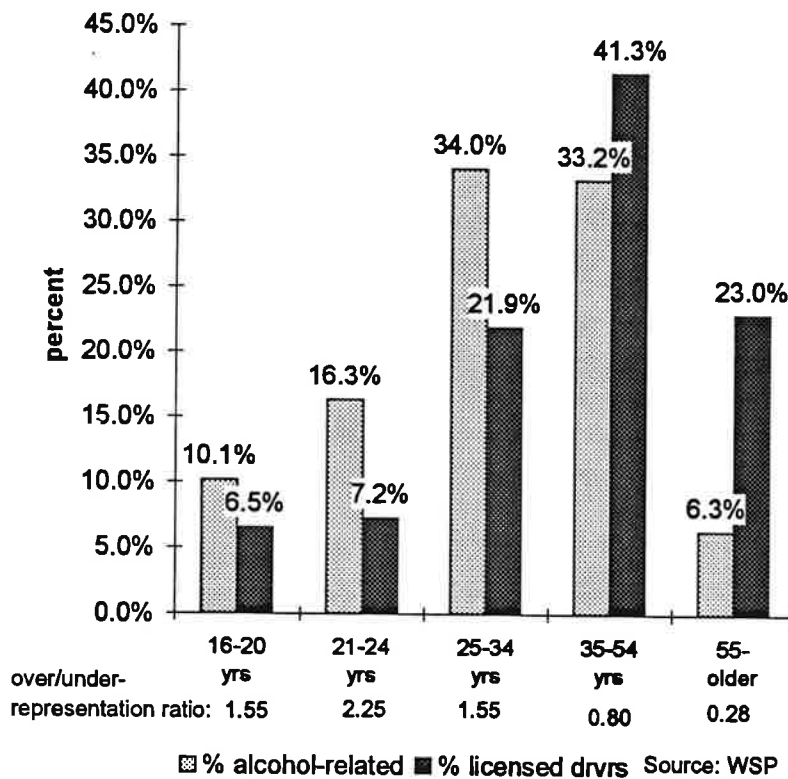


Table 2-8 displays the number of drinking drivers by age groups involved in fatal and total collisions in 1994. The age group of 20 to 24 had the highest number of drivers involved in fatal collisions with 43. Drivers under age 35 were over-represented with respect to the percentage of vehicle miles traveled.

Table 2-8: "Had been drinking" drivers in collisions
Fatal and total collisions by age & sex - 1994

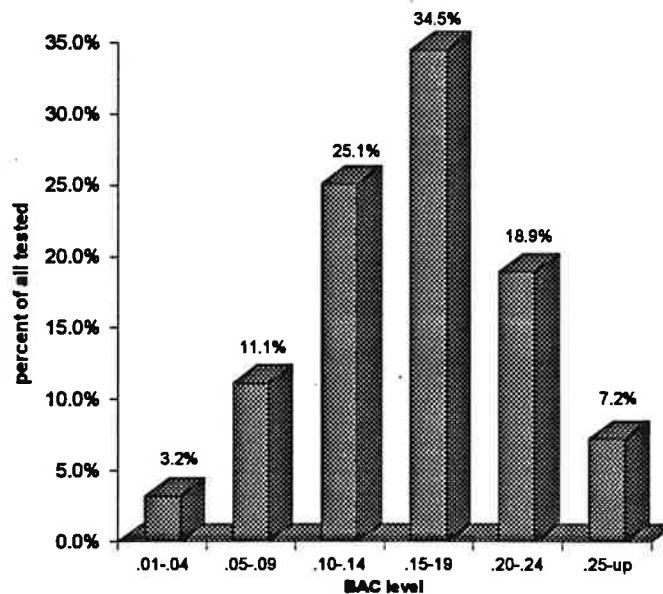
drivers	% of miles traveled*	fatal collisions	%	over-under ratio	total collisions	%	over-under ratio
15 & under	----	1	0.4%	----	43	0.3%	----
18-19	3.3%	19	7.5%	2.28	883	6.8%	2.06
20-24	8.5%	43	17.0%	2.01	2,388	18.4%	2.18
25-29	12.8%	42	16.6%	1.30	2,146	16.5%	1.29
30-34	14.9%	40	15.8%	1.06	2,116	16.3%	1.09
35-39	15.2%	30	11.9%	0.78	1,721	13.3%	0.87
40-44	12.8%	27	10.7%	0.84	1,226	9.4%	0.74
45-49	10.1%	19	7.5%	0.75	747	5.8%	0.57
50-54	6.8%	15	5.9%	0.87	460	3.5%	0.52
55-59	5.1%	1	0.4%	0.08	267	2.1%	0.40
60-64	3.8%	3	1.2%	0.31	202	1.6%	0.41
65-69	2.9%	1	0.4%	0.14	140	1.1%	0.37
70 & over	3.9%	11	4.3%	1.12	185	1.4%	0.37
Not stated	----	1	0.4%	----	450	3.5%	----
Male	56.0%	219	86.6%	1.55	9,953	76.7%	1.37
Female	44.0%	34	13.4%	0.31	2,737	21.1%	0.48
Sex not stated			----	----	264	----	----
Total		253	100.0%	----	12,974	100.0%	----

Source: WSP, USDOT

* Percent of miles traveled estimate from 1990 Nationwide Personal Transportation Study - USDOT

Figure 2-4:
BAC levels of drivers in collisions* 1994

Figure 2-4 summarizes BAC levels of drivers involved in collisions. BAC levels of .15 to .19 were most frequent. Over half had levels above .15, more than 85% were above the per se BAC limit of .10.



* Drivers with positive BACs only.

Source: WSP

II / Alcohol Involvement

Data on the BAC levels for drinking drivers in fatal crashes are shown in Figure 2-5. The numbers of drivers with BACs of .15 and under has decreased significantly over the past nine years, while the numbers of higher-BAC drivers in fatal crashes has improved only over the last four years.

**Figure 2-5:
Driver BAC levels in fatal collisions
9-year comparison**

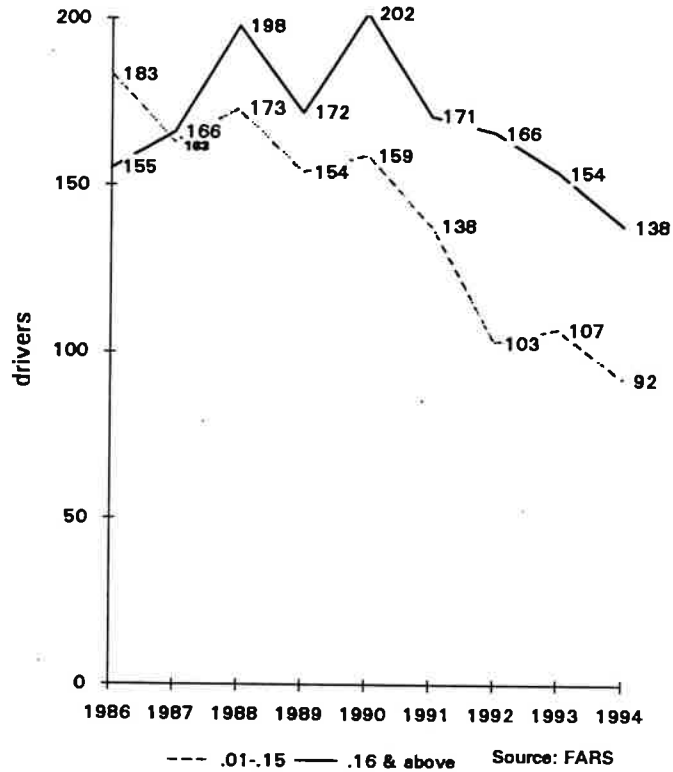


Table 2-9 presents the number of fatally injured drivers with positive tests for blood alcohol, and the average BAC levels of those drivers as reported by the state toxicologist. The number of positive BAC, fatally injured drivers has gone down during the last four years, but the average BAC increased from 0.17 to 0.20. The highest average BAC level was in the 45-54 age group.

**Table 2-9: Drivers with positive BAC readings who were killed
Three-year comparison - by age group**

age group	1994		1993		1992		1991	
	dvrs	avg BAC	dvrs	avg BAC	dvrs	avg BAC	dvrs	avg BAC
16 - 20	15	0.16	16	0.15	12	0.13	20	0.18
21 - 24	19	0.19	33	0.18	39	0.18	31	0.17
25 - 34	48	0.21	53	0.19	55	0.19	62	0.17
35 - 44	38	0.19	33	0.17	40	0.20	30	0.21
45 - 54	22	0.24	18	0.25	9	0.23	18	0.23
55 - 64	4	0.20	3	0.17	5	0.13	8	0.18
65 & older	5	0.18	5	0.15	4	0.12	5	0.13
Total	151	0.20	161	0.18	164	0.17	174	0.17

Source: State Toxicologist

DUI & physical control citations and dispositions

The number of DUI citations filed in the state decreased over the preceding year along with the number of persons who were convicted of the original charge. The number of cases convicted on reduced charges have increased over the past 10 years (Table 2-10).

**Table 2-10: Court dispositions for DUI/Physical Control
Ten-year comparison**

	citations filed	convicted	reduced charges	deferred prosecution	not guilty
1985	36,151	17,530	5,298	5,541	1,207
1986	38,041	19,086	5,506	5,431	723
1987	33,848	15,528	6,407	5,322	640
1988	34,920	14,605	6,071	6,085	565
1989	40,060	16,012	7,454	6,840	546
1990	42,075	15,800	7,969	7,906	499
1991	38,610	17,502	8,767	8,424	437
1992	44,144	20,682	9,420	9,879	529
1993	45,139	23,239	10,135	9,471	413
1994	41,408	17,103	10,646	9,308	316

Source: OAC

II / Alcohol Involvement

Drinking-driver collisions by county and city

Table 2-11 compares total collisions with drinking-driver-related collisions by county. The highest percentage of drinking-driver-related collisions to total collisions was in San Juan County, where 23.7% of total collisions were drinking-driver-related. The lowest percentage was in King and Whitman Counties, where 7.3% of collisions were drinking-driver-related.

Table 2-11: Drinking-driver collisions* vs total collisions
By county - 1994

county	fatal collisions	DD fatal collisions	percent DD-relate	total collisions	DD collisions	percent DD-related
Adams	7	1	14.3%	354	39	11.0%
Asotin	1	1	100.0%	236	37	15.7%
Benton	12	6	50.0%	2,603	207	8.0%
Chelan	6	2	33.3%	1,477	152	10.3%
Callam	4	3	75.0%	1,154	117	10.1%
Clark	26	12	46.2%	5,884	548	9.3%
Columbia	0	0	—	122	10	8.2%
Cowlitz	10	5	50.0%	2,299	241	10.5%
Douglas	5	3	60.0%	507	82	16.2%
Ferry	2	2	100.0%	153	30	19.6%
Franklin	14	5	35.7%	860	96	11.2%
Garfield	1	1	—	76	8	10.5%
Grant	12	5	41.7%	1,244	189	15.2%
Grays Harbor	6	1	16.7%	1,666	202	12.1%
Island	6	2	33.3%	820	114	13.9%
Jefferson	5	2	40.0%	436	59	13.5%
King	108	39	36.1%	46,083	3,353	7.3%
Kitsap	22	10	45.5%	4,197	462	11.0%
Kittitas	11	6	54.5%	1,219	119	9.8%
Klickitat	3	1	33.3%	357	45	12.6%
Lewis	17	4	23.5%	1,884	192	10.2%
Lincoln	2	0	0.0%	190	26	13.7%
Mason	10	7	70.0%	1,003	179	17.8%
Okanogan	9	3	33.3%	775	137	17.7%
Pacific	4	2	50.0%	452	75	16.6%
Pend Oreille	5	2	40.0%	220	28	12.7%
Pierce	54	19	35.2%	15,717	1,543	9.8%
San Juan	2	2	100.0%	135	32	23.7%
Skagit	15	5	33.3%	2,190	355	16.2%
Skamania	0	0	—	223	30	13.5%
Snohomish	43	24	55.8%	11,013	1,239	11.3%
Spokane	39	16	41.0%	9,900	811	8.2%
Stevens	7	4	57.1%	583	104	17.8%
Thurston	27	10	37.0%	4,365	405	9.3%
Wahkiakum	2	1	50.0%	85	11	12.9%
Walla Walla	9	5	55.6%	1,055	108	10.2%
Whatcom	20	11	55.0%	3,018	361	12.0%
Whitman	11	1	9.1%	730	53	7.3%
Yakima	37	21	56.8%	4,614	588	12.7%
Total	574	244	42.5%	129,899	12,387	9.5%

Source: WSP

* A collision in which one or more drivers involved had been drinking.

A five-year comparison of collisions by county where drivers "had been drinking" (including DUI) reveals that 7 counties experienced increases in drinking-driver-related collisions during 1994 compared to the previous 4-year average, and 32 counties recorded reductions (Table 2-12).

Table 2-12: Drinking driver collisions*

Five-year comparison by county

county	1994	1993	1992	1991	1990	%94 vs	
						prev 4-yr avg	prev 4-yr avg
Adams	39	51	44	44	41	45	-13.3%
Asotin	37	21	38	36	38	33	11.3%
Benton	207	232	222	230	249	233	-11.3%
Chelan	152	145	159	170	180	164	-7.0%
Clallam	117	131	171	125	157	146	-19.9%
Clark	548	572	601	622	725	630	-13.0%
Columbia	10	19	21	22	20	21	-51.2%
Cowlitz	241	249	263	244	290	262	-7.8%
Douglas	82	68	56	67	63	64	29.1%
Ferry	30	23	46	34	51	39	-22.1%
Franklin	96	117	135	144	138	134	-28.1%
Garfield	8	8	3	5	5	5	52.4%
Grant	189	162	181	183	174	175	8.0%
Grays Harbor	202	219	235	276	300	258	-21.6%
Island	114	100	124	124	138	122	-6.2%
Jefferson	59	51	67	80	96	74	-19.7%
King	3,353	3,368	3,769	4,044	4,530	3,928	-14.6%
Kitsap	462	557	667	705	721	663	-30.3%
Kittitas	119	105	121	134	133	123	-3.4%
Klickitat	45	53	60	64	63	60	-25.0%
Lewis	192	199	209	226	230	216	-11.1%
Lincoln	26	25	36	35	25	30	-14.0%
Mason	179	174	209	179	197	190	-5.7%
Okanogan	137	106	126	123	138	123	11.2%
Pacific	75	80	80	88	92	85	-11.8%
Pend Oreille	28	27	27	39	42	34	-17.0%
Pierce	1,543	1,699	1,877	1,977	2,122	1,919	-19.6%
San Juan	32	38	39	37	44	40	-19.0%
Skagit	355	300	328	312	323	316	12.4%
Skamania	30	33	44	41	48	42	-27.7%
Snohomish	1,239	1,285	1,375	1,551	1,729	1,485	-16.6%
Spokane	811	854	929	931	934	912	-11.1%
Stevens	104	89	101	93	94	94	10.3%
Thurston	405	414	505	482	503	476	-14.9%
Wahkiakum	11	15	15	10	13	13	-17.0%
Walla Walla	108	101	119	114	130	116	-6.9%
Whatcom	361	367	412	423	447	412	-12.4%
Whitman	53	57	63	77	63	65	-18.5%
Yakima	588	611	636	685	712	661	-11.0%
Total	12,387	12,725	14,113	14,776	15,998	14,403	-14.0%

Source: WSP

* A collision in which one or more drivers involved had been drinking.

II / Alcohol Involvement

Table 2-13 summarizes drinking-driver-related fatalities, injuries and collisions by county.

Table 2-13: Drinking-driver-related* fatalities, injuries and collisions
By county and street type - 1994

county	fatalities	injuries				collisions				
		serious injury	evident injury	possible injury	total injuries	city streets	state routes**	county roads	other roads	total clsns
Adams	1	2	19	2	23	7	18	12	2	39
Asotin	1	4	10	5	19	14	9	14	0	37
Benton	6	18	94	54	166	92	79	36	0	207
Chelan	12	22	70	27	119	26	61	55	10	152
Clallam	3	17	56	34	107	23	66	25	3	117
Clark	13	75	221	196	492	128	161	251	8	548
Columbia	0	0	13	0	13	0	2	6	2	10
Cowlitz	5	28	112	71	211	102	77	61	1	241
Douglas	3	20	34	12	66	14	41	27	0	82
Ferry	2	10	17	5	32	1	18	11	0	30
Franklin	5	10	33	27	70	43	21	31	1	96
Garfield	2	1	4	0	5	1	4	2	1	8
Grant	10	35	101	51	187	52	79	58	0	189
Grays Harbor	1	30	79	37	146	52	87	51	12	202
Island	2	17	46	29	92	5	40	67	2	114
Jefferson	2	8	27	17	52	5	30	19	5	59
King	42	368	1,063	1,449	2,880	1,814	1,113	412	14	3,353
Kitsap	10	51	163	139	353	95	143	221	3	462
Kittitas	6	15	49	30	94	22	61	25	11	119
Klickitat	1	12	24	7	43	1	30	14	0	45
Lewis	4	25	65	40	130	36	82	69	5	192
Lincoln	0	7	8	3	18	1	16	9	0	26
Mason	7	33	83	75	191	11	82	76	10	179
Okanogan	3	23	74	37	134	12	58	63	4	137
Pacific	2	7	36	17	60	6	43	24	2	75
Pend Oreille	2	9	7	9	25	4	13	11	0	28
Pierce	21	125	632	658	1,415	522	478	533	10	1,543
San Juan	2	5	12	3	20	3	0	29	0	32
Skagit	9	34	159	112	305	82	141	127	5	355
Skamania	0	4	12	10	26	2	10	7	11	30
Snohomish	25	104	480	440	1,024	361	465	407	6	1,239
Spokane	17	82	323	289	694	372	184	245	10	811
Stevens	4	14	61	29	104	6	37	58	3	104
Thurston	12	44	146	138	328	143	78	178	6	405
Wahkiakum	1	1	8	2	11	0	6	5	0	11
Walla Walla	8	7	59	17	83	56	29	22	1	108
Whatcom	11	35	155	86	276	84	114	140	23	361
Whitman	1	8	29	8	45	14	23	15	1	53
Yakima	25	75	266	157	498	217	134	222	15	588
Total	281	1,385	4,850	4,322	10,557	4,429	4,133	3,638	187	12,387

* A collision in which one or more drivers involved had been drinking.

** Includes interstate and U.S. routes.

Source: WSP

Table 2-14 displays drinking-driver-related collisions in cities over 10,000 population. The highest rate was in Tukwila, with 66.7 per 10,000 population. Sea-Tac and Kelso were next highest, with rates of 49.1 and 43.0, respectively.

Table 2-14: Drinking-driver-related collisions*

Cities over 10,000 population - 1994

	population	fatal	injury	ppty dmg only	total collisions	collision rate**
<i>250,000 and over</i>						
Seattle	531,400	8	728	642	1,378	25.9
<i>100,000 to 250,000</i>						
Spokane	185,600	4	221	199	424	22.8
Tacoma	182,800	6	278	249	533	29.2
<i>50,000 to 100,000</i>						
Bellevue	99,140	0	65	67	132	13.3
Everett	78,240	8	134	111	253	32.3
Federal Way	73,500	4	85	69	158	21.5
Yakima	59,740	2	76	87	165	27.6
Vancouver	59,225	0	80	74	154	26.0
Bellingham	57,020	1	38	41	80	14.0
<i>25,000 to 50,000</i>						
Kennewick	46,960	1	53	29	83	17.7
Renton	43,970	5	80	50	135	30.7
Kirkland	41,900	0	37	40	77	18.4
Kent	41,880	2	72	53	127	30.3
Redmond	39,390	1	36	34	71	18.0
Olympia	36,740	0	33	42	75	20.4
Bremerton	35,920	1	42	48	91	25.3
Richland	35,430	2	20	21	43	12.1
Auburn	34,970	0	47	49	96	27.5
Longview	33,080	0	45	33	78	23.6
Lynnwood	31,680	1	49	36	86	27.1
Edmonds	31,100	1	14	19	34	10.9
Walla Walla	28,730	1	30	26	57	19.8
Burien	27,610	0	38	51	89	32.2
Puyallup	26,680	1	39	32	72	27.0
Bothell	25,440	2	31	38	71	27.9
<i>15,000 to 25,000</i>						
Lacey	24,280	0	29	32	61	25.1
Pulman	23,770	0	9	8	17	7.2
Wenatchee	23,460	0	9	20	29	12.4
Sea Tac	22,800	0	65	47	112	49.1
Pasco	22,170	0	20	34	54	24.4
Des Moines	21,330	2	10	14	26	12.2
Mercer Island	21,270	2	14	13	29	13.6
Mount Vernon	20,950	0	20	34	54	25.8
Mountlake Terrace	19,920	0	20	17	37	18.6
Oak Harbor	19,000	0	6	5	11	5.8
Port Angeles	18,310	0	15	18	33	18.0
Bainbridge Island	17,510	0	15	16	31	17.7
Aberdeen	16,750	0	9	33	42	25.1
Marysville	15,530	0	16	26	42	27.0
<i>10,000 to 15,000</i>						
Tukwila	14,690	2	55	41	98	66.7
Mukilteo	14,500	0	14	19	33	22.8
Ellensburg	12,860	0	4	14	18	14.0
Centralia	12,520	0	19	18	37	29.6
Anacortes	12,510	0	12	11	23	18.4
Moses Lake	12,190	0	26	26	52	42.7
Kelso	11,850	1	21	29	51	43.0
Sunnyside	11,660	0	9	17	26	22.3
Turnwater	11,200	0	10	18	28	25.0

Source: WSP, OFM

* A collision in which one or more drivers involved had been drinking.

**Drinking-driver-related collisions per 10,000 population

III. Safety Restraint Use



Much of the restraint usage data in this summary are based upon collision investigation reports by law enforcement officers. Direct observation is usually not possible, so the investigating officer must rely on questioning those involved as to their seat belt use. There is a tendency for occupants to falsely report compliance with the seat belt law and the reported usage rates become artificially inflated. The collision-based rates are best used for comparison purposes.

The best available estimates of actual restraint use are from observational surveys. These studies are limited to shoulder-belt use by drivers and front-window-seat occupants of passenger vehicles.

Observed safety restraint use

Since the passage of the seat belt law in 1986, a steady increase in restraint usage has been associated with reductions of fatalities and serious injuries. Observed belt use in passenger vehicles was 36% in 1986; it has more than doubled to 81% in 1994 (Table 3-1).

Table 3-1: Observed seatbelt use, deaths and injuries
Nine-year comparison

	1994	1993	1992	1991	1990	1989	1988	1987	1986 +
Observed SB use rate *	81%	78%	73%	69%	---	55%	53%	52%	36%
Fatal rate **	1.34	1.42	1.34	1.50	1.87	1.83	1.88	2.05	1.96
Serious injury rate **	11.18	12.31	13.43	14.98	17.33	18.84	19.95	22.08	22.92
Deaths	639	661	651	683	825	781	785	790	714
Serious injuries	5,331	5,713	6,531	6,839	7,653	8,044	8,318	8,506	8,348
Motor vehicle travel	47,674	46,426	48,644	45,663	44,157	42,696	41,698	38,520	36,416

Source: WSP, DOT, WTSC

* Statewide surveys conducted by WTSC each year except 1990.

** Fatalities/serious injuries per 100 million miles of travel.

+Seatbelt law passed in 1986.

III / Safety Restraint Use

Western Washington occupants were observed wearing safety restraints at a rate of 82.3%, while Eastern Washington's rate was 73.3%. Both Western and Eastern Washington's rates increased over 1993, and have increased more than 9 percent over the previous 3-year average. Interstate highway travel had the highest rate at 84.8%, while the rate for city streets was lowest at 68.3%. More lanes of travel and higher speeds were associated with higher use-rates (Table 3-2).

Table 3-2: Observed belt use
Four-year comparison* by roadway characteristics

characteristic	1994	1993	1992	1991	prev 3-yr avg	'94 vs prev 3-yr avg
Western Washington	82.3%	80.4%	75.6%	70.3%	75.4%	9.1%
Eastern Washington	73.3%	70.1%	66.5%	64.3%	67.0%	9.5%
Interstate highways	84.8%	80.9%	75.4%	71.9%	76.1%	11.5%
State routes	75.9%	74.4%	69.7%	66.1%	70.1%	8.3%
US routes	75.0%	73.0%	68.3%	67.2%	69.5%	7.9%
County roads	69.8%	66.5%	60.1%	71.8%	66.1%	5.5%
City streets	68.3%	70.9%	62.3%	62.5%	65.2%	4.7%
Three or more lanes+	85.3%	82.5%	76.5%	72.9%	77.3%	10.3%
Two lanes+	77.7%	73.7%	69.4%	68.3%	70.5%	10.3%
One lane+	73.2%	72.4%	67.5%	60.9%	66.9%	9.4%
Average speed 20 mph	65.7%	68.7%	61.6%	62.1%	64.1%	2.4%
Average speed 40 mph	74.5%	72.0%	66.5%	64.0%	67.5%	10.4%
Average speed 60 mph	83.1%	79.2%	74.4%	72.3%	75.3%	10.4%
Commuter rush hours	79.9%	77.0%	72.2%	70.5%	73.2%	9.1%
Non-rush hours	80.6%	77.7%	73.6%	67.8%	73.0%	10.4%

* Observational surveys performed in September of each year.

Source: WTSC

+ For one direction of travel

Types of restraints used

Table 3-3 and Figure 3-1 summarize the types of restraint systems used and severity of injuries sustained. The higher the level of injury sustained, the less likely was a safety restraint used. Persons sustaining evident injuries were nearly twice as likely to be wearing safety restraints as those persons killed.

Table 3-3: Types of restraints used* in collisions
By severity of injury - 1994

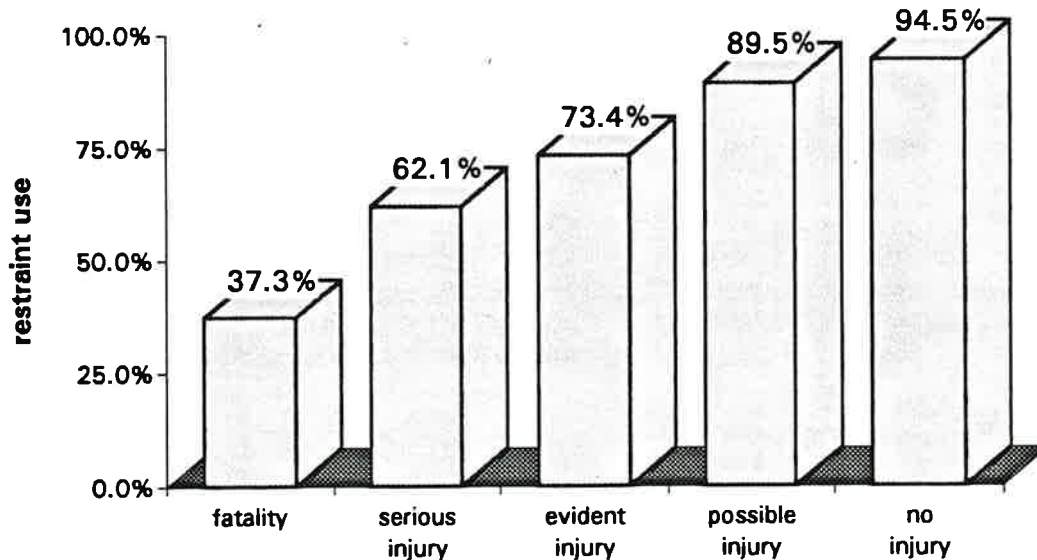
restraint type	killed	serious injury	evident injury	possible injury	no injury	total
Lap & shoulder belt	130	1,927	11,050	28,225	129,471	170,803
Lap belt	17	253	1,752	2,726	15,877	20,625
Shoulder belt	12	85	288	510	2,895	3,790
Child restraint	5	12	175	294	3,558	4,044
Air bag**/belted	4	37	242	227	302	812
Air bag**/no belt	3	13	28	6	31	81
Total restraints	171	2,327	13,535	31,988	152,134	200,155
No restraints	288	1,422	4,893	3,741	8,772	19,116
Percent used	37.3%	62.1%	73.4%	89.5%	94.5%	91.3%

* Where restraint use was stated.

Source: WSP

** Air bag activated.

Figure 3-1:
Safety restraint* use and injury severity - 1994



* Includes lap belts, shoulder straps, child restraints and airbags

Source: WSP

III / Safety Restraint Use

Table 3-4 displays restraint systems used in collisions by various age groupings. The age group of 11 to 15 had the lowest use rate. Overall, lap and shoulder belts were the most used safety restraint, followed by lap belt only. Child restraints were in use by 4,045 children in collisions, and air bags (with and without restraints) were deployed 894 times in collisions.

Table 3-4: Types of safety restraints used in collisions
By occupant age - 1994

age	lap & shldr belt	shldr belt	lap belt	air bag w/rstrnt	air bag no rstrnt	child restraint	total used	restraint not used	% used
Under 1	101	4	26	0	1	809	941	44	95.5%
1	194	6	63	0	0	1,240	1,503	70	95.5%
2	366	13	269	1	0	879	1,528	115	93.0%
3	631	11	443	1	0	523	1,609	142	91.9%
4	834	20	515	0	1	201	1,571	128	92.5%
5	743	23	487	1	0	73	1,327	122	91.6%
6 - 10	3,466	71	1,869	5	1	57	5,469	576	90.5%
11 - 15	5,070	121	1,833	14	0	--	7,038	1,488	82.5%
16 - 20	28,192	739	3,761	85	9	--	32,786	4,588	87.7%
21 - 24	17,949	410	1,614	83	8	--	20,064	2,586	88.6%
25 - 29	19,223	406	1,722	109	9	--	21,469	2,104	91.1%
30 - 64	78,018	1,615	6,629	424	45	--	86,731	5,922	93.6%
65 & over	12,787	274	903	82	6	--	14,052	699	95.3%
Unknown	3,423	78	493	8	1	263	4,266	551	88.6%
Total	170,997	3,791	20,627	813	81	4,045	200,354	19,135	91.3%

Source: WSP, WSDOT

Observational survey of restraint use by children under age 10

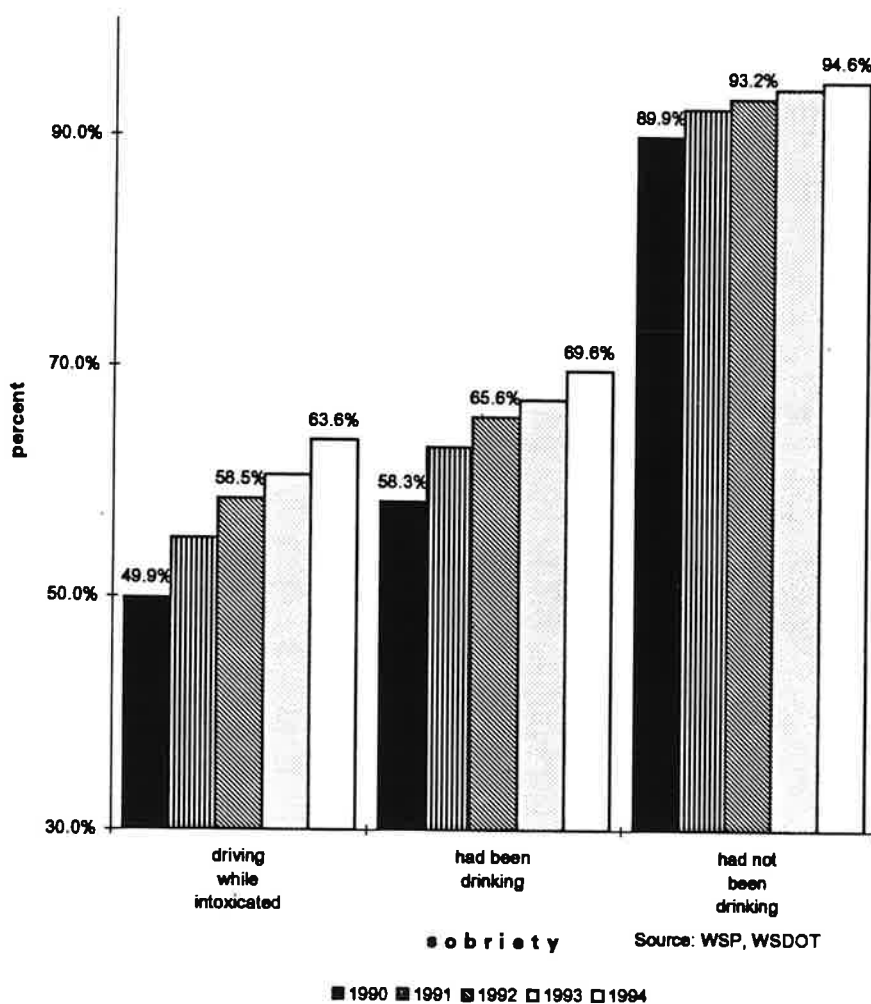
In October, 1994, the WTSC conducted an observational survey of children under ten riding in motor vehicles and found an overall usage rate of 77.9 percent. The older the child, the less likely they were to be in safety restraints. Also, lower restraint use was recorded for the child passengers of male drivers, drivers 16 to 25 years old, drivers who were themselves not using seat belts, low-value vehicles, and observations at medical facilities.

There was some type of misuse noted in 12.5 percent of children who were restrained. The younger the child, the more often safety-restraint misuse was noted. The most common types of misuse observed were "child too young for restraint type" and "infant seat not facing rear."

Restraint use by sobriety

Among drivers involved in 1994 collisions, those who had been drinking were less likely to be wearing restraints than non-drinking drivers. The restraint usage rate for the non-drinking category was reported at 94.6%. Drinking drivers had a much lower usage rate, with 63.6% for drivers under the influence and 69.6% for all drivers who had been drinking. Drivers in all three categories have recorded increasing use rates over the past five years (Figure 3-2).

Figure 3-2:
Restraint use by drivers in collisions
Five-year comparison by sobriety



III / Safety Restraint Use

Table 3-6 displays safety restraint use and injury severity in Washington counties. In most cases the percentage of safety-restraint use is lower as injury severity increases.

Table 3-5: Restraint use * and severity of injuries
By county - 1994

	fatality			serious injury			evident/possible injury			no injury		
	used	n/used	pct	used	n/used	pct	used	n/used	pct	used	n/used	pct
Adams	5	4	55.6%	20	15	57.1%	138	54	71.9%	361	38	90.5%
Asotin	0	1	0.0%	8	2	80.0%	32	21	60.4%	230	70	76.7%
Benton	3	11	21.4%	52	36	59.1%	838	200	80.7%	3,788	247	93.9%
Chelan	1	5	16.7%	46	27	63.0%	420	123	77.3%	1,710	103	94.3%
Cllallam	0	2	0.0%	22	23	48.9%	396	91	81.3%	1,371	97	93.4%
Clark	6	11	35.3%	112	67	62.6%	1,936	366	84.1%	6,312	432	93.6%
Columbia	0	0	—	2	0	100.0%	30	12	71.4%	98	10	90.7%
Cowlitz	1	3	25.0%	38	30	55.9%	762	244	75.7%	2,981	241	92.5%
Douglas	0	3	0.0%	12	20	37.5%	161	47	77.4%	629	62	91.0%
Ferry	0	1	0.0%	3	10	23.1%	35	23	60.3%	78	18	81.3%
Franklin	3	7	30.0%	17	25	40.5%	264	86	75.4%	940	88	91.4%
Garfield	0	0	—	2	0	100.0%	15	10	60.0%	46	6	88.5%
Grant	6	9	40.0%	41	47	46.6%	469	155	75.2%	1,458	172	89.4%
Grays Harbor	1	6	14.3%	32	31	50.8%	485	144	77.1%	1,907	185	91.2%
Island	4	2	66.7%	43	11	78.6%	328	55	85.6%	1,060	36	96.7%
Jefferson	5	3	62.5%	12	8	60.0%	147	44	77.0%	464	37	92.6%
King	30	33	47.6%	679	320	68.0%	15,557	1,860	89.3%	52,993	1,996	96.4%
Kitsap	6	8	42.9%	92	40	69.7%	1,702	282	85.8%	5,836	308	95.0%
Kititas	4	8	33.3%	25	10	71.4%	378	65	85.3%	1,434	90	94.1%
Klickitat	1	2	33.3%	5	16	23.8%	95	31	75.4%	351	20	94.6%
Lewis	8	6	57.1%	52	39	57.1%	582	177	76.7%	2,289	153	93.7%
Lincoln	1	2	33.3%	7	3	70.0%	76	22	77.6%	167	20	89.3%
Mason	2	4	33.3%	29	33	46.8%	338	162	67.6%	1,048	95	91.7%
Okanogan	0	7	0.0%	16	31	34.0%	152	96	61.3%	622	110	85.0%
Pacific	2	2	50.0%	11	3	78.6%	128	42	75.3%	383	35	91.6%
Pend Oreille	1	3	25.0%	8	12	40.0%	49	16	75.4%	188	26	87.9%
Pierce	12	23	34.3%	293	125	70.1%	6,870	1,150	85.7%	19,588	1,002	95.1%
San Juan	0	1	0.0%	2	5	28.6%	24	17	58.5%	74	22	77.1%
Skagit	9	5	64.3%	26	34	43.3%	770	213	78.3%	2,748	248	91.7%
Skamania	0	0	—	1	10	9.1%	52	12	81.3%	194	24	88.0%
Snohomish	13	26	33.3%	177	76	70.0%	4,402	745	85.5%	14,061	749	94.9%
Spokane	14	21	40.0%	201	88	69.6%	3,168	724	81.4%	8,959	675	93.0%
Stevens	3	4	42.9%	19	20	48.7%	180	99	64.5%	352	46	88.4%
Thurston	9	17	34.6%	84	61	57.9%	1,516	295	83.7%	6,064	279	95.6%
Wahkiakum	1	0	100.0%	4	0	100.0%	26	9	74.3%	103	3	97.2%
Walla Walla	6	6	50.0%	9	11	45.0%	268	100	72.8%	1,197	122	90.8%
Whatcom	6	8	42.9%	33	37	47.1%	1,082	244	81.6%	3,981	243	94.2%
Whitman	0	9	0.0%	20	11	64.5%	243	72	77.1%	831	54	93.9%
Yakima	6	27	18.2%	73	84	46.5%	1,409	526	72.8%	5,409	610	89.9%
Total	169	290	36.8%	2,328	1,421	62.1%	45,385	8,634	84.0%	152,305	8,772	94.6%

*Includes lap belts, shoulder straps, child restraints and air bags.

Source: WSP, DOT

IV. Youthful Drivers

In 1994, drivers age 24 and younger were involved in 48,179 total collisions that injured 35,281 persons, 2,217 serious injuries, and 225 fatalities. As a percentage of all fatalities, younger drivers accounted for 35.2 percent of traffic deaths. The rates of total and fatal collisions for drivers in this age group were 905.09 collisions per 10,000 licensed drivers and 3.68 fatal collisions per 10,000 youthful drivers (Table 4-1).



Table 4-1: Collisions involving youthful drivers (24 & younger)
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total collisions	48,179	46,189	47,588	48,564	50,906	48,312	-0.3%
Fatal collisions	198	223	219	221	261	231	-15.2%
Injury collisions	22,106	20,909	21,172	20,922	21,798	21,200	4.3%
Property damage only***	25,877	25,057	26,197	27,421	28,847	26,881	-3.7%
Persons killed**	225	274	243	255	301	268	-18.1%
Percent of all traffic fatalities	35.2%	41.5%	37.3%	37.3%	36.5%	38.1%	-7.7%
Total injuries**	35,281	33,275	33,805	32,546	34,225	33,463	5.4%
Serious injuries	2,217	2,465	2,805	3,017	3,409	2,924	-24.2%
Evident injuries	11,015	10,824	11,139	11,131	11,927	11,255	-2.1%
Possible injuries	22,049	19,986	19,861	18,398	18,889	19,284	14.3%
Youth licensed drivers	532,309	533,114	527,379	518,047	481,691	515,058	3.3%
Youth drivers in clans	54,464	52,215	54,066	55,559	58,026	54,967	-0.9%
Total collision rate*	905.09	866.40	902.35	937.44	1,056.82	940.75	-3.8%
Fatal collision rate*	3.68	4.18	4.15	4.27	5.42	4.51	-18.3%

*Youthful-driver fatal/total collisions per 10,000 youthful licensed drivers.

Source: WSP, DOL

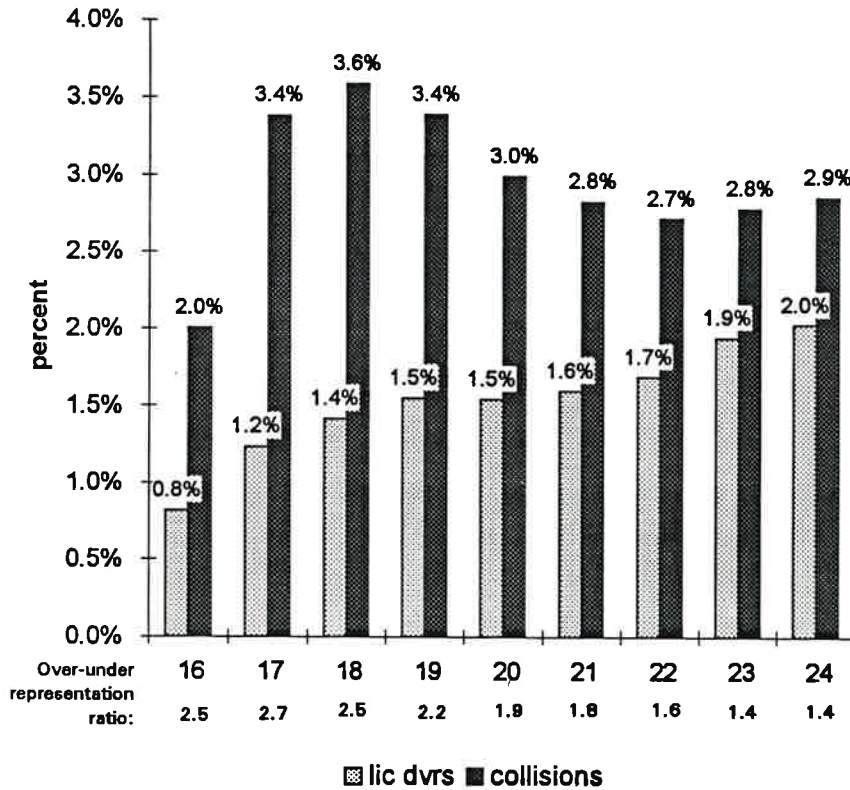
**All persons killed/injured in collisions involving youthful drivers.

***Damage over \$500

Collision involvement by driver age

Drivers age 17 made up 1.2 percent of the state's licensed drivers and were involved in 3.4 percent of all collisions, creating an over-representation ratio of 2.7. Drivers age 16 and 18 were each over-represented by a ratio of 2.5 (Figure 4-1).

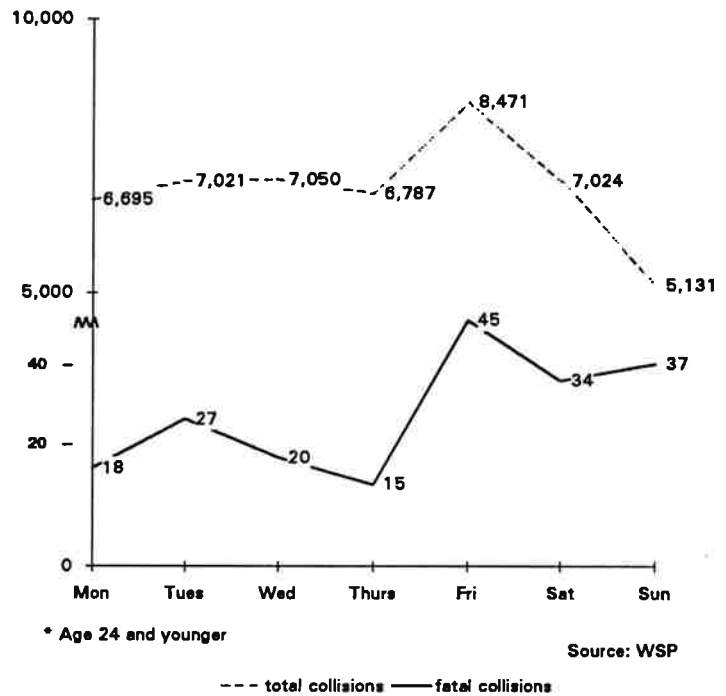
**Figure 4-1:
Pct. of total collisions & licensed drivers
Drivers age 16 to 24 - 1994**



Youthful driver involvement by day of week, time of day

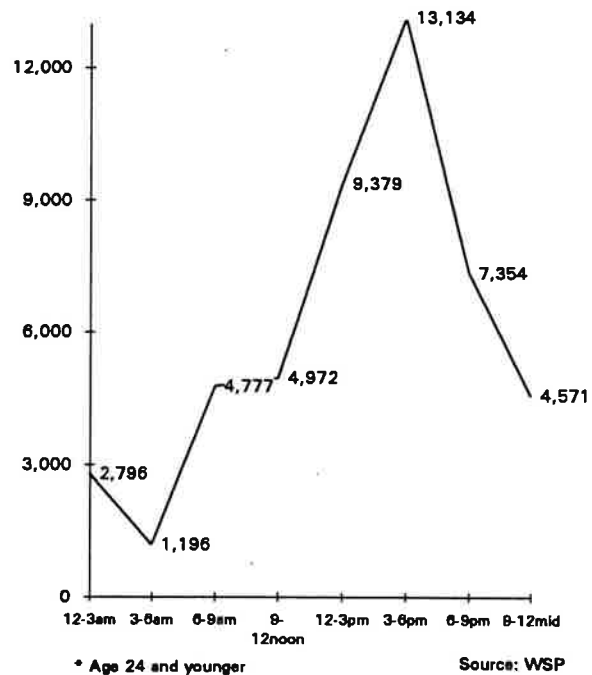
During 1994, Friday was the day of the week accounting for the highest number of fatal and total reported collisions involving youthful drivers (Figure 4-2).

Figure 4-2:
Youthful drivers* in total & fatal collisions
By day of week - 1994



The highest number of collisions in 1994 involving youthful drivers occurred between the hours of 3-6 p.m. The least number of reported collisions occurred between the hours of 3-6 a.m. (Figure 4-3).

Figure 4-3:
Youthful drivers* in traffic collisions
By time of day - 1994



Youthful drivers in collisions by first harmful event

Of total collisions involving youthful drivers, 76.9% were with other moving vehicles and 13.9% were collisions with fixed/other objects. Of fatal collisions involving youthful drivers, crashes with other moving vehicles accounted for 45.4%, and 25.5% were with fixed/other objects. Nearly half of youthful-driver fatal collisions were single-vehicle crashes (Table 4-2).

Table 4-2: Collisions involving youthful drivers*
By first harmful event - 1994

type of collision	fatal collisions		injury collisions		total collisions	
	count	percentage	count	percentage	count	percentage
Collision w/other moving motor vehicles	89	45.4%	16,898	76.4%	37,046	76.9%
Collision w/fixed/other object	50	25.5%	3,022	13.7%	6,705	13.9%
Overturning & other non-collision	27	13.8%	1,254	5.7%	2,121	4.4%
Collisions w/pedestrians & pedalcyclists	27	13.8%	577	2.6%	611	1.3%
Collision w/parked vehicle	3	1.5%	297	1.3%	1,393	2.9%
Other collisions - animal & R.R. train	0	0.0%	58	0.3%	303	0.6%
Total	196	100.0%	22,106	100.0%	48,179	100.0%

*Drivers 24 and younger

Source: WSP

Traffic collisions involving youthful drinking drivers

There were 3,262 collisions in 1994 which involved drivers age 24 and younger who had been drinking. As a result of these collisions 79 persons were killed and 3,100 persons were injured. Fatal alcohol-related collisions involving youthful drivers have declined 36.7% when compared to the previous four-year average (Table 4-3).

Table 4-3: Traffic collisions involving youthful drinking drivers*
Five-year comparison

	1994	1993	1992	1991	1990	'94 vs	
						prev 4-yr avg	prev 4-yr avg
Total collisions	3,262	3,522	3,988	4,419	4,972	4,225	-22.8%
Fatal collisions	63	94	90	102	112	100	-36.7%
Injury collisions	1,821	1,998	2,215	2,481	2,794	2,372	-23.2%
Property damage only**	1,378	1,490	1,683	1,836	2,066	1,769	-22.1%
Persons killed	79	115	102	114	132	116	-31.7%
Percent of all traffic fatalities	12.4%	17.4%	15.7%	16.7%	16.0%	16.4%	-24.8%
Persons injured	3,100	3,352	3,738	4,212	4,785	4,022	-22.9%
Serious injuries	468	518	623	746	854	685	-31.7%
Evident injuries	1,506	1,651	1,832	2,138	2,397	2,005	-24.9%
Possible injuries	1,126	1,183	1,283	1,328	1,534	1,332	-15.5%
Number of drinking drivers	3,314	3,582	4,070	4,499	5,075	4,307	-23.0%

*Drinking drivers age 24 and younger; includes DUI

Source: WSP

**Damage over \$500

Teenage driver collisions

Teenage drivers (age 19 and under) were involved in 23,843 collisions, 87 fatal collisions, and 10,823 injury collisions during 1994. The fatal collision rate for teenage drivers was 4.5 fatal collisions per 10,000 licensed drivers, down 14.1% from the previous four-year average (Table 4-4).

Table 4-4: Teenage driver collisions - 19 years & younger
Five-year comparison

collisions & rates	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total collisions	23,843	22,227	22,519	21,646	23,965	22,589	5.6%
Fatal collisions	87	94	80	89	112	94	-7.2%
Injury collisions	10,823	9,825	9,936	9,267	10,265	9,823	10.2%
Licensed drivers	193,346	189,187	181,300	179,409	169,377	179,818	7.5%
Teenage drivers involved	25,611	23,838	24,252	23,209	25,775	24,269	5.5%
Fatal collision rate*	4.50	4.97	4.41	4.96	6.61	5.24	-14.1%
Total collision rate*	1,324.62	1,260.02	1,337.67	1,293.64	1,521.75	1,353.27	-2.1%

* Fatal/total collisions per 10,000 licensed drivers

Source: WSP, DOL

Teenage driver violations in collisions

"Speed too fast for conditions" was the leading violation in collisions involving teenage drivers, noted in 24.1% of teenage driver collisions. "Failure to yield right of way" was second, noted in 21.6% of these collisions. "Following too closely" was the third contributor with 13.3% (Table 4-5).

Table 4-5: Teenage driver violations in collisions*
By age - 1994

	16/ yngr	17 yrs	18 yrs	19 yrs	total	
Speed—too fast for conditions	830	1,093	1,202	1,089	4,214	24.1%
Failure to yield right of way	706	1,061	1,055	961	3,783	21.6%
Following too closely	312	667	691	665	2,335	13.3%
Exceeding legal speed	234	257	255	226	972	5.5%
Disregarding traffic sig./ signs	212	269	326	317	1,124	6.4%
Operating defective equipment	136	152	195	196	679	3.9%
Driving under the influence	63	89	178	181	511	2.9%
Crossing over the center line	69	119	115	97	400	2.3%
Improper passing	58	93	115	97	363	2.1%
All other circumstances+	601	846	871	820	3,138	17.9%
Total	3,221	4,646	5,003	4,649	17,519	100.0%

* Investigated collisions only

Source: WSP

+ Including driver inattention

IV / Youthful Drivers

There were 10 counties in 1994 with no fatal collisions involving youthful drivers (drivers 24 and younger). The highest fatality rate (fatalities involving a youthful driver per 1,000 collisions) was San Juan County, based upon 2 fatalities and 49 total collisions. Columbia and Kittitas Counties had the highest youthful collisions rate, with 1285.3 and 1285.2 collisions per 10,000 youthful licensed drivers respectively (Table 4-6).

Table 4-6: Collisions involving youthful drivers (24 and under)
By county - 1994

county	youthful lic. drivers	persons killed	persons injured	total collisions	deaths per rate*	1,000 clsn
Adams	1,951	5	114	150	768.8	33.3
Asotin	1,832	0	48	96	524.0	0.0
Benton	14,603	5	689	1,169	800.5	4.3
Chelan	6,230	14	289	483	775.3	29.0
Clallam	5,272	0	282	442	838.4	0.0
Clark	29,102	10	1,889	2,509	862.1	4.0
Columbia	389	0	36	50	1285.3	0.0
Cowlitz	9,482	0	660	951	1003.0	0.0
Douglas	2,960	2	149	201	679.1	10.0
Ferry	684	1	36	47	687.1	21.3
Franklin	5,200	3	278	376	723.1	8.0
Garfield	269	0	13	21	780.7	0.0
Grant	7,257	6	378	521	717.9	11.5
Grays Harbor	6,310	3	392	658	1042.8	4.6
Island	5,879	1	275	348	591.9	2.9
Jefferson	1,712	1	116	141	823.6	7.1
King	152,836	41	11,011	15,049	984.7	2.7
Kitsap	21,198	7	1,312	1,804	851.0	3.9
Kittitas	3,408	4	230	438	1285.2	9.1
Klickitat	1,789	2	58	100	559.0	20.0
Lewis	7,214	5	481	729	1010.5	6.9
Lincoln	795	0	57	63	792.5	0.0
Mason	3,649	2	266	328	898.9	6.1
Okanogan	4,018	0	175	246	612.2	0.0
Pacific	1,731	0	93	145	837.7	0.0
Pend Oreille	1,086	0	44	58	534.1	0.0
Pierce	59,168	27	4,963	5,911	999.0	4.6
San Juan	886	2	34	49	553.0	40.8
Skagit	9,419	3	631	912	968.3	3.3
Skamania	680	0	43	59	867.6	0.0
Snohomish	49,965	22	3,231	4,252	851.0	5.2
Spokane	42,153	9	2,875	3,804	902.4	2.4
Stevens	3,340	2	178	221	661.7	9.0
Thurston	20,365	12	1,219	1,769	868.6	6.8
Wahkiakum	260	1	30	33	1269.2	30.3
Walla Walla	4,917	2	249	436	886.7	4.6
Whatcom	16,458	7	924	1,309	795.4	5.3
Whitman	4,911	9	228	367	747.3	24.5
Yakima	21,147	17	1,305	1,934	914.6	8.8
Total**	532,309	225	35,281	48,179	905.1	4.7

* Traffic collisions per 10,000 youthful licensed drivers

Source: WSP, DOL

** Total youthful licensed drivers includes 1,784 licensed out of state or country.

V. Senior Drivers



During 1994, 28,982 senior drivers (55 years and older) were involved in 26,731 reported collisions, which included 114 fatal collisions and 11,165 injury collisions. The number of collisions involving senior drivers increased 4.3%, and there were 9.9% more injury collisions when compared to the previous four-year average. Fatal collisions involving senior drivers decreased 14.6% and property damage collisions increased 0.7% when compared to the four-year baseline average. The number of drivers licenses issued to senior drivers (886,544) increased 7.8 % from the baseline period. The collision rate for senior drivers was 301.52 senior drivers in collisions per 10,000 licensed senior drivers, and the fatal collision rate was 1.29 (Table 5-1).

Table 5-1: Collisions involving senior drivers (55 & older)
Five-year comparison by severity

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total collisions	26,731	25,509	26,020	25,101	25,907	25,634	4.3%
Fatal	114	114	144	134	142	134	-14.6%
Injury	11,165	10,338	10,399	9,823	10,059	10,155	9.9%
Property damage only ***	15,452	15,057	15,477	15,144	15,706	15,346	0.7%
Persons killed **	126	127	161	151	164	151	-16.4%
Percent of all killed	19.7%	19.2%	24.7%	22.1%	19.9%	21.5%	-8.2%
Persons injured **	17,230	15,831	15,995	14,944	15,378	15,537	10.9%
Serious injuries	1,091	1,155	1,355	1,333	1,445	1,322	-17.5%
Evident injuries	4,844	4,738	4,607	4,547	4,667	4,640	4.4%
Possible injuries	11,295	9,938	10,033	9,064	9,266	9,575	18.0%
Licensed senior dvrs	886,544	862,554	834,826	811,424	781,620	822,606	7.8%
Senior dvrs in collisions	28,982	27,790	28,403	27,237	28,103	27,883	3.9%
Fatal collision rate *	1.29	1.32	1.72	1.65	1.82	1.63	-21.0%
Total collision rate *	301.52	295.74	311.68	309.35	331.45	312.05	-3.4%

* Fatal/total collisions involving senior drivers per 10,000 licensed senior drivers.

Source: WSP, DOL

** All persons killed and injured in collisions involving senior drivers.

*** Damage over \$500

V / Senior Driver Involvement

The greatest number of crashes involving senior drivers occurred between the hours of 12:00 noon and 6:00 p.m. Very few crashes were recorded between midnight and 6:00 a.m. (Figure 5-1).

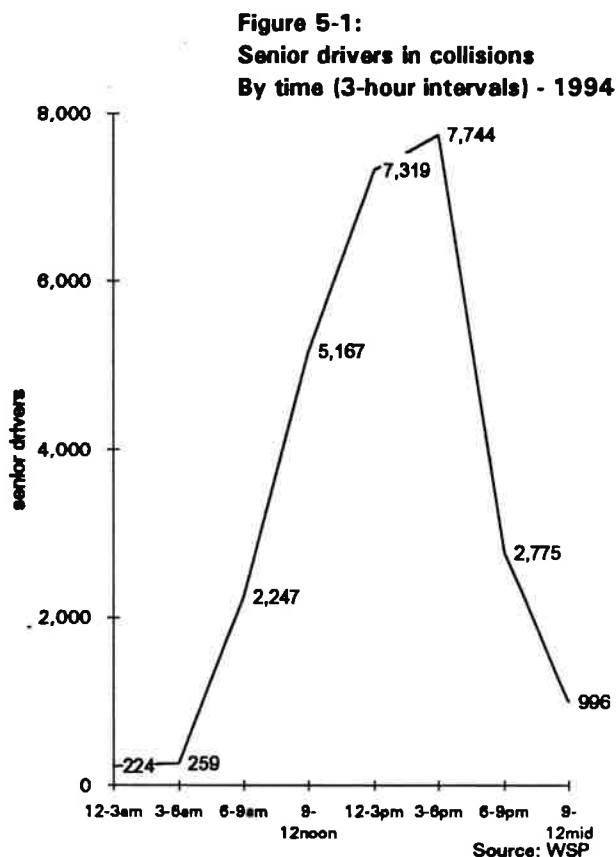
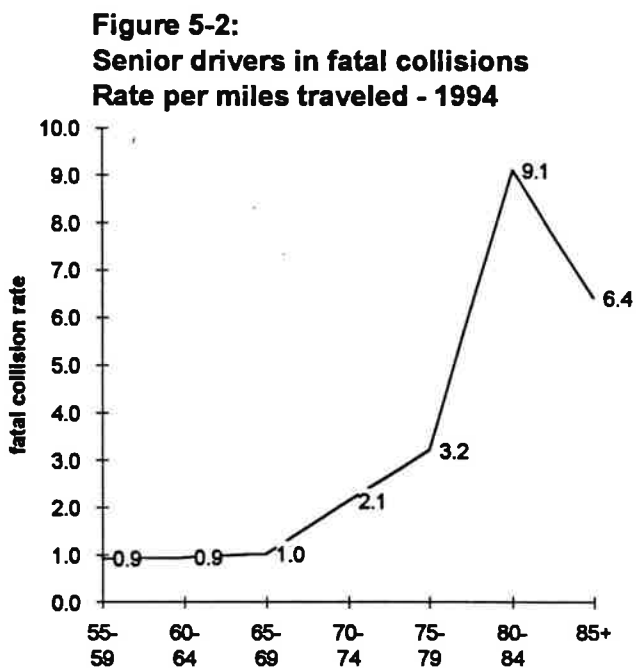


Figure 5-2 displays fatal collision rates by various senior driver age groups based upon estimated percentage of miles traveled. The 75-79, 80-84, and 85+ age groups showed increasing fatal collision rates. Although these rates are high, they are based on few fatal collisions and much less miles of travel than for younger age groups.



* Fatal collisions per 100 million vehicle miles of travel. Percent of miles traveled by age groups est. for 1990 in USDOT research note, May 1992.

Source: WSP, USDOT

Senior driver collisions by first harmful event

The great majority of collisions involving senior drivers were crashes with other moving vehicles, with 87.4%. Collisions with other moving vehicles accounted for the majority of fatal crashes, with 57.9%. Collisions with fixed/other objects were less frequent, accounting for 19.3% of fatal collisions and 5.7% of total collisions (Table 5-2).

Table 5-2: Collisions involving senior drivers*
By first harmful event - 1994

type of collision	fatal collisions		injury collisions		total collisions	
	number	%	number	%	number	%
Collision w/other moving motor veh	66	57.9%	9,687	86.8%	23,368	87.4%
Collision with fixed/other object	22	19.3%	645	5.8%	1,520	5.7%
Collision with parked vehicle	4	3.5%	108	1.0%	594	2.2%
Collisions with pedestrian & bicycles	13	11.4%	476	4.3%	496	1.9%
Overturning & other non collision	8	7.0%	209	1.9%	410	1.5%
Other collisions inc. RR train, animal	1	0.9%	40	0.4%	343	1.3%
Total	114	100.0%	11,165	100.0%	26,731	100.0%

* Collisions involving one or more senior drivers - age 55 or older

Source: WSP

Senior driver contributing circumstances in collisions

"Failure to yield right of way" was the most frequent driver violation in all of the older age groups. "Speed too fast for conditions", "disregarding traffic signals/signs," and "following too closely" were also noted frequently on police collision reports (Table 5-3).

Table 5-3: Contributing circumstances in senior driver collisions
By age group - 1994

contributing circumstances	55-59		60-64		65-69		70-74		75 & older	
	#	%	#	%	#	%	#	%	#	%
Failure to yield right of way	914	37.3%	861	43.5%	814	45.6%	895	49.9%	1,748	56.4%
Speed too fast for conditions	471	19.2%	360	18.2%	257	14.4%	216	12.0%	320	10.3%
Following too closely	438	17.9%	333	16.8%	284	15.9%	288	16.6%	421	13.6%
Disregard traffic signal/signs	243	9.9%	173	8.7%	196	11.0%	225	12.5%	425	13.7%
DWI	174	7.1%	118	6.0%	95	5.3%	54	3.0%	30	1.0%
Defective equipment	80	3.3%	60	3.0%	52	2.9%	39	2.2%	52	1.7%
Improper passing	58	2.4%	31	1.6%	35	2.0%	29	1.6%	36	1.2%
Crossing over the centerline	47	1.9%	32	1.6%	34	1.9%	24	1.3%	52	1.7%
Exceeding legal speed	23	0.9%	13	0.7%	17	1.0%	15	0.8%	16	0.5%
All other circumstances +	647	26.4%	529	26.7%	506	28.4%	490	27.3%	836	27.0%
Total	2,448	100.0%	1,981	100.0%	1,784	100.0%	1,795	100.0%	3,100	100.0%

+including driver inattention

Source: WSP

V / Senior Driver Involvement

In 1994, Kittitas County had the highest collision rate involving senior drivers with 425.4 collisions per 10,000 licensed drivers (Table 5-4).

Table 5-4: Collisions involving senior drivers (55 and older)
By county - 1994

county	senior lic. drivers*	persons killed	persons injured	total collisions	collision rate*
Adams	2,752	1	47	56	203.5
Asotin	4,259	0	30	68	159.7
Benton	20,128	0	307	569	282.7
Chelan	12,232	2	173	301	246.1
Clallam	16,828	1	168	323	191.9
Clark	44,343	4	733	1,158	261.1
Columbia	1,055	0	9	19	180.1
Cowlitz	16,943	3	304	545	321.7
Douglas	5,169	0	58	102	197.3
Ferry	1,252	0	8	23	183.7
Franklin	6,047	6	132	229	378.7
Garfield	764	0	7	15	196.3
Grant	11,575	2	179	267	230.7
Grays Harbor	14,639	4	223	409	279.4
Island	13,318	2	129	196	147.2
Jefferson	6,920	2	76	116	167.6
King	246,071	24	5,516	8,680	352.7
Kitsap	32,528	4	560	852	261.9
Kittitas	5,548	0	113	236	425.4
Klickitat	3,712	0	30	68	183.2
Lewis	14,466	5	273	460	318.0
Lincoln	2,412	3	40	49	203.2
Mason	11,082	1	157	217	195.8
Okanogan	7,749	3	73	163	210.3
Pacific	6,184	2	42	120	194.0
Pend Oreille	2,401	2	22	52	216.6
Pierce	97,218	7	2,630	3,473	357.2
San Juan	3,138	0	6	19	60.5
Skagit	19,527	6	324	509	260.7
Skamania	1,469	0	28	41	279.1
Snohomish	73,925	9	1,484	2,218	300.0
Spokane	67,660	10	1,517	2,156	318.7
Stevens	6,549	1	101	120	183.2
Thurston	31,345	6	525	876	279.5
Wahkiakum	886	1	9	19	214.4
Walla Walla	9,726	2	146	284	292.0
Whatcom	23,874	4	371	639	267.7
Whitman	5,378	2	68	94	174.8
Yakima	33,692	7	612	990	293.8
Total	886,544	126	17,230	26,731	301.5

Source: WSP, DOL

* Total senior licensed drivers includes 1,780 with unknown county or "other".

** Traffic collisions per 10,000 licensed senior drivers.

VI. Pedestrians

During 1994, 85 pedestrians were killed and 1,916 were injured in the state. This was a increase of 5.9% in the number killed, and 3.7% in the number injured compared to the previous four-year average. Pedestrian fatalities accounted for 13.3% of all 1994 traffic deaths, and this percentage has increased over prior years. In urban areas 40 were killed, compared to 45 killed in rural areas. Rural areas showed an increase in pedestrians killed and a decrease in injured when compared to the previous four-year average while urban areas showed changes in the opposite directions (Table 6-1).



Table 6-1: Pedestrians killed and injured in traffic collisions
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total ped.collisions	1,804	1,709	1,716	1,779	1,743	1,737	3.9%
Pedestrians killed	85	80	81	79	81	80	5.9%
Percent of all killed	13.3%	12.1%	12.4%	11.6%	9.8%	11.5%	15.8%
Pedestrians injured	1,916	1,813	1,809	1,911	1,861	1,849	3.7%
Serious injuries	394	405	431	464	524	456	-13.6%
Evident injuries	967	930	894	918	827	892	8.4%
Possible injuries	555	478	484	529	510	500	10.9%
Rural*							
Pedestrians killed	45	39	33	41	43	39	15.4%
Pedestrians injured	415	387	420	455	463	431	-3.8%
Urban*							
Pedestrians killed	40	41	48	38	38	41	-3.0%
Pedestrians injured	1,501	1,426	1,389	1,456	1,398	1,417	5.9%

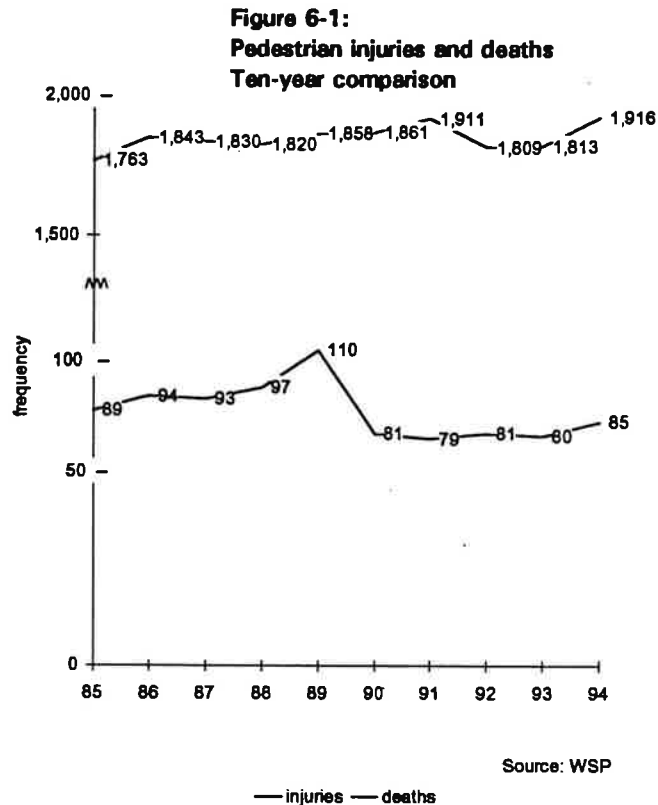
*Rural =Less than 2,500 population

Source: WSP

*Urban =2,500 population and greater

VI / Pedestrians

Pedestrian fatalities, after reaching a high in 1989 with 110 deaths, dropped significantly in 1990 to 81 deaths and remained relatively constant over the previous 4 years until 1994 when they increased to 85 (Figure 6-1).



Ages of pedestrians killed and injured

The age group with the highest ratio of persons killed and injured compared to their population was the 15-19 age group with 1.39, followed by the 10-14 group with 1.33. The ages of 25 to 44 also showed an over-representation (Table 6-2).

**Table 6-2: Pedestrians involved in motor vehicle collisions
By age & percent of population - 1994**

	population*		killed	injured	total killed/inj	pct	ratio**
0-4	406,660	10.5%	2	108	110	5.5%	0.52
5-9	396,029	10.2%	5	188	193	9.6%	0.94
10-14	384,762	9.9%	7	258	265	13.2%	1.33
15-19	335,808	8.7%	4	237	241	12.0%	1.39
20-24	366,462	9.5%	2	170	172	8.6%	0.91
25-34	429,979	11.1%	14	267	281	14.0%	1.26
35-44	445,036	11.5%	10	274	284	14.2%	1.23
45-54	304,120	7.9%	8	147	155	7.7%	0.99
55-64	192,298	5.0%	11	82	93	4.6%	0.94
65-74	347,779	9.0%	12	63	75	3.7%	0.42
75 & Older	262,060	6.8%	10	72	82	4.1%	0.61
Age not stated	0		0	50	50	2.5%	
Total	3,870,993	100.0%	85	1,916	2,001	100.0%	1.00

*Population figures from 1993 OFM report.

Source: WSP, OFM

**Ratio of percent pedestrians killed/injured to percent population within age group.

Pedestrian actions

Of pedestrians killed or injured during 1994, the largest percentage (47.0%) were crossing at an intersection. Of pedestrians who were killed in urban areas, the largest percentage (45.0%) were crossing not at an intersection (Table 6-3).

Table 6-3: Pedestrians killed or injured - urban areas
By pedestrian action and age - 1994

action	killed & injured							killed		
	0-4	5-14	15-24	25-64	65+	n/stat	total	%	#	%
Crossing at intersection	20	134	147	315	84	28	728	47.0%	10	25.0%
Crossing not at intersection	53	169	77	177	33	8	517	33.4%	18	45.0%
Not in roadway	5	13	32	45	3	5	103	6.6%	2	5.0%
Standing/working in roadway	1	4	21	71	4	2	103	6.6%	2	5.0%
Playing in roadway	5	21	2	0	0	0	28	1.8%	2	5.0%
Walking with traffic	0	3	4	17	0	0	24	1.5%	2	5.0%
Walking against traffic	1	1	2	8	2	0	14	0.9%	0	0.0%
Lying in roadway	0	2	0	4	1	0	7	0.5%	2	5.0%
Other & not stated	1	5	5	14	0	0	25	1.6%	2	5.0%

Source: WSP

In rural areas during 1994, 164 pedestrians were killed or injured while crossing the roadway not at an intersection, and 59 of those were between the ages of 5 and 14 (Table 6-4).

Table 6-4: Pedestrians killed or injured - rural areas
By pedestrian action and age - 1994

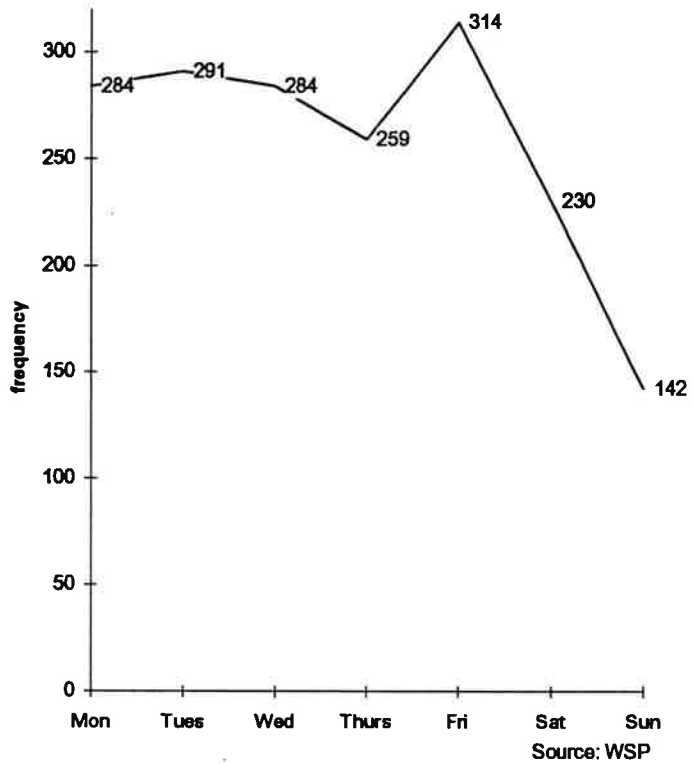
action	killed & injured							killed		
	0-4	5-14	15-24	25-64	65+	n/stat	total	%	#	%
Crossing not at intersection	11	59	37	38	15	4	164	35.6%	35	41.2%
Crossing at intersection	6	21	26	31	7	1	92	20.0%	11	12.9%
Not in roadway	1	9	26	36	5	1	78	16.9%	9	10.6%
Standing/working in roadway	1	2	10	31	2	6	52	11.3%	7	8.2%
Walking with traffic	0	5	15	11	2	0	33	7.2%	5	5.9%
Walking against traffic	0	2	3	7	0	0	12	2.6%	2	2.4%
Playing in roadway	3	7	1	0	0	0	11	2.4%	3	3.5%
Other & not stated	1	2	4	3	0	0	10	2.2%	6	7.1%
Lying in roadway	1	1	2	5	0	0	9	2.0%	7	8.2%

Source: WSP

Pedestrian collisions by day of week/hour of day

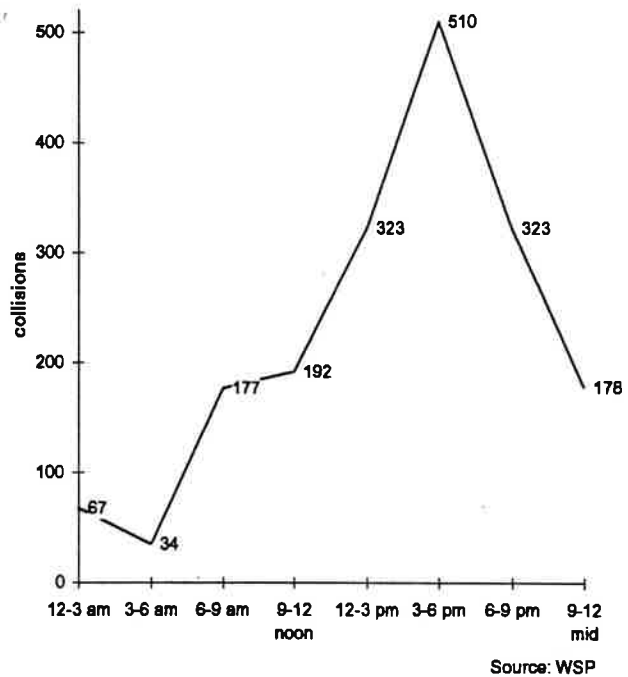
Pedestrian collisions in 1994 were least likely to occur on Saturdays and Sundays. The greatest number of pedestrian collisions occurred on Fridays (Figure 6-2).

**Figure 6-2:
Pedestrian collisions
By day of week - 1994**



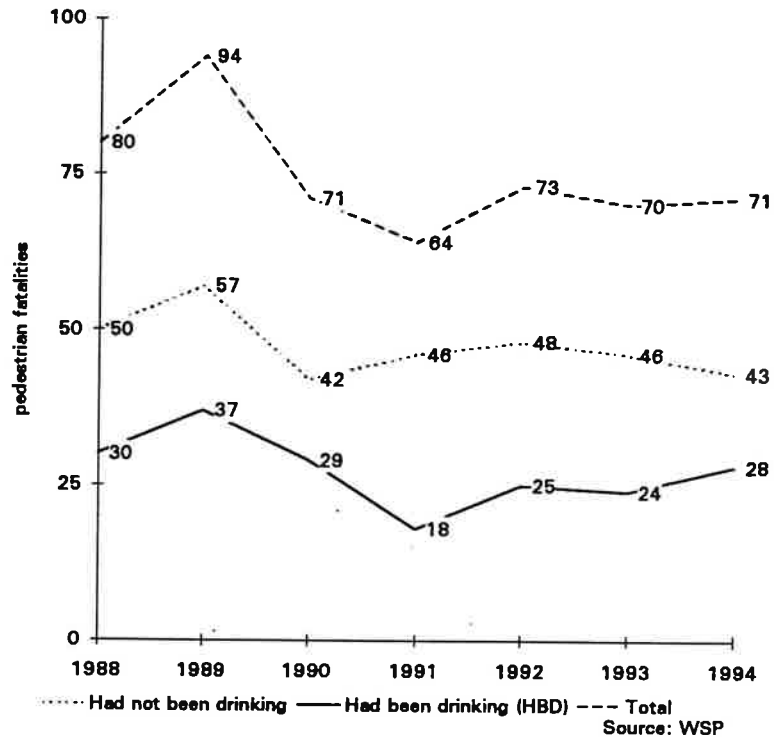
Most pedestrian collisions occurred between 12 noon to 9 p.m., peaking during the 3:00 to 6:00 p.m. period (Figure 6-3).

**Figure 6-3:
Pedestrian collisions
By hour of day - 1994**



During 1994, 28 pedestrians age 15 years and older had been drinking when involved in a fatal crash. Pedestrians who had been drinking account for a significant proportion of all pedestrian fatalities over the last seven years (Figure 6-4).

Figure 6-4:
Pedestrians fatalities - age 15 and over
Pedestrian drinking vs not drinking



Observational survey of driver compliance with pedestrian crosswalk law

During 1994, the WTSC conducted a survey to assess driver compliance with the pedestrian crosswalk law, i.e. whether drivers stopped when a pedestrian entered a crosswalk and waited until the pedestrian had crossed the number of lanes of traffic specified in the law. Overall, 69.9 percent of the drivers observed complied. Eastern Washington's compliance rate was substantially lower than Western Washington, and counties rates ranged from 28 percent in Chelan County to 93 percent in Pierce County. Areas near high schools and universities had lower-than-average compliance. Compliance was lower during "rush hour," and compliance in marked crosswalks at intersections was lower than at unmarked crosswalks.

Vehicle-pedestrian collisions in counties and cities

King County had the highest pedestrian collision rate with 4.92 collisions per 10,000 population, followed by Columbia and Okanogan Counties with 4.82 and 4.46 respectively. King County also had the highest rate of fatalities and injuries with 5.51 killed or injured per 10,000 population. This was followed by Okanogan and Columbia Counties with 5.29 and 4.82 per 10,000 population respectively. Garfield County was the only county that did not have any car-pedestrian collisions for 1994 (Table 6-5).

Table 6-5: Pedestrians killed & injured in traffic collisions By county - 1994

county	population	killed	injured	injury rate*	collisions	coll rate**
Over 1,000,000						
King	1,599,500	29	853	5.51	787	4.92
250,000 to 750,000						
Pierce	648,900	13	228	3.71	221	3.41
Snohomish	516,500	4	127	2.54	116	2.25
Spokane	392,000	6	181	4.77	171	4.36
Clark	280,800	3	75	2.78	70	2.49
100,000 to 250,000						
Kitsap	213,200	5	50	2.58	52	2.44
Yakima	202,100	3	63	3.27	63	3.12
Thurston	185,900	0	37	1.99	36	1.94
Whatcom	145,000	3	26	2.00	26	1.79
Benton	127,000	0	31	2.44	29	2.28
50,000 to 100,000						
Skagit	91,000	2	24	2.86	22	2.42
Cowlitz	87,800	1	24	2.85	24	2.73
Grays Harbor	67,900	0	15	2.21	15	2.21
Island	67,400	0	7	1.04	6	0.89
Lewis	63,600	2	22	3.77	23	3.62
Clallam	62,500	0	16	2.56	16	2.56
Grant	62,200	1	14	2.41	13	2.09
Chelan	58,000	0	19	3.28	17	2.93
Walla Walla	52,600	0	16	3.04	9	1.71
25,000 to 50,000						
Mason	44,300	0	13	2.93	11	2.48
Franklin	42,900	3	10	3.03	12	2.80
Whitman	39,800	2	5	1.76	6	1.51
Okanogan	35,900	2	17	5.29	16	4.46
Stevens	34,500	0	6	1.74	5	1.45
Kittitas	29,700	0	9	3.03	8	2.69
Douglas	29,300	2	1	1.02	3	1.02
10,000 to 25,000						
Jefferson	24,300	0	4	1.65	3	1.23
Pacific	20,300	1	8	4.43	8	3.94
Asotin	18,900	0	3	1.59	3	1.59
Klickitat	17,700	0	6	3.39	4	2.26
Adams	14,600	0	1	0.68	1	0.68
San Juan	12,100	0	1	0.83	1	0.83
Pend Oreille	10,500	1	0	0.95	1	0.95
Under 10,000						
Lincoln	9,300	0	1	1.08	1	1.08
Skamania	9,300	0	1	1.08	1	1.08
Ferry	7,000	1	0	1.43	1	1.43
Columbia	4,150	0	2	4.82	2	4.82
Wahkiakum	3,600	1	0	2.78	1	2.78
Garfield	2,350	0	0	0.00	0	0.00
Total	5,334,400	85	1,916	3.75	1,804	3.38

Source: WSP, OFM

*Pedestrians injured per 10,000 population - includes fatal injuries.

** Car-pedestrian collisions per 10,000 population.

The city of Pasco had the highest pedestrian fatality rate, with 1.35 pedestrians killed per 10,000 population, based upon 3 pedestrian fatalities. Yakima had the highest pedestrian total collision rate with 10.55 vehicle-pedestrian collisions per 10,000 population, followed by Seattle and Burien with 8.66 and 7.97 respectively (Table 6-6).

Table 6-6: Pedestrian fatalities, injuries & collisions
Cities 15,000 population & greater - 1994

city	population	fatalities		injuries		total ped clns	
		number	rate*	number	rate*	number	rate*
250,000 and over							
Seattle	531,400	12	0.23	503	9.47	460	8.66
100,000 to 250,000							
Spokane	185,600	3	0.16	137	7.38	129	6.95
Tacoma	182,800	4	0.22	144	7.88	138	7.55
50,000 to 100,000							
Bellevue	99,140	0	0.00	40	4.03	36	3.63
Everett	78,240	1	0.13	47	6.01	41	5.24
Federal Way	73,500	2	0.27	28	3.81	27	3.67
Yakima	59,740	3	0.50	63	10.55	63	10.55
Vancouver	59,225	2	0.34	35	5.91	34	5.74
Bellingham	57,020	0	0.00	16	2.81	15	2.63
25,000 to 50,000							
Kennewick	46,960	0	0.00	14	2.98	14	2.98
Renton	43,970	0	0.00	25	5.69	22	5.00
Kirkland	41,900	0	0.00	16	3.82	13	3.10
Kent	41,880	2	0.48	27	6.45	28	6.69
Redmond	39,390	0	0.00	10	2.54	9	2.28
Olympia	36,740	0	0.00	20	5.44	19	5.17
Bremerton	35,920	2	0.56	24	6.68	24	6.68
Richland	35,430	0	0.00	12	3.39	11	3.10
Auburn	34,970	1	0.29	16	4.58	17	4.86
Longview	33,080	0	0.00	16	4.84	15	4.53
Lynnwood	31,680	0	0.00	10	3.16	9	2.84
Edmonds	31,100	0	0.00	11	3.54	10	3.22
Walla Walla	28,730	0	0.00	10	3.48	6	2.09
Burien	27,610	0	0.00	23	8.33	22	7.97
Puyallup	26,680	0	0.00	8	3.00	8	3.00
Bothell	25,440	0	0.00	5	1.97	5	1.97
15,000 to 25,000							
Lacey	24,280	0	0.00	8	3.29	8	3.29
Pullman	23,770	1	0.42	3	1.26	4	1.68
Wenatchee	23,460	0	0.00	12	5.12	10	4.26
Sea Tac	22,800	1	0.44	18	7.89	17	7.46
Pasco	22,170	3	1.35	10	4.51	12	5.41
Des Moines	21,330	0	0.00	9	4.22	9	4.22
Mercer Island	21,270	0	0.00	3	1.41	2	0.94
Mbunt Vernon	20,950	0	0.00	4	1.91	4	1.91
Mountlake Terrace	19,920	0	0.00	4	2.01	4	2.01
Oak Harbor	19,000	0	0.00	6	3.16	5	2.63
Port Angeles	18,310	0	0.00	8	4.37	8	4.37
Bainbridge Island	17,510	0	0.00	5	2.86	5	2.86
Aberdeen	16,750	0	0.00	8	4.78	8	4.78
Marysville	15,530	0	0.00	7	4.51	4	2.58

*Frequency per 10,000 population

Source:WSP,OF

VI / Pedestrians

VII. Pedalcycles



Vehicle-pedalcycle collisions and injuries in 1994 increased 10% from the previous four-year average. There were 14 pedalcyclists killed, an increase of 55.6% from the previous four-year average and 13 of these fatalities occurred in rural areas. The number of pedalcyclists injured increased 11.7% in urban areas and 3.8% in rural areas from the previous four-year averages. There were 1,624 vehicle-pedalcycle collisions, almost 200 more than during 1993 (Table 7-1, Figure 7-1).

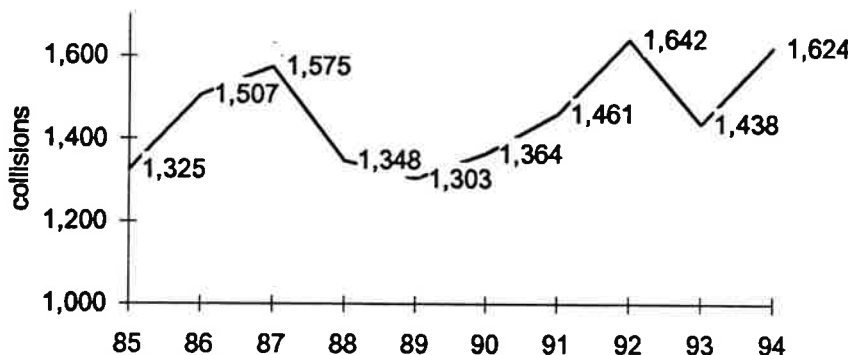
Table 7-1: Pedalcyclists killed & injured in traffic collisions
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Total pedalcycle collisions	1,624	1,438	1,642	1,461	1,364	1,476	10.0%
Pedalcyclists killed	14	8	9	5	14	9	55.6%
% of all killed	2.2%	1.2%	1.4%	0.7%	1.7%	1.3%	74.5%
Pedalcyclists injured	1,607	1,430	1,622	1,463	1,349	1,466	9.6%
Serious injuries	195	202	224	226	221	218	-10.7%
Evident injuries	1,063	889	1,052	909	813	916	16.1%
Possible injuries	349	339	346	328	315	332	5.1%
Urban* injured	1,208	1,095	1,208	1,045	978	1,082	11.7%
Urban killed	1	4	4	1	4	3	-69.2%
Rural injured	399	335	414	418	371	385	3.8%
Rural killed	13	4	5	4	10	6	126.1%

* Cities with population of 2,500 and greater

Source: WSP

Figure 7-1:
Vehicle-pedalcyclist collisions*
Ten-year comparison



* Includes only collisions where vehicle-pedalcycle crash was first occurrence.

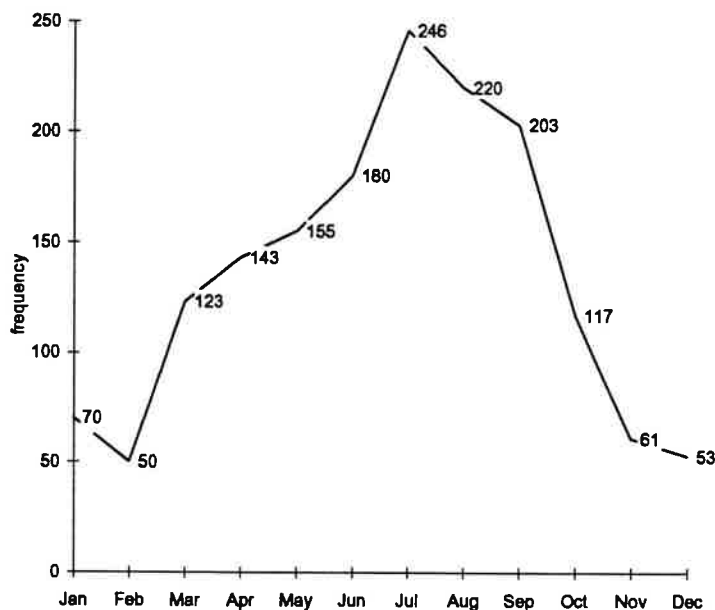
Source: WSP

VII / Pedalcycles

The months of July, August and September recorded the highest numbers of persons killed and injured in pedalcycle-related collisions during 1994.

February recorded the least number of pedalcycle injuries with 50, and July recorded the most with 246 (Figure 7-2).

Figure 7-2:
Pedalcyclists Injured* In traffic collisions
By month - 1994



* Includes 14 pedalcyclists killed

Source: WSP

Ages of pedalcyclists injured

In 1994, 481 pedalcyclists between the ages of 10 to 14 were killed or injured, the highest frequency of the age groups. There were five age groups which experienced reductions in pedalcycle-related collision involvement when compared to previous four-year averages, while the 10-14 year age group showed a 20.7% increase (Table 7-2).

Table 7-2: Pedalcyclists killed or injured in motor vehicle collisions
Five-year comparison by age group

age	1994	1993	1992	1991	1990	'94 vs	
						prev 4-yr avg	prev 4-yr avg
0-4	29	41	40	32	16	32	-10.1%
5-9	194	209	230	232	191	216	-10.0%
10-14	481	419	408	386	381	399	20.7%
15-19	205	161	228	181	194	191	7.3%
20-24	181	164	195	207	163	182	-0.7%
25-34	254	248	267	217	213	236	7.5%
35-44	141	94	134	97	96	105	34.0%
45-54	72	44	56	34	35	42	70.4%
55-64	14	22	13	20	18	18	-23.3%
65-74	7	5	9	17	9	10	-30.0%
75 & older	7	5	6	5	5	5	33.3%
Not stated	36	26	45	40	42	38	-5.9%
Total injured	1,607	1,430	1,622	1,463	1,349	1,466	9.6%
Total killed	14	8	9	5	14	9	55.6%

Source: WSP

The pedalcycle actions associated with the most deaths and injuries was "crossing/entering traffic" with 5 killed and 64 serious injuries, followed by "riding with traffic" with 4 killed and 64 serious injuries (Table 7-3).

Table 7-3: Actions of pedalcyclists killed & injured
By severity - 1994

	killed	serious injury	evident injury	possible injury	total killed/inj
Crossing/entering traffic	5	64	441	152	662
Riding with traffic	4	64	339	124	531
Riding against traffic	1	24	138	39	202
Turned into vehicle path - same dir	2	21	69	11	103
Turned into vehicle path - opp dir	2	13	56	8	79
Crossing diagonally	0	8	13	11	32
Fell into vehicle path	0	0	6	3	9
Other & not stated	0	1	1	1	3
Total	14	195	1,063	349	1,621

Source: WSP

Bicycle Helmet Use

A statewide observational survey of bicycle helmet usage was conducted by the WTSC in May 1994. The overall statewide rate for bicycle helmet use was 39.5%. The highest use rate was for pre-school children and the lowest was for teens. Females showed a slightly higher rate of use than males. Comparing Black, White and Asian races, there were no significant differences in bicycle helmet use; however, the rate for Hispanics was lower.

Eastern Washington had a 32.9% bicycle helmet use rate compared to 46.5% in Western Washington. Port Angeles, the only city in the survey with a bicycle helmet ordinance, had the highest rate with 72.7%. Bike trails and bike lanes had the highest use rates, and low-economic residential areas had the lowest rate.

County and city pedalcycle collisions

In 1994, Spokane County experienced the highest pedalcycle collision rate with 4.72 collisions per 10,000 population. Adams County was second highest, with a rate of 4.11 collisions, and Kittitas County was third with a rate of 4.04 (Table 7-4).

Table 7-4: Pedalcycle collisions and injuries
By county - 1994

county	population	killed	& injured	rate killed/inj*	collisions	collision rate*
Over 1,000,000						
King	1,599,500	3	625	3.91	624	3.90
250,000 to 750,000						
Pierce	648,900	3	162	2.50	163	2.51
Snohomish	516,500	0	104	2.01	105	2.03
Spokane	392,000	1	187	4.77	185	4.72
Clark	280,800	2	80	2.85	79	2.81
100,000 to 250,000						
Kitsap	213,200	2	57	2.67	59	2.77
Yakima	202,100	0	45	2.23	45	2.23
Thurston	185,900	0	47	2.53	49	2.64
Whatcom	145,000	0	40	2.76	39	2.69
Benton	127,000	0	28	2.20	27	2.13
50,000 to 100,000						
Skagit	91,000	0	27	2.97	28	3.08
Cowlitz	87,800	1	31	3.53	31	3.53
Island	67,900	0	7	1.03	8	1.18
Grays Harbor	67,400	0	20	2.97	20	2.97
Lewis	63,600	0	14	2.20	15	2.36
Clallam	62,500	0	21	3.36	21	3.36
Grant	62,200	0	14	2.25	14	2.25
Chelan	58,000	0	17	2.93	17	2.93
Walla Walla	52,600	0	14	2.66	14	2.66
25,000 to 50,000						
Mason	44,300	2	10	2.26	10	2.26
Franklin	42,900	0	6	1.40	6	1.40
Whitman	39,800	0	4	1.01	5	1.26
Okanogan	35,900	0	9	2.51	9	2.51
Stevens	34,500	0	6	1.74	6	1.74
Kittitas	29,700	0	12	4.04	12	4.04
Douglas	29,300	0	9	3.07	9	3.07
10,000 to 25,000						
Jefferson	24,300	0	3	1.23	3	1.23
Pacific	20,300	0	5	2.46	5	2.46
Asotin	18,900	0	5	2.65	4	2.12
Klickitat	17,700	0	4	2.26	4	2.26
Adams	14,600	0	6	4.11	6	4.11
San Juan	12,100	0	0	0.00	0	0.00
Pend Oreille	10,500	0	1	0.95	1	0.95
Under 10,000						
Lincoln	9,300	0	1	1.08	1	1.08
Skamania	9,300	0	0	0.00	0	0.00
Ferry	7,000	0	0	0.00	0	0.00
Columbia	4,150	0	0	0.00	0	0.00
Wahkiakum	3,600	0	0	0.00	0	0.00
Garfield	2,350	0	0	0.00	0	0.00
Total	5,334,400	14	1,621	3.04	1,624	3.04

*Frequency per 10,000 population

Source: WSP, OFM

The city of Kelso recorded the highest pedalcycle collision rate in the state during 1994 with 10.97 collisions per 10,000 population. Mount Vernon was second highest with 8.11, followed by Ellensburg with 7.78 and Yakima at 7.53 (Table 7-5).

Table 7-5: Pedalcycle-vehicle collisions in cities
Cities 10,000 population & greater - 1994

city	population	killed	injured	death/ inj rate*	collisions	collision rate*
250,000 and over						
Seattle	531,400	0	317	5.97	316	5.95
100,000 to 250,000						
Spokane	185,600	0	132	7.11	129	6.95
Tacoma	182,800	0	71	3.88	73	3.99
50,000 to 100,000						
Bellevue	99,140	0	38	3.83	38	3.83
Everett	78,240	0	32	4.09	30	3.83
Federal Way	73,500	0	20	2.72	20	2.72
Yakima	59,740	0	48	7.70	45	7.53
Vancouver	59,225	0	29	4.90	27	4.58
Bellingham	57,020	0	32	5.61	31	5.44
25,000 to 50,000						
Kennewick	48,980	0	12	2.58	11	2.34
Renton	43,970	1	14	3.18	10	2.27
Kirkland	41,900	0	19	4.53	19	4.53
Kent	41,880	0	22	5.25	24	5.73
Redmond	39,390	0	11	2.79	13	3.30
Olympia	36,740	0	22	5.99	23	6.26
Bremerton	35,920	0	21	5.85	21	5.85
Richland	35,430	0	11	3.10	11	3.10
Auburn	34,970	0	24	6.86	25	7.15
Longview	33,080	0	16	4.84	16	4.84
Lynnwood	31,680	0	13	4.10	13	4.10
Edmonds	31,100	0	5	1.61	5	1.61
Walla Walla	28,730	0	12	4.18	12	4.18
Burien	27,610	0	11	3.98	11	3.98
Puyallup	26,680	0	13	4.87	13	4.87
Bothell	25,440	0	12	4.72	12	4.72
15,000 to 25,000						
Lacey	24,280	0	8	3.29	8	3.29
Pullman	23,770	0	3	1.28	4	1.68
Wenatchee	23,460	0	11	4.69	11	4.69
Sea Tac	22,800	0	10	4.39	10	4.39
Pasco	22,170	0	5	2.26	5	2.26
Des Moines	21,330	0	6	2.81	6	2.81
Mercer Island	21,270	0	6	2.82	5	2.35
Mount Vernon	20,950	0	16	7.64	17	8.11
Mountlake Terrace	19,920	0	3	1.51	3	1.51
Oak Harbor	19,000	0	5	2.63	5	2.63
Port Angeles	18,310	0	13	7.10	13	7.10
Bainbridge Island	17,510	0	5	2.86	7	4.00
Aberdeen	16,750	0	10	5.97	10	5.97
Marysville	15,530	0	6	3.88	7	4.51
10,000 to 15,000						
Tukwila	14,690	0	3	2.04	4	2.72
Mukiteo	14,500	0	7	4.83	7	4.83
Ellensburg	12,880	0	10	7.78	10	7.78
Centralia	12,520	0	4	3.19	4	3.19
Anacortes	12,510	0	6	4.80	6	4.80
Moses Lake	12,190	0	6	4.92	7	5.74
Kelso	11,850	0	13	10.97	13	10.97
Sunnyside	11,660	0	3	2.57	3	2.57
Tumwater	11,200	0	2	1.79	3	2.68
TOTAL	2,289,175	1	1,114	4.87	1,113	4.86

*injuries/collisions per 10,000 population

Source: WSP, OFM

VIII. Motorcycles



Motorcycle fatalities, injuries and collisions all decreased compared to their previous four-year averages. Motorcycle registrations increased from the previous year to 97,075. The total collision rate, based on collisions per 1,000 registered motorcycles, was down 10.2% from the four-year average. The total number of persons killed in motorcycle collisions was down from 54 for the four-year baseline to 35 in 1994, a reduction of 34.9%. In 1989 motorcycle collisions accounted for nearly 10% of all traffic fatalities compared to 5.5% in 1994 (Table 8-1).

Table 8-1: Collisions involving motorcycles

Six-year comparison

	1994	1993	1992	1991	1990+	1989	prev 5-yr avg	'94 vs prev 5-yr avg
Total collisions	1,744	1,739	2,044	2,048	2,167	2,516	2,103	-17.1%
Fatal	34	38	48	41	60	70	51	-33.9%
Injury	1,473	1,489	1,745	1,751	1,840	2,171	1,799	-18.1%
Property dmg only	237	212	251	256	267	275	252	-6.0%
Persons killed**	35	39	49	44	62	75	54	-34.9%
Percent of all killed	5.5%	5.9%	7.5%	6.4%	7.5%	9.6%	7.4%	-26.0%
Persons injured**	1,752	1,810	2,112	2,114	2,223	2,724	2,197	-20.2%
Serious injury	406	439	533	576	639	897	617	-34.2%
Evident injury	889	909	1,073	1,018	1,137	1,329	1,093	-18.7%
Possible injury	457	462	506	520	447	498	487	-6.1%
MC drivers killed	32	35	42	35	55	59	45	-29.2%
MC passengers killed	3	3	6	8	5	10	6	-53.1%
MC drivers injured	1,419	1,452	1,699	1,709	1,789	2,119	1,754	-19.1%
MC passengers injured	209	211	253	228	272	392	271	-22.9%
MC drivers involved	1,726	1,742	2,031	2,035	2,163	2,510	1,993	-13.4%
MC endorsements	223,195	225,230	225,316	210,862	196,512	184,259	214,480	4.1%
Registered motorcycles	97,075	96,609	98,131	100,970	103,537	110,617	99,812	-2.7%
Collision rate*	17.97	18.00	20.83	20.28	20.93	22.75	20.01	-10.2%
Fatality rate*	0.36	0.40	0.50	0.44	0.60	0.68	0.48	-25.6%

*Motorcycle collisions/fatalities per 1,000 registered motorcycles.

Source: WSP, DOL

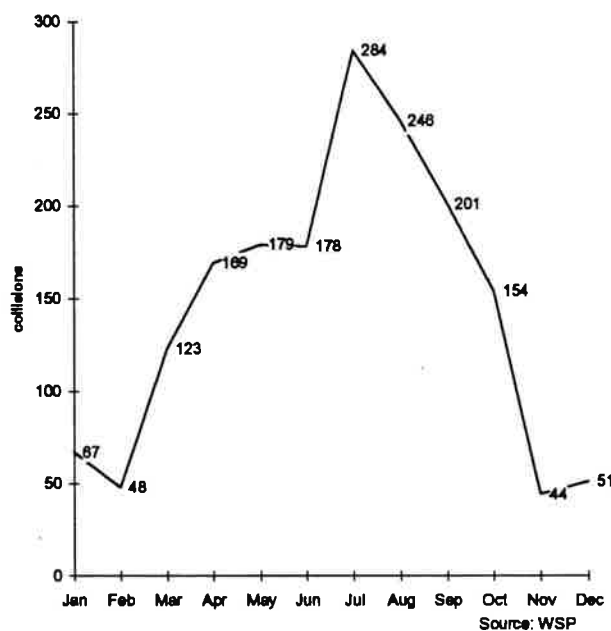
**Includes occupants of other vehicles, pedestrians/pedalcyclists.

+Motorcycle helmet law passed in 1990.

VIII / Motorcycles

As illustrated in Figure 8-1, the summer months of July, August and September experienced the greatest number of collisions with 284, 246 and 201 respectively. November and February had the fewest collisions (Figure 8-1)

Figure 8-1:
Motorcycle collisions
By month - 1994



**Table 8-2: Reported motorcycle collisions
1971 to 1994**

Table 8-2 compares 24-years of motorcycle registrations and collisions. The number of motorcycle registrations peaked in 1981, and has declined steadily since then. The number of reported collisions increased from 1971 until 1979, then have generally decreased through 1994. During 1994, there were fewer injuries and fatalities than there were during any other year of the 24-year period. The collision rate was also the lowest at 17.97 collisions per 1,000 motorcycles registered.

year	registered m/cycles	m/cycles collisions	m/cycles involved	rate*	total fatalities	m/cyclists killed	total injuries	m/cyclists injured
1971	74,574	1,957	1,972	26.24	54	51	2,107	1,934
1972	81,200	1,893	1,937	23.31	48	43	2,076	1,932
1973	91,782	2,200	2,235	23.97	38	35	2,406	2,230
1974	110,024	2,605	2,657	23.68	60	58	2,764	2,583
1975	110,130	2,518	2,556	22.86	57	51	2,664	2,459
1976	111,211	2,761	2,807	24.83	61	61	2,978	2,752
1977+	115,454	3,093	3,230	26.79	76	75	3,432	3,230
1978	106,212	3,282	3,350	30.90	117	115	3,610	3,416
1979	129,641	3,992	4,054	30.79	121	119	4,350	4,126
1980	135,899	3,914	3,985	28.80	129	119	4,201	3,991
1981	139,931	3,727	3,796	26.63	105	101	3,920	3,752
1982	131,667	3,376	3,424	25.64	109	108	3,341	3,289
1983	127,950	3,312	3,362	25.89	77	77	3,555	3,351
1984	126,703	3,477	3,527	27.44	75	72	3,656	3,434
1985	125,224	3,699	3,762	29.54	85	82	3,884	3,632
1986	122,751	3,508	3,562	28.58	81	80	3,673	3,427
1987	124,215	3,379	3,443	27.20	90	90	3,497	3,288
1988	117,155	2,773	2,813	23.67	77	77	2,896	2,737
1989	110,617	2,516	2,557	22.75	75	69	2,724	2,511
1990@	103,537	2,167	2,198	20.93	62	60	2,223	2,061
1991	100,970	2,048	2,087	20.28	44	43	2,114	1,965
1992	98,131	2,044	2,078	20.83	49	48	2,112	1,952
1993	96,609	1,739	1,742	18.00	39	38	1,810	1,663
1994	97,075	1,744	1,774	17.97	35	35	1,752	1,650

*Collisions per 1,000 motorcycles registered

Source: WSP, DOL

+Repeal of the Mandatory Helmet Law effective 9/27/77

@Mandatory Helmet Law Reinstated 6/30/90

Location of motorcycle collisions

City streets recorded the highest number of total collisions involving motorcycles with 904. County roads experienced 14 fatal collisions. County roads, state routes and interstate routes all had rates in excess of 30 persons killed per 1,000 collisions (Table 8-3).

Table 8-3: Location of motorcycle collisions
By severity - 1994

location	collisions				persons		persons killed per 1,000 clsns
	fatal	injury	pty dmg*	total	killed	injured	
City streets **	8	730	166	904	8	875	8.8
County roads	14	365	42	421	14	427	33.3
State route- rural	7	225	16	248	8	273	32.3
Interstate	4	113	11	128	4	129	31.3
Other trafficways ***	1	40	2	43	1	48	23.3
Total	34	1,473	237	1,744	35	1,752	20.1

*Property damage only collisions (no deaths or injuries)

Source: WSP

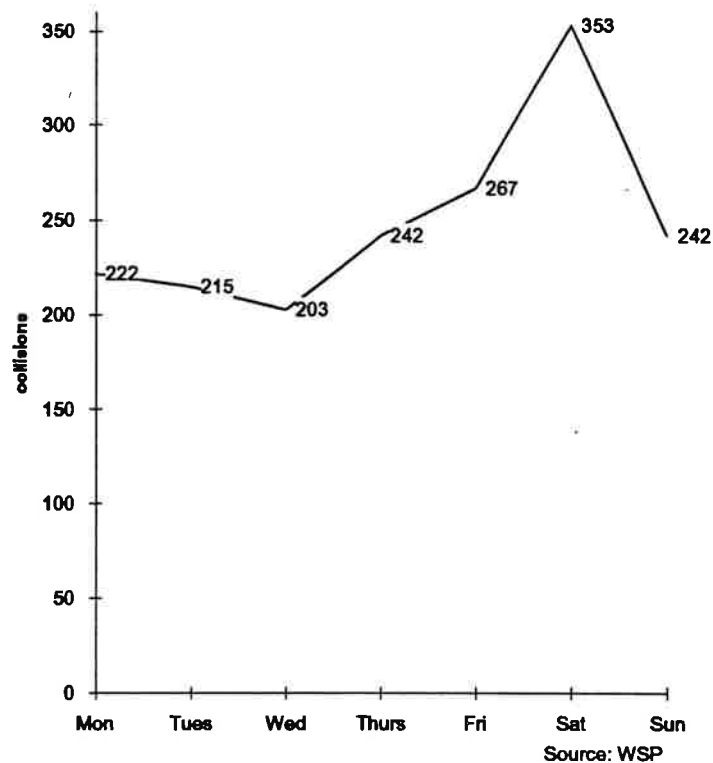
**Including U.S. and state routes in cities

***Includes parks/forest service roads. Does not include all-terrain-vehicle trails.

Motorcycle collisions by day of week

Figure 8-2 shows that Saturday had the highest number of collisions involving motorcycles, with 353.

Figure 8-2:
Motorcycle collisions
By day of week - 1994



First harmful event in motorcycle collisions

Of single-vehicle motorcycle collisions, overturning was the most prevalent with 440 (61.6%). Of multiple-vehicle motorcycle collisions, the most frequent types were rear-end, angular direction, and entering/leaving driveway (Table 8-4).

Table 8-4: First harmful event in motorcycle collisions
Single & multiple collisions - 1994

	fatal	injury	ppty dmg only	total collisions	
				number	percentage
Single motorcycle collisions					
Overtuned	6	403	31	440	61.6%
Struck fixed object	12	164	16	192	26.9%
Motorcycle-animal	0	38	3	41	5.7%
Motorcycle-pedestrian	0	7	0	7	1.0%
Non-collision	0	7	3	10	1.4%
Struck other object	0	11	1	12	1.7%
Motorcycle-pedalcyclist	0	12	0	12	1.7%
Total single motorcycle	18	642	54	714	100.0%
Multiple vehicle clsns (w/m.c)					
Rear-end	1	216	47	264	25.6%
Angular direction	4	174	36	214	20.8%
Enter/leave driveway	2	178	28	208	20.2%
One left/one straight-opp dir	4	87	7	98	9.5%
Sideswipe	1	106	17	124	12.0%
Struck parked vehicle	2	23	39	64	6.2%
Broadside (same or opp. dir.)	0	25	7	32	3.1%
Enter/leave parked position	0	11	2	13	1.3%
Head-on	2	11	0	13	1.3%
Total multiple vehicle	16	831	183	1,030	100.0%
Total motorcycle collisions	34	1,473	237	1,744	

Source: WSP

Motorcycle drivers by age group

When compared to their percentage of licensed drivers, motorcyclists aged 20 and younger were over-represented by a factor of nearly 18 times in 1994 collisions. Table 8-5 and Figure 8-3 illustrate that as the age of the motorcycle driver increases, the ratio of collisions to licensed drivers decreases.

Table 8-5: Motorcycle drivers in collisions
By age group - 1994

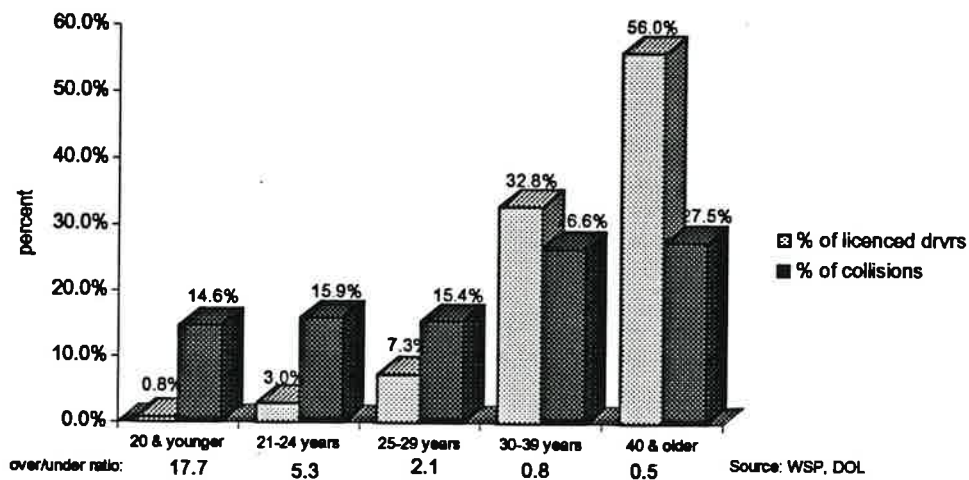
age	licensed m/cyclists		dvrs - fatal clsns		dvrs - inj clsns		dvrs - totl clsns		
	number	%	number	%	number	%	number	%	ratio*
Under 16	-----	-----	1	2.9%	37	2.5%	39	2.3%	-----
16	22	0.0%	0	0.0%	14	0.9%	14	0.8%	82.29
17-18	414	0.2%	0	0.0%	45	3.0%	53	3.1%	16.55
19-20	1,415	0.6%	2	5.7%	115	7.7%	136	7.9%	12.43
21-22	2,568	1.2%	6	17.1%	111	7.4%	127	7.4%	6.40
23-24	4,083	1.8%	2	5.7%	118	7.9%	135	7.8%	4.28
25-29	16,398	7.3%	7	20.0%	218	14.6%	255	14.8%	2.01
30-34	29,744	13.3%	6	17.1%	207	13.9%	242	14.0%	1.05
35-39	43,558	19.5%	1	2.9%	183	12.3%	197	11.4%	0.58
40-44	44,721	20.0%	3	8.6%	155	10.4%	177	10.3%	0.51
45-54	52,617	23.6%	5	14.3%	175	11.7%	195	11.3%	0.48
55-64	19,308	8.7%	0	0.0%	54	3.6%	58	3.4%	0.39
65/over	8,347	3.7%	1	2.9%	21	1.4%	24	1.4%	0.37
Not stated	-----	-----	1	-----	39	-----	74	-----	-----

* Ratio of percent of licensed drivers to percent of drivers in total collisions

Source: WSP, DOL

The younger group of motorcyclists (age 20 and under) were involved in 14.6% of motorcycle collisions, but they comprised only 0.8% of motorcycle-licensed drivers, creating an over-representation ratio of 17.7. The 21 to 24 age group was over-represented by a factor of 5.3 (Figure 8-3).

Figure 8-3:
Motorcycle drivers in collisions by age group
Percent of motorcycle-licensed drivers and collisions - 1994



Motorcyclist violations in collisions

As shown in Table 8-6, speeding was the most-reported motorcyclist violation in fatal, injury and property-damage-only collisions. DUI was the second most-reported motorcyclist violation.

Table 8-6: Motorcyclist violations in collisions*
By severity - 1994

violation	fatal	injury	ppty dmg only	total collisions
Speeding	18	409	34	461
D.U.I.	12	137	9	158
Following too closely	0	106	10	116
Defective equipment	4	72	11	87
Improper passing	1	62	6	69
Failed to yield	0	52	9	61
Over center line	3	30	2	35
Disregd signs/signals	2	27	3	32
Other violations	4	152	26	182
Total	44	1047	110	1,201

*Investigated collisions only.

Source: WSP

Helmet use in collisions

In 1994, there were 1,718 motorcyclists in collisions wearing a helmet, and there were 147 in collisions while not wearing a helmet. Among the helmeted riders, 28 died and 1,452 received some type of injury while 234 motorcyclists received no injury (Table 8-7, Figure 8-4).

The 1994 observation survey of motorcycle helmet use found that 98.3 percent were wearing helmets; 90.6 percent using approved helmets and 7.7 percent using non-approved helmets.

Table 8-7: Motorcyclist Injuries and helmet use
By severity - 1994

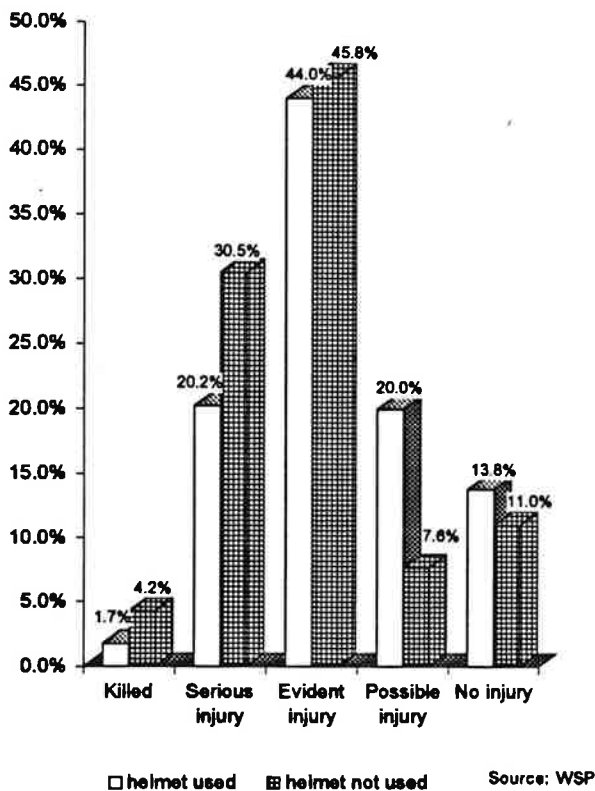
	helmet use				total**
	used	% used*	not used	unknown	
Killed	28	82.4%	6	1	35
Serious injury	338	88.3%	45	15	398
Evident injury	766	91.6%	70	53	889
Possible injury	348	96.9%	11	34	393
No injury	234	94.4%	14	35	283
Injury status unknown	4	80.0%	1	2	7
Total	1,718	92.1%	147	140	2,005

* Percent used does not including unknown use.

Source: WSP

** Total includes unknown use.

Figure 8-4:
Severity of motorcyclist injuries
Percentage by helmet use - 1994



Motorcycle collisions by county

Motorcyclist fatalities, injuries and collisions for 1994 are summarized for counties in Table 8-8.

**Table 8-8: Motorcyclists killed and injured
Collisions by county - 1994**

county	registered motorcycles	m/cyclsts killed	m/cyclsts injured	total m/c collision	collision rate*
Adams	170	0	4	3	17.6
Asotin	321	0	7	7	21.8
Benton	2,383	1	27	33	13.8
Chelan	1,803	0	21	23	12.8
Clallam	1,250	0	12	11	8.8
Clark	4,132	2	80	81	19.6
Columbia	104	0	1	1	9.6
Cowlitz	1,536	1	29	23	15.0
Douglas	647	0	8	9	13.9
Ferry	105	0	2	2	19.0
Franklin	677	1	8	9	13.3
Garfield	23	2	3	3	130.4
Grant	1,114	1	18	14	12.6
Grays Harbor	1,099	0	14	17	15.5
Island	1,170	0	14	17	14.5
Jefferson	696	0	5	7	10.1
King	28,759	8	511	588	20.4
Kitsap	4,704	1	60	72	15.3
Kittitas	933	0	26	21	22.5
Klickitat	344	0	2	2	5.8
Lewis	1,295	0	23	23	17.8
Lincoln	142	0	3	2	14.1
Mason	896	2	21	17	19.0
Okanogan	758	1	12	12	15.8
Pacific	271	0	4	6	22.1
Pend Oreille	181	0	6	4	22.1
Pierce	9,674	3	181	178	18.4
San Juan	396	1	1	4	10.1
Skagit	2,255	1	34	38	16.9
Skamania	138	0	21	21	152.2
Snohomish	10,427	4	159	170	16.3
Spokane	7,018	1	124	122	17.4
Stevens	610	1	11	14	23.0
Thurston	3,903	2	44	52	13.3
Wahkiakum	29	0	0	0	0.0
Walla Walla	832	0	9	11	13.2
Whatcom	2,864	2	60	67	23.4
Whitman	574	0	7	7	12.2
Yakima	2,842	0	56	53	18.6
Total	97,075	35	1,628	1,744	18.0

Source: WSP, DOL

* Collisions involving motorcycles per 1,000 motorcycles registered.

IX. Trucks



During 1994 there were 6,364 collisions involving heavy trucks (in excess of 10,000 pound gross weight), up 8.6% from the previous four-year average. The heavy truck collision rate (collisions per 10,000 registered heavy trucks) was up from the previous year and the previous four-year average (Table 9-1).

Table 9-1: Traffic collisions involving heavy trucks (10,000 lbs & greater)
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Collisions involving heavy trucks	6,364	5,816	5,530	5,617	6,486	5,862	8.6%
Fatal collisions	55	62	49	54	76	60	-8.7%
Injury collisions	2,081	1,853	1,650	1,687	2,051	1,810	15.0%
Property damage only clsns	4,228	3,901	3,831	3,876	4,359	3,992	5.9%
Persons killed	58	71	60	63	82	69	-15.9%
Percent of all traffic fatalities	9.1%	10.7%	9.2%	9.2%	9.9%	9.8%	-7.2%
Persons injured	2,883	2,695	2,335	2,354	2,879	2,566	12.4%
Serious injuries	244	234	279	275	372	290	-15.9%
Evident injuries	954	953	810	826	995	896	6.5%
Possible injuries	1,685	1,508	1,246	1,253	1,512	1,380	22.1%
Heavy-truck drivers involved	6,447	5,884	5,546	5,684	6,561	5,919	8.9%
Heavy trucks involved	6,590	6,029	5,683	5,811	6,725	6,062	8.7%
Heavy trucks registered**	133,000	130,000	132,300	136,500	128,100	131,725	1.0%
Fatal collision rate**	4.14	4.77	3.70	3.96	5.93	4.59	-9.9%
Collision rate*	478.50	447.38	417.99	411.50	506.32	445.80	7.3%

*Collisions per 10,000 registered trucks

Source: WSP, DOL, DOT

**Estimated by DOT and DOL

Collisions involving light trucks

Table 9-2 displays a five-year comparison of collisions involving light trucks (gross weight of under 10,000 pounds). The number of collisions during 1994 involving light trucks increased 11.0% when compared to the previous four-year average. The number of persons killed increased by 8.8% over the same period. The estimated number of registered light trucks increased only 0.6% over the previous four-year average.

Table 9-2: Traffic collisions involving light trucks*
Five-year comparison

	1994	1993	1992	1991	1990	prev 4-yr avg	'94 vs prev 4-yr avg
Collisions involving light trucks	62,041	57,757	56,270	52,907	56,655	55,897	11.0%
Fatal collisions	281	249	266	259	306	270	4.1%
Injury collisions	25,210	22,866	21,892	20,364	21,076	21,550	17.0%
Property damage only clsns	36,550	34,642	34,112	32,284	35,273	34,078	7.3%
Persons killed	335	289	292	294	357	308	8.8%
Persons injured	38,800	34,868	33,384	30,926	31,971	32,787	18.3%
Serious injuries	2,474	2,453	2,742	2,827	3,084	2,777	-10.9%
Evident injuries	11,570	10,830	10,330	10,109	10,603	10,468	10.5%
Possible injuries	24,756	21,585	20,312	17,990	18,284	19,543	26.7%
Total light trucks involved	73,584	67,967	65,896	61,344	65,713	65,230	12.8%
Light trucks registered**	1,076,694	1,053,200	1,092,900	1,081,900	1,051,300	1,069,825	0.6%
Fatal collision rate +	2.61	2.36	2.43	2.39	2.91	2.53	3.3%
Collision rate +	576.2	548.4	514.9	489.0	538.9	522.8	10.2%

* Less than 10,000 lbs. including vans

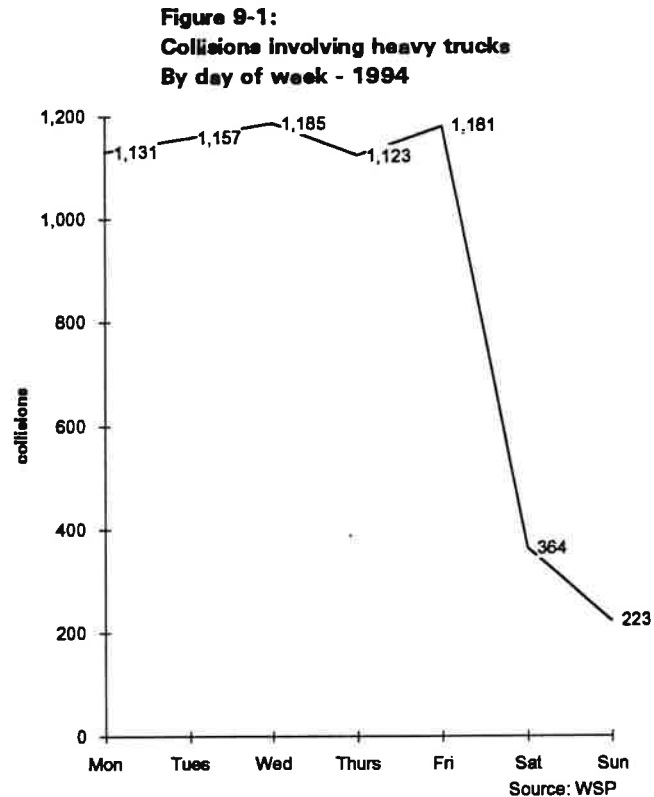
** Estimated by DOT and DOL

+Fatal collisions / collisions per 10,000 registered trucks

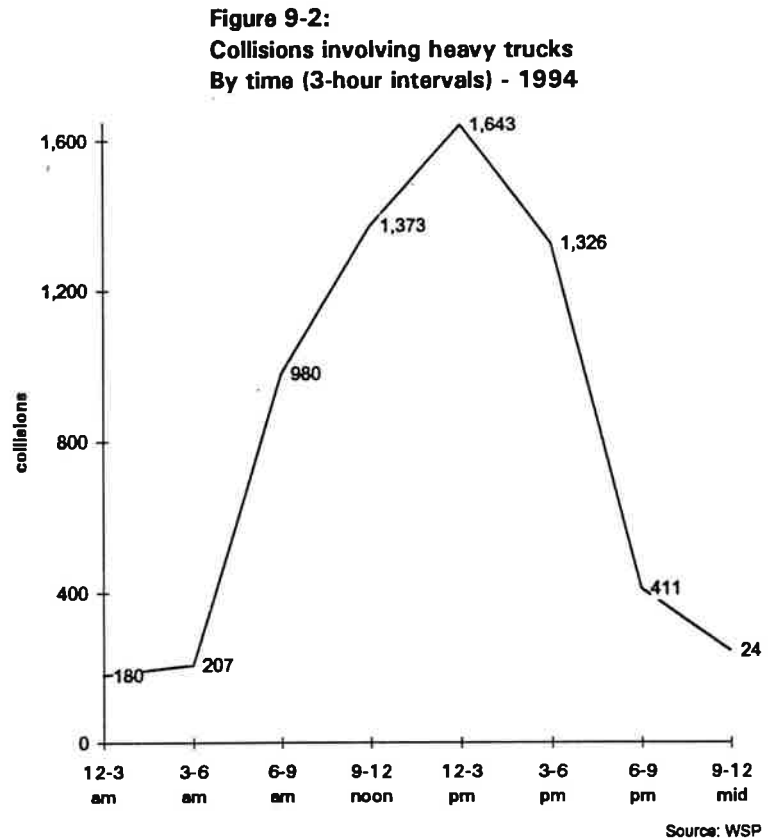
Source: WSP, DOL, DOT

Heavy truck collisions by day of week and hour of day

The number of collisions were roughly equivalent for weekdays, with just over 1,100 each for Monday through Friday during the year. Saturday and Sunday had dramatically lower numbers with 364 and 223 for the year respectively (Figure 9-1).



In 1994 the number of heavy truck collisions was highest during the 12:00 noon to 3:00 p.m. time period, with 1,643. The majority of collisions occurred between 9 a.m. and 6 p.m. (Figure 9-2).



Heavy truck collisions by first harmful event

During 1994, heavy trucks were involved in 4,778 collisions involving other moving motor vehicles. This accounted for 75.1% of all heavy truck collision, including 35 fatal crashes. In addition, heavy trucks were involved in 705 collisions with fixed or other objects (Table 9-3).

**Table 9-3: First harmful event in collisions involving heavy truck
By severity - 1994**

type of collision	fatal	injury	ppty dmg only	total collisions	percent
Clsn w/other moving motor veh	35	1,680	3,063	4,778	75.1%
Collision with fixed/other object	7	161	537	705	11.1%
Collision with parked vehicle	2	53	325	380	6.0%
Overturning	4	120	166	290	4.6%
Other non-collision	0	17	98	115	1.8%
All other collisions *	7	50	39	96	1.5%
Total	55	2,081	4,228	6,364	100.0%

* Pedestrians, pedalcyclists, RR train & animal.

Source: WSP

Heavy truck driver violations

In 1994, failure to yield the right of way was the leading heavy-truck-driver violation in collisions, accounting for 18.6% of all violations noted. Exceeding legal or safe speed and driver inattention were the next most frequent violations (Table 9-4).

**Table 9-4: Heavy truck driver violations in collisions
By severity - 1994**

type of collision	fatal	injury	ppty dmg only	total collisions	percent
Failure to yield right of way	3	238	485	726	18.6%
Exceeding legal or safe speed	8	307	337	652	16.7%
Driver inattention	2	143	439	584	15.0%
Improper turning	0	57	384	441	11.3%
Following too closely	0	226	183	409	10.5%
Operating defective equipment	9	117	249	375	9.6%
Disregarding traffic sig./signs	1	69	103	173	4.4%
Apparently asleep	1	29	24	54	1.4%
Crossing over the center line	1	21	18	40	1.0%
Improper passing	1	10	29	40	1.0%
Driving under the influence	1	16	12	29	0.7%
All other circumstances +	2	62	307	371	9.5%
Total	29	1,295	2,570	3,894	100.0%

Source: WSP

+includes fail to signal, imprp signal, imprp parking, fail/yield to pedestrian, fail to dim headlights.

Heavy truck defects

Defective brakes were present in 143 of 442 collisions, and in 5 of 14 fatal collisions where heavy-truck vehicle defects were reported. Worn or smooth tires were present in 26, or 5.9%, of heavy-truck defects in collisions (Table 9-5).

**Table 9-5: Defects of heavy trucks in collisions
By collision severity - 1994**

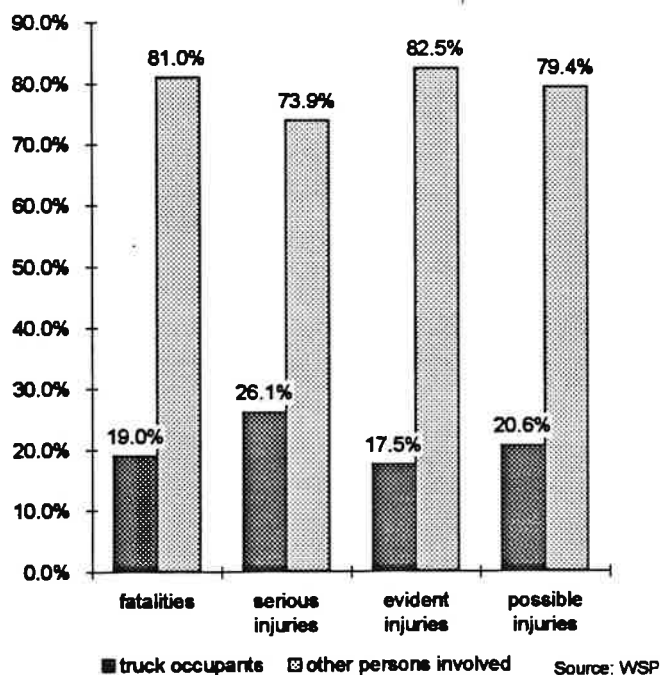
condition of vehicle	fatal	injury	ppty dmg only	total collisions	percent
Defective brakes	5	67	71	143	32.4%
Worn or smooth tires	2	14	10	26	5.9%
Defective rear lights	0	7	10	17	3.8%
Puncture or blowout	1	8	14	23	5.2%
Defective steering	1	9	9	19	4.3%
Defective headlights	0	1	1	2	0.5%
Other defects	5	48	159	212	48.0%
Total	14	154	274	442	100.0%

Source: WSP

Persons involved in heavy truck collisions by status and severity

Figure 9-3 shows that occupants of heavy truck involved in collisions are far less likely to be killed or injured than other persons involved in these collisions, primarily the occupants of the other vehicles involved.

**Figure 9-3:
Persons involved in heavy truck collisions
By severity and status - 1994**



X. Pupil Transportation



During the 1993-1994 school year, there were 366 school bus collisions reported in which 262 persons were injured. Of the injured, there were 130 pupils, 23 school bus drivers and 1 other occupant. There were no fatalities in 1993-1994 school bus collisions. No school bus occupants have been killed during the last five school years. The 7 fatalities during this time were pedestrians, bicyclists or occupants of other vehicles (Table 10-1).

Table 10-1: Collisions involving school buses
Five-year comparison

Severity, exposure & rates	93-94	92-93	91-92	90-91	89-90	93-94 vs	
						prev 4-yr avg	prev 4-yr avg
Total collisions	366	402	348	340	325	354	3.5%
Fatal collisions	0	2	0	4	1	2	-100.0%
Injury collisions	124	108	92	92	98	98	27.2%
Property damage collisions	242	292	256	244	228	255	-4.9%
Total persons killed	0	2	0	4	1	2	-100.0%
Pupils	0	0	0	0	0	0	----
School bus drivers	0	0	0	0	0	0	----
Other occupants of school bus	0	0	0	0	0	0	----
Pedestrian/bicyclist	0	1	0	2	1	1	-100.0%
Occupants of other vehicles involved	0	1	0	2	0	1	-100.0%
Total persons injured	262	237	192	189	232	213	23.3%
Pupils	130	104	85	82	85	89	46.1%
School bus drivers	23	26	20	16	17	20	16.5%
Other occupants of school bus	1	2	2	1	1	2	-33.3%
Pedestrian/bicyclist	12	4	3	4	6	4	182.4%
Occupants of other vehicles involved	96	101	82	86	123	98	-2.0%
Injuries to school bus occupants *	154	132	107	99	103	110	39.7%
Serious injuries	0	5	0	1	8	4	-100.0%
Evident injuries	9	34	16	8	31	22	-59.6%
Possible injuries	145	93	91	90	64	85	71.6%
School bus registration	7,672	7,534	7,349	7,113	6,906	7,226	6.2%
Collision rate by school bus registration **	47.7	53.4	47.4	47.8	47.1	48.9	-2.4%
Miles traveled (in thousands)	90,302.2	87,691.4	87,972.7	83,060.5	78,127.9	84,213	7.2%
Collision rate by mileage ***	0.41	0.46	0.40	0.41	0.42	0.42	-3.5%

* Includes school bus passengers and driver

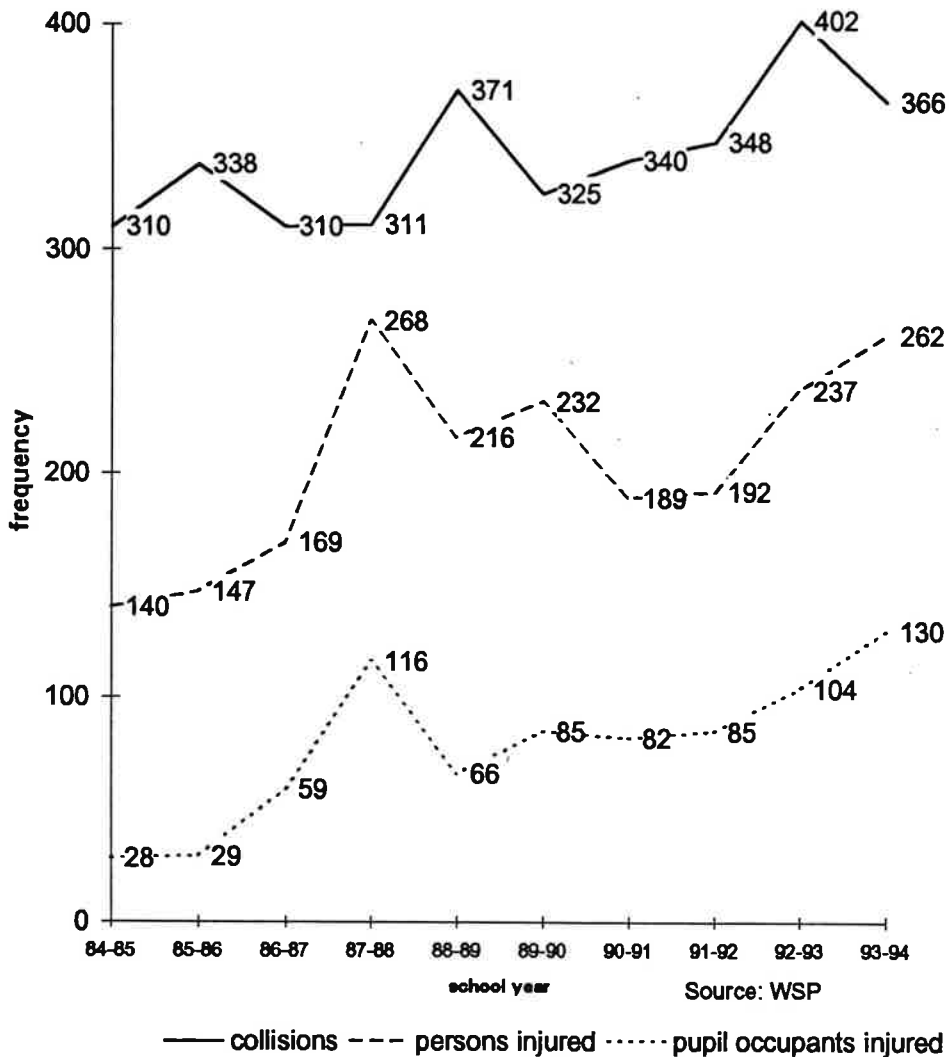
** Collisions per 1,000 registered vehicles

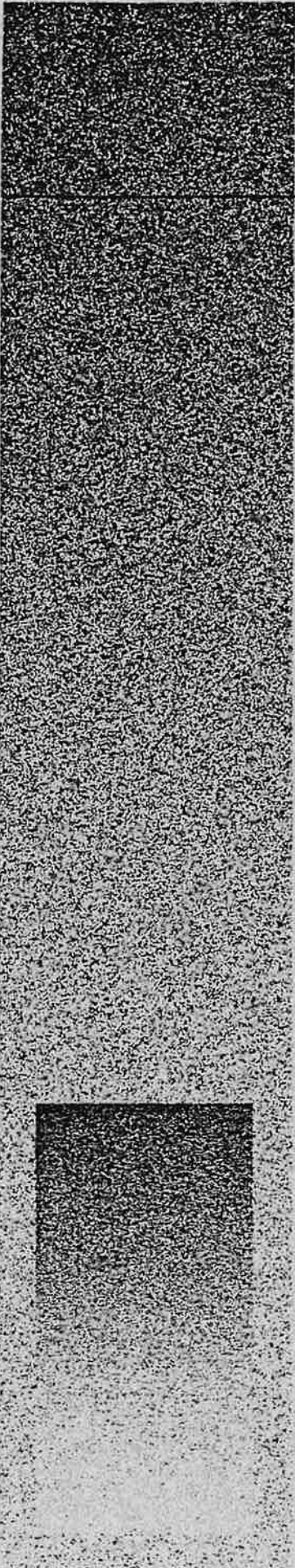
*** Collisions per 100,000 miles traveled

Source: WSP, SPI

Figure 10-1 displays a ten-year trend of school bus collisions, persons injured and pupil occupants injured. There has been an overall upward trend in these three categories.

**Figure 10-1:
School bus collisions and injuries
Ten-year comparison**





Appendix

Data
Summary &
Highway
Safety
Problem
Analysis

Glossary



Collisions

Collision - A crash involving one or more motor vehicles on a public trafficway which results in personal injury or death, or damage to any one person's property to an apparent extent of \$500 or more.

Fatal collision - A traffic collision where one or more persons are killed or die within 30 days as a result of the collision.

Investigated collision - A collision that has been investigated by a law enforcement officer. Data relating to alcohol involvement, contributing circumstances (driver violations), vehicle defects and safety-restraint use are collected from investigated collisions.

Injury classes

Fatal injury / fatality - A motor-vehicle, traffic-related injury that results in death within 30 days of the collision.

Serious injury - An injury other than fatal that prevents the injured person from continuing normal activities; an "incapacitating" injury.

Evident injury - Any injury not incapacitating but evident to others at the scene.

Possible injury - Any injury reported or claimed other than the above; includes momentary unconsciousness, limping, complaint of pain, nausea or hysteria.

Death/injury rates

Vehicle miles traveled - Traffic deaths/injuries per 100 million vehicle miles of travel (travel is estimated by WSDOT).

Registered vehicles - Traffic deaths/injuries per 10,000 registered vehicles; 1,000 for motorcycles.

Population - Traffic deaths/injuries per 10,000 population.

Licensed drivers - traffic deaths/injuries per 10,000 licensed drivers.

Calculation of economic loss

The calculable costs of motor vehicle collisions include wage loss, medical expense, legal and insurance administration costs, and property damage. Costs are figured per person for deaths and injuries and per crash for property damage only collisions. The National Safety Council estimated average 1994 costs as follows:

○ Death	\$920,000
○ Disabling injury	\$ 46,000
○ Non-disabling injury	\$ 14,000
○ Possible injury	\$ 8,800
○ Property damage only	\$ 6,600

Persons Involved in Collisions (Status)

Occupant - Any person who is within or upon a motor vehicle. Occupants include drivers and passengers.

Driver - An occupant who is in actual physical control of a motor vehicle in transport.

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

Pedalcyclist - Any rider of a pedalcycle in transport. Pedalcycles include bicycles and tricycles. Motor-driven cycles are not included.

Pedestrian - Any person who is not an occupant or a pedalcyclist.

Location

Urban area - Incorporated areas with population of 2,500 or greater.

Rural area - Unincorporated or incorporated areas with population less than 2,500.

Trafficway - Any public roadway or highway used for motor vehicle travel.

Alcohol Involvement

Drinking driver collision - a collision in which one or more drivers had some level of alcohol in their system; includes DUI.

DUI / driving under the influence - Driving or in physical control of a motor vehicle while under the influence of alcohol (BAC of .10 and over) and/or when the investigating officer determines that the driver's driving ability was impaired by alcohol.

HBD / had been drinking - The investigating officer has determined that the driver had consumed some amount of alcohol and/or BAC test results greater than zero.

Vehicles

Motorcycle - Does not include mopeds, motorized bicycles, or motorized wheelchairs.

Heavy truck - 10,000 pounds or more gross weight.

Light truck - Under 10,000 pounds gross weight; includes pickup trucks and passenger vans.

Milestones in Washington Traffic Safety

- 1905:** Car owners required to register vehicles.
- 1921:** Driver's license required.
- 1933** Driving test required for driver's license.
- 1959** Director of DOL given the power to suspend or revoke driver's licenses.
- 1963** Driver Education Act requiring new drivers under 18 to take a driver class.
- 1967:** Creation of Washington Traffic Safety Commission.
Mandatory motorcycle helmet law.
Minimum driver's license age raised from 16 to 18 (16 with driver education).
- 1968:** Implied consent law.
- 1971:** Habitual traffic offender law.
- 1973:** Speed limit reduced to 55 mph.
- 1975:** Negligent homicide statute.
Deferred prosecution statute.
- 1977** Motorcycle helmet law repealed.
- 1979:** DWI law modified to make .10% BAC illegal per se.
Mandatory day in jail for first DWI offense.
- 1982:** Alcohol assessment and education/treatment required for DWI.
- 1983:** Vehicular homicide and assault statute.
Open container law for alcoholic beverages.
Mandatory child restraint law for children up to age 1 (effective 1/1/84).
- 1985:** Deferred prosecution procedures made more stringent.
- 1986:** Mandatory seat belt law.
- 1987:** Speed limit increased to 65 mph (60 mph for trucks) on rural interstates.
Motorcycle helmets required for persons under 18 years of age.
Children under 5 years of age prohibited from riding on motorcycles.
- 1989:** DWI youth (under 19) lose license for 90 days or until age 19, whichever is longer.
- 1990:** Mandatory insurance required.
Mandatory motorcycle helmet law for all ages.
- 1991:** Mandatory installation of crossing arms on school buses.
- 1992:** DWI victim panels authorized as a sentencing option.
Children up to age 2 required to ride in child safety seats (effective 7/1/93).
- 1993:** Children up to age 3 required to ride in child safety seats (effective 6/9/94).
Enhancement of pedestrian crosswalk law.
Vehicle confiscation for second DUI conviction.
- 1994:** Omnibus Drunk Driving Act of 1994 - stiffer penalties for higher BAC/repeat offenses and zero tolerance (.02% BAC for drivers under age 21).
Child safety seats required for children up to age 3.
Primary seatbelt enforcement for children up to age 10.
- 1995:** Law enforcement authorized to take blood sample when driver is suspected of DUI-drugs.

Traffic Safety Resource Material

Accident Facts

National Safety Council
Statistics Department (Chicago, Illinois).
444 N. Michigan Ave, Chicago, IL 60611
+ Includes a section on motor vehicle traffic collisions.

Annual Traffic Report

Washington State Department of Transportation
Planning, Research and Public Transportation Programs.
Transportation Building, P.O. Box 47372, Olympia, WA 98504-7372
+ Contains traffic volumes on state highways.

Caseloads of the Courts of Limited Jurisdiction of Washington

Office of the Administrator for the Courts
1206 S. Quince St., P.O. Box 41170, Olympia, WA 98504-1170
+ Includes DWI citation and disposition information.

Crime Trends in Washington Jurisdictions

Washington Association of Sheriffs and Police Chiefs (WASPC)
P.O. Box 826, Olympia, WA 98507
+ Includes statistics on DWI arrests.

Fatal Accident Reporting System

National Highway Traffic Safety Administration (NHTSA)
U.S. Department of Transportation (USDOT).
National Transportation Systems Center, DTS-44
Kendall Square, Cambridge, MA 02142
+ Statistics on nationwide traffic fatalities.

Population Trends for Washington State

Office of Financial Management (OFM), Forecasting Division.
300 Insurance Building, P.O. Box 43113, Olympia, WA 98504-3113

Washington State Highway Accident Report

Washington State Department of Transportation
Planning, Research and Public Transportation Division.
Transportation Building, P.O. Box 47372, Olympia, WA 98504-7372
Olympia, WA 98504-5201
+ Accident rates for state highway sections.

Washington State Reportable Motor Vehicle Traffic Collision Statistics

Washington State Patrol
Accident Records Section
4242 Martin Way, P.O. Box 42628, Olympia, WA 98504-2628

Documents listed above are updated annually.

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Motorcycle Helmet Use, Injury Outcome, and Hospital Costs: A Population-Based Study of Motorcycle Crash Victims; Philip Salzberg, Ph.D.; Frederick Rivara, MD, MPH; Jefferson Rowland, MS; June 1991.

Safety Restraint Usage Rates in Washington, 1991; Philip Salzberg, Ph.D.; Richard Thurston; October 1991.

Uninsured Driving in Washington State: A Report to the Legislature on Substitute Senate Bill 5499 (1989 Legislative Session); Philip Salzberg, Ph.D.; November 1991.

Vehicle Registration Cancellation for Driving with a Suspended Drivers License, An Evaluation of Substitute House Bill 196 (1987 Legislative Session); Philip Salzberg, Ph.D.; November 1991.

Deferred Prosecution of DWI Cases in Washington State: An Evaluation of Offender Characteristics and Recidivism; Brent Baxter, Ph.D.; Philip Salzberg, Ph.D.; Jeanne Kleyn, Ph.D.; February 1992.

Safety Restraint and Motorcycle Helmet Usage Rates in Washington State, 1993; Philip Salzberg, Ph.D.; Richard Thurston; December 1993.

The Effectiveness of Deferred Prosecution in Reducing DWI Recidivism: An Update; Brent L. Baxter, Ph.D.; Philip M. Salzberg, Ph.D.; Jeanne E. Kleyn, Ph.D.; December 1993.

High-BAC DWI Arrestees: Distinguishing Characteristics and Risk of Recidivism and Crashes; Brent L. Baxter, Ph.D.; October 1994.

Observational Survey of Driver Compliance with the Pedestrian Crosswalk Law; Charlie Saibel; Philip Salzberg, Ph.D.; Richard Thurston; March, 1995.

Alcohol-Related Fatal Collisions in Washington State: Driver and Crash Characteristics; William Cooper; Philip Salzberg, Ph.D.; March 1995.

Observational Survey of Safety Restraint and Car Safety Seat Use for Children; Charlie Saibel; Philip Salzberg, Ph.D.; Richard Thurston; June 1995.

Bicycle Helmet Survey; Charlie Saibel; Philip Salzberg, Ph.D.; Richard Thurston; August 1995.

The Counties of Washington State

