

1992

Traffic Collisions in Washington State

Data
Summary and
Highway
Safety
Problem
Analysis

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Introduction

This Data Summary and Problem Analysis identifies and analyzes traffic safety problems in the State of Washington. Factors that 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 the effectiveness of ongoing countermeasure programs, and document successes or failures of program efforts.

Data are presented for significant traffic safety problem areas. These identified problem areas include the drinking driver and other major segments of the population at risk for motor vehicle collisions, injuries and fatalities; these include youth, older drivers, pedestrians, pedalcyclists, motorcyclists and drivers of heavy trucks. One identified problem area affecting all segments of the motoring public is safety restraint use by drivers and passengers in motor vehicles. 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 major data source is the collision record system. Collisions involving motor vehicles on public trafficways that result in death, injury, or property damage of \$500 or more are required by law to be reported. The collision records include both citizen reports and law enforcement investigation reports. The records include information on vehicles, roadways, collision circumstances, and the drivers, passengers, pedestrians, and pedalcyclists involved in collisions. The different analyses reported in this document use 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.

I. Overview

Six hundred and fifty one (651) persons were killed in 593 fatal traffic collisions in the state of Washington during 1992. This was a 4.7% decrease in traffic deaths from the previous year and a 15.3% decrease compared to the previous 4-year average (1988-1991). A total of 75,803 persons were injured in 1992, up 5.3% from the previous year and up 3.0% from the previous 4-year average. Disabling injuries have decreased dramatically while non-disabling injuries have decreased slightly and possible injuries have increased over the past 5 years. Property-damage-only collisions were down 3.1% from the previous 4-year average. The estimated economic loss for 1992 has been computed at \$1.288 billion based on National Safety Council estimates of the cost of motor vehicle crashes. This estimate may be conservative; a NHTSA study of the economic cost of motor vehicle crashes gave an estimate of \$2.733 billion for Washington State 1990 collisions. There were 125,565 total reported collisions in 1992. The 1992 motor vehicle traffic death rate was 1.34 persons killed per 100 million vehicle miles traveled, down 10.7% from the 1.50 rate for 1991 and down 24.4% from the previous 4-year average (Table 1-1).



Table 1-1: Severity of collisions
Five-year comparison

severity	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Total collisions	125,565	121,686	132,056	128,800	125,920	127,116	-1.2%
Drivers in totl clsns	224,316	215,989	234,215	227,803	223,162	225,292	-0.4%
Mbtor veh. travel*	48,650	45,663	44,157	42,696	41,698	43,554	11.7%
Fatal collisions	593	603	726	694	706	682	-13.1%
Persons killed	651	683	825	781	785	769	-15.3%
Death rate**	1.34	1.50	1.87	1.83	1.88	1.77	-24.4%
Injury collisions	51,186	49,048	51,713	50,747	49,482	50,248	1.9%
Persons injured	75,803	72,004	76,064	73,993	72,449	73,628	3.0%
Disabling injury	6,531	6,839	7,653	8,044	8,318	7,714	-15.3%
Non-disabling	24,246	24,212	25,722	26,974	26,496	25,851	-6.2%
Possible injury	45,026	40,953	42,689	38,974	37,635	40,063	12.4%
Injury rate**	155.81	157.69	157.69	173.30	173.75	165.61	-5.9%
Property dmg only	73,786	72,035	79,617	77,359	75,732	76,186	-3.1%
Economic loss +	\$1,288	\$1,130	\$1,146	\$922	\$877	\$1,019	26.4%

*In millions of miles

Source: WSP, WSDOT, Nat'l Safety Council

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

+In millions of dollars.

I / Overview

Exposure

Increases were recorded in all motor vehicle exposure data for 1992. Motor vehicle travel increased 6.5%, motor vehicle registration was up 1.2%, the number of licensed drivers was up 3.3%, and the state's population was up 2.3% compared to 1991 (Table 1-2).

Table 1-2: Exposure - travel, vehicles, drivers and population
Five-year comparison

exposure	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Motor vehicle travel*	48,650	45,663	44,157	42,696	41,698	43,554	11.7%
Motor veh. registration	4,435,259	4,381,757	4,233,854	4,084,367	3,896,828	4,149,202	6.9%
Licensed drivers	3,689,741	3,572,038	3,366,146	3,350,324	3,264,065	3,388,143	8.9%
State's population	5,116,685	5,000,400	4,866,692	4,660,700	4,565,000	4,773,198	7.2%

*In millions of miles

Source: WSDOT, DOL, OFM

Status of persons killed

More than half of all persons killed in traffic crashes (excluding motorcyclists) were motor vehicle drivers (339 out of 651 total fatalities). Passengers made up the next largest segment with 26.4%, followed by pedestrians with 12.4% and motorcyclists with 7.4%. Pedalcyclists accounted for 1.4% of all traffic fatalities. Two persons were categorized as "other"; both were inside a building when hit by a motor vehicle. The largest percentage decreases for 1992 were drivers and motorcyclists (Table 1-3).

Table 1-3: Status of persons killed
Five-year comparison

status	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Drivers (no motorcyclists)	339	380	438	420	394	408	-16.9%
Passengers	172	176	232	174	206	197	-12.7%
Pedestrians	81	79	81	110	97	92	-11.7%
Motorcyclists	48	43	60	69	76	62	-22.6%
Pedalcyclists	9	5	14	8	12	10	-7.7%
Other	2						
Total	651	683	825	781	785	769	-15.3%

Source: WSP

Age and status of persons killed and injured

In 1992, the highest numbers of traffic fatalities were in the 25-34 and 20-24 year age groups, with 131 and 106 deaths respectively. The majority of persons killed in traffic collisions in all age groups were motor vehicle occupants, and the greatest numbers were also in the 25-34 and 20-24 year age groups. Of pedestrians killed, the highest number was in the 75 and older group with 17 fatalities. Of motorcyclists killed, the highest number occurred in the 20-24 year age group, with 15 killed. The highest number of pedalcyclist injuries occurred in the 10-14 year range, with 408 injured (Table 1-4).

Table 1-4: Persons killed and Injured - 1992
By age and by status

age	total*		occupants +		pedestrians		motorcyclists		pedalcyclists	
	killed	injured	killed	injured	killed	injured	killed	injured	killed	injured
0 - 4	11	1,478	8	1,312	2	126	0	0	1	39
5 - 9	16	2,076	9	1,648	4	194	0	7	3	227
10 - 14	12	2,665	8	1,991	2	214	2	51	0	408
15 - 19	66	11,046	59	10,353	2	203	5	257	0	228
20 - 24	106	11,357	82	10,534	8	172	15	449	1	194
25 - 34	131	17,194	110	16,094	7	259	13	562	1	266
35 - 44	99	12,838	78	12,071	13	239	5	382	1	133
45 - 54	51	6,953	34	6,627	10	122	6	143	1	55
55 - 64	33	3,787	24	3,659	8	66	1	46	0	13
65 - 74	59	2,621	49	2,522	8	80	1	10	1	8
75/older	63	1,595	46	1,514	17	71	0	4	0	6
Not stated	4	2,193	4	2,041	0	63	0	41	0	45
Total	651	75,803	511	70,366	81	1,809	48	1,952	9	1,622

Source: WSP

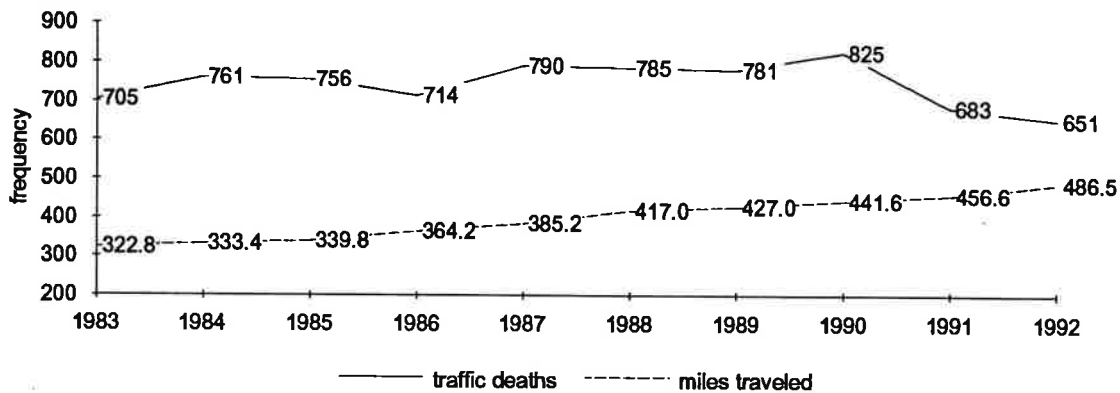
*Totals include 2 killed and 54 injured where the status of the person killed or injured was unknown or 'other'.
#includes motor vehicle drivers and passengers - excludes motorcyclists.

I / Overview

Traffic deaths, injuries, and rates

Figures 1-1 through 1-3 depict trends for traffic deaths, miles traveled, death rates and reported collisions and injuries over the past ten years. Motor vehicle travel has increased steadily over the past decade, while the number of deaths recorded in 1992 was the lowest in a decade (Figure 1-1).

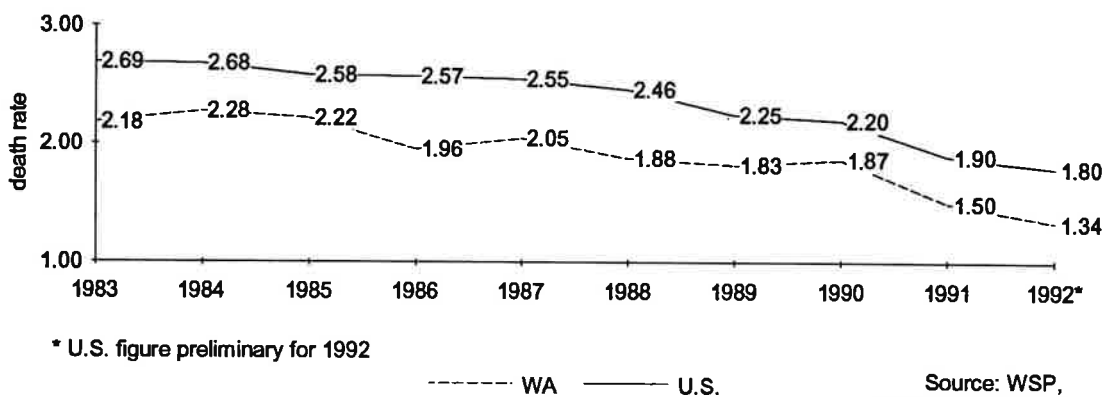
**Figure 1-1: Traffic deaths and miles traveled (In 100 millions)
Ten-year comparison**



Source: WSP, DOT

Washington's 1992 death rate (deaths per 100 million vehicle miles traveled) was a record low 1.34, down 41.2% from the 2.28 rate recorded in 1984. Washington's rate has been consistently lower than the national rate (Figure 1-2). Traffic collisions and injuries both recorded increases in 1992 compared to the previous year. There has been a general trend upward in collisions and injuries through 1992 (Figure 1-3).

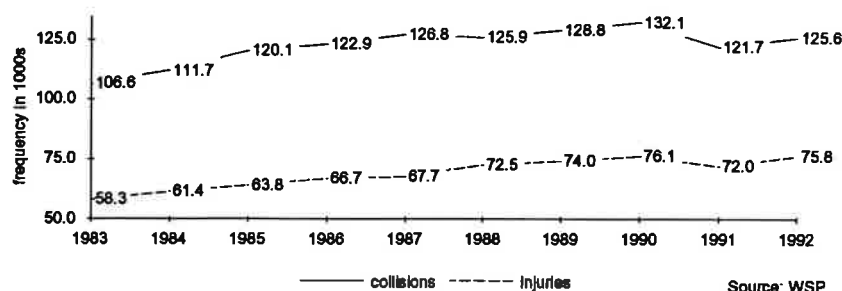
**Figure 1-2: Death rate (deaths per 100 million vehicle miles)
Ten-year comparison - Washington vs U.S.**



* U.S. figure preliminary for 1992

Source: WSP,
Nat'l Safety Council

Figure 1-3: Reported collisions & injuries
Ten-year comparison - in 1000s



Traffic safety statistics: 1972 to 1992

Exposure statistics, including total licensed drivers, population, vehicle registration and travel, have all increased annually (average increases have been 1% to 5%). Motor vehicle collisions and injuries peaked in 1990 with 132,056 collisions and 76,064 injuries. The annual traffic death total ranged from a low of 651 deaths recorded in 1992 to a high of 1,034 recorded in 1979. The fatality rate (deaths per 100 million miles of travel) has decreased over the years, from a high of 3.82 in 1972 to a low of 1.34 in 1992 (Table 1-5).

Table 1-5: Population, vehicle and collision summary
1972 - 1992

year	population	lic. drivers	reg. vehicles	travel*	collisions**	injuries	deaths +	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	3,042,265	29,378	116,923	64,669	1,006	3.42
1979	3,911,200	2,579,368	3,186,898	29,122	118,888	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	61,063	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	111,855	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	48,650	125,565	75,803	651	1.34

Source: WSP, OFM, DOL, WSDOT

* In millions, estimated for 1992

** 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.

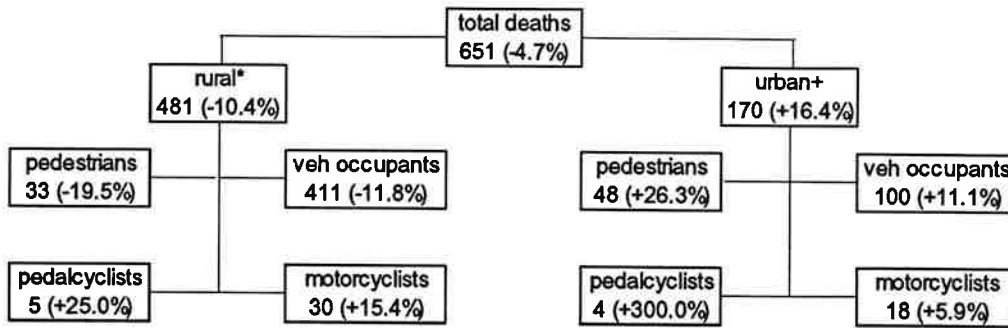
+ State adopted a 90-day fatal-reporting policy in 1980 and a 30-day fatal-reporting policy in 1989.

++ Traffic deaths per 100 million vehicle miles of travel.

I / Overview

Of the 651 traffic deaths in 1992, 481 occurred in rural areas of the state, while 170 occurred in urban areas (cities with a population of 2,500 or greater). Rural areas recorded a decrease of 10.4% from the previous year, while the urban area experienced an increase of 16.4% (Figure 1-4).

Figure 1-4: Urban vs rural traffic fatalities by type - 1992
Percent of change from previous year



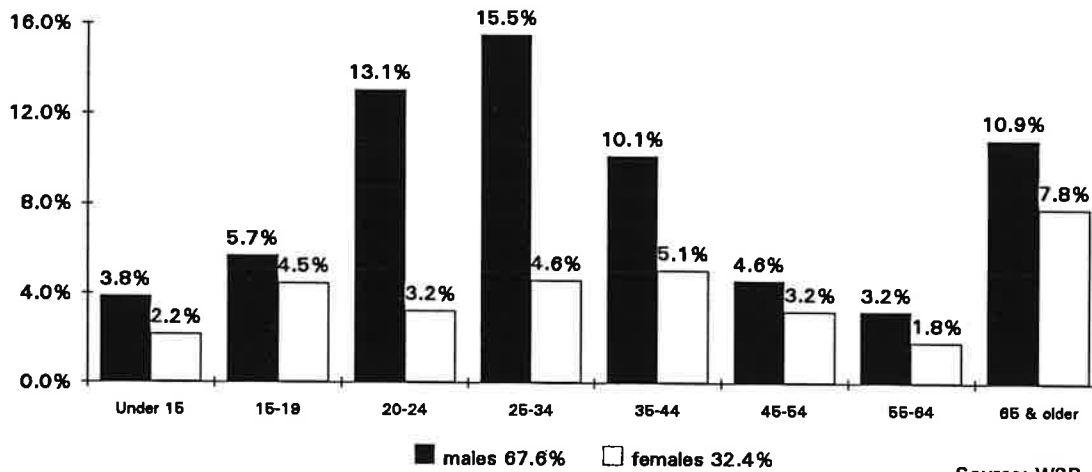
* Rural: Unincorporated areas plus incorporated areas with population less than 2,500.
Rural total includes two fatalities with status of "other".
+ Urban: Cities with population 2,500 and greater.

Source: WSP

Age and sex of persons killed

The majority of traffic fatalities were males (67.6%). For males, the age group with the most traffic fatalities was 25-34 with 15.5% of the total fatalities. For females, the age group with the most fatalities was the 65 and older, with 7.8% of the total (Figure 1-5)

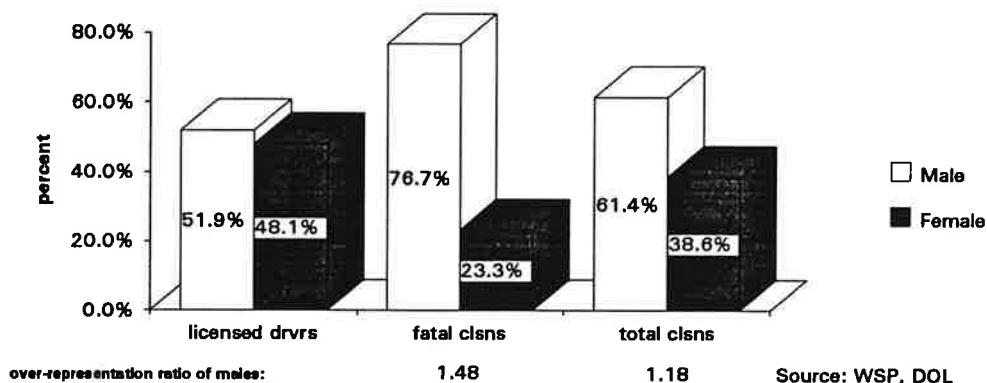
Figure 1-5: Percentage of traffic fatalities By age and sex - 1992



Source: WSP

Just over half, or 51.9%, of all licensed drivers in 1992 were males. However, males drivers were involved in 76.7% of fatal collisions, creating an over-representation ratio of 1.48, and were involved in 61.4% of total collisions, with an over-representation ratio of 1.18 (Figure 1-6).

Figure 1-6:
Male and female drivers involved in collisions - 1992



Traffic death occurrences by month

During 1992, the months recording the greatest number of traffic deaths were August and December, recording 71 for each. The months of November and July recorded the biggest reductions from the previous 4-year average. During the previous 4 years, the greatest numbers of fatalities generally occurred in the summer months of May to September (Table 1-6).

Table 1-6: Traffic deaths by month
Five-year comparison -

month	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
January	45	54	63	42	40	50	-9.5%
February	49	49	53	33	42	44	10.7%
March	46	55	61	53	70	60	-23.0%
April	47	47	55	52	55	52	-10.0%
May	51	64	75	74	69	71	-27.7%
June	61	52	82	65	82	70	-13.2%
July	50	58	85	76	88	76	-34.4%
August	71	73	92	72	79	79	-10.1%
September	56	66	80	85	70	75	-25.6%
October	67	62	62	81	68	68	-1.1%
November	37	54	56	71	66	62	-40.1%
December	71	49	61	77	60	62	15.0%
Total	651	683	825	781	785	769	-15.3%

Source: WSP

I / Overview

Traffic collisions by hour of day and day of week

Nearly fifty-one percent of Washington's fatal collisions occurred on the week-end days of Friday, Saturday and Sunday. Of total reported collisions, 42.6% occurred during the week-end (Table 1-7).

Table 1-7: Collisions by hour and day of week - 1992

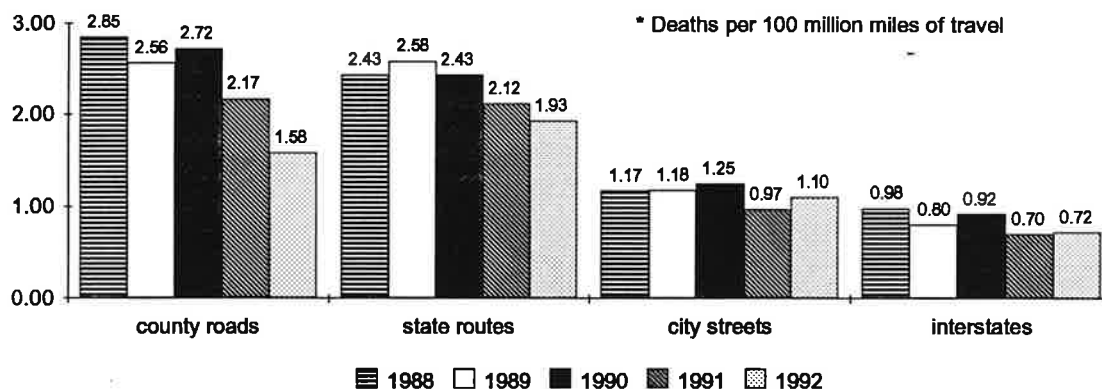
hour	total week			Monday - Thursday			Friday - Sunday		
	total	injury	fatal	total	injury	fatal	total	injury	fatal
midnight	3,054	1,213	18	1,213	470	7	1,841	743	11
1:00 a.m.	2,560	1,060	30	940	373	13	1,620	687	17
2:00 a.m.	2,439	1,011	21	810	353	8	1,629	658	13
3:00 a.m.	1,321	521	29	471	181	10	850	340	19
4:00 a.m.	1,021	410	10	424	167	4	597	243	6
5:00 a.m.	1,379	565	16	816	343	7	563	222	9
6:00 a.m.	2,722	1,062	10	1,886	741	7	836	321	3
7:00 a.m.	5,286	2,060	16	3,982	1,563	10	1,304	497	6
8:00 a.m.	4,815	1,813	11	3,366	1,268	4	1,449	545	7
9:00 a.m.	4,213	1,550	11	2,684	996	5	1,529	554	6
10:00 a.m.	5,096	1,885	20	3,005	1,103	10	2,091	782	10
11:00 a.m.	6,500	2,538	18	3,804	1,417	13	2,696	1,121	5
noon	7,788	3,165	12	4,435	1,739	8	3,353	1,426	4
1:00 p.m.	7,841	3,183	25	4,384	1,708	10	3,457	1,475	15
2:00 p.m.	8,999	3,593	35	5,332	2,093	22	3,667	1,500	13
3:00 p.m.	10,312	4,334	34	6,322	2,616	17	3,990	1,718	17
4:00 p.m.	10,892	4,621	38	6,707	2,858	16	4,185	1,763	22
5:00 p.m.	10,940	4,759	33	6,736	2,934	17	4,204	1,825	16
6:00 p.m.	7,499	3,213	37	4,299	1,864	25	3,200	1,349	12
7:00 p.m.	5,383	2,241	38	2,878	1,206	16	2,505	1,035	22
8:00 p.m.	4,280	1,764	25	2,219	911	14	2,061	853	11
9:00 p.m.	4,140	1,701	32	2,179	910	10	1,961	791	22
10:00 p.m.	3,715	1,585	44	1,741	761	22	1,974	824	22
11:00 p.m.	3,370	1,339	30	1,447	560	15	1,923	779	15
Total	125,565	51,186	593	72,080	29,135	290	53,485	22,051	303

Source: WSP

Traffic collisions & deaths by type of roadway

During 1992, the interstate system recorded the lowest death rate per vehicle miles traveled with 0.72 deaths per 100 million miles. The highest rates were on state highways with a 1.93 death rate, and county roads at a 1.58 rate. City streets had by far the greatest number of total collisions with 58,104, followed by state highways and county roads. The greatest amount of vehicle travel was on state highways with an estimated 13,088 million miles (Figure 1-7, Table 1-8).

**Figure 1-7: Death rate* by type of highway
Five-year comparison**



Source: WSP, WSDOT

**Table 1-8: Highways, travel and collisions
By type of highway - 1992**

type of highway	highway miles	%	miles + traveled	%	collisions	fatalities	death rate*
Interstate system	773	1.0%	11,818	24.3%	12,964	85	0.72
All other state highways	6,264	7.8%	13,088	26.9%	28,511	253	1.93
County roads	41,519	51.9%	11,788	24.2%	25,048	186	1.58
City streets	11,775	14.7%	10,300	21.2%	58,104	113	1.10
All other traffic ways**	19,612	24.5%	1,656	3.4%	938	14	0.85
Total	79,943	100.0%	48,650	100.0%	125,565	651	1.34

Source: WSP, WSDOT, WTSC

†Preliminary estimates in millions. Interstate & other state highway travel from WSDOT.

Other roadway miles are estimates by WTSC.

*Fatalities per hundred million vehicle miles

**Does not include (all terrain vehicle) trails.

I / Overview

Collisions by age group of driver

Drivers 16 to 20 years of age comprised 6.5% of all licensed drivers in the state in 1992, yet this group accounted for 12.2% of drivers involved in fatal collisions and 15.2% of drivers in total collisions. This youngest group of drivers were over-represented by 1.98 in fatal collisions and 2.20 in total collisions. The 21-24 age group comprised 7.8% of total licensed drivers. They were involved in 14.4% of fatal collisions and 11.9% of total collisions, producing over-representation ratios of 1.85 in fatal collisions and 1.53 in total collisions. Senior drivers 55 years and older comprised 22.6% of total licensed drivers; they were involved in 14.5% of total collisions, producing an under-representation ratio of 0.64. The oldest driver group (70 and over) were over-represented in fatal collisions by a ratio of 1.16 (Table 1-9).

Table 1-9: Driver distribution and collision involvement
By age group - 1992

age	lic drivers	% of lic dvrs	total collisions	% of collisions	ratio*of collisions	fatal collisions	% of fatal clsns	ratio*of fatal clsns
Under 16	-----	-----	623	0.32%	-----	7	0.82%	-----
16	28,770	0.78%	4,208	2.14%	2.74	9	1.06%	1.35
17	43,205	1.17%	6,409	3.26%	2.78	23	2.70%	2.31
18	52,470	1.42%	6,679	3.39%	2.39	24	2.82%	1.98
19	56,855	1.54%	6,434	3.27%	2.12	18	2.11%	1.37
20	57,823	1.57%	6,115	3.11%	1.98	30	3.52%	2.25
21	67,311	1.82%	6,281	3.19%	1.75	34	3.99%	2.19
22	73,811	2.00%	6,011	3.06%	1.53	31	3.64%	1.82
23	75,622	2.05%	5,832	2.96%	1.45	35	4.11%	2.00
24	71,512	1.94%	5,354	2.72%	1.40	23	2.70%	1.39
25-29	393,190	10.66%	25,649	13.04%	1.22	101	11.85%	1.11
30-34	454,936	12.33%	25,091	12.75%	1.03	107	12.56%	1.02
35-39	463,227	12.55%	22,291	11.33%	0.90	101	11.85%	0.94
40-44	421,441	11.42%	18,448	9.38%	0.82	70	8.22%	0.72
45-49	346,675	9.40%	13,617	6.92%	0.74	60	7.04%	0.75
50-54	248,067	6.72%	9,286	4.72%	0.70	21	2.46%	0.37
55-59	193,387	5.24%	7,111	3.61%	0.69	28	3.29%	0.63
60-64	174,930	4.74%	6,000	3.05%	0.64	20	2.35%	0.50
65-69	163,713	4.44%	5,103	2.59%	0.58	29	3.40%	0.77
70 & over	302,796	8.21%	10,189	5.18%	0.63	81	9.51%	1.16

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

Source: WSP, DOL

Table 1-10 summarizes collision involvement for age groups based upon the percentage of miles traveled by each group. The representation ratios for total collisions and fatal collisions based on travel are similar to those based on licensed drivers (Table 1-9) with the exception of older drivers. Drivers age 70 and older are substantially over-represented in fatal crashes and drivers age 65-69 are somewhat over-represented when miles of travel forms the basis of the comparison.

Table 1-10: Drivers in collisions by age group - 1992
Percent of miles traveled

driver age	% of miles traveled*	fatal collisions**	%	over-unde ratio	total collisions**	%	over-unde ratio
16-19	3.3%	74	9.1%	2.75	23,730	12.1%	3.67
20-24	8.5%	123	15.1%	1.78	29,593	15.1%	1.78
25-29	12.8%	101	12.4%	0.97	25,649	13.1%	1.02
30-34	14.9%	107	13.1%	0.88	25,091	12.8%	0.86
35-39	15.2%	101	12.4%	0.82	22,291	11.4%	0.75
40-44	12.8%	70	8.6%	0.67	18,448	9.4%	0.74
45-49	10.1%	60	7.4%	0.73	13,617	6.9%	0.69
50-54	6.8%	21	2.6%	0.38	9,286	4.7%	0.70
55-59	5.1%	28	3.4%	0.67	7,111	3.6%	0.53
60-64	3.8%	20	2.5%	0.64	6,000	3.1%	0.80
65-69	2.9%	29	3.6%	1.23	5,103	2.6%	0.68
70 & over	3.9%	81	9.9%	2.57	10,189	5.2%	1.34

Source: WSP, USDOT

*Est. from 1990 Nationwide Personal Transportation Study - USDOT

**Does not include drivers under 16 or age not stated in fatal or total collisions.

Collision, death and injury rates by county and city populations

Tables 1-11 and 1-12 show deaths, injuries, and collisions for Washington counties and cities. These tables also display rates based upon population to allow for comparisons of various jurisdictions. Population collision rates ranged from a low of 132.87 (collisions per 10,000 persons) in Island County to a high of 432.01 in Kittitas county. The state-wide collision rate has been computed at 245.40 for 1992 (Table 1-11).

Of cities of 10,000 population and greater, Mercer Island recorded the lowest collision rate with 123.06 collisions per 10,000 population. The city with the highest collision rate was Tukwila, recording 987.03 collisions per 10,000 population (Table 1-12).

I / Overview

Table 1-11: Collisions, deaths and injuries
By county - 1992

county	population	deaths		injuries		total collisions	
		number	rate*	number	rate*	number	rate*
Over 1,000,000							
King	1,564,486	123	0.79	26,466	169.17	45,413	290.27
250,000 to 750,000							
Pierce	624,000	60	0.96	10,508	168.40	14,773	236.75
Snohomish	494,300	42	0.85	7,014	141.90	10,974	222.01
Spokane	374,569	31	0.83	5,633	150.39	9,607	256.48
100,000 to 250,000							
Clark	257,500	39	1.51	3,167	122.99	4,954	192.39
Kitsap	205,600	30	1.46	2,775	134.97	4,212	204.86
Yakima	193,900	42	2.17	2,618	135.02	4,712	243.01
Thurston	174,300	30	1.72	2,388	137.01	4,110	235.80
Whatcom	137,100	15	1.09	1,848	134.79	3,177	231.73
Benton	118,500	17	1.43	1,309	110.46	2,320	195.78
50,000 to 100,000							
Skagit	85,490	11	1.29	1,320	154.40	2,257	264.01
Cowlitz	84,500	8	0.95	1,180	139.64	2,085	246.75
Grays Harbor	65,400	13	1.99	772	118.04	1,512	231.19
Island	64,800	5	0.77	508	78.40	861	132.87
Lewis	61,500	19	3.09	856	139.19	1,592	258.86
Clallam	60,000	6	1.00	661	110.17	1,180	196.67
Grant	58,240	15	2.58	653	112.12	1,146	196.77
Chelan	54,600	12	2.20	735	134.62	1,390	254.58
Walla Walla	50,500	8	1.58	477	94.46	960	190.10
25,000 to 50,000							
Mason	41,200	17	4.13	685	166.26	982	238.35
Franklin	39,200	14	3.57	486	123.98	822	209.69
Whitman	38,800	3	0.77	369	95.10	655	168.81
Okanogan	34,400	13	3.78	324	94.19	658	191.28
Stevens	32,200	4	1.24	394	122.36	572	177.64
Douglas	27,900	7	2.51	324	116.13	499	178.85
Kittitas	27,800	21	7.55	563	202.52	1,201	432.01
10,000 to 25,000							
Jefferson	22,500	5	2.22	289	128.44	438	194.67
Pacific	19,400	6	3.09	231	119.07	377	194.33
Asotin	18,000	0	0.00	123	68.33	241	133.89
Klickitat	17,100	4	2.34	196	114.62	348	203.51
Adams	14,100	7	4.96	231	163.83	339	240.43
San Juan	11,300	1	0.88	94	83.19	173	153.10
Under 10,000							
Pend Oreille	9,400	4	4.26	113	120.21	187	198.94
Lincoln	9,000	7	7.78	140	155.56	217	241.11
Skamania	8,700	4	4.60	104	119.54	194	222.99
Ferry	6,700	3	4.48	116	173.13	184	274.63
Columbia	4,000	3	7.50	54	135.00	93	232.50
Wahkiakum	3,400	0	0.00	51	150.00	82	241.18
Garfield	2,300	2	8.70	28	121.74	68	295.65
Total	5,116,685	651	1.27	75,803	148.15	125,565	245.40

*Frequency per 10,000 population

Source: WSP, OFM

Table 1-12: Collisions, deaths and injuries*
By city population - 1992

city	population	deaths		injuries		total collisions	
		number	rate+	number	rate+	number	rate+
250,000 and over							
Seattle	522,000	40	0.77	11,742	224.94	20,956	401.46
100,000 to 250,000							
Spokane	180,800	12	0.66	3,655	202.16	6,450	356.75
Tacoma	179,000	14	0.78	4,587	256.26	6,559	366.42
50,000 to 100,000							
Bellevue	88,580	3	0.34	1,496	168.89	2,688	303.45
Everett	75,840	5	0.66	1,602	211.23	2,785	367.22
Federal Way	72,350	4	0.55	1,184	163.65	1,859	256.95
Yakima	58,706	6	1.02	1,057	180.05	2,132	363.17
Bellingham	54,270	1	0.18	768	141.51	1,522	280.45
25,000 to 50,000							
Vancouver	47,340	4	0.84	641	135.40	1,332	281.37
Kennewick	44,490	2	0.45	571	128.34	1,021	229.49
Renton	43,090	2	0.46	1,018	236.25	1,996	463.22
Kirkland	41,390	0	0.00	642	155.11	1,229	296.93
Kent	40,300	6	1.49	1,142	283.37	1,834	455.09
Redmond	39,040	1	0.26	423	108.35	946	242.32
Bremerton	38,990	2	0.51	694	177.99	1,369	351.12
Olympia	35,689	1	0.28	671	188.01	1,434	401.80
Auburn	34,260	4	1.17	671	195.86	1,117	326.04
Richland	33,550	2	0.60	346	103.13	683	203.58
Longview	32,030	2	0.62	530	165.47	935	291.91
Edmonds	30,749	2	0.65	329	107.00	512	166.51
Lynnwood	29,052	1	0.34	871	299.81	1,424	490.16
Walla Walla	28,134	3	1.07	267	94.90	581	206.51
Puyallup	25,400	4	1.57	378	148.82	728	286.61
15,000 to 25,000							
Pullman	23,190	0	0.00	108	46.57	302	130.23
Sea Tac	22,830	5	2.19	700	306.61	1,147	502.41
Wenatchee	22,710	1	0.44	236	103.92	606	266.84
Lacey	21,290	2	0.94	337	158.29	624	293.10
Mercer Island	21,210	0	0.00	138	65.06	261	123.06
Pasco	20,840	4	1.92	326	156.43	568	272.55
Mountlake Terrace	19,820	0	0.00	243	122.60	387	195.26
Mount Vernon	19,550	0	0.00	253	129.41	530	271.10
Oak Harbor	18,340	0	0.00	93	50.71	243	132.50
Des Moines	18,170	1	0.55	152	83.65	273	150.25
Port Angeles	18,030	1	0.55	188	104.27	452	250.69
Bainbridge Island	16,850	1	0.59	102	60.53	186	110.39
Aberdeen	16,630	3	1.80	222	133.49	548	329.52
10,000 to 15,000							
Tukwila	14,650	5	3.41	905	617.75	1,446	987.03
Mukitao	13,420	1	0.75	147	109.54	259	193.00
Bothell	13,220	1	0.76	193	145.99	392	296.52
Marysville	13,030	1	0.77	175	134.31	403	309.29
Ellensburg	12,439	1	0.80	62	49.84	186	149.53
Centralia	12,330	1	0.81	214	173.56	454	368.21
Anacortes	12,110	1	0.83	90	74.32	179	147.81
Kelso	11,837	1	0.84	249	210.36	450	380.16
Moses Lake	11,530	0	0.00	157	136.17	331	287.08
Sunnyside	11,370	0	0.00	82	72.12	190	167.11
Tumwater	10,950	1	0.91	181	165.30	348	317.81
TOTAL	2,171,396	152	0.70	40,838	188.07	72,857	335.53

*Includes collisions occurring on the interstate system

Source: WSP, OFM

+Frequency per 10,000 population

I / Overview

Traffic death and injury rates by county based upon number of registered vehicles

Table 1-13 displays deaths and injuries and county rates based on the numbers of registered vehicles. Two counties, Asotin and Wahkiakum, recorded zero fatal collisions during 1992. Eleven counties recorded lower death rates than the statewide average of 1.47 deaths per 10,000 registered vehicles. San Juan County recorded a death rate of 0.85, based on one traffic death; King recorded a 0.91 rate, based on 123 deaths; and Snohomish County's rate was 0.97, based on 42 traffic deaths. Asotin, San Juan and Garfield recorded the lowest injury rates with 80.08, 80.12 and 99.43 injuries per 10,000 registered vehicles (Table 1-13).

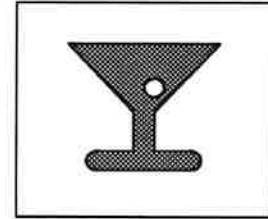
**Table 1-13: Traffic deaths, injuries and rates*
By county - 1992**

county	registered vehicles	deaths	death rate*	injuries	injury rate*
Adams	16,402	7	4.27	231	140.84
Asotin	15,360	0	0.00	123	80.08
Benton	101,093	17	1.68	1,309	129.48
Chelan	55,809	12	2.15	735	131.70
Clallam	56,201	6	1.07	661	117.61
Clark	223,153	39	1.75	3,167	141.92
Columbia	4,646	3	6.46	54	116.23
Cowlitz	79,440	8	1.01	1,180	148.54
Douglas	22,700	7	3.08	324	142.73
Ferry	4,582	3	6.55	116	253.16
Franklin	43,758	14	3.20	486	111.07
Garfield	2,816	2	7.10	28	99.43
Grant	53,900	15	2.78	653	121.15
Grays Harbor	58,847	13	2.21	772	131.19
Island	48,622	5	1.03	508	104.48
Jefferson	19,856	5	2.52	289	145.55
King	1,350,496	123	0.91	26,466	195.97
Kitsap	166,576	30	1.80	2,775	166.59
Kittitas	26,199	21	8.02	563	214.89
Klickitat	16,378	4	2.44	196	119.67
Lewis	63,050	19	3.01	856	135.77
Lincoln	11,338	7	6.17	140	123.48
Mason	37,316	17	4.56	685	183.57
Okanogan	31,111	13	4.18	324	104.14
Pacific	16,913	6	3.55	231	136.58
Pend Oreille	8,744	4	4.57	113	129.23
Pierce	480,844	60	1.25	10,508	218.53
San Juan	11,732	1	0.85	94	80.12
Skagit	88,425	11	1.24	1,320	149.28
Skamania	5,791	4	6.91	104	179.59
Snohomish	435,203	42	0.97	7,014	161.17
Spokane	315,081	31	0.98	5,633	178.78
Stevens	26,009	4	1.54	394	151.49
Thurston	181,055	30	1.66	2,388	131.89
Wahkiakum	2,858	0	0.00	51	178.45
Walla Walla	36,349	8	2.20	477	131.23
Whatcom	120,936	15	1.24	1,848	152.81
Whitman	27,865	3	1.08	369	132.42
Yakima	167,805	42	2.50	2,618	156.01
Total	4,435,259	651	1.47	75,803	170.91

Source: WSP, DOL

* Traffic deaths/injuries per 10,000 registered vehicles

II. Alcohol Involvement



Washington State has experienced a gradual reduction in the number and the seriousness of collisions involving alcohol. However, the problem remains significant in that 47.3% of all traffic fatalities in 1992 did involve a driver with some level of alcohol-involvement (Table 2-1). Drivers found to be "under the influence" (DWI) were involved in collisions in which 41.3% of the state's total traffic deaths occurred (Table 2-2).

Table 2-1: Alcohol-related* collision summary
Five-year comparison

	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Total collisions	14,113	14,776	15,998	16,061	17,299	16,034	-12.0%
Number of drinking drivers	14,813	15,470	16,760	16,756	18,049	16,759	-11.6%
Fatal collisions	278	300	372	344	374	348	-20.0%
Injury collisions	7,698	8,020	8,667	8,717	8,796	8,550	-10.0%
Prply damage only**	6,137	6,456	6,959	7,000	8,129	7,136	-14.0%
Persons killed	308	335	431	392	433	398	-22.6%
Percent of all traffic fatalities	47.3%	49.0%	52.2%	50.1%	55.2%	51.6%	-8.4%
Persons injured	12,108	12,575	13,749	13,660	13,724	13,427	-9.8%
Disabling injuries	1,938	2,132	2,476	2,595	2,665	2,467	-21.4%
Non-disabling injuries	5,549	5,944	6,486	6,516	6,418	6,341	-12.5%
Possible injuries	4,621	4,499	4,787	4,549	4,641	4,619	0.0%

* All drinking drivers, including DWI

Source: WSP

** Damage over \$500

Table 2-2: Collisions involving drivers "under the influence" *
Five-year comparison

status	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Total collisions	8,990	9,237	9,887	9,816	9,463	9,601	-6.4%
DWI drivers	9,086	9,331	9,973	9,901	9,532	9,684	-6.2%
Fatal collisions	243	271	320	306	326	306	-20.5%
Injury collisions	5,174	5,375	5,604	5,622	5,270	5,468	-5.4%
Prop. damage only**	3,573	3,591	3,963	3,888	3,867	3,827	-6.6%
Persons killed	269	304	371	353	376	351	-23.4%
% of all traffic fatalities	41.3%	44.5%	45.0%	45.2%	47.9%	45.7%	-9.5%
Persons injured:	8,267	8,598	9,016	8,898	8,359	8,718	-5.2%
Disabling	1,455	1,616	1,801	1,840	1,832	1,772	-17.9%
Non-disabling	3,876	4,203	4,322	4,316	3,986	4,207	-7.9%
Possible injury	2,936	2,779	2,893	2,742	2,541	2,739	7.2%

* DWI drivers only

Source: WSP

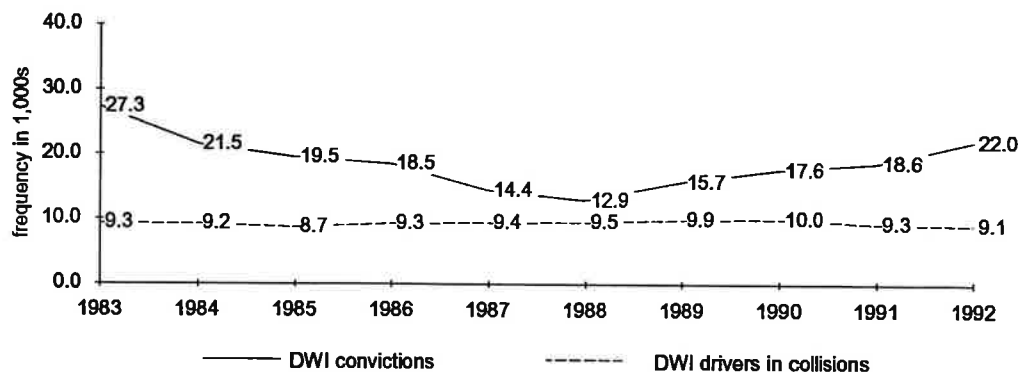
** Minimum damage: \$500

II / Alcohol Involvement

DWI Convictions

In 1992, DWI convictions increased for the fourth consecutive year after a six-year decrease. The number of DWI drivers involved in investigated collisions decreased for the second consecutive year (Figure 2-1).

Figure 2-1: DWI convictions & DWI drivers in investigated collisions
Ten-year comparison* - in thousands



* Year during which the conviction was reported

Source: WSP, DOL

Persons killed in alcohol-related collisions by month

Table 2-3 shows the monthly toll of persons killed in alcohol-related collisions (including DWI), and table 2-4 shows the number injured.

Table 2-3: Persons killed in collisions where driver "had been drinking"
Five-year comparisons by month

month	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr av	prev 4-yr avg
January	18	23	34	26	18	25	-28.7%
February	23	26	30	11	28	24	-3.2%
March	24	28	37	20	47	33	-27.3%
April	24	27	31	29	36	31	-22.0%
May	24	34	39	46	47	42	-42.2%
June	28	26	40	27	50	36	-21.7%
July	30	33	45	42	45	41	-27.3%
August	35	32	41	36	35	36	-2.8%
September	31	36	41	45	38	40	-22.5%
October	28	32	34	43	32	35	-20.6%
November	20	24	30	33	35	31	-34.4%
December	23	14	29	34	22	25	-7.1%
Total	308	335	431	392	433	398	-22.6%

Source: WSP

Table 2-4: Persons injured in collisions where driver "had been drinking"
Five-year comparisons by month

month	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr av	prev 4-yr avg
January	903	811	1,086	976	866	935	-3.4%
February	905	826	889	702	876	823	9.9%
March	971	1,115	1,107	920	1,053	1,049	-7.4%
April	1,031	943	1,046	1,066	1,130	1,046	-1.5%
May	1,001	1,077	1,126	1,196	1,284	1,171	-14.5%
June	1,059	1,059	1,287	1,185	1,133	1,166	-9.2%
July	1,155	1,164	1,229	1,335	1,372	1,275	-9.4%
August	1,183	1,322	1,373	1,202	1,170	1,267	-6.6%
September	1,056	1,085	1,256	1,264	1,173	1,195	-11.6%
October	1,052	1,040	1,152	1,261	1,321	1,194	-11.9%
November	949	1,068	1,119	1,292	1,126	1,151	-17.6%
December	843	1,065	1,079	1,261	1,220	1,156	-27.1%
Total	12,108	12,575	13,749	13,660	13,724	13,427	-9.8%

Source: WSP

Drinking drivers

The percentage of drinking drivers involved in fatal collisions dropped from 37.5% of all drivers in fatal collisions during the previous 4-year average to 34.2% in 1992. The percentage of drunk drivers also decreased from 32.3% during the previous 4-year average to 29.1% in 1992 (Table 2-5). Figure 2-2 shows the long-term trend for both the drinking driver and the DWI driver for the years 1983 to 1992.

Table 2-5: Sobriety of drivers in fatal collisions
Five-year comparison

sobriety of driver	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr avg	prev 4-yr avg
Had been drinking - ability impaired	246	279	324	309	340	313	-21.4%
Had been drinking - ability not impaired	32	30	41	33	45	37	-14.1%
Had been drinking - sobriety unknown	11	7	23	12	15	14	-22.8%
Had not been drinking	557	545	636	657	586	606	-8.1%
Not stated	29	37	45	37	41	40	-27.5%
Total drivers drinking	289	316	388	354	400	365	-20.7%
Total drivers - excluding not stated	846	861	1,024	1,011	986	971	-12.8%
Total drivers	875	898	1,069	1,048	1,027	1,011	-13.4%
Percentage of drivers drinking	34.2%	36.7%	37.9%	35.0%	40.6%	37.5%	-9.0%
Percentage of drivers drunk	29.1%	32.4%	31.6%	30.6%	34.5%	32.3%	-9.9%

Source: WSP

II / Alcohol Involvement

**Figure 2-2: Percent of drinking & DWI drivers to total drivers
In fatal collisions - ten-year comparison**

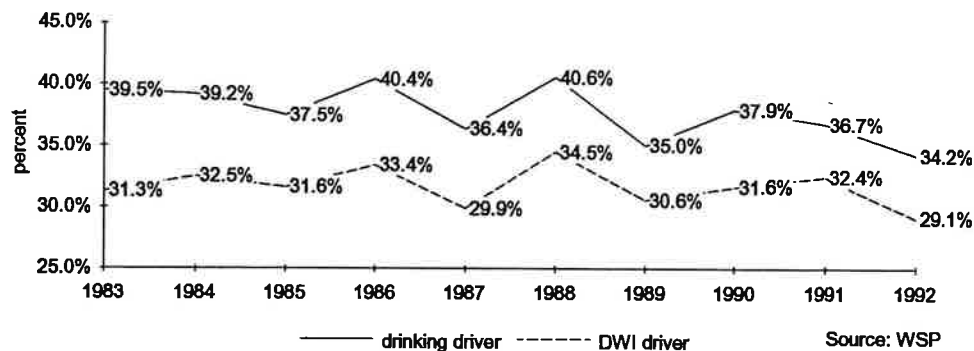


Table 2-6 and 2-7 depict driver sobriety for alcohol-related injury collisions and for total investigated alcohol-related collisions. Figure 2-3 compares the percentages of drinking drivers and DWI drivers involved in investigated collisions from 1983 to 1992.

Table 2-6: Sobriety of drivers in Injury collisions
Five-year comparison

sobriety of driver	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Had been drinking - ability impaired	5,236	5,429	5,669	5,677	5,306	5,520	-5.1%
Had been drinking - ability not impaired	1,234	1,236	1,547	1,620	1,657	1,515	-18.5%
Had been drinking - sobriety unknown	1,622	1,704	1,868	1,796	2,198	1,892	-14.2%
Had not been drinking	60,584	57,029	60,603	58,541	59,644	58,954	2.8%
Not stated	7,455	6,653	6,454	5,812	4,992	5,978	24.7%
Total drivers drinking	8,092	8,369	9,084	9,093	9,161	8,927	-9.4%
Total drivers - excluding not stated	68,676	65,399	69,687	67,634	68,805	67,881	1.2%
Total drivers	76,131	72,051	76,141	73,446	73,797	73,859	3.1%
Percentage of drivers drinking	11.8%	12.6%	13.0%	13.4%	13.3%	13.1%	-10.4%
Percentage of drivers drunk	7.6%	8.3%	8.1%	8.4%	7.7%	8.1%	-6.3%

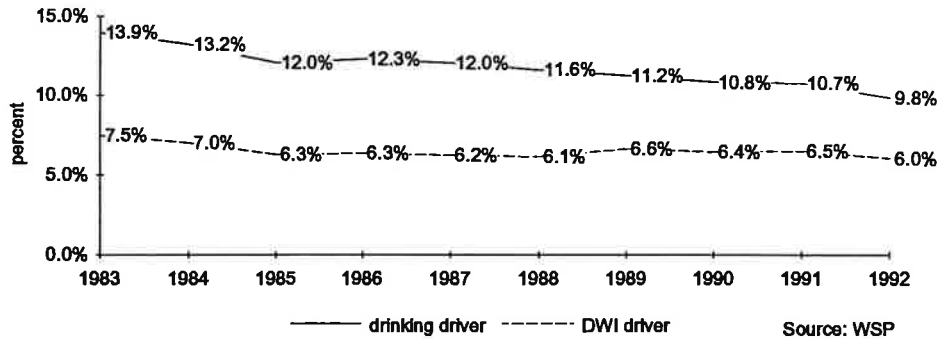
Source: WSP

Table 2-7: Sobriety of drivers in all Investigated collisions
Five-year comparison

sobriety of driver	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Had been drinking - ability impaired	9,086	9,331	9,973	9,901	9,532	9,684	-6.2%
Had been drinking - ability not impaired	2,468	2,551	3,118	3,184	3,368	3,055	-19.2%
Had been drinking - sobriety unknown	3,259	3,588	3,669	3,671	5,149	4,019	-18.9%
Had not been drinking	136,489	128,672	138,604	132,731	137,184	134,298	1.6%
Not stated	22,552	20,590	21,569	19,181	16,082	19,356	16.5%
Total drivers drinking	14,813	15,470	16,760	16,756	18,049	16,759	-11.6%
Total drivers - excluding not stated	151,302	144,142	155,364	149,487	155,233	151,057	0.2%
Total drivers	173,854	164,732	176,933	168,668	171,315	170,412	2.0%
Percentage of drivers drinking	9.8%	10.7%	10.8%	11.2%	11.6%	11.1%	-11.7%
Percentage of drivers drunk	6.0%	6.5%	6.4%	6.6%	6.1%	6.4%	-6.4%

Source: WSP

Figure 2-3: Percent of drinking & DWI drivers in total investigated collisions
Ten-year comparison



Alcohol involvement by age group

Table 2-8 shows the number of "had been drinking" (including DWI) drivers involved in fatal, injury and total collisions in 1992. The age group of 20 to 24 had the highest number of drivers in all three categories. The age group of 25 to 29 was second highest in all three categories.

Table 2-8: "Had been drinking" drivers in collisions
By age and collision severity - 1992

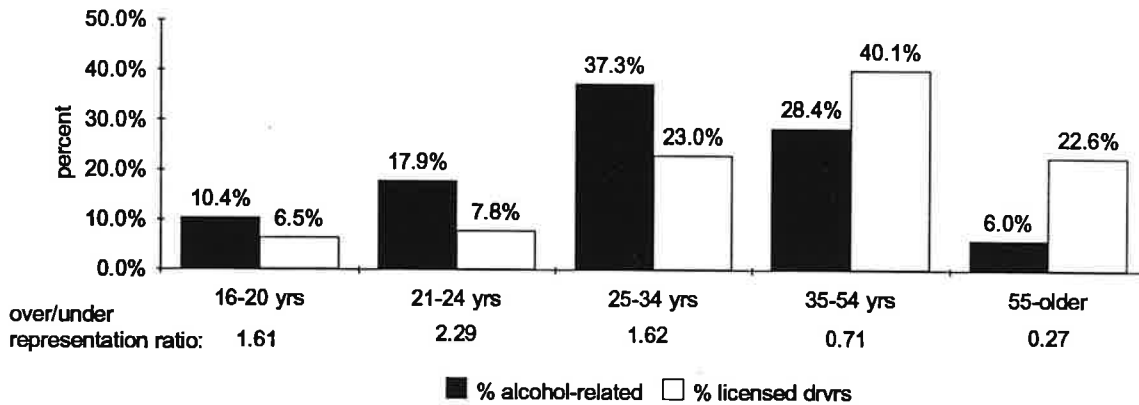
driver age	fatal collisions	injury collisions	total collisions
15 & under	3	29	51
16-19	16	570	1,008
20-24	72	1,668	3,011
25-29	49	1,544	2,764
30-34	46	1,396	2,527
35-39	47	1,032	1,845
40-44	27	648	1,163
45-49	9	374	694
50-54	6	231	435
55-59	3	165	288
60-64	3	109	215
65-69	3	88	173
70 & over	2	82	176
Not stated	3	156	463
Total	289	8,092	14,813

Source: WSP

When comparing the number of licensed drivers to the number of alcohol-related collisions, drivers under 34 years of age continue to be over-represented and drivers 35 and older are under-represented. The 21-24 year age group has the highest over-representation ratio at 2.27 (Figure 2-4).

II / Alcohol Involvement

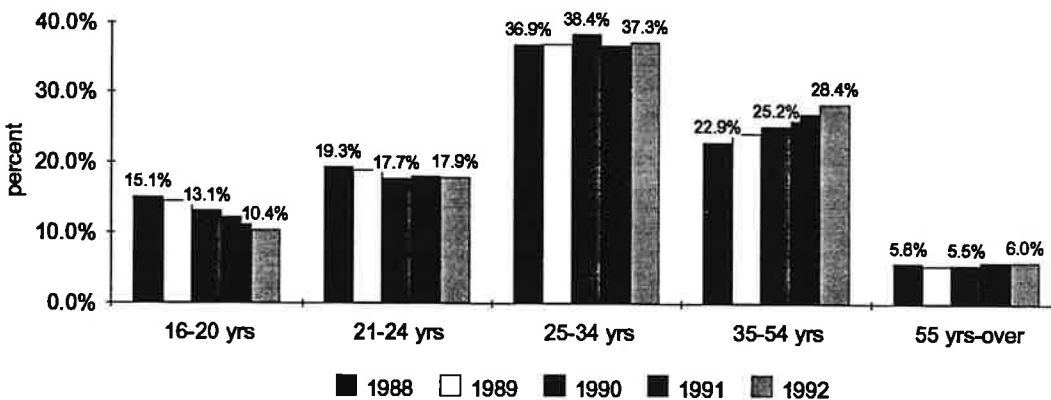
Figure 2-4: Percent of all alcohol-related collisions & licensed drivers By age group - 1992



Source: WSP, DOL

Figure 2-5 shows 5-year trends of drivers by age group involved in alcohol-related collisions. The 35 to 54 year group increased from 22.9% of all drivers involved in 1988 to 28.4% in 1992. In the 16-20 age group, the percent of drivers involved dropped from 15.1% in 1988 to 10.4% in 1992.

Figure 2-5: Percent of total alcohol-related collisions by age group Five-year trend

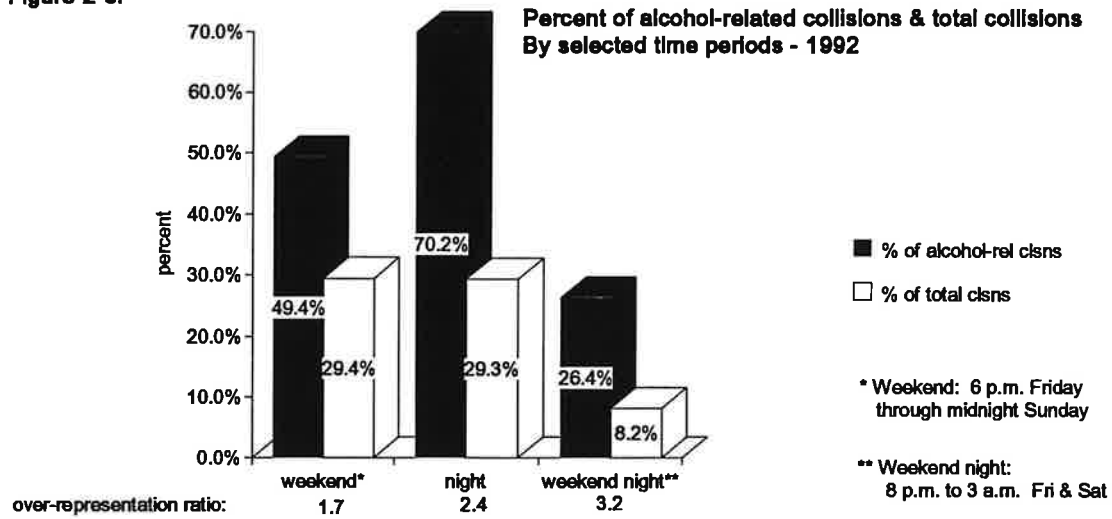


Source: WSP

Alcohol involvement during selected time periods

Figure 2-6 shows that 26.4% of alcohol-related collisions but only 8.2% of all collisions occurred during the time period of 8 p.m. to 3 a.m. Fridays and Saturdays. This comparison shows an over-representation ratio of 3.2 for alcohol-related collisions during that period. All nights of the week show an over-representation ratio of 2.4 and weekends (6 p.m. Friday through midnight Sunday) show an over-representation ratio of 1.7.

Figure 2-6:



Source: WSP

Location of single- and multiple-vehicle alcohol-related collisions

Table 2-9 presents data on single- and multiple-vehicle collisions in urban and rural areas (2,500 or more population designates urban). Of single-vehicle, fatal collisions, 79.8% occurred in rural areas of the state; 59.4% of multiple-vehicle injury collisions occurred in urban areas.

Table 2-9: Alcohol-related collisions - 1992
 Urban/rural, single/multiple-vehicle by severity*

collisions	urban		rural		total
	number	%	number	%	
All single	2,238	31.9%	4,774	68.1%	7,012
Fatal	33	20.2%	130	79.8%	163
Injury	1,152	28.4%	2,902	71.6%	4,054
Prop drng	1,053	37.7%	1,742	62.3%	2,795
All multiple	4,397	63.8%	2,500	36.2%	6,897
Fatal	27	26.5%	75	73.5%	102
Injury	2,074	59.4%	1,419	40.6%	3,493
Prop drng	2,296	69.5%	1,006	30.5%	3,302
All collisions	6,736	47.7%	7,377	52.3%	14,113
Fatal	65	23.4%	213	76.6%	278
Injury	3,314	43.1%	4,384	56.9%	7,698
Prop drng	3,357	54.7%	2,780	45.3%	6,137

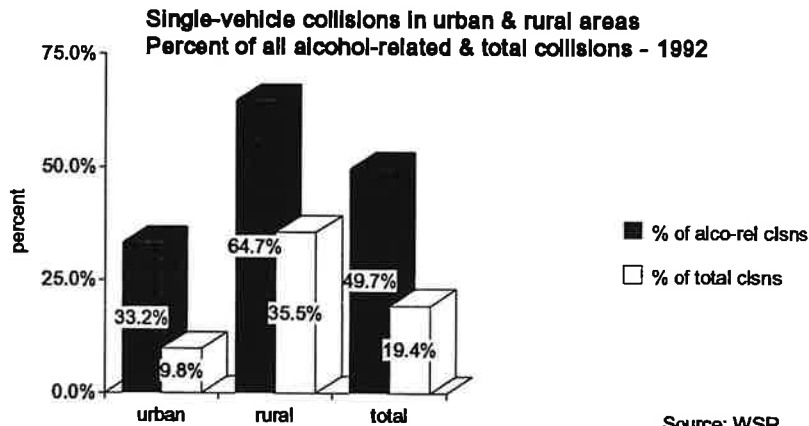
Source: WSP

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

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Single-vehicle collisions accounted for 19.4% of all collisions in the state in 1992. Of alcohol-related collisions, single-vehicle collisions made up a much larger percentage, 49.7%. In rural areas, single vehicle-collisions comprised 64.7% of all alcohol-related collisions (Figure 2-7).

Figure 2-7:



BAC levels

Driver blood-alcohol concentration (BAC) levels in fatal and serious injury collisions by age group is presented in Table 2-10. The 16-20 age group and the 70 and over age showed the greatest incidence of involvement at the .10-.14 BAC range. All other groups had the highest frequency of occurrence at the .15-.19 BAC range.

Table 2-10: Driver alcohol levels in collisions
By age group - 1992

age	BAC level							results n/avail	total tested	test refused
	.01-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25-.29	.30-up			
16-20	46	131	214	189	96	21	11	173	881	144
21-24	40	132	349	395	169	45	17	239	1,386	242
25-29	40	126	328	433	236	81	23	301	1,568	365
30-34	30	96	306	389	252	89	40	254	1,456	380
35-39	25	89	209	303	192	99	41	190	1,148	288
40-44	33	56	164	162	148	56	36	144	799	190
45-49	17	28	103	129	84	51	13	86	511	135
50-54	5	12	68	95	56	17	9	66	328	79
55-59	5	23	42	56	29	15	9	37	216	49
60-64	8	17	36	38	28	9	8	28	172	29
65-69	5	7	24	31	34	8	6	24	139	15
70 & ovr	6	10	35	27	16	8	4	16	122	23
Total	260	727	1,878	2,247	1,340	499	217	1,558	8,726	1,939

Source: WSP

Table 2-11 presents the number of fatally injured drivers with positive tests for blood alcohol, and the average BAC levels of those drivers for the last 3 years as reported by the state toxicologist. The number of positive-tested, fatally injured drivers has gone down during the last three years, but the average BAC has gone up from 0.18 to 0.19.

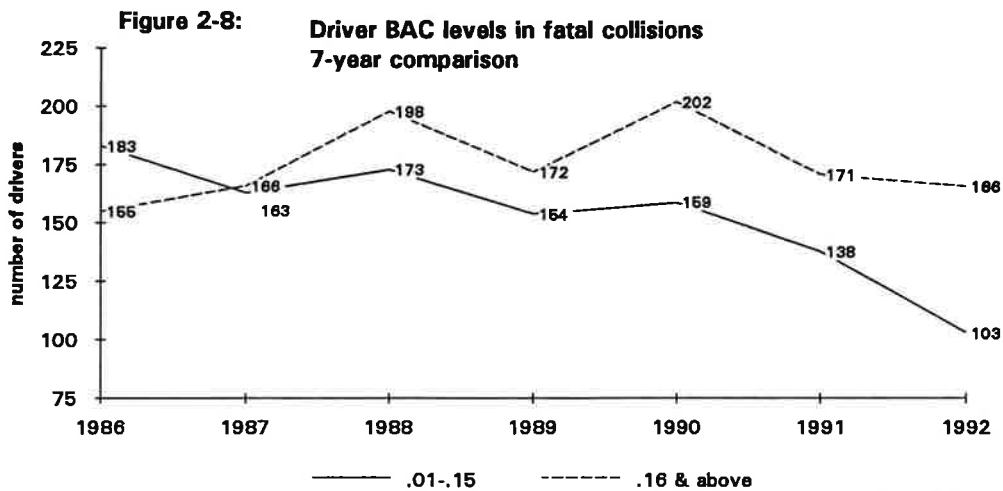
Table 2-11: Average BAC of drivers* killed in collisions
Five-year comparison - by age

age	1992		1991		1990		3-year avg
	#	avg	#	avg	#	avg	
16	0	0.00	1	0.14	3	0.07	0.09
17	1	0.03	1	0.03	1	0.05	0.04
18	3	0.15	5	0.21	4	0.13	0.17
19	3	0.17	5	0.15	4	0.17	0.16
20	5	0.11	8	0.15	10	0.15	0.14
21	8	0.18	11	0.16	8	0.17	0.17
22	9	0.18	7	0.17	14	0.14	0.16
23	11	0.22	10	0.19	7	0.26	0.22
24	11	0.17	3	0.16	5	0.18	0.17
25	5	0.15	7	0.18	16	0.17	0.17
26	6	0.15	7	0.17	4	0.21	0.17
27	10	0.19	7	0.13	7	0.14	0.16
28	4	0.20	5	0.18	6	0.15	0.17
29	5	0.19	5	0.15	8	0.19	0.18
30	5	0.23	4	0.18	7	0.22	0.21
31	6	0.21	16	0.18	7	0.19	0.19
32	9	0.23	4	0.22	12	0.22	0.22
33	6	0.19	1	0.12	6	0.19	0.18
34	2	0.20	6	0.19	8	0.25	0.22
35	7	0.24	2	0.29	6	0.18	0.22
36	4	0.19	5	0.18	10	0.15	0.17
37	2	0.23	5	0.20	6	0.24	0.22
38	3	0.15	3	0.22	6	0.18	0.18
39	9	0.16	0	0.00	4	0.17	0.16
40	2	0.23	3	0.19	4	0.18	0.19
41-45	15	0.23	14	0.22	14	0.17	0.21
46-50	7	0.19	11	0.21	8	0.23	0.21
51-55	3	0.19	5	0.13	5	0.18	0.16
56-60	2	0.12	5	0.18	3	0.23	0.18
61-65	1	0.03	4	0.19	2	0.11	0.14
66 & over	4	0.12	4	0.11	5	0.14	0.12
Total/avg	168	0.19	174	0.18	210	0.18	0.18

Source: State Toxicologist

* Only includes drivers with a positive BAC reading.

Data on the "hard core" (high BAC) drinking driver in fatal crashes are shown in Figure 2-8. This figure shows drivers in fatal crashes who were tested for BAC from 1986 to 1992. The numbers of low BAC drivers have decreased, while high BAC drivers in fatal crashes has remained relatively constant over the past 7 years.



Source: FARS

II / Alcohol Involvement

Alcohol-related collisions by day of week/roadway type

An analysis of roadway type by day of occurrence for collisions involving alcohol indicates that Saturdays recorded the highest incidence on all types of roadways, registering 3,257 collisions, an increase of 1,230 collisions from the previous year. These collisions occurred predominately on county roads and city streets on weekends (Table 2-12).

Table 2-12: Alcohol-involved collisions
By roadway type and day of week - 1992

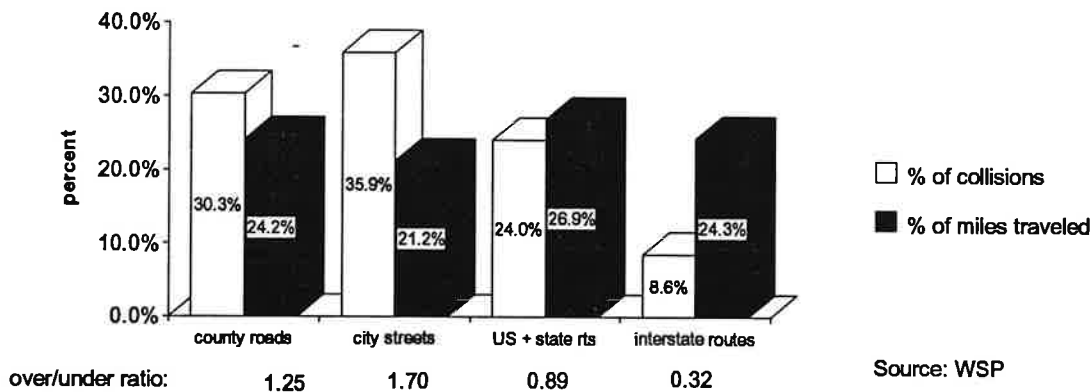
roadway type	Mon	Tue	Wed	Thu	Fri	Sat	Sun	total	pct
County roads	380	386	497	533	665	1,025	795	4,281	30.3%
City streets	464	536	562	651	888	1,144	830	5,075	36.0%
U.S. & state routes	316	319	379	436	580	784	579	3,393	24.0%
Interst & full control	118	106	146	137	224	261	219	1,211	8.6%
Other routes	16	13	11	14	16	43	42	155	1.1%
Total	1,294	1,360	1,595	1,771	2,373	3,257	2,465	14,115	100.0%
% of total	9.2%	9.6%	11.3%	12.5%	16.8%	23.1%	17.5%		

Source: WSP

City streets accounted for 35.9% of fatal and injury alcohol-related collisions, but only 21.2% of vehicle miles were traveled on city streets, yielding an over-representation ratio of 1.70 in alcohol-related collisions. County roads were similarly over-represented at 1.25. Interstate routes and U.S. plus state routes were under-represented with 0.32 and 0.89 respectively (Figure 2-9).

Figure 2-9:

Fatal and injury collisions involving alcohol
By roadway type - 1992



Source: WSP

Alcohol-related collisions by county

Table 2-13 shows alcohol-related collisions, percentage of registered vehicles, and over- and under-representation ratios by county. Of counties with over 100 alcohol-related collisions, Mason and Kittitas Counties had the highest over-representation ratios with 1.76 and 1.45 respectively. Benton, with 0.69, was the most under-represented of all counties with more than 100 alcohol-related collisions.

Table 2-13: Alcohol-related collisions
By county and type of roadway - 1992

county	alco-rel collisions	% alc-rel collisions	registered vehicles	% reg. vehicles	ovr/ undr ratio	city streets	state routes*	county roads	other roads
Adams	44	0.3%	16,402	0.37%	0.84	7	23	13	1
Asotin	38	0.3%	15,360	0.35%	0.78	13	12	12	1
Benton	222	1.6%	101,093	2.28%	0.69	119	65	38	0
Chelan	159	1.1%	55,809	1.26%	0.90	54	43	60	2
Clallam	171	1.2%	56,201	1.27%	0.96	39	91	39	2
Clark	601	4.3%	223,153	5.03%	0.85	105	189	303	4
Columbia	21	0.1%	4,646	0.10%	1.42	8	4	7	2
Cowlitz	263	1.9%	79,440	1.79%	1.04	113	89	61	0
Douglas	56	0.4%	22,700	0.51%	0.78	5	37	14	0
Ferry	46	0.3%	4,582	0.10%	3.16	0	19	25	2
Franklin	135	1.0%	43,758	0.99%	0.97	78	26	31	0
Garfield	3	0.0%	2,816	0.06%	0.33	0	2	0	1
Grant	181	1.3%	53,900	1.22%	1.06	43	76	60	2
Grays Harbor	235	1.7%	58,847	1.33%	1.25	74	114	43	4
Island	124	0.9%	48,622	1.10%	0.80	8	38	76	2
Jefferson	67	0.5%	19,856	0.45%	1.06	13	34	19	1
King	3,769	26.7%	1,350,496	30.45%	0.88	1,908	1,243	596	22
Kitsap	667	4.7%	166,576	3.76%	1.26	174	164	326	3
Kittitas	121	0.9%	26,199	0.59%	1.45	20	69	25	7
Klickitat	60	0.4%	16,378	0.37%	1.15	5	31	22	2
Lewis	209	1.5%	63,050	1.42%	1.04	41	92	70	6
Lincoln	36	0.3%	11,338	0.26%	1.00	0	27	9	0
Mason	209	1.5%	37,316	0.84%	1.76	25	87	92	5
Okanogan	126	0.9%	31,111	0.70%	1.27	17	39	61	9
Pacific	80	0.6%	16,913	0.38%	1.49	8	47	21	4
Pend Oreille	27	0.2%	8,744	0.20%	0.97	2	7	18	0
Pierce	1,877	13.3%	480,844	10.84%	1.23	637	546	680	14
San Juan	39	0.3%	11,732	0.26%	1.04	3	0	35	1
Skagit	328	2.3%	88,425	1.99%	1.17	82	151	93	2
Skamania	44	0.3%	5,791	0.13%	2.39	2	22	11	9
Snohomish	1,375	9.7%	435,203	9.81%	0.99	416	512	439	8
Spokane	929	6.6%	315,081	7.10%	0.93	454	218	248	9
Stevens	101	0.7%	26,009	0.59%	1.22	6	42	50	3
Thurston	505	3.6%	181,055	4.08%	0.88	161	112	227	5
Wahkiakum	15	0.1%	2,858	0.06%	1.65	1	8	6	0
Walla Walla	119	0.8%	36,349	0.82%	1.03	57	37	24	1
Whatcom	412	2.9%	120,936	2.73%	1.07	136	135	135	6
Whitman	63	0.4%	27,865	0.63%	0.71	20	28	15	0
Yakima	636	4.5%	167,805	3.78%	1.19	219	125	277	15

* Includes interstate and U.S. routes

Source: WSP

II / Alcohol Involvement

A five-year comparison of collisions by county where drivers "had been drinking" (including DWI) reveals that 11 counties experienced increases in alcohol-related collisions during 1992 compared to the previous 4-year average, and 28 counties recorded reductions (Table 2-14).

Table 2-14: Collisions where driver "had been drinking"
Five-year comparison by county

county	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr avg	prev 4-yr avg
Adams	44	44	41	55	43	46	-3.8%
Asotin	38	36	38	35	45	39	-1.3%
Benton	222	230	249	268	290	259	-14.4%
Chelan	159	170	180	230	216	199	-20.1%
Clallam	171	125	157	192	203	169	1.0%
Clark	601	622	725	680	675	676	-11.0%
Columbia	21	22	20	30	16	22	-4.5%
Cowlitz	263	244	290	296	292	281	-6.2%
Douglas	56	67	63	58	75	66	-14.8%
Ferry	46	34	51	43	43	43	7.6%
Franklin	135	144	138	131	184	149	-9.5%
Garfield	3	5	5	5	5	5	-40.0%
Grant	181	183	174	170	151	170	6.8%
Grays Harbor	235	276	300	267	349	298	-21.1%
Island	124	124	138	122	131	129	-3.7%
Jefferson	67	80	96	85	92	88	-24.1%
King	3,769	4,044	4,530	4,663	5,174	4,603	-18.1%
Kitsap	667	705	721	699	680	701	-4.9%
Kittitas	121	134	133	142	137	137	-11.4%
Klickitat	60	64	63	54	48	57	4.8%
Lewis	209	226	230	234	261	238	-12.1%
Lincoln	36	35	25	23	39	31	18.0%
Mason	209	179	197	214	219	202	3.3%
Okanogan	126	123	138	125	157	136	-7.2%
Pacific	80	88	92	89	82	88	-8.8%
Pend Oreille	27	39	42	42	43	42	-34.9%
Pierce	1,877	1,977	2,122	1,992	2,288	2,095	-10.4%
San Juan	39	37	44	42	50	43	-9.8%
Skagit	328	312	323	343	329	327	0.4%
Skamania	44	41	48	41	40	43	3.5%
Snohomish	1,375	1,551	1,729	1,672	1,741	1,673	-17.8%
Spokane	929	931	934	987	1,076	982	-5.4%
Stevens	101	93	94	104	105	99	2.0%
Thurston	505	482	503	518	488	498	1.5%
Wahkiakum	15	10	13	12	20	14	9.1%
Walla Walla	119	114	130	144	124	128	-7.0%
Whatcom	412	423	447	447	487	451	-8.6%
Whitman	63	77	63	102	99	85	-26.1%
Yakima	636	685	712	705	802	726	-12.4%
Total	14,113	14,776	15,998	16,061	17,299	16,034	-12.0%

Source: WSP

A comparison of collisions involving DWI drivers reveals that Wahkiakum County experienced the largest increase (28.6%) in collisions of this type during 1992 compared to the previous 4-year average. Overall, there were 6.4% fewer DWI collisions in 1992 than during the previous 4-year average (Table 2-15). Tables 2-16 and 2-17 summarize fatalities and injuries in "had been drinking" collisions by county.

Table 2-15: Collisions where driver was "intoxicated"
Five-year comparison by county

county	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr avg	prev 4-yr avg
Adams	31	38	28	45	23	34	-7.5%
Asotin	19	19	23	16	24	21	-7.3%
Benton	154	155	171	184	189	175	-11.9%
Chelan	99	111	108	153	120	123	-19.5%
Clallam	108	74	96	126	119	104	4.1%
Clark	366	381	406	394	334	379	-3.4%
Columbia	10	13	10	19	6	12	-16.7%
Cowlitz	164	154	173	185	165	169	-3.1%
Douglas	44	55	41	35	34	41	6.7%
Ferry	27	22	25	18	26	23	18.7%
Franklin	94	97	96	79	99	93	1.3%
Garfield	2	2	3	3	2	3	-20.0%
Grant	126	119	114	116	94	111	13.8%
Grays Harbor	140	187	188	149	195	180	-22.1%
Island	69	82	79	71	55	72	-3.8%
Jefferson	40	48	61	53	57	55	-26.9%
King	2,206	2,240	2,554	2,621	2,561	2,494	-11.5%
Kitsap	460	463	467	441	413	446	3.1%
Kittitas	65	75	83	86	73	79	-18.0%
Klickitat	38	45	38	27	27	34	10.9%
Lewis	151	150	144	144	137	144	5.0%
Lincoln	22	15	17	16	13	15	44.3%
Mason	147	107	140	132	111	123	20.0%
Okanogan	85	79	91	81	97	87	-2.3%
Pacific	55	49	58	56	45	52	5.8%
Pend Oreille	19	23	26	29	18	24	-20.8%
Pierce	1,256	1,261	1,325	1,282	1,294	1,291	-2.7%
San Juan	21	19	25	18	27	22	-5.6%
Skagit	233	225	225	227	202	220	6.0%
Skamania	23	20	37	23	26	27	-13.2%
Snohomish	910	1,041	1,112	1,104	1,051	1,077	-15.5%
Spokane	586	580	621	582	561	586	0.0%
Stevens	58	57	58	66	54	59	-1.3%
Thurston	332	338	306	343	283	318	4.6%
Wahkiakum	9	6	7	3	12	7	28.6%
Walla Walla	83	77	90	103	75	86	-3.8%
Whatcom	269	288	307	281	294	293	-8.0%
Whitman	27	44	32	55	58	47	-42.9%
Yakima	442	478	502	450	489	480	-7.9%
TOTAL	8,990	9,237	9,887	9,816	9,463	9,601	-6.4%

Source: WSP

II / Alcohol Involvement

Table 2-16: Fatalities in collisions where driver "had been drinking"
Five-year comparison by county

county	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr avg	prev 4-yr avg
Adams	2	3	0	5	5	3	-38.5%
Asotin	0	2	1	1	0	1	-100.0%
Benton	9	7	12	8	4	8	16.1%
Chelan	6	8	5	10	6	7	-17.2%
Clallam	3	1	3	6	7	4	-29.4%
Clark	14	21	28	21	16	22	-34.9%
Columbia	1	0	2	2	0	1	0.0%
Cowlitz	4	3	10	10	8	8	-48.4%
Douglas	2	5	7	3	2	4	-52.9%
Ferry	3	2	8	4	6	5	-40.0%
Franklin	8	5	9	5	7	7	23.1%
Garfield	0	0	0	0	1	0	-100.0%
Grant	8	3	13	13	7	9	-11.1%
Grays Harbor	5	15	8	7	10	10	-50.0%
Island	1	3	3	7	4	4	-76.5%
Jefferson	3	2	1	4	6	3	-7.7%
King	51	53	76	67	88	71	-28.2%
Kitsap	16	14	28	17	8	17	-4.5%
Kittitas	8	14	5	8	5	8	0.0%
Klickitat	4	3	7	0	6	4	0.0%
Lewis	8	6	12	9	8	9	-8.6%
Lincoln	3	2	2	2	1	2	71.4%
Mason	8	2	6	9	14	8	3.2%
Okanogan	9	5	9	7	10	8	16.1%
Pacific	4	3	1	5	3	3	33.3%
Pend Oreille	2	1	1	1	2	1	60.0%
Pierce	28	27	45	25	55	38	-26.3%
San Juan	0	2	1	1	2	2	-100.0%
Skagit	7	7	13	8	14	11	-33.3%
Skamania	2	1	2	1	0	1	100.0%
Snohomish	26	40	44	41	33	40	-34.2%
Spokane	16	6	23	18	24	18	-9.9%
Stevens	1	8	7	5	3	6	-82.6%
Thurston	14	13	9	9	20	13	9.8%
Wahkiakum	0	0	0	0	0	0	—
Walla Walla	4	7	2	3	8	5	-20.0%
Whatcom	8	7	9	15	11	11	-23.8%
Whitman	1	8	1	8	2	5	-78.9%
Yakima	19	26	18	27	27	25	-22.4%
Total	308	335	431	392	433	398	-22.6%

Source: WSP

Table 2-17: Injuries in collisions where driver "had been drinking"
 Five-year comparison by county

county	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr avg	prev 4-yr avg
Adams	35	37	45	58	34	44	-19.5%
Asotin	30	29	30	25	26	28	9.1%
Benton	157	181	197	206	206	198	-20.5%
Chelan	102	142	167	196	160	166	-38.6%
Clallam	144	86	150	148	127	128	12.7%
Clark	557	544	594	526	528	548	1.6%
Columbia	17	29	17	26	15	22	-21.8%
Cowlitz	203	187	224	243	215	217	-6.6%
Douglas	57	57	56	50	70	58	-2.1%
Ferry	38	46	33	56	56	48	-20.4%
Franklin	103	110	92	90	135	107	-3.5%
Garfield	0	3	6	3	9	5	-100.0%
Grant	142	156	163	160	106	146	-2.9%
Grays Harbor	166	213	212	212	267	226	-26.5%
Island	110	116	135	93	94	110	0.5%
Jefferson	59	66	81	73	80	75	-21.3%
King	3,227	3,287	3,815	3,874	3,885	3,715	-13.1%
Kitsap	563	631	597	617	559	601	-6.3%
Kittitas	105	109	104	113	94	105	0.0%
Klickitat	52	70	64	44	38	54	-3.7%
Lewis	174	199	189	190	203	195	-10.9%
Lincoln	32	37	19	32	36	31	3.2%
Mason	220	160	182	182	187	178	23.8%
Okanogan	109	122	112	105	150	122	-10.8%
Pacific	82	65	60	83	70	70	18.0%
Pend Oreille	24	45	43	44	38	43	-43.5%
Pierce	1,717	1,845	1,909	1,887	2,017	1,915	-10.3%
San Juan	28	31	32	28	42	33	-15.8%
Skagit	263	286	276	306	265	283	-7.1%
Skamania	28	35	42	31	36	36	-22.2%
Snohomish	1,192	1,261	1,583	1,379	1,349	1,393	-14.4%
Spokane	759	750	800	826	901	819	-7.4%
Stevens	120	93	91	131	111	107	12.7%
Thurston	432	418	424	425	389	414	4.3%
Wahkiakum	12	3	12	9	26	13	-4.0%
Walla Walla	92	94	95	111	108	102	-9.8%
Whatcom	345	350	400	397	459	402	-14.1%
Whitman	66	65	59	88	90	76	-12.6%
Yakima	546	617	639	593	543	598	-8.7%
Total	12,108	12,575	13,749	13,660	13,724	13,427	-9.8%

Source: WSP

III. Safety Restraint Use



Much of the restraint usage data in this summary are based upon collision investigation reports by law enforcement officers. When direct observation is impossible, the officer's only alternative is to question those involved as to their seat belt use. Since Washington has a mandatory seat belt use law, there is a tendency for occupants to falsely report compliance. This artificially inflates the usage rate. These collision-based rates are most useful for comparison purposes. The best available estimates of actual restraint use are from observational studies. However, these studies are limited to shoulder-belt use by drivers and front-window-seat occupants of passenger vehicles (trucks not included).

Observed belt use

A steady increase in restraint usage in recent years has been associated with a reduction of 15.3% for 1992 in fatalities and 15.3% in disabling injuries from the previous 4-year average, and reductions of over 24% in the fatal and injury rates per 100 million miles of travel. Observed belt use was 36% in 1986; it has doubled to 73% in 1992 (Table 3-1).

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

	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Observed SB use rate	73%	69%	**	55%	53%	59%	24.1%
Fatal rate*	1.34	1.50	1.87	1.83	1.88	1.77	-24.4%
Disabling injury rate*	13.42	14.98	17.33	18.84	19.95	17.77	-24.5%
Deaths	651	683	825	781	785	769	-15.3%
Disabling injuries	6,531	6,839	7,653	8,044	8,318	7,714	-15.3%
Motor vehicle travel	48,650	45,663	44,157	42,696	41,698	43,554	11.7%

Source: WTSC

*Fatalities/disabling injuries per 100 million miles of travel

†Surveys performed April 1988, May 1989, Sept 1991 and Sept 1992.

**1990 observational survey not performed.

III / Safety Restraint Use

Western Washington occupants were observed wearing safety restraints 75.6%, while Eastern Washington occupants were observed wearing theirs 66.5%. Both Western and Eastern Washington's rates showed increases over 1991's results, with 7.5% and 3.4% increases respectively. Interstate highway travel had the highest usage rate at 75.4% while city streets was lowest at 62.3% (Table 3-2).

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

characteristic	1992	1991	% chg
Western Washington	75.6%	70.3%	7.5%
Eastern Washington	66.5%	64.3%	3.4%
Three or more lanes+	76.5%	72.9%	4.9%
Two lanes+	69.4%	68.3%	1.6%
One lane+	67.5%	60.9%	10.8%
Interstate highways	75.4%	71.9%	4.9%
County roads	60.1%	71.8%	-16.3%
US routes	68.3%	67.2%	1.6%
State routes	69.7%	66.1%	5.4%
City streets	62.3%	62.5%	-0.3%
Commuter rush hours	72.2%	70.5%	2.4%
Non-rush hours	73.6%	67.8%	8.6%
Average speed 20 mph	61.6%	62.1%	-0.8%
Average speed 40 mph	66.5%	64.0%	3.9%
Average speed 60 mph	74.4%	72.3%	2.9%

Source: WTSC

* Observational surveys performed in September of each year.
+ For one direction of travel

Restraint use and injuries sustained

During 1992, a reported 186,619 occupant were wearing restraints when involved in collisions. This is an increase of 9.7% over the previous year. Last year, 329 occupants (1.5%) who were not using a safety restraint died and 1,884 (8.3%) were seriously injured. Among occupants using restraints, 152 (0.1%) died and 2,766 (1.5%) were seriously injured. These data suggest that a crash-involved occupant who did not "buckle up" was 15 times more likely to be killed and 5.5 times more likely to be seriously injured than an occupant using a safety restraint (Table 3-3).

Table 3-3: Restraint use and injuries sustained* - 1992

type	total occupants +		restraints used		restraints not used		child restraints**	
	number	%	number	%	number	%	number	%
Deaths	481	0.2%	152	0.1%	329	1.5%	2	0.1%
Disabling injuries	4,650	2.2%	2,766	1.5%	1,884	8.3%	12	0.3%
Evident injuries	17,867	8.5%	12,557	6.7%	5,310	23.5%	138	3.8%
Possible injuries	31,408	15.0%	27,362	14.7%	4,046	17.9%	272	7.5%
No injuries	154,788	74.0%	143,743	77.0%	11,045	48.8%	3,214	88.3%
Not stated			39	0.0%	14	0.1%	3	0.1%
Total	209,247	100.0%	186,619	100.0%	22,628	100.0%	3,641	100.0%

Source: WSP

*Investigated collisions only. Excludes cases where restraint use was unknown.

+Does not include 30 occupants where the injury data was unknown.

**Included with restraints used category.

Types of restraints used

Tables 3-4 and 3-5 summarize the different types of restraint systems used in collisions by severity of injury and by occupant age. Table 3-4 shows that the likelihood of fatalities and serious injuries is lower among restrained occupants and that the likelihood varies among different restraint systems used. Table 3-5 gives a detailed age breakdown of different restraint systems reported to be used among crash-involved occupants.

Table 3-4: Types of restraints used in collisions
By severity of injury - 1992

type	deaths		disabling injury		evident injury		possible injury		no injury		total	
	#	%	#	%	#	%	#	%	#	%	#	%
Lap belt	22	0.1%	339	1.4%	1,942	8.0%	3,124	12.9%	18,793	77.6%	24,220	100.0%
Shoulder belt	5	0.1%	87	2.0%	282	6.5%	551	12.8%	3,385	78.5%	4,310	100.0%
Lap & shoulder	119	0.1%	2,301	1.5%	10,096	6.6%	23,342	15.1%	118,216	76.7%	154,074	100.0%
Child restraint	2	0.1%	12	0.3%	138	3.8%	272	7.5%	3,214	88.3%	3,638	100.0%
Air bag*/ belted	0	0.0%	21	7.6%	81	29.1%	69	24.8%	107	38.5%	278	100.0%
Air bag*/ no bit	4	6.7%	6	10.0%	18	30.0%	4	6.7%	28	46.7%	60	100.0%
No restraints	329	1.5%	1,884	8.3%	5,310	23.5%	4,046	17.9%	11,045	48.8%	22,814	100.0%
Total occupants	481	0.2%	4,650	2.2%	17,867	8.5%	31,408	15.0%	154,788	74.0%	209,194	100.0%

* Air bag activated

Source: WSP

Table 3-5: Types of restraints used in collisions
By occupant age - 1992

age	total restraint used				total not used	total restraint used	%	air bag	
	lap belt	shoulder belt	lap & shldr belt	child restraint				air bag w/rstrnt	air bag not rstrnt
Under 1	22	4	95	684	805	48	94.4%	0	0
1	116	3	208	1,139	1,484	70	95.4%	0	0
2	308	13	358	852	1,531	126	92.4%	1	0
3	462	18	517	432	1,429	133	91.5%	0	0
4	527	12	613	181	1,333	145	90.2%	1	0
5	506	18	621	78	1,221	109	91.8%	0	0
6	455	17	579	23	1,074	142	88.3%	0	0
7	448	11	525	--	984	128	88.5%	0	0
8	417	10	522	--	949	143	86.9%	1	0
9	387	10	539	--	936	134	87.5%	0	0
10	347	17	578	--	940	133	87.6%	0	0
11	318	13	550	--	881	122	87.8%	0	0
12	301	20	629	--	950	174	84.5%	0	0
13	283	23	595	--	901	205	81.5%	0	1
14	400	24	844	--	1,288	342	78.8%	0	1
15	592	48	1,545	--	2,185	586	78.9%	1	0
16	921	142	4,383	--	5,426	889	86.2%	4	2
17	902	181	5,508	--	6,589	1,111	85.6%	9	2
18	849	193	5,351	--	6,393	1,173	84.5%	8	1
19	740	141	4,910	--	5,791	1,063	84.5%	7	2
20	655	155	4,753	--	5,563	987	84.9%	7	1
21 - 24	2,133	507	17,321	--	19,961	3,188	86.2%	28	7
25 - 29	2,143	455	18,177	--	20,775	2,763	88.3%	28	12
30 - 64	7,945	1,813	68,745	--	78,503	7,081	91.7%	142	19
65 & over	1,159	357	11,581	--	13,077	952	93.2%	40	11
Unknown	571	84	2,651	--	3,306	541	85.9%	1	1
Total	23,907	4,289	152,652	3,387	184,236	22,468	89.1%	278	60

Source: WSP, WSDOT

III / Safety Restraint Use

Male-female safety restraint usage in collisions

Female motor-vehicle occupants in collisions reported using restraints more often than male occupants. Percentages for all groups have increased steadily over the past 5 years, with male passengers showing the biggest increase with 10.1% (Table 3-6).

Table 3-6: Percent of safety restraint usage rates in collisions*
Five-year comparison by sex

occupant	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Male driver	89.8%	88.3%	85.5%	81.4%	80.3%	83.9%	7.1%
Female driver	93.2%	92.2%	89.4%	86.0%	85.5%	88.3%	5.6%
Male passenger	82.3%	79.9%	76.4%	71.9%	70.9%	74.8%	10.1%
Female passenger	87.3%	85.9%	83.4%	79.0%	78.5%	81.7%	6.9%

*Excludes occupants where restraint use was unknown

Source: WSP

Restraint use by seat position

Drivers are the most frequent users of safety restraints, followed by occupants riding in the right front seat, then occupants in the right back seat. Mid-front and mid-back occupants continue to have the lowest rates, except for the "other" position, which includes positions in non-designated areas such as the back of station wagons and truck beds (Table 3-7). Children aged 0-4 sitting in the left-back, right-back and middle-back recorded the highest usage rates (Table 3-8).

Table 3-7: Percentage of restraint use by occupant seat position
Five-year comparison

occupants	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Driver	91.0%	89.6%	86.8%	82.9%	82.1%	83.9%	8.4%
Mid-front	70.1%	67.4%	62.1%	57.0%	54.8%	60.3%	16.2%
Right-front	87.5%	85.7%	82.5%	78.3%	78.0%	81.1%	7.9%
Left-back	85.9%	84.6%	81.3%	78.4%	77.7%	80.5%	6.7%
Mid-back	79.2%	75.1%	73.0%	68.9%	66.7%	70.9%	11.7%
Right-back	86.3%	85.0%	82.8%	78.4%	77.8%	81.0%	6.5%
Other	47.2%	40.9%	39.2%	31.6%	29.0%	35.2%	34.2%
Average	78.2%	75.5%	72.5%	67.9%	66.6%	70.6%	10.7%

Source: WSP

**Table 3-8: Percent of reported restraint use in collisions
By occupant age & seat position - 1992**

seat position	0-4	5-9	10-14	15-20	21-24	25-29	30-64	65/over
Driver	-	-	-	88.4%	88.2%	91.1%	92.5%	93.3%
Md-front	83.1%	78.9%	68.5%	57.0%	63.5%	67.4%	67.4%	84.4%
Right-front	92.6%	91.5%	88.3%	83.3%	83.7%	84.4%	90.1%	93.3%
Left-back	95.8%	91.6%	85.7%	76.3%	76.7%	75.2%	83.2%	92.7%
Md-back	93.1%	86.9%	75.1%	61.9%	57.4%	55.0%	70.1%	87.9%
Right-back	95.9%	91.5%	87.1%	78.8%	75.1%	79.6%	84.7%	95.6%
Other	57.0%	60.8%	51.0%	38.3%	40.0%	22.0%	41.4%	65.2%
Unknown	81.7%	78.5%	64.9%	60.1%	56.5%	64.3%	63.1%	92.9%

Source: WSP, WSDOT

Restraint use in collisions by road type

Of the occupants that were involved in investigated collisions occurring on Interstate highways, 92.9% indicated that they were wearing restraints. County road travelers had the lowest reported usage rate at 84.5% (Table 3-9).

**Table 3-9: Restraint use in collisions by roadway type
Five-year comparison**

functional class	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Interstate	92.9%	92.2%	90.4%	87.0%	86.5%	89.0%	4.4%
Other state routes	90.4%	88.6%	85.0%	81.5%	79.8%	83.7%	8.0%
County roads	84.5%	82.3%	79.9%	75.9%	75.0%	78.3%	8.0%
City streets	90.3%	88.9%	85.8%	81.5%	80.7%	84.2%	7.2%

Source: WSP, WSDOT

Restraint use by type of vehicle occupied

Occupants of passenger cars had the highest reported usage rate of 90.0% for vehicles involved in investigated collisions, followed by heavy trucks at 87.9% and light trucks at 87.6% (Table 3-10).

**Table 3-10: Reported restraint use by type of vehicle occupied
Five-year comparison**

type of vehicle	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Passenger car	90.0%	88.7%	86.0%	82.1%	81.6%	84.6%	6.4%
Light trucks	87.6%	85.6%	82.5%	78.0%	76.2%	80.6%	8.7%
Heavy trucks	87.9%	86.3%	82.2%	75.8%	71.7%	79.0%	11.3%
All others	77.6%	74.7%	74.6%	73.2%	68.3%	72.7%	6.7%

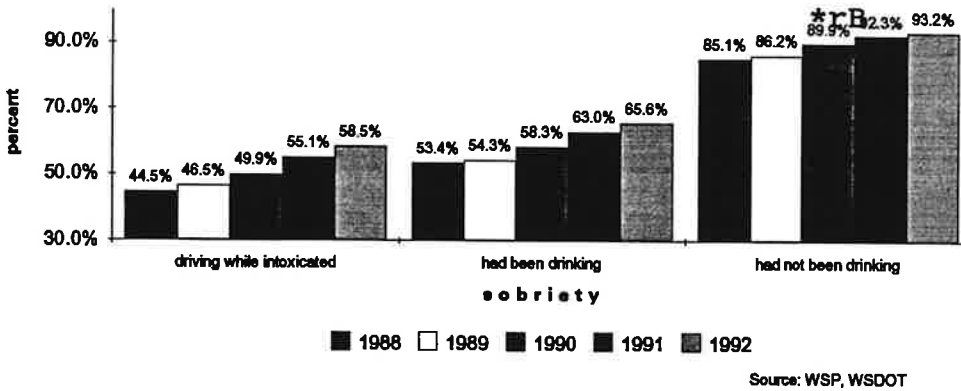
Source: WSP, WSDOT

III / Safety Restraint Use

Restraint use by sobriety

Among drivers involved in 1992 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 93.2%. Those drinking had a much lower usage rate, with 58.5% for drivers under the influence of intoxicants and 65.6% for all drivers who had been drinking. An increasing trend in reported restraint use among non-drinking drivers seems also to have occurred among drinking drivers (Figure 3-1).

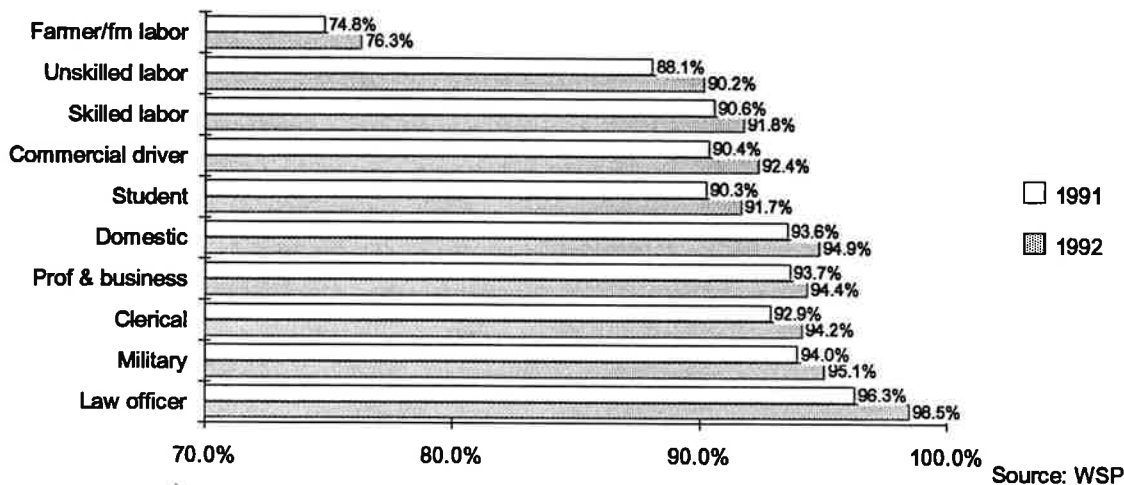
**Figure 3-1: Restraint use by drivers in collisions
Five-year comparison by sobriety**



Restraint use by driver occupation

Law enforcement officers and military personnel reported the highest restraint usage rates for 1992 with 98.5% and 95.1% respectively. Farmers and farm laborers reported the lowest rate with 76.3%. All occupation classes experienced increases in usage compared to 1991 (Figure 3-2).

Figure 3-2: Safety restraint use by driver occupation



Ejection of motor vehicle occupants

Occupants who were ejected from a motor vehicle as the result of a crash had much higher fatality percentages than all occupants in collisions. Persons 65 and over had a 25% probability of being killed if they were ejected, but only a 0.7% probability for all persons in collisions. In the 0 to 4 age group, 13.5% of those ejected were killed, compared to only 0.1% killed in all collisions. The ratio of percentage killed for ejected to percentage killed in all collisions is 119.24 in the 0 to 4 age group. Over all age groups, ejected occupants were 59 times more likely to be killed as compared to all occupants (Table 3-11).

Table 3-11: Ejection of motor vehicle occupants*
Total or partial ejection; by age group - 1992

age	occupants ejected			all occupants in collisions			ratio **-
	occ inv	killed	% killed	occ inv	killed	% killed	
0 - 4	37	5	13.5%	7,059	8	0.1%	119.24
5 - 9	30	3	10.0%	5,793	9	0.2%	64.37
10 - 14	46	4	8.7%	5,969	8	0.1%	64.88
15 - 20	319	36	11.3%	38,806	77	0.2%	56.87
21 - 24	189	34	18.0%	24,074	70	0.3%	61.87
25 - 29	141	19	13.5%	24,439	49	0.2%	67.21
30 - 64	350	56	16.0%	88,392	193	0.2%	73.28
65 & ovr	28	7	25.0%	14,355	95	0.7%	37.78
Unknown age					2		
Total	1,140	164	14.4%	208,887	511	0.2%	58.81

* Includes total and partial ejection - does not include motorcyclists
** Percentage of fatalities in ejections to percentage of fatalities in total collisions
Source: WSDOT

Restraint use by county

King County reported the highest safety-restraint usage rate with 92.5%, up 7.5% from the previous 4-year average. Asotin County had the lowest usage rate for 1992 at 66.7%. Eleven counties had reductions in their usage rates from 1991, but still improved over their previous 4-year averages. Garfield county experienced a had the largest reduction, 9.4% compared to the previous year (Table 3-12).

Injury severity and seatbelt use in Washington's counties and cities

In cities over 10,000, 36.3% of fatality victims were wearing a safety restraint. The lower the severity, the higher was the use rate, with 67.7% of persons with disabling injuries using restraints, 84.8% of persons with non-disabling or possible injuries, and 93.7% of persons with no injury. Table 3-13 provides comparisons of individual cities for injury severity and belt use; table 3-14 provides these comparisons for counties.

III / Safety Restraint Use

Table 3-12: Seat belt use in Investigated collisions
Five-year comparison - by county

county	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Adams	79.5	82.6	75.6	71.4	74.4	76.0	4.6%
Asotin	66.7	67.7	54.9	57.8	54.2	58.7	13.7%
Benton	87.2	87.0	82.2	75.0	75.3	79.9	9.2%
Chelan	89.7	88.6	83.7	81.3	79.9	83.4	7.6%
Clallam	86.9	85.2	82.1	76.8	75.6	79.9	8.7%
Clark	86.2	86.0	80.4	75.0	72.8	78.6	9.7%
Columbia	72.1	76.1	67.9	67.7	74.0	71.4	0.9%
Cowlitz	84.4	82.8	76.2	72.9	68.3	75.1	12.5%
Douglas	84.3	84.1	79.4	77.7	77.8	79.8	5.7%
Ferry	70.9	71.4	73.4	63.2	53.9	65.5	8.3%
Franklin	77.8	75.6	70.6	68.5	65.1	70.0	11.2%
Garfield	69.8	79.2	57.6	65.7	59.7	65.6	6.5%
Grant	81.6	77.6	75.4	69.3	73.8	74.0	10.2%
Grays Harbor	78.4	76.6	74.3	67.5	64.0	70.6	11.0%
Island	89.5	90.6	89.2	85.4	85.1	87.6	2.2%
Jefferson	84.8	80.5	79.3	75.4	75.3	77.6	9.2%
King	92.5	91.4	89.1	86.0	85.0	87.9	5.3%
Kitsap	89.1	87.1	84.2	81.2	78.9	82.9	7.5%
Kittitas	85.8	85.6	81.4	78.2	79.4	81.2	5.7%
Klickitat	78.6	79.2	72.5	72.7	68.0	73.1	7.5%
Lewis	86.6	86.0	81.6	77.1	72.6	79.3	9.2%
Lincoln	75.1	74.9	80.7	73.9	71.0	75.1	0.0%
Mason	83.3	81.6	76.7	70.0	68.9	74.3	12.1%
Okanogan	74.7	69.5	67.6	62.0	53.9	63.3	18.1%
Pacific	82.9	81.7	75.0	71.9	78.4	76.8	8.0%
Pend Oreille	76.9	71.1	67.6	58.8	65.6	65.8	16.9%
Pierce	89.3	87.8	85.2	80.0	82.3	83.8	6.5%
San Juan	78.0	59.7	52.7	56.8	54.1	55.8	39.7%
Skagit	87.4	82.9	81.9	77.6	72.8	78.8	10.9%
Skamania	81.0	83.7	70.9	70.7	55.5	70.2	15.4%
Snohomish	90.0	87.6	85.1	80.2	79.2	83.0	8.4%
Spokane	89.8	84.4	84.8	82.4	80.7	83.1	8.1%
Stevens	75.6	77.1	67.0	57.5	70.8	68.1	11.0%
Thurston	90.3	87.9	85.1	82.6	81.6	84.3	7.1%
Wahkiakum	82.6	85.1	82.9	81.8	71.2	80.3	2.9%
Walla Walla	82.2	80.5	76.6	72.0	71.5	75.2	9.4%
Whatcom	89.8	89.9	86.7	81.6	79.4	84.4	6.4%
Whitman	87.9	84.9	81.7	79.4	77.8	81.0	8.6%
Yakima	82.9	79.5	76.0	68.7	66.8	72.8	14.0%

Source: WSP

Table 3-13: Injury severity by seatbelt use
 Cities over 10,000 - 1992

city	fatality			disabling injury			non-disab/possbl inj			no injury		
	used	n/used	pct	used	n/use	pct	used	n/use	pct	used	n/use	pct
250,000 and over												
Seattle	7	13	35.0%	352	148	70.4%	5,750	775	88.1%	19,768	971	95.3%
100,000 to 250,000												
Spokane	4	3	57.1%	146	55	72.6%	1,856	365	83.6%	7,025	465	93.8%
Tacoma	2	6	25.0%	153	73	67.7%	2,500	521	82.8%	7,241	559	92.8%
50,000 to 100,000												
Bellevue	1	0	100.0%	23	6	79.3%	940	94	90.9%	3,609	126	96.6%
Everett	1	3	25.0%	35	28	55.6%	841	176	82.7%	3,366	252	93.0%
Federal Way	0	1	0.0%	51	27	65.4%	612	103	85.6%	2,367	128	94.9%
Yakima	1	2	33.3%	12	12	50.0%	528	158	77.0%	2,697	275	90.7%
Bellingham	0	0	—	15	11	57.7%	426	70	85.9%	2,246	157	93.5%
25,000 to 50,000												
Vancouver	0	2	0.0%	19	12	61.3%	287	55	83.9%	1,383	153	90.0%
Kennewick	0	1	0.0%	25	11	69.4%	290	92	75.9%	1,606	127	92.7%
Renton	2	0	100.0%	19	6	76.0%	600	75	88.9%	2,599	118	95.7%
Kirkland	0	0	—	7	10	41.2%	346	45	88.5%	1,489	40	97.4%
Kent	1	2	33.3%	76	33	69.7%	657	135	83.0%	2,978	252	92.2%
Redmond	0	1	0.0%	9	5	64.3%	214	31	87.3%	1,359	51	96.4%
Bremerton	0	1	0.0%	27	5	84.4%	361	63	85.1%	1,732	191	90.1%
Olympia	0	1	0.0%	13	11	54.2%	392	74	84.1%	2,367	111	95.5%
Auburn	0	2	0.0%	46	16	74.2%	339	64	84.1%	1,503	81	94.9%
Richland	2	0	100.0%	13	3	81.3%	183	43	81.0%	870	71	92.5%
Longview	0	1	0.0%	9	7	56.3%	290	78	78.8%	1,319	160	89.2%
Edmonds	0	0	—	3	1	75.0%	185	37	83.3%	735	54	93.2%
Lynnwood	0	0	—	13	2	86.7%	517	72	87.8%	2,032	97	95.4%
Walla Walla	0	1	0.0%	4	9	30.8%	128	43	74.9%	710	122	85.3%
Puyallup	1	3	25.0%	9	10	47.4%	213	53	80.1%	904	61	93.7%
15,000 to 25,000												
Pullman	0	0	—	2	0	100.0%	61	13	82.4%	471	43	91.6%
Sea Tac	1	1	50.0%	30	19	61.2%	345	59	85.4%	1,332	90	93.7%
Wenatchee	1	0	100.0%	6	14	30.0%	102	19	84.3%	826	58	93.4%
Lacey	0	0	—	4	0	100.0%	201	27	88.2%	1,067	59	94.8%
Mercer Island	0	0	—	5	2	71.4%	82	12	87.2%	362	19	95.0%
Pasco	0	3	0.0%	5	12	29.4%	151	50	75.1%	557	116	82.8%
Mountlake Terrace	0	0	—	14	3	82.4%	130	19	87.2%	426	12	97.3%
Mount Vernon	0	0	—	7	5	58.3%	146	29	83.4%	1,015	77	92.9%
Oak Harbor	0	0	—	0	0	—	48	4	92.3%	322	13	96.1%
Des Moines	1	0	100.0%	5	2	71.4%	68	21	76.4%	348	27	92.8%
Port Angeles	0	0	—	8	0	100.0%	68	29	70.1%	642	66	90.7%
Bainbridge Island	1	0	100.0%	2	1	66.7%	48	19	71.6%	207	12	94.5%
Aberdeen	0	0	—	4	1	80.0%	91	39	70.0%	635	70	90.1%
10,000 to 15,000												
Tukwila	0	2	0.0%	37	18	67.3%	542	65	89.3%	1,985	78	96.2%
Mukitso	1	0	100.0%	5	4	55.6%	98	5	95.1%	389	18	95.6%
Bothell	0	0	—	7	3	70.0%	114	13	89.8%	478	18	96.4%
Marysville	1	0	100.0%	5	0	100.0%	74	10	88.1%	477	27	94.6%
Ellensburg	0	1	0.0%	3	0	100.0%	18	12	60.0%	144	35	80.4%
Centralia	1	0	100.0%	13	4	76.5%	121	23	84.0%	771	80	90.6%
Anacortes	0	1	0.0%	3	6	33.3%	39	27	59.1%	229	32	87.7%
Kelso	0	0	—	5	3	62.5%	110	45	71.0%	409	72	85.0%
Moses Lake	0	0	—	1	1	50.0%	97	23	80.8%	482	52	90.3%
Sunnyside	0	0	—	2	0	100.0%	33	13	71.7%	121	30	80.1%
Tumwater	0	0	—	10	3	76.9%	100	15	87.0%	460	18	96.2%
TOTAL	29	51	36.3%	1,262	602	67.7%	21,342	3,813	84.8%	86,060	5,744	93.7%

* Includes collisions occurring on the interstate system
 † Frequency per 10,000 population

III / Safety Restraint Use

Table 3-14: Seatbelt use and severity of injuries
By county - 1992

	fatality			disabling injury			non-disab/ possibl inj			no injur		
	used	n/used	pct	used	n/used	pct	used	n/used	pct	used	n/used	pct
Adams	1	6	14.3%	13	22	37.1%	119	50	70.4%	358	49	88.0%
Asotin	0	0	—	4	4	50.0%	44	30	59.5%	217	84	72.1%
Benton	3	12	20.0%	52	32	61.9%	663	221	75.0%	2,988	279	91.5%
Chelan	3	3	50.0%	43	32	57.3%	362	85	81.0%	1,716	126	93.2%
Cllalam	3	1	75.0%	30	22	57.7%	336	114	74.7%	1,368	129	91.4%
Clark	10	17	37.0%	119	68	63.6%	1,459	426	77.4%	5,298	549	90.6%
Columbia	1	2	33.3%	3	2	60.0%	19	9	67.9%	70	23	75.3%
Cowlitz	1	4	20.0%	29	28	50.9%	586	201	74.5%	2,441	333	88.0%
Douglas	3	3	50.0%	8	19	29.6%	172	49	77.8%	553	66	89.3%
Ferry	1	2	33.3%	5	11	31.3%	48	26	64.9%	92	21	81.4%
Franklin	2	9	18.2%	13	29	31.0%	220	90	71.0%	783	164	82.7%
Garfield	0	2	0.0%	2	2	50.0%	11	4	73.3%	24	8	75.0%
Grant	3	11	21.4%	31	32	49.2%	310	135	69.7%	1,168	164	87.7%
Grays Harbor	2	7	22.2%	22	34	39.3%	302	177	63.0%	1,334	239	84.8%
Island	2	3	40.0%	31	15	67.4%	291	54	84.3%	916	77	92.2%
Jefferson	2	2	50.0%	17	21	44.7%	144	50	74.2%	440	36	92.4%
King	34	42	44.7%	942	483	66.1%	13,693	2,126	86.6%	50,253	2,615	95.1%
Kitsap	10	14	41.7%	83	36	69.7%	1,631	388	80.8%	5,523	456	92.4%
Kittitas	4	14	22.2%	35	30	53.8%	266	104	71.9%	1,208	104	92.1%
Klickitat	1	1	50.0%	11	19	36.7%	89	34	72.4%	278	49	85.0%
Lewis	6	10	37.5%	53	53	50.0%	428	165	72.2%	1,893	140	93.1%
Lincoln	1	6	14.3%	15	13	53.6%	58	36	61.7%	189	32	85.5%
Mason	5	8	38.5%	52	46	53.1%	333	112	74.8%	931	101	90.2%
Okanogan	2	10	16.7%	10	22	31.3%	136	89	60.4%	496	103	82.8%
Pacific	1	4	20.0%	10	12	45.5%	98	53	64.9%	293	14	95.4%
Pend Oreille	0	0	—	8	8	50.0%	53	23	69.7%	139	29	82.7%
Pierce	11	34	24.4%	309	203	60.4%	5,842	1,328	81.5%	17,643	1,281	93.2%
San Juan	0	1	0.0%	2	5	28.6%	22	18	55.0%	104	12	89.7%
Skagit	3	5	37.5%	46	37	55.4%	736	202	78.5%	2,821	282	90.9%
Skamania	1	2	33.3%	5	8	38.5%	39	21	65.0%	176	21	89.3%
Snohomish	11	21	34.4%	219	130	62.8%	3,835	867	81.8%	13,286	928	93.5%
Spokane	8	14	36.4%	246	129	65.6%	2,892	641	81.9%	10,516	772	93.2%
Stevens	2	1	66.7%	20	20	50.0%	145	98	59.7%	385	60	86.5%
Thurston	3	17	15.0%	74	81	47.7%	1,334	326	80.4%	5,756	353	94.2%
Wahkiakum	0	0	—	2	3	40.0%	21	9	70.0%	72	8	90.0%
Walla Walla	0	5	0.0%	13	34	27.7%	231	78	74.8%	1,070	167	86.5%
Whatcom	2	8	20.0%	68	45	60.2%	1,045	244	81.1%	4,372	329	93.0%
Whitman	2	1	66.7%	19	6	76.0%	209	66	76.0%	784	66	92.2%
Yakima	8	26	23.5%	72	81	47.1%	1,269	522	70.9%	5,082	698	87.9%
Total	152	328	31.7%	2,736	1,877	59.3%	39,491	9,271	81.0%	143,036	10,967	92.9%

Source: WSP, DOT

IV. Youthful Driver Involvement

The number of youthful drivers (24 years of age and younger) involved in traffic collisions has decreased for the fifth consecutive year. During 1992, 54,066 youthful drivers were involved in 47,588 traffic collisions. Fatal, injury, and total collisions involving youth declined 12.6%, 3.2% and 6.9% respectively from the previous 4-year average. The fatal collision rate (fatal collisions involving youthful drivers per 10,000 licensed youthful drivers) decreased 17.4% (Table 4-1).



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

collisions & rates	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Total collisions	47,588	48,564	50,906	51,507	53,375	51,088	-6.9%
Fatal collisions	219	221	261	249	271	251	-12.6%
Injury collisions	21,172	20,922	21,798	22,127	22,607	21,864	-3.2%
Persons killed	243	255	301	287	314	289	-16.0%
Persons injured	33,805	32,546	34,225	34,449	35,100	34,080	-0.8%
Youthful licensed drivers	527,379	518,047	481,691	496,433	497,527	498,425	5.8%
Youthful drivers involved	54,066	55,559	58,026	58,689	61,408	58,421	-7.5%
Fatal collision rate *	4.15	4.27	5.42	5.02	5.45	5.03	-17.4%
Total collision rate *	902.35	937.44	1056.82	1037.54	1072.81	1,024.99	-12.0%

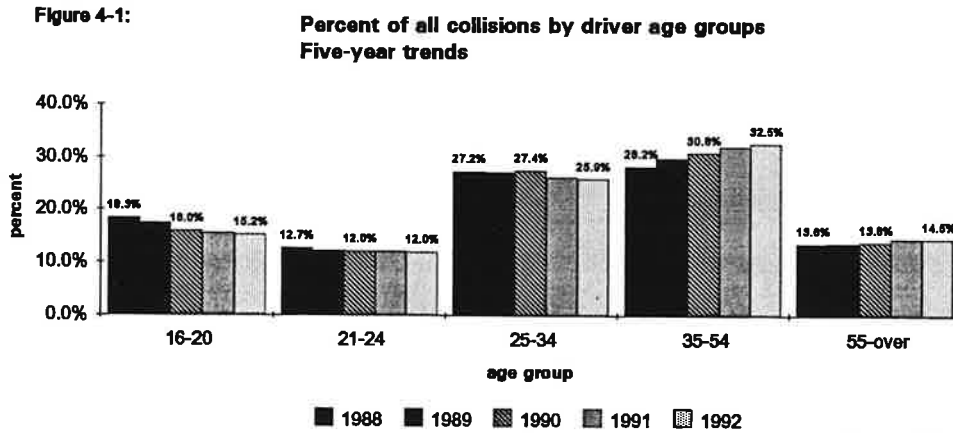
* Fatal collisions/total collisions per 10,000 youthful licensed drivers

Source: WSP, DOL

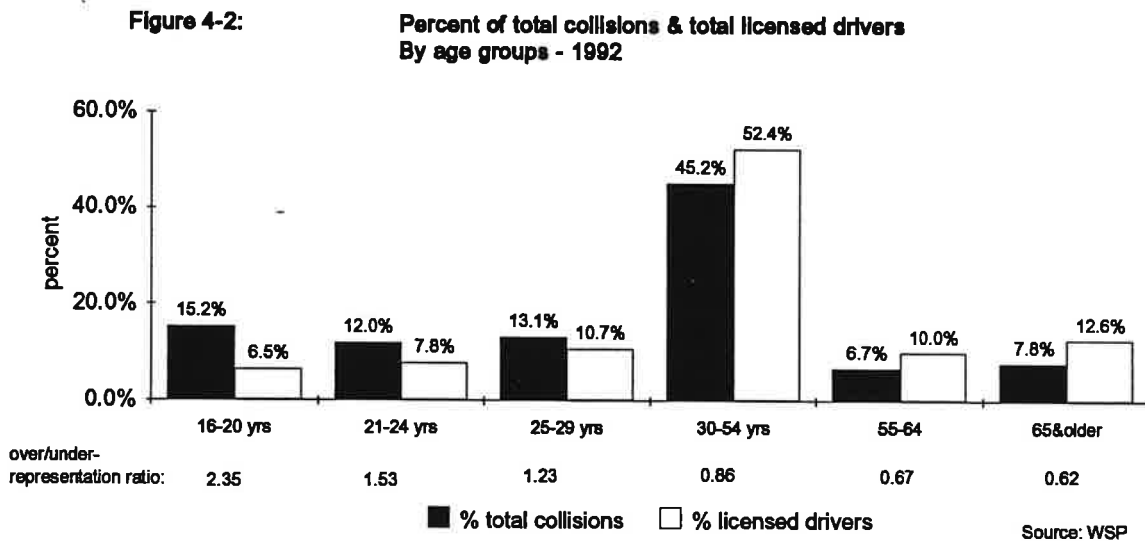
IV / Youthful Driver Involvement

Collision involvement by driver age

The youthful age group 16-20 showed a consistent decrease over the past several years in percentage of collision involvement, while drivers age 35-54 have had an increasing percentage involvement (Figure 4-1).



The 16-20 year age group was involved in 15.2% of all collisions and made up 6.5% of the state's licensed drivers, creating an over-representation ratio of 2.35 (Figure 4-2).



Youthful drivers in collisions by first harmful event

Of youthful drivers involved in collisions, 76.5% collided with other moving vehicles and 14.2% with fixed objects. Collisions with other moving vehicles accounted for a much smaller percentage of fatal crashes (38.8%). Almost half of the fatal collisions were single-vehicle, fixed-object or overturning collisions (Table 4-2).

Table 4-2: Collisions involving youthful drivers*
By first harmful event - 1992

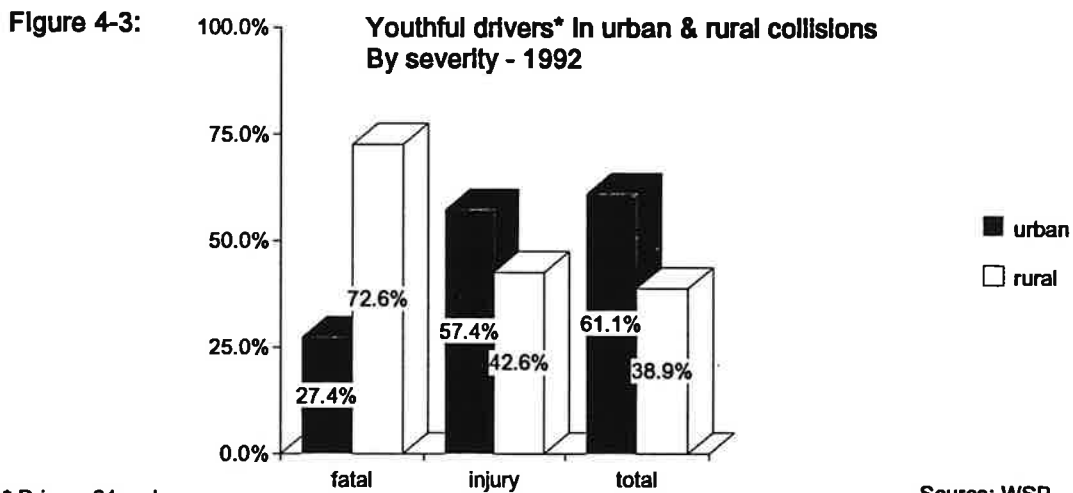
type of collision	fatal collisions		injury collisions		total collisions	
	#	%	#	%	#	%
Collision w/other moving motor vehicles	85	38.8%	15,860	74.9%	36,391	76.5%
Collision w/parked vehicle	0	0.0%	347	1.6%	1,424	3.0%
Collision w/fixed/other object	65	29.7%	3,035	14.3%	6,766	14.2%
Overturning & other non-collision	42	19.2%	1,292	6.1%	2,127	4.5%
Collisions w/pedestrians & pedalcyclists	26	11.9%	590	2.8%	620	1.3%
Other collisions - animal & R.R. train	1	0.5%	48	0.2%	260	0.5%
Total	219	100.0%	21,172	100.0%	47,588	100.0%

*Drivers 24 and younger

Source: WSP

Youthful driver involvement by location

In 1992, 72.6% of the fatal collisions involving youthful drivers occurred in the rural areas. In injury and total reported collisions, however, 57.4% of the injury collisions and 61.1% of the total reported collisions occurred in urban areas (Figure 4-3).



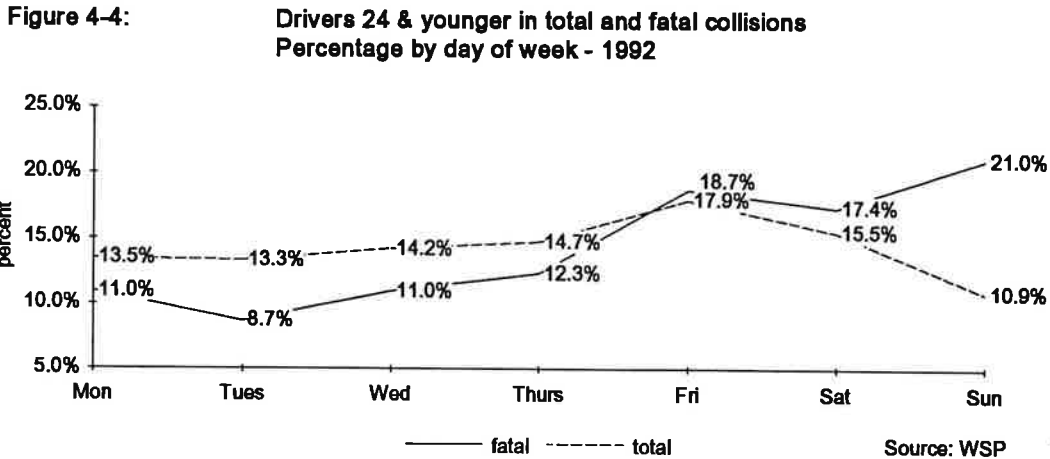
* Drivers 24 and younger

Source: WSP

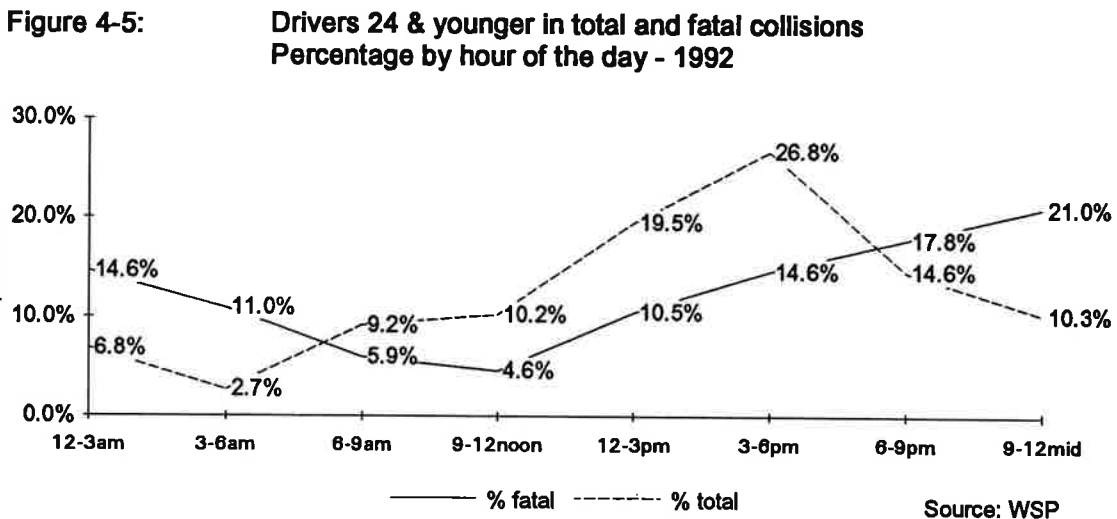
IV / Youthful Driver Involvement

Youthful drivers involvement by day of week/time of day

During 1992, Fridays, Saturdays and Sundays accounted for more than half of youthful fatal crashes. Fridays recorded the largest percentage of total reported collisions with 17.9% (Figure 4-4).



The highest percentage of fatal collisions involving youthful drivers, 21.0%, occurred between 9 p.m. and 12 midnight, while two-thirds of fatals occurred between 3:00 p.m. and 3:00 a.m. The highest percentage of total collisions involving youthful drivers, 26.8%, occurred between 3 p.m. and 6 p.m. (Figure 4-5).



IV / Youthful Driver Involvement

Teenage driver collisions

There were 24,252 teenage drivers 19 years and younger who were involved in 22,519 total collisions, 80 fatal collisions and 9,936 injury collisions during 1992. The total collision rate for teenagers was computed at 1,337.67 collisions per 10,000 licensed drivers for 1992. This was down 8.1% from the previous four-year average rate of 1,455.21. Fatal collisions and the fatal rate were down 26.2% from the previous 4 year average (Table 4-3).

Table 4-3: Teenage driver collisions - 19 years & younger
Five-year comparison

collisions & rates	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Total collisions	22,519	21,646	23,965	25,312	27,017	24,485	-8.0%
Teenage drivers involved	24,252	23,209	25,775	27,263	29,348	26,399	-8.1%
Fatal collisions	80	89	112	108	125	109	-26.3%
Injury collisions	9,936	9,267	10,265	10,821	11,254	10,402	-4.5%
Licensed drivers	181,300	179,409	169,377	186,237	190,610	181,408	-0.1%
Fatal collision rate*	4.41	4.96	6.61	5.80	6.56	5.98	-26.2%
Total collision rate*	1,337.67	1,293.64	1,521.75	1,463.89	1,539.69	1,455.21	-8.1%

* Fatal/ total collisions per 10,000 licensed drivers

Source: WSP, DOL

Contributing circumstances in teenage collisions

"Speed too fast for conditions" was the leading contributing circumstance in teenage driver collisions, noted as a factor in 23.6% of all collisions. "Failure to yield right of way" was second, noted in 21.7% of teenage driver collisions. "Following too closely" was the third contributor in teenage driver collisions with 13.0% (Table 4-4).

Table 4-4: Contributing circumstances in teenage driver collisions
By age - 1992

contributing circumstances*	16 & younger		17 years		18 years		19 years		total teenage drivers	
	#	%	#	%	#	%	#	%	#	%
Speed—too fast for conditions	814	24.6%	1,022	24.0%	1,032	23.5%	952	22.5%	3,820	23.6%
Failure to yield right of way	725	21.9%	966	22.7%	981	22.3%	838	19.8%	3,510	21.7%
Following too closely	351	10.6%	588	13.8%	595	13.5%	577	13.6%	2,111	13.0%
Exceeding legal speed	242	7.3%	269	6.3%	257	5.9%	202	4.8%	970	6.0%
Disregarding traffic sig./ signs	191	5.8%	309	7.2%	274	6.2%	308	7.3%	1,082	6.7%
Driving under the influence	65	2.0%	75	1.8%	164	3.7%	218	5.2%	522	3.2%
Operating defective equipment	115	3.5%	149	3.5%	172	3.9%	161	3.8%	597	3.7%
Crossing over the center line	89	2.7%	90	2.1%	99	2.3%	95	2.2%	373	2.3%
Improper passing	44	1.3%	86	2.0%	94	2.1%	96	2.3%	320	2.0%
All other circumstances+	676	20.4%	709	16.6%	725	16.5%	781	18.5%	2,891	17.9%
Total	3,312	100.0%	4,263	100.0%	4,393	100.0%	4,228	100.0%	16,196	100.0%

* Investigated collisions only

+ Including driver inattention

Source: WSP

IV / Youthful Driver Involvement

Collisions involving youthful drivers by county

The 3 counties in 1992 with no fatal collisions involving youthful drivers (drivers 24 and younger) were Asotin, Garfield and Wahkiakum. The highest youthful driver fatal collision rate (fatal collisions involving a youthful driver per 10,000 youthful licensed drivers) was in Columbia County, based upon 3 fatal collisions and 370 youthful drivers licensed. Kittitas County had 423 total collisions with youthful drivers involved and a rate of 1,405.32 collisions per youthful licensed driver, the highest in the state (Table 4-5).

Table 4-5: Collisions involving youthful drivers (24 and under)
By county - 1992

county	youthful lic. drivers	deaths		injuries		total collisions	
		number	rate*	number	rate*	number	rate*
Adams	1,955	3	15.35	119	608.70	132	675.19
Asotin	1,819	0	0.00	82	450.80	125	687.19
Benton	13,754	4	2.91	629	457.32	971	705.98
Chelan	6,082	3	4.93	307	504.77	527	866.49
Cllalam	5,124	1	1.95	262	511.32	407	794.30
Clark	28,000	14	5.00	1,572	561.43	2,104	751.43
Columbia	370	3	81.08	31	837.84	34	918.92
Cowlitz	9,407	4	4.25	586	622.94	908	965.24
Douglas	2,832	3	10.59	135	476.69	181	639.12
Ferry	614	2	32.57	48	781.76	39	635.18
Franklin	4,856	6	12.36	265	545.72	363	747.53
Garfield	272	0	0.00	15	551.47	18	661.76
Grant	6,985	4	5.73	302	432.36	456	652.83
Grays Harbor	6,167	8	12.97	357	578.89	591	958.33
Island	5,616	1	1.78	236	420.23	351	625.00
Jefferson	1,604	1	6.23	120	748.13	147	916.46
King	157,521	42	2.67	10,625	674.51	15,328	973.08
Kitsap	20,829	12	5.76	1,451	696.62	1,924	923.71
Kittitas	3,010	14	46.51	270	897.01	423	1,405.32
Klickitat	1,730	1	5.78	71	410.40	88	508.67
Lewis	7,060	6	8.50	391	553.82	629	890.93
Lincoln	744	2	26.88	54	725.81	63	846.77
Mason	3,553	3	8.44	269	757.11	333	937.24
Okanogan	4,010	7	17.46	135	336.66	197	491.27
Pacific	1,664	1	6.01	81	486.78	107	643.03
Pend Oreille	1,073	1	9.32	57	531.22	62	577.82
Pierce	60,450	18	2.98	4,896	809.93	5,755	952.03
San Juan	864	1	11.57	33	381.94	38	439.81
Skagit	9,100	4	4.40	617	678.02	942	1,035.16
Skamania	670	1	14.93	40	597.01	59	880.60
Snohomish	49,551	17	3.43	3,095	624.61	4,329	873.65
Spokane	40,939	13	3.18	2,622	640.47	3,922	958.01
Stevens	2,908	1	3.44	156	536.45	191	656.81
Thurston	19,527	15	7.68	1,194	611.46	1,772	907.46
Wahkiakum	245	0	0.00	23	938.78	26	1,061.22
Walla Walla	4,870	4	8.21	240	492.81	412	846.00
Whatcom	15,253	3	1.97	962	630.70	1,450	950.63
Whitman	4,408	1	2.27	206	467.33	337	764.52
Yakima	21,049	19	9.03	1,251	594.33	1,847	877.48
Total	526,485	243	4.62	33,805	642.09	47,588	903.88

* Traffic deaths/injuries per 10,000 youthful licensed drivers

Source: WSP, DOL

V. Senior Driver Involvement



During 1992, 28,403 senior drivers (55 years and older) were involved in reported collisions. There were 158 senior drivers involved in fatal collisions and 11,368 involved in injury collisions. Senior driver involvement in 1992 increased 4.4% in total collisions, 0.5% in fatal collisions and 7.3% in injury collisions when compared to the 4-year baseline average. The number of drivers licenses issued to senior drivers (834,826) increased 6.5 % from the baseline period. The total collision rate for senior drivers (senior drivers in total collisions per 10,000 licensed senior drivers) was 340.23 for 1992, down 1.9% and the fatal collision rate of 1.89 was down 5.6% from the baseline period (Table 5-1).

Table 5-1: Senior drivers (55 & older) involved in collisions
Five-year comparison by severity

severity & rates	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Senior drivers in:							
Total collisions	28,403	27,237	28,103	26,873	26,584	27,199	4.4%
Fatal collisions	158	150	157	174	148	157	0.5%
Injury collisions	11,368	10,691	10,937	10,559	10,197	10,596	7.3%
Licensed senior drivers	834,826	811,424	781,620	780,607	763,079	784,183	6.5%
Fatal collision rate *	1.89	1.85	2.01	2.23	1.94	2.01	-5.6%
Total collision rate *	340.23	335.67	359.55	344.26	348.38	346.85	-1.9%

* Sr. drivers in fatal/total collisions per 10,000 licensed drivers

Source: WSP, DOL

V / Senior Driver Involvement

Senior driver collisions by first harmful event

The vast majority of collisions involving senior drivers, 87.5% , were with other moving vehicles. This type of collision also accounted for the majority of fatal crashes (70.8%). In contrast to young drivers (Table 4-2), single vehicle collisions with fixed or other objects and overturning were less frequent in fatal collisions, 17.4% and 4.9% respectively (Table 5-2).

Table 5-2: Collisions involving senior drivers*
By first harmful event - 1992

type of collision	fatal collisions		injury collisions		total collisions	
	number	%	number	%	number	%
Collision w/other moving motor veh	102	70.8%	8,980	86.4%	22,773	87.5%
Collision with fixed/other object	25	17.4%	601	5.8%	1,415	5.4%
Collision with parked vehicle	2	1.4%	110	1.1%	637	2.4%
Collisions with pedestrian & bicycles	8	5.6%	496	4.8%	512	2.0%
Overturning & other non collision	7	4.9%	176	1.7%	351	1.3%
Other collisions inc. RR train, animal	0	0.0%	36	0.3%	332	1.3%
Total	144	100.0%	10,399	100.0%	26,020	100.0%

*Collisions in which one or more senior drivers involved

Source: WSP

Contributing circumstances in senior driver collisions

"Failure to yield right of way" was a frequent driver violation in all of the older age groups. "Speed too fast for conditions" was the second leading driver violation for senior drivers ages 55-59, 60-64 and 70-74. Disregarding traffic signals/signs and following too closely were the next most frequent contributing circumstances in senior driver collisions (Table 5-3).

Table 5-3: Contributing circumstances in senior driver collisions
By age group - 1992

contributing circumstances	55-59		60-64		65-69		70-74		75 & older	
	number	%	number	%	number	%	number	%	number	%
Failure to yield right of way	830	29.5%	842	33.7%	787	34.5%	951	42.4%	1,718	47.2%
Speed too fast for conditions	416	14.8%	330	13.2%	268	11.7%	217	9.7%	298	8.2%
Disregard traffic signal/signs	231	8.2%	221	8.9%	224	9.8%	206	9.1%	391	10.7%
Following too closely	369	13.1%	315	12.6%	278	12.2%	211	9.4%	312	8.6%
DWI	177	6.3%	144	5.8%	101	4.4%	55	2.5%	31	0.9%
Defective equipment	90	3.2%	63	2.5%	60	2.6%	47	2.1%	54	1.5%
Crossing over the centerline	37	1.3%	31	1.2%	26	1.1%	37	1.6%	41	1.1%
Exceeding legal speed	28	1.0%	22	0.9%	26	1.1%	14	0.6%	13	0.4%
All other circumstances +	639	22.7%	527	21.1%	513	22.5%	507	22.6%	785	21.5%
Total	2,817	100.0%	2,495	100.0%	2,283	100.0%	2,244	100.0%	3,643	100.0%

+including driver inattention

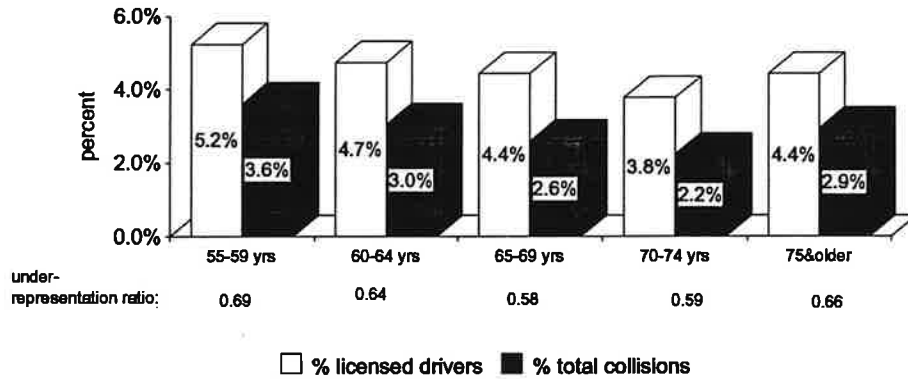
Source: WSP

Senior driver collisions by age group

Figure 5-1 shows that each senior driver age group has been under-represented in collisions compared to their percentage of licensed drivers. The 55-59 age group was involved in 3.6% of reported collisions but constituted 5.2% of the total licensed drivers, creating a 0.69 under-representation ratio.

Figure 5-1:

Percentage of licensed drivers and drivers in total collisions
By senior age groups - 1992

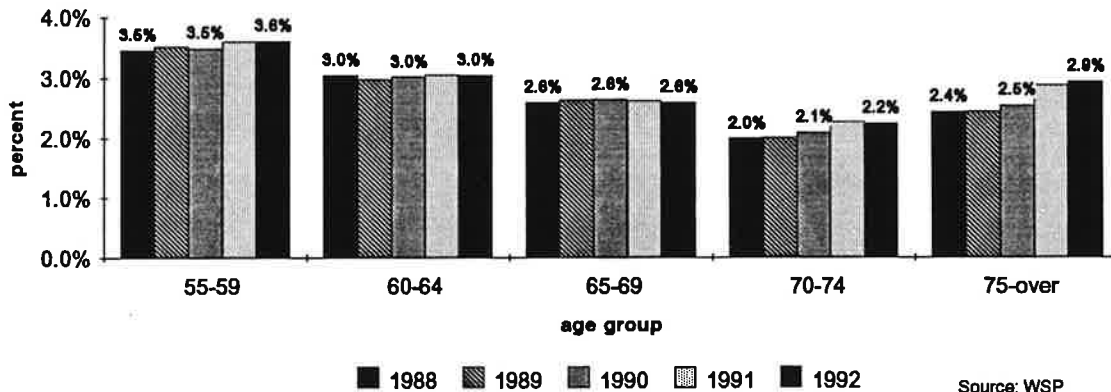


Source: WSP, DOL

Figure 5-2 shows percentages of all collisions by senior age groups over the past 5 years. There has been a very slight increase in collision involvement in the over 70 age groups.

Figure 5-2:

Percent of total collision involvement by senior drivers
Five-year comparison by age group

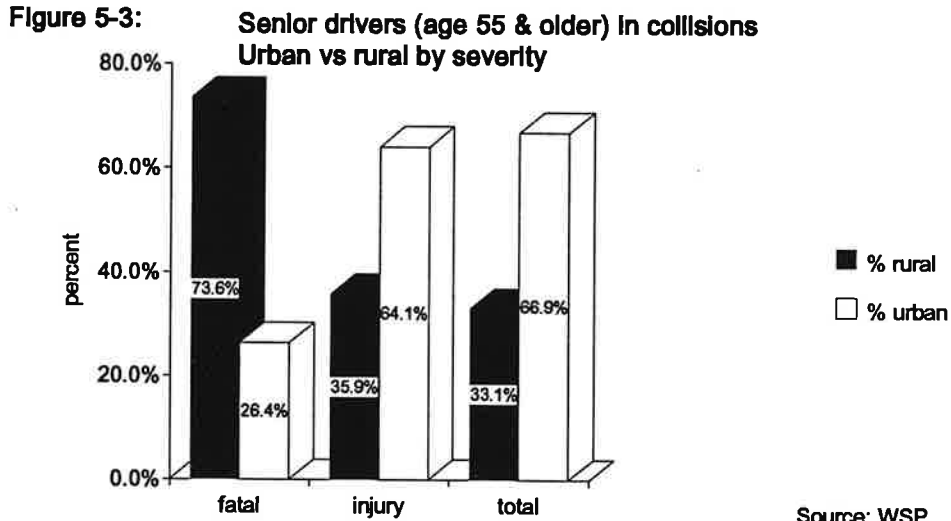


Source: WSP

V / Senior Driver Involvement

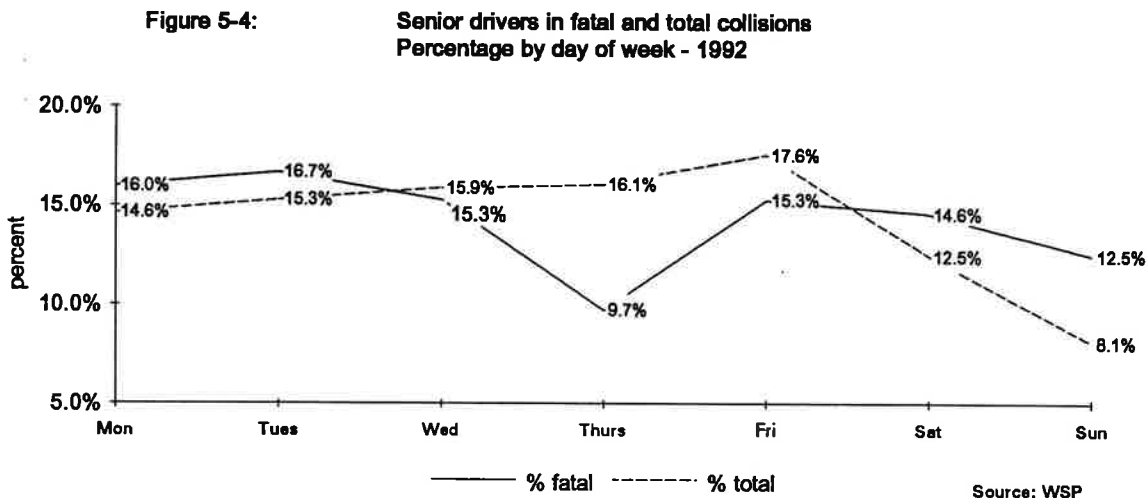
Senior driver collisions by location and severity

In 1992, 66.9% of total senior driver collisions occurred in urban areas. Most senior driver injury collisions, 64.1%, occurred in urban areas. Most senior driver fatal collisions, 73.6%, occurred in rural areas (Figure 5-3).



Senior driver collisions by day of the week/hour of day

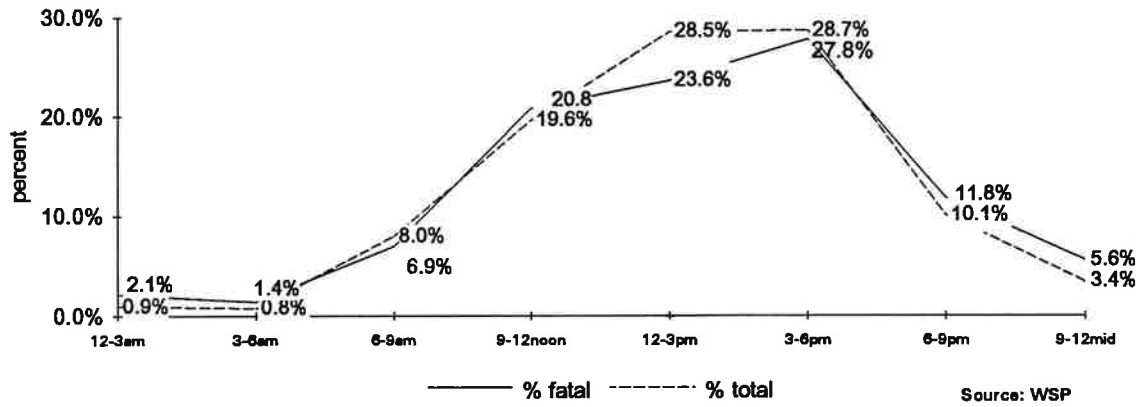
Collisions involving senior drivers are most frequent on weekdays and less likely to occur on weekends. Senior fatal crashes did not taper off as much on the weekends as did total collisions (Figure 5-4).



V / Senior Driver Involvement

The greatest percentages of both fatal crashes and total crashes involving senior drivers occurred during daylight hours of 9:00 a.m. to 6:00 p.m. (Figure 5-5).

**Figure 5-5: Senior drivers in fatal and total collisions
Percentage by time (three-hour intervals) - 1992**



V / Senior Driver Involvement

VI. Pedestrians

During 1992, 81 pedestrians were killed and 1,809 were injured in the state. This was a decrease of 11.7% in the number killed, and 2.9% in the number injured compared to the previous 4-year average. In rural areas, 33 were killed compared to 48 killed in urban areas. Similarly, more pedestrian injuries occurred in urban areas than in rural areas, 1,389 compared to 420 in rural areas. Pedestrian fatalities and injuries have decreased in rural areas, while pedestrian fatalities have increased in urban areas. (Table 6-1).



Table 6-1: Pedestrians killed & injured in vehicle collisions
Five-year comparison by urban/rural*

severity by area	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr avg	prev 4-yr avg
Statewide:							
Pedestrians killed	81	79	81	110	97	92	-11.7%
Pedestrians injured	1,809	1,911	1,861	1,858	1,820	1,863	-2.9%
Rural:							
Pedestrians killed	33	41	43	70	51	51	-35.6%
Pedestrians injured	420	455	463	493	497	477	-11.9%
Urban:							
Pedestrians killed	48	38	38	40	46	41	18.5%
Pedestrians injured	1,389	1,456	1,398	1,365	1,323	1,386	0.3%

*Urban =2,500 population and greater

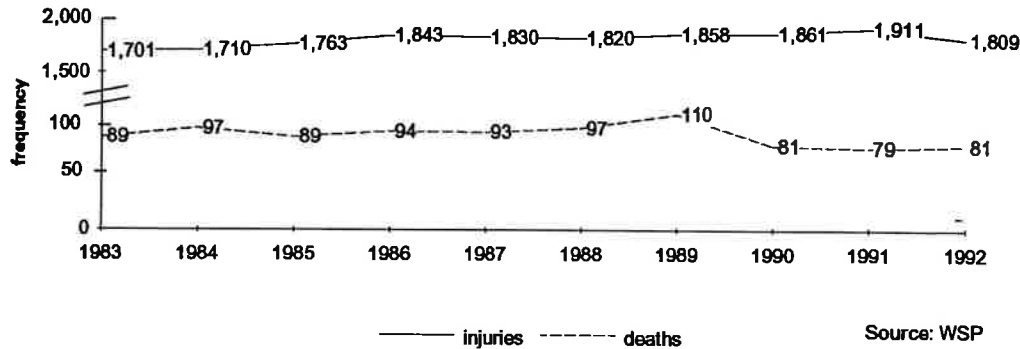
Rural =Less than 2,500 population

Source: WSP

VI / Pedestrians

Pedestrian injuries showed a gradual increase between 1983 and 1991, with a low of 1,701 in 1983 and a high of 1,911 in 1991. Fatalities dropped in 1990 and have remained relatively constant over the past 3 years (Figure 6-1).

Figure 6-1: Pedestrian injuries and deaths
Ten-year comparison



Ages of pedestrians killed and injured

The age group with the most pedestrians killed over the last five years has been the 75 and older group. Pedestrian fatalities have generally decreased among youth (under age 20) and generally increased in the older age groups (Table 6-2).

Table 6-2: Pedestrians killed in motor vehicle collisions
Five-year comparison by age

age	1992	1991	1990	1989	1988	prev 4-yr av	'92 vs prev 4-yr avg
0-4	2	2	3	5	10	5	-60.0%
5-9	4	6	7	6	4	6	-30.4%
10-14	2	7	0	5	3	4	-46.7%
15-19	2	8	5	13	10	9	-77.8%
20-24	8	3	5	10	3	5	52.4%
25-34	7	11	9	19	15	14	-48.1%
35-44	13	8	7	11	12	10	36.8%
45-54	10	5	11	10	7	8	21.2%
55-64	8	7	6	8	7	7	14.3%
65-74	8	9	11	5	8	8	-3.0%
75 & Older	17	13	17	18	15	16	7.9%
Not Stated	0	0	0	0	3	1	
TOTAL	81	79	81	110	97	92	-11.7%

Source: WSP

Total pedestrian injuries have stayed relatively constant during the past five years. The biggest increase in pedestrian injuries was in the 0-4 year age group, which experienced an increase of 37.0% from the previous 4-year average. The 55-64 year age group experienced the largest reduction, decreasing 26.9% from the previous 4-year average. No consistent pattern of change in pedestrian injuries is evident across age groups (Table 6-3).

Table 6-3: Pedestrians injured in motor vehicle collisions
Five-year comparison by age

age	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr avg	prev 4-yr avg
0-4	126	113	75	83	97	92	37.0%
5-9	194	217	225	235	234	228	-14.8%
10-14	214	218	226	226	197	217	-1.3%
15-19	203	193	203	218	190	201	1.0%
20-24	172	186	170	185	149	173	-0.3%
25-34	259	267	312	288	295	291	-10.8%
35-44	239	263	205	219	210	224	6.6%
45-54	122	121	117	95	95	107	14.0%
55-64	66	96	82	87	96	90	-26.9%
65-74	80	76	80	78	74	77	3.9%
75 & older	71	89	90	74	91	86	-17.4%
Not stated	63	72	76	70	92	78	-18.7%
Total	1,809	1,911	1,861	1,858	1,820	1,863	-2.9%

Source: WSP

Actions of pedestrians killed and injured in urban and rural areas

In urban areas, the vast majority of pedestrians killed and injured were struck while crossing the roadway, and most often at an intersection. In contrast, most pedestrians under 15 years of age were crossing the roadway at a location other than an intersection (Table 6-4).

Table 6-4: Actions of pedestrians killed & Injured - urban areas
By age and action - 1992

action	killed & injured							killed		
	0-4	5-14	15-24	25-64	65+	n/stat	total	%	#	%
Crossing at intersection	25	117	139	310	90	28	709	49.2%	13	27.1%
Crossing not at intersection	59	146	85	135	40	13	478	33.1%	22	45.8%
Walking with traffic	0	1	3	9	2	1	16	1.1%	2	4.2%
Walking against traffic	1	2	1	5	0	0	9	0.6%	0	0.0%
Standing/working in roadway	1	3	20	49	2	4	79	5.5%	2	4.2%
Playing in roadway	9	6	4	0	0	0	19	1.3%	0	0.0%
Lying in roadway	0	0	1	3	0	0	4	0.3%	2	4.2%
Not in roadway	3	11	20	30	9	5	78	5.4%	4	8.3%
Other & not stated	3	6	12	22	2	5	50	3.5%	3	6.3%
Total	101	292	285	563	145	56	1,442	100.0%	48	100.0%

Source: WSP

VI / Pedestrians

In rural areas, 38.2% of the pedestrians killed or injured were crossing the roadway at a location other than at an intersection, accounting for 14 fatalities during 1992. Pedestrians "not in roadway" accounted for 16.7% of pedestrians killed or injured in rural areas as compared to 5.4% in urban areas (Table 6-5).

Table 6-5: Actions of pedestrians killed & injured - rural areas
By age and action - 1992

action	killed & injured						total		killed	
	0-4	5-14	15-24	25-64	65+	n/stat	total	%	#	%
Crossing at intersection	5	27	16	38	9	2	97	21.3%	6	18.2%
Crossing not at intersection	16	67	31	42	16	2	174	38.2%	14	42.4%
Walking with traffic	0	1	5	10	1	0	17	3.7%	2	6.1%
Walking against traffic	0	2	4	7	0	0	13	2.9%	1	3.0%
Standing/working in roadway	2	1	13	19	0	1	36	7.9%	5	15.2%
Playing in roadway	2	7	1	3	0	0	13	2.9%	1	3.0%
Lying in roadway	0	0	2	4	1	0	7	1.5%	1	3.0%
Not in roadway	1	16	25	27	3	4	76	16.7%	3	9.1%
Other & not stated	1	1	5	14	2	0	23	5.0%	0	0.0%
Total	27	122	102	164	32	9	456	100.0%	33	100.0%

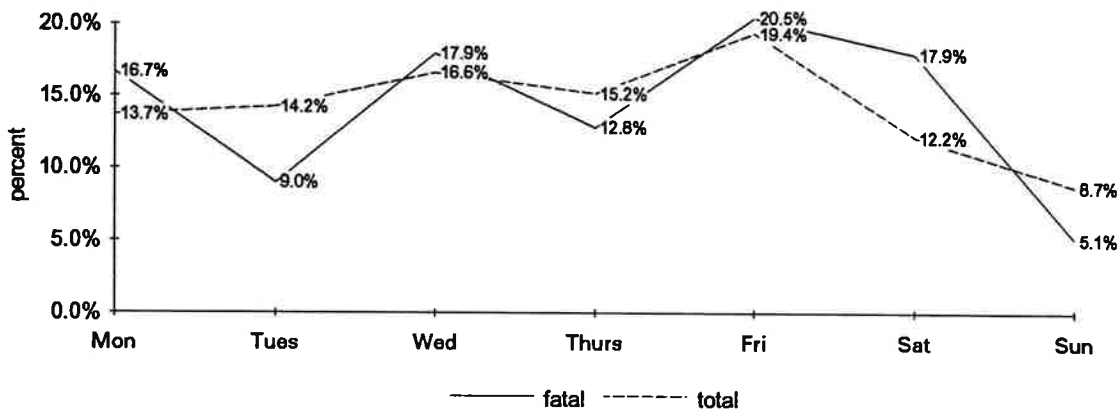
Source: WSP

$$KIA \chi_{ij} = 55 = 67.9\%$$

Pedestrian collisions by day of week/hour of day

Pedestrian collisions and fatalities were least likely to occur on Sundays and fairly equally distributed across the other days of the week. There was a somewhat greater percentage of fatal occurrences in Fridays and Saturdays (Figure 6-2).

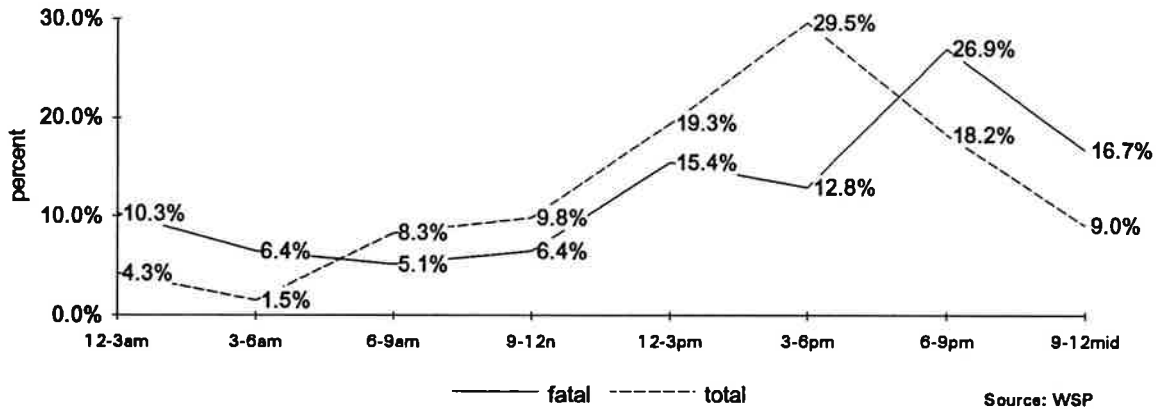
Figure 6-2: Pedestrian fatal and total collisions
Percentage by day of week - 1992



Source: WSP

Most pedestrian collisions occurred from 12 noon to 12 midnight, with fatalities peaking during the 6:00 - 9:00 p.m. time period and total collisions during the 3:00 - 6:00 p.m. period (Figure 6-3).

Figure 6-3: Pedestrian fatal and total collisions
Percentage by hour of day - 1992



Vehicle-pedestrian collisions in cities over 15,000

The city of Sea-Tac had the highest injury rate with 10.95 pedestrians injured per 10,000 population. Seattle had the second highest pedestrian injury rate with 9.54. Sea-Tac and Seattle also had the highest pedestrian collision rates with 11.39 and 9.23 per 10,000 population respectively (Table 6-6).

VI / Pedestrians

Table 6-6: Pedestrian fatalities, injuries & collisions - 1992
 Cities 15,000 population & greater

city	population	fatalities		injuries		total ped clsns	
		number	rate*	number	rate*	number	rate*
250,000 and over							
Seattle	522,000	10	0.19	498	9.54	482	9.23
100,000 to 250,000							
Spokane	180,800	2	0.11	119	6.58	115	6.36
Tacoma	179,000	3	0.17	119	6.65	117	6.54
50,000 to 100,000							
Bellevue	88,580	1	0.11	30	3.39	28	3.16
Everett	75,840	0	0.00	42	5.54	41	5.41
Federal Way	72,350	3	0.41	30	4.15	29	4.01
Yakima	58,706	3	0.51	41	6.98	42	7.15
Bellingham	54,270	1	0.18	30	5.53	27	4.98
25,000 to 50,000							
Vancouver	47,340	1	0.21	34	7.18	34	7.18
Kennewick	44,490	0	0.00	13	2.92	13	2.92
Renton	43,090	0	0.00	10	2.32	10	2.32
Kirkland	41,390	0	0.00	17	4.11	17	4.11
Kent	40,300	2	0.50	18	4.47	20	4.96
Redmond	39,040	0	0.00	11	2.82	11	2.82
Bremerton	38,990	1	0.26	34	8.72	34	8.72
Olympia	35,689	0	0.00	18	5.04	18	5.04
Auburn	34,260	1	0.29	24	7.01	25	7.30
Richland	33,550	0	0.00	5	1.49	4	1.19
Longview	32,030	1	0.31	9	2.81	10	3.12
Edmonds	30,749	1	0.33	7	2.28	8	2.60
Lynnwood	29,052	1	0.34	8	2.75	9	3.10
Walla Walla	28,134	1	0.36	6	2.13	7	2.49
Puyallup	25,400	0	0.00	12	4.72	12	4.72
15,000 to 25,000							
Pullman	23,190	0	0.00	4	1.72	3	1.29
Sea Tac	22,830	2	0.88	25	10.95	26	11.39
Wenatchee	22,710	0	0.00	8	3.52	7	3.08
Lacey	21,290	0	0.00	9	4.23	8	3.76
Mercer Island	21,210	0	0.00	1	0.47	1	0.47
Pasco	20,840	0	0.00	12	5.76	11	5.28
Mountlake Terrace	19,820	0	0.00	3	1.51	2	1.01
Mount Vernon	19,550	0	0.00	4	2.05	4	2.05
Oak Harbor	18,340	0	0.00	4	2.18	4	2.18
Des Moines	18,170	0	0.00	8	4.40	7	3.85
Port Angeles	18,030	1	0.55	10	5.55	9	4.99
Bainbridge Island	16,850	0	0.00	0	0.00	0	0.00
Aberdeen	16,630	1	0.60	7	4.21	8	4.81

*Frequency per 10,000 population

Source: WSP, OFM

Vehicle-pedestrian collisions in Washington counties

King County had the highest pedestrian collision rate with 4.95 collisions per 10,000 population, followed by Spokane and Kittitas Counties with 3.68 and 3.60 respectively. King County also had the highest rate of fatalities and injuries with 5.27 killed or injured per 10,000 population. This was followed by San Juan and Spokane Counties with 4.42 and 3.95 per 10,000 population respectively. There were six counties with no reported car-pedestrian collisions (Table 6-7).

Table 6-7: Pedestrian collisions*
By county - 1992

county	population	killed**	injured	rate+ killed	collision	rate+ injured
Over 1,000,000						
King	1,564,486	29	796	5.27	775	4.95
250,000 to 750,000						
Fierce	624,000	7	213	3.53	210	3.37
Snohomish	494,300	6	118	2.51	117	2.37
Spokane	374,569	4	144	3.95	138	3.68
100,000 to 250,000						
Clark	257,500	7	76	3.22	81	3.15
Kitsap	205,600	3	55	2.82	57	2.77
Yakima	193,900	6	65	3.66	67	3.46
Thurston	174,300	4	38	2.41	40	2.29
Whatcom	137,100	2	45	3.43	43	3.14
Benton	118,500	0	22	1.86	21	1.77
50,000 to 100,000						
Cowlitz	85,490	1	16	1.99	17	1.99
Skagit	84,500	0	18	2.13	18	2.13
Grays Harbor	65,400	1	20	3.21	18	2.75
Island	64,800	0	5	0.77	5	0.77
Lewis	61,500	0	8	1.30	8	1.30
Clallam	60,000	2	15	2.83	15	2.50
Grant	58,240	0	10	1.72	9	1.55
Chelan	54,600	1	13	2.56	12	2.20
Walla Walla	50,500	1	7	1.58	8	1.58
25,000 to 50,000						
Mason	41,200	1	6	1.70	7	1.70
Franklin	39,200	0	14	3.57	12	3.06
Whitman	38,800	0	5	1.29	4	1.03
Okanogan	34,400	1	4	1.45	5	1.45
Stevens	32,200	0	3	0.93	3	0.93
Douglas	27,900	1	5	2.15	4	1.43
Kittitas	27,800	1	9	3.60	10	3.60
10,000 to 25,000						
Jefferson	22,500	0	3	1.33	3	1.33
Pacific	19,400	0	0	0.00	0	0.00
Asotin	18,000	0	1	0.56	1	0.56
Klickitat	17,100	0	1	0.58	1	0.58
Adams	14,100	0	1	0.71	1	0.71
San Juan	11,300	0	5	4.42	4	3.54
Under 10,000						
Pend Oreille	9,400	0	1	1.06	1	1.06
Lincoln	9,000	0	0	0.00	0	0.00
Skamania	8,700	0	2	2.30	1	1.15
Ferry	6,700	0	0	0.00	0	0.00
Columbia	4,000	0	0	0.00	0	0.00
Wahkiakum	3,400	0	0	0.00	0	0.00
Garfield	2,300	0	0	0.00	0	0.00
Total	5,116,685	78	1,744	3.56	1,716	3.35

Source: WSP, OFM

* Collisions in which the car-pedestrian crash was the first occurrence.

** There were 3 additional pedestrians killed in other types of collisions.

+Killed/injured and car-pedestrian collisions per 10,000 population

VII. Pedalcyclists



Vehicle pedalcycle collisions increased 19.9% from the previous 4-year average in 1992, and injuries increased 18.5%. There were 4 persons killed in urban areas and 5 killed in rural areas. The number injured increased 1.6% in rural areas and 25.6% in urban areas from the previous 4-year average (Table 7-1).

Table 7-1: Pedalcycle traffic collisions in urban & rural areas
Five-year comparison

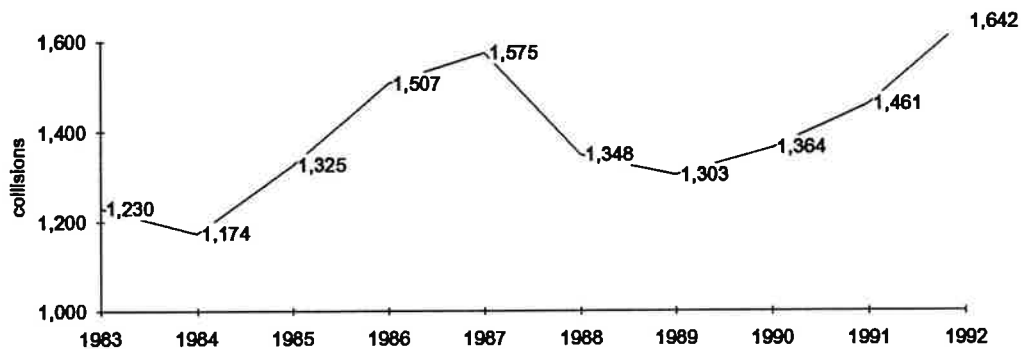
severity	1992	1991	1990	1989	1988	prev 4-yr av	'92 vs prev 4-yr avg
Statewide:							
Total collisions	1,642	1,461	1,364	1,303	1,348	1,369	19.9%
Persons killed	9	5	14	8	12	10	-7.7%
Persons injured	1,642	1,476	1,362	1,331	1,375	1,386	18.5%
Rural areas:							
Total collisions	420	416	377	392	439	406	3.4%
Persons killed	5	4	10	6	6	7	-23.1%
Persons injured	420	422	379	402	450	413	1.6%
Urban* areas:							
Total collisions	1,222	1,045	987	911	909	963	26.9%
Persons killed	4	1	4	2	6	3	23.1%
Persons injured	1,222	1,054	983	929	925	973	25.6%

*Population of 2,500 and greater

Source: WSP

During 1992 there were 1,642 vehicle-pedalcyclist collisions, 181 more than during the previous year. This is the highest number of vehicle-pedalcyclist collisions during the last 10 years (Figure 7-1).

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

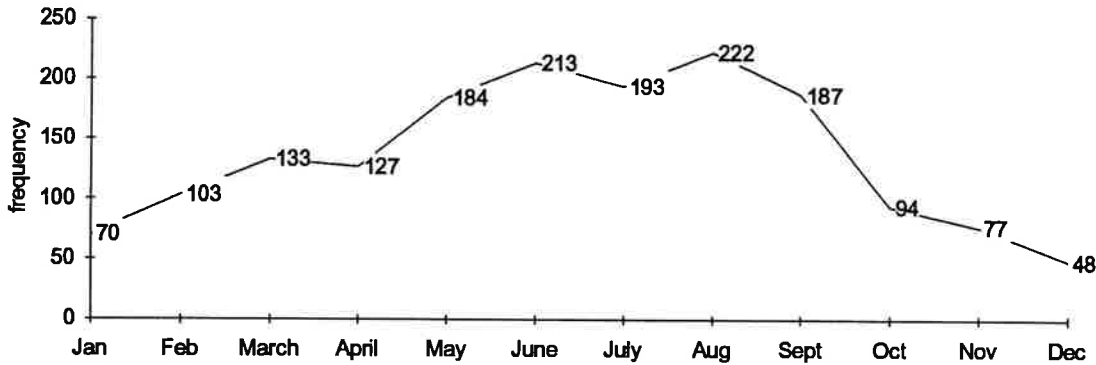


Source: WSP

VII / Pedalcyclists

The months of May through September accounted for 49.0% of all persons killed and injured in pedalcycle-related collisions during 1992. December recorded the least number of pedalcycle injuries with 48, and August recorded the most with 222 (Figure 7-2).

**Figure 7-2: Persons Injured In pedalcycle collisions*
By month - 1992**



* Includes 9 fatal injuries

Source: WSP

Ages of pedalcyclists injured

In 1992, 408 pedalcyclists between the ages of 10 to 14 were killed or injured; this was the highest frequency for any age group. The next highest age group was the 25-34 age group with 265 pedalcyclists injured. The 55 to 64 and 65-74 age groups experienced reductions in car-pedalcycle collision involvement when compared to the previous 4-year average. All other age groups show increases over the previous 4-year average (Table 7-2).

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

age	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
0-4	39	32	16	14	23	21	83.5%
5-9	230	232	191	233	215	218	5.6%
10-14	408	386	381	355	368	373	9.5%
15-19	227	181	194	215	253	211	7.7%
20-24	194	207	163	130	155	164	18.5%
25-34	265	217	213	185	158	193	37.1%
35-44	132	97	96	69	73	84	57.6%
45-54	56	34	35	31	33	33	68.4%
55-64	13	20	18	14	18	18	-25.7%
65-74	9	17	9	7	9	11	-14.3%
75 & older	6	5	5	3	4	4	41.2%
Not stated	45	40	42	51	49	46	-1.1%
Total (inc. fatalities)	1,624	1,468	1,363	1,307	1,358	1,374	18.2%
Fatalities	9	5	14	8	12	10	-7.7%

Source: WSP

Pedalcycle collisions in urban areas

The city of Olympia recorded the highest pedalcycle collision rate in the state during 1992 with 10.37 collisions per 10,000 population. Centralia was second highest in this category with 9.73 followed by Port Angeles with 7.77 and Bremerton 7.69 (Table 7-3).

Table 7-3: Pedalcycle collisions in urban areas
Cities 10,000 population & greater - 1992

city	population	killed/ injured+	fatal-injury rate*	collisions	collision rate*
250,000 and over					
Seattle	522,000	312	5.98	310	5.94
100,000 to 250,000					
Spokane	180,800	(1) 115	6.36	117	6.47
Tacoma	179,000	(1) 86	4.80	79	4.41
50,000 to 100,000					
Bellevue	88,580	49	5.53	48	5.42
Everett	75,840	46	6.07	46	6.07
Federal Way	72,350	25	3.46	25	3.46
Yakima	58,706	21	3.58	22	3.75
Bellingham	54,270	29	5.34	30	5.53
25,000 to 50,000					
Vancouver	47,340	28	5.91	28	5.91
Kennewick	44,490	10	2.25	10	2.25
Renton	43,090	9	2.09	9	2.09
Kirkland	41,390	10	2.42	10	2.42
Kent	40,300	30	7.44	30	7.44
Redmond	39,040	12	3.07	12	3.07
Bremerton	38,990	31	7.95	30	7.69
Olympia	35,689	36	10.09	37	10.37
Auburn	34,280	21	6.13	21	6.13
Richland	33,550	8	2.38	7	2.09
Longview	32,030	21	6.56	22	6.87
Edmonds	30,749	14	4.55	14	4.55
Lynnwood	29,052	18	6.20	19	6.54
Walla Walla	28,134	11	3.91	11	3.91
Puyallup	25,400	8	3.15	8	3.15
15,000 to 25,000					
Pullman	23,190	4	1.72	6	2.59
Sea Tac	22,830	8	3.50	8	3.50
Wenatchee	22,710	9	3.96	9	3.96
Lacey	21,290	(1) 16	7.52	15	7.05
Mercer Island	21,210	6	2.83	7	3.30
Pasco	20,840	5	2.40	4	1.92
Mountlake Terrace	19,820	2	1.01	2	1.01
Mount Vernon	19,550	11	5.63	10	5.12
Oak Harbor	18,340	6	3.27	6	3.27
Des Moines	18,170	3	1.65	3	1.65
Port Angeles	18,030	13	7.21	14	7.76
Bainbridge Island	16,850	9	5.34	10	5.93
Aberdeen	16,630	8	4.81	7	4.21
10,000 to 15,000					
Tukwila	14,650	8	5.46	8	5.46
Mukitno	13,420	1	0.75	1	0.75
Bothell	13,220	7	5.30	7	5.30
Marysville	13,030	5	3.84	5	3.84
Ellensburg	12,439	5	4.02	5	4.02
Centralia	12,330	13	10.54	12	9.73
Anacortes	12,110	8	6.61	8	6.61
Kelso	11,837	9	7.60	9	7.60
Moses Lake	11,530	4	3.47	4	3.47
Sunnyside	11,370	2	1.76	2	1.76
Turnwater	10,950	2	1.83	2	1.83
TOTAL	2,171,396	1,114	5.13	1,109	5.11

*Fatalities-injuries, collisions per 10,000 population Source: WSP, OFM

+Number includes injured and killed - number killed also appears in parenthesis ().

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Pedalcycle collisions in unincorporated areas

The unincorporated areas of Columbia County experienced the highest collision rate in 1992 for unincorporated areas in Washington State with 7.33 collisions per 10,000 population. This was followed by Wahkiakum County with 6.91 and Pacific with 3.88 collisions per 10,000 population. Nine counties experienced no pedalcycle collisions in 1992 (Table 7-4).

Table 7-4: Pedalcycle collisions in unincorporated areas By county - 1992

county	unincorp. population	fatal/ injuries +	fatal/inj rate*	collisions	collision rate*
Over 100,000					
King	540,900	(2) 102	1.89	103	1.90
Pierce	370,432	65	1.75	66	1.78
Snohomish	268,679	46	1.71	44	1.64
Clark	191,320	(1) 40	2.09	39	2.04
Spokane	174,348	34	1.95	35	2.01
Kitsap	139,205	27	1.94	27	1.94
25,000 to 100,000					
Thurston	101,853	20	1.96	20	1.96
Yakima	88,790	9	1.01	9	1.01
Whatcom	64,833	(1) 7	1.08	7	1.08
Island	44,065	5	1.13	4	0.91
Skagit	40,490	10	2.47	9	2.22
Lewis	37,437	(1) 8	2.14	6	1.60
Cowlitz	34,847	8	2.30	8	2.30
Clallam	34,790	6	1.72	6	1.72
Mason	33,870	3	0.89	3	0.89
Benton	30,000	5	1.67	4	1.33
Grant	28,942	2	0.69	2	0.69
Grays Harbor	25,815	3	1.16	3	1.16
10,000 to 25,000					
Chelan	24,055	6	2.49	6	2.49
Stevens	23,732	3	1.26	3	1.26
Douglas	20,280	2	0.99	2	0.99
Okanogan	20,168	0	0.00	0	0.00
Franklin	15,820	0	0.00	0	0.00
Walla Walla	14,661	0	0.00	0	0.00
Jefferson	14,970	0	0.00	0	0.00
Pacific	12,875	4	3.11	5	3.88
Klickitat	11,173	1	0.90	1	0.90
Kittitas	11,276	1	0.89	1	0.89
Asotin	10,202	0	0.00	0	0.00
Under 10,000					
San Juan	9,675	1	1.03	1	1.03
Skamania	7,113	2	2.81	1	1.41
Adams	6,888	1	1.45	1	1.45
Whitman	6,647	0	0.00	0	0.00
Pend Oreille	6,545	0	0.00	0	0.00
Ferry	5,660	0	0.00	0	0.00
Lincoln	3,740	1	2.67	1	2.67
Wahkiakum	2,895	2	6.91	2	6.91
Columbia	1,365	1	7.33	1	7.33
Garfield	885	0	0.00	0	0.00
Total	2,481,241	(5) 425	1.71	420	1.69

Source: WSP, OFM

*Rates are frequency per 10,000 population

+Larger number includes injured and killed.

Number killed also appears in parenthesis ().

Pedalcycle collisions by county

In 1992, Wahkiakum County experienced the highest pedalcycle collision rate with 5.88 collisions per 10,000 population and also the highest injury rate with 5.88 pedalcyclist injuries per 10,000 population. Cowlitz County followed with rates of 4.62 for collisions and 4.50 for injuries (Table 7-5).

**Table 7-5: Pedalcycle collisions and injuries+
By county - 1991**

county	population	killed/ injured +	injury rate *	collisions	collision rate *
Over 1,000,000					
King	1,564,486	(2) 613	3.92	612	3.91
250,000 to 750,000					
Pierce	624,000	(1) 168	2.69	163	2.61
Snohomish	494,300	148	2.99	147	2.97
Spokane	374,569	(1) 150	4.00	153	4.08
100,000 to 250,000					
Clark	257,500	(1) 72	2.80	71	2.76
Kitsap	205,600	70	3.40	70	3.40
Yakima	193,900	36	1.86	37	1.91
Thurston	174,300	(1) 74	4.25	74	4.25
Whatcom	137,100	(1) 47	3.43	48	3.50
Benton	118,500	25	2.11	24	2.03
50,000 to 100,000					
Skagit	85,490	37	4.33	36	4.21
Cowlitz	84,500	38	4.50	39	4.62
Grays Harbor	65,400	19	2.91	18	2.75
Island	64,800	11	1.70	10	1.54
Lewis	61,500	(1) 22	3.58	19	3.09
Clallam	60,000	21	3.50	22	3.67
Grant	58,240	7	1.20	7	1.20
Chelan	54,600	16	2.93	16	2.93
Walla Walla	50,500	15	2.97	15	2.97
25,000 to 50,000					
Mason	41,200	9	2.18	9	2.18
Franklin	39,200	5	1.28	4	1.02
Whitman	38,800	4	1.03	5	1.29
Okanogan	34,400	0	0.00	0	0.00
Stevens	32,200	5	1.55	5	1.55
Douglas	27,900	7	2.51	7	2.51
Kittitas	27,800	6	2.16	6	2.16
10,000 to 25,000					
Jefferson	22,500	7	3.11	7	3.11
Pacific	19,400	(1) 8	4.12	8	4.12
Asotin	18,000	2	1.11	2	1.11
Klickitat	17,100	1	0.58	1	0.58
Adams	14,100	1	0.71	1	0.71
San Juan	11,300	1	0.88	1	0.88
Under 10,000					
Pend Oreille	9,400	0	0.00	0	0.00
Lincoln	9,000	1	1.11	1	1.11
Skamania	8,700	2	2.30	1	1.15
Ferry	6,700	0	0.00	0	0.00
Columbia	4,000	1	2.50	1	2.50
Wahkiakum	3,400	2	5.88	2	5.88
Garfield	2,300	0	0.00	0	0.00
Total	5,116,685	(9) 1,651	3.23	1,642	3.21

*Frequency per 10,000 population

Source: WSP, OFM

+Larger number includes injured and killed.

Number killed also appears in parenthesis ().

VIII. Motorcyclists



Motorcycle fatalities, injuries and collisions all decreased compared the previous 4-year baseline average. Motorcycle registrations decreased for the fourth straight year to 98,131. The total collision rate, based on collisions per 1,000 registered motorcycles, was down 4.9% from the 4-year average. The total persons killed in motorcycle collisions was down from 65 for the 4-year baseline to 49 in 1992, a reduction of 24.0% (Table 8-1).

Table 8-1: Motorcycle collisions
Five-year comparison

severity/exposure/rates	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Total collisions	2,044	2,048	2,167	2,516	2,773	2,376	-14.0%
Fatal collisions	48	41	60	70	72	61	-21.0%
Motorcycle registration	98,131	100,970	103,537	110,617	117,155	108,070	-9.2%
Collision rate*	20.83	20.28	20.93	22.75	23.67	21.91	-4.9%
Fatal collision rate**	0.49	0.41	0.58	0.63	0.61	0.56	-12.4%
Total persons killed	49	44	62	75	77	65	-24.0%
Total persons injured	2,112	2,114	2,223	2,724	2,896	2,489	-15.2%
M/C drivers killed	43	35	55	59	66	54	-20.0%
M/C drivers injured	1,699	1,709	1,789	2,119	2,320	1,984	-14.4%
M/C passengers killed	5	8	5	10	10	8	-39.4%
M/C passengers inj	253	228	272	392	383	319	-20.6%

*Motorcycle collisions per 1,000 motorcycles registered

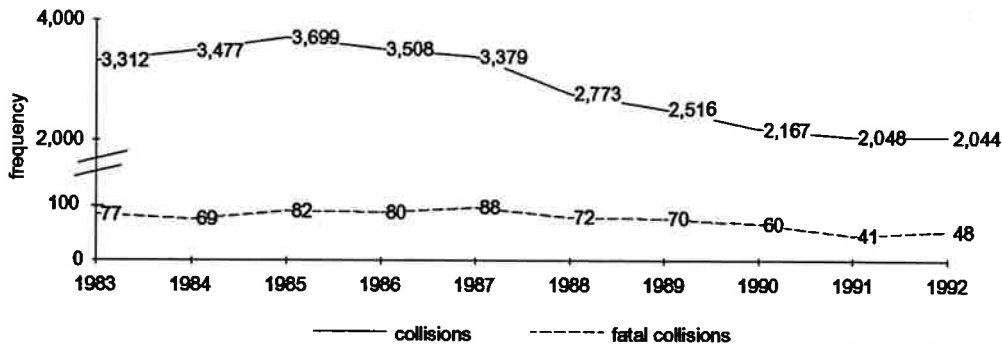
Source: WSP, DOL

**Fatal collisions per 1,000 motorcycles registered

Figure 8-1 compares total and fatal collisions over the 10-year period of 1983-1992. The most motorcycle collisions were recorded in 1985, with 3,699, while 1987 recorded the most fatal crashes with 88. A low of 41 fatal crashes was recorded in 1991, and a low of 2,044 total collisions was recorded in 1992.

VIII / Motorcyclists

Figure 8-1: Motorcycle fatal collisions & total collisions
Ten-year comparison



Source: WSP

Table 8-2 contains a 23-year motorcycle registration and collision comparison. Motorcycle registration increased yearly from 1970 to 1981. From that point until 1992, registration declined each year (except for 1987, when it increased slightly). The number of reportable collisions followed a similar pattern, increasing from 1970 until 1979, then decreasing through 1992 (with the exception of 1984-1985). The highest motorcycle collision involvement rate (collisions per 1,000 motorcycles registered) was 30.90 recorded in 1978. That same year yielded the highest fatal collision rate at 1.03 fatal collisions per 1,000 motorcycles registered. The 1991 collision rate was the lowest of the 22-year history, at 20.28 collisions per 1,000 motorcycles registered. The 1992 fatal collision rate, 0.49, was the fourth lowest rate in 23 years.

Table 8-2: Reported motorcycle collisions
1970 to 1992

year	total collisions				fatal collisions				injury collisions				
	registered motorcycles	reportable collisions	motorcycles involved	rate*	fatal collisions	motorcycles involved	rate*	total fatalities	motorcyclists killed	injury collisions	motorcycles involved	total injuries	motorcyclists injured
1970	62,150	1,777	1,783	28.59	44	41	0.71	46	45	1,528	1,526	N/A	N/A
1971	74,574	1,957	1,972	26.24	48	53	0.64	54	51	1,678	1,690	2,107	1,934
1972	81,200	1,893	1,937	23.31	44	48	0.54	48	43	1,654	1,691	2,076	1,932
1973	91,782	2,200	2,235	23.97	37	37	0.40	38	35	1,917	1,951	2,406	2,230
1974	110,024	2,605	2,657	23.68	57	60	0.52	60	58	2,233	2,279	2,764	2,583
1975	110,130	2,518	2,556	22.86	50	51	0.45	57	51	2,142	2,176	2,664	2,459
1976	111,211	2,761	2,807	24.83	59	61	0.53	61	61	2,364	2,404	2,978	2,752
1977+	115,454	3,093	3,230	26.79	72	79	0.62	76	75	2,716	2,770	3,432	3,230
1978	106,212	3,282	3,350	30.90	109	111	1.03	117	115	2,853	2,915	3,610	3,416
1979	129,641	3,992	4,054	30.79	116	118	0.89	121	119	3,471	3,524	4,350	4,126
1980	135,899	3,914	3,985	28.80	116	118	0.85	129	119	3,373	3,432	4,201	3,991
1981	139,931	3,727	3,796	26.63	104	106	0.74	105	101	3,186	3,245	3,920	3,752
1982	131,667	3,376	3,424	25.64	103	104	0.78	109	108	2,867	2,908	3,341	3,289
1983	127,950	3,312	3,362	25.89	77	77	0.60	77	77	2,839	2,882	3,555	3,351
1984	126,703	3,477	3,527	27.44	69	73	0.54	75	72	2,965	3,007	3,656	3,434
1985	125,224	3,699	3,762	29.54	82	84	0.65	85	82	3,139	3,190	3,884	3,632
1986	122,751	3,508	3,562	28.58	80	80	0.65	81	80	3,003	3,050	3,673	3,427
1987	124,215	3,379	3,443	27.20	88	91	0.71	90	90	2,816	2,866	3,497	3,288
1988	117,155	2,773	2,813	23.67	72	73	0.61	77	77	2,393	2,424	2,896	2,737
1989	110,617	2,516	2,557	22.75	70	72	0.63	75	69	2,171	2,208	2,724	2,511
1990@	103,537	2,167	2,198	20.93	60	61	0.58	62	60	1,840	1,865	2,223	2,061
1991	100,970	2,048	2,087	20.28	41	42	0.41	44	43	1,751	1,784	2,114	1,965
1992B	98,131	2,044	2,078	20.83	48	48	0.49	49	48	1,745	1,768	2,112	1,952

*Collisions/fatal collisions per 1,000 motorcycles registered

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

@Mandatory Helmet Law Reinstated 6/30/90

Source: WSP, DOL

Location of motorcycle collisions

Eighteen motorcyclists were killed in urban areas of the state, an increase of 2 fatal crashes compared to 1991, but down 5.3% from the previous 4-year average. Total motorcycle collisions were down 13.7%, and injury collisions were down 15.0% from the 4-year average (Table 8-3).

Table 8-3: Motorcycle collisions in urban areas
Five-year comparison

severity	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr av	prev 4-yr avg
Total collisions	1,126	1,127	1,207	1,417	1,468	1,305	-13.7%
Fatal collisions	18	16	12	23	25	19	-5.3%
Injury collisions	935	936	1,011	1,206	1,247	1,100	-15.0%
Property-damage-only clsns	173	175	184	188	196	186	-6.9%
Motorcyclists killed	18	17	12	23	27	20	-8.9%
Motorcyclists injured	1,005	1,024	1,106	1,376	1,313	1,205	-16.6%
All persons killed	18	18	13	25	28	21	-14.3%
All persons injured	1,099	1,107	1,188	1,485	1,481	1,315	-16.4%

Source: WSP

The rural areas of the state recorded decreases in total, fatal and injury collisions of 14.3%, 28.1%, and 13.7% respectively, compared to previous 4-year averages (Table 8-4).

Table 8-4: Motorcycle collisions in rural areas
Five-year comparison

severity	1992	1991	1990	1989	1988	'92 vs	
						prev 4-yr av	prev 4-yr avg
Total collisions	918	921	960	1,099	1,305	1,071	-14.3%
Fatal collisions	30	25	48	47	47	42	-28.1%
Injury collisions	810	815	829	965	1,146	939	-13.7%
Property-damage-only clsns	78	81	83	87	112	91	-14.0%
Motorcyclists killed	30	26	48	46	49	42	-29.0%
Motorcyclists injured	947	941	955	1,135	1,330	1,090	-13.1%
All persons killed	31	26	49	50	49	44	-28.7%
All persons injured	1,013	1,007	1,035	1,239	1,415	1,174	-13.7%

Source: WSP

VIII / Motorcyclists

Table 8-5 presents 1992 motorcycle collision severity data by roadway class. Motorcycle collisions occurring on city streets recorded the highest number of injury, property damage and total collisions. County roads and city streets accounted for more than half of fatal collisions. Figure 8-2 shows that city streets, county roads and state routes have all shown reductions in motorcycle collisions over the past five years.

Table 8-5: Location of motorcycle collisions
By severity - 1992

location	collisions				persons	
	fatal	injury	pty dmg*	total	killed	injured
Interstate system	8	128	17	153	8	167
U.S. route**	2	46	2	50	3	56
State route**	10	181	16	207	10	226
County roads	15	496	47	558	15	620
City streets***	13	862	165	1,040	13	1,006
Other traffic ways	0	32	4	36	0	37
Total	48	1,745	251	2,044	49	2,112

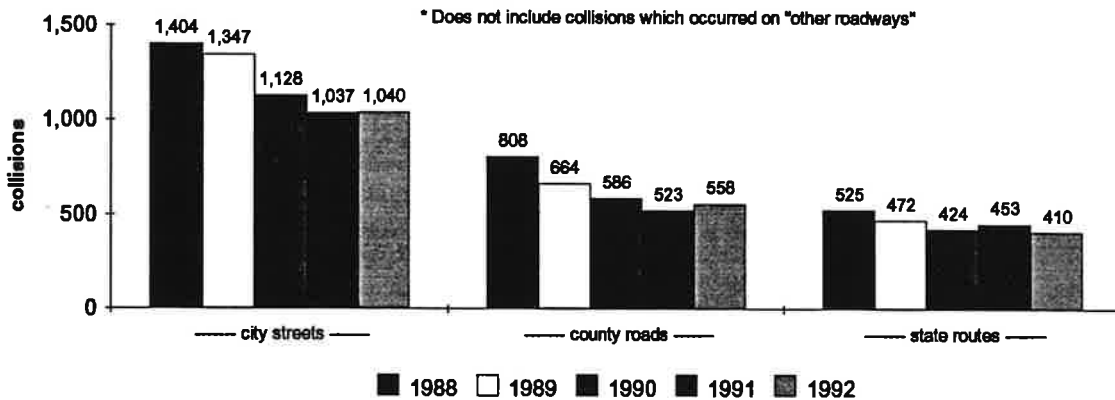
*Property damage collisions (no deaths or injuries)

Source: WSP

**Excluding city streets

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

Figure 8-2: Motorcycle collisions by road type*
Five-year comparison



Source: WSP

First harmful event in motorcycle collisions

The majority of motorcyclists in collisions, 53.9%, were involved in multiple-vehicle collisions, and the most frequent types were rear-end collisions and angular direction collisions. Of single-vehicle collisions, overturning was the most prevalent with 27.2% (Table 8-6).

Table 8-6: Motorcyclists in traffic collisions
Single/multiple by first harmful event - 1992

type of collision	all age	%	20/undr	21-24	25-29	30-34	35-44	45-54	55/ovr
Single motorcycle collisions									
Struck fixed object	251	13.5%	46	47	41	46	51	14	6
Struck other object	15	0.8%	0	4	2	1	3	4	1
Overturned	505	27.2%	89	109	81	62	99	45	20
Motorcycle-pedestrian	10	0.5%	0	2	2	1	4	1	0
Motorcycle-pedalcyclist	9	0.5%	0	4	2	2	0	1	0
Motorcycle-animal	56	3.0%	7	9	11	6	12	4	7
Non-collision	11	0.6%	2	2	1	1	5	0	0
Total single motorcycle	857	46.1%	144	177	140	119	174	69	34
Multiple vehicle collisions (w/mc)									
Head-on	23	1.2%	9	4	1	5	4	0	0
Rear-end	298	16.0%	47	48	37	51	75	30	10
Sideswipe	110	5.9%	20	18	24	20	19	5	4
Angular direction	261	14.0%	52	53	42	36	50	19	9
Enter/leave driveway	196	10.5%	46	28	34	35	31	16	6
One left/one straight-opp dir	115	6.2%	17	15	20	21	35	6	1
Enter/leave parked position	29	1.6%	7	10	2	3	4	2	1
Struck parked vehicle	27	1.5%	8	4	1	4	7	3	0
Broadside (same or opp. dir.)	40	2.2%	17	3	3	4	7	5	1
Total multiple vehicle	1,003	53.9%	191	166	158	168	214	76	30
Total motorcycle collisions*	1,860	100.0%	335	343	298	287	388	145	64

*Does not include 96 where drivers age not stated.

Source: WSP

VIII / Motorcyclists

Collision involvement by age group

Age 20 and younger motorcyclists were highly over-represented in 1992 collisions as shown in Figure 8-3. This group was involved in 18.8% of total collisions but they comprised only 1.1% of motorcycle-licensed drivers, creating an over-representation ratio of 17.8. The 21 to 24 age group was over-represented by a factor of 4.9. Table 8-7 gives a detailed breakdown by age groups..

Figure 8-3:

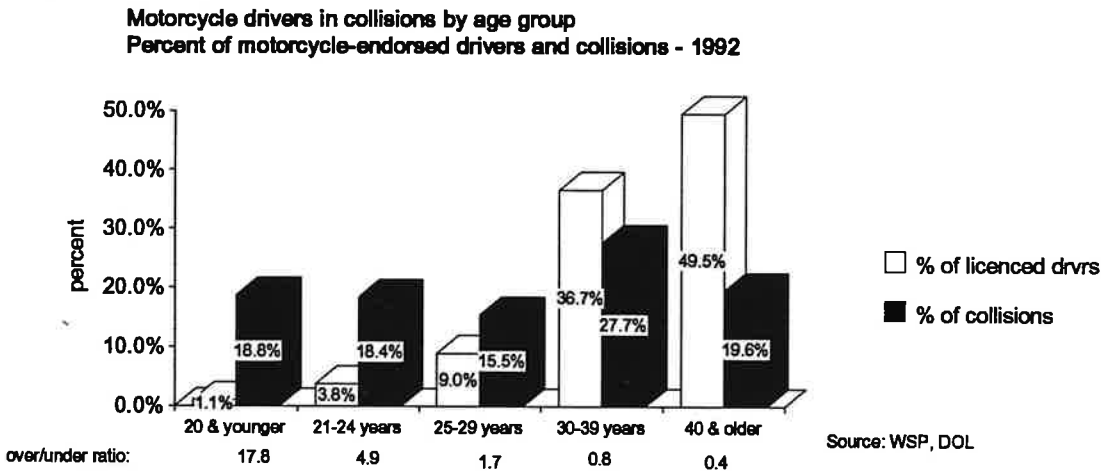


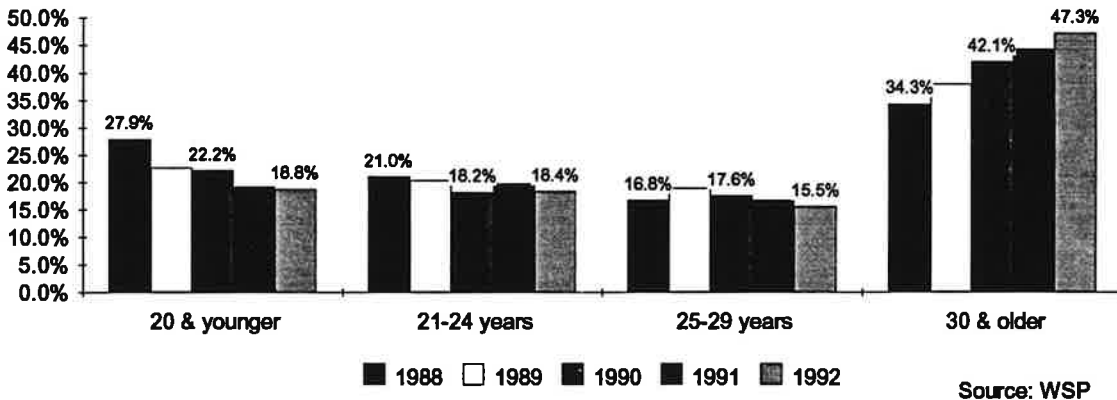
Table 8-7: Motorcycle drivers in collisions
By age group - 1992

age	dvrs in fatal clsn		dvrs in inj clsns		dvrs in totl clsns		% licensed M/cyclists	ovr/undr ratio-ttl clsns
	number	%	number	%	number	%		
Under 16	2	4.2%	48	2.7%	54	2.7%	-----	-----
16	0	0.0%	20	1.1%	23	1.1%	0.02%	68.96
17-18	1	2.1%	79	4.5%	88	4.3%	0.26%	16.55
19-20	4	8.3%	178	10.1%	202	9.9%	0.78%	12.83
21-22	6	12.5%	179	10.1%	193	9.5%	1.55%	6.15
23-24	7	14.6%	142	8.0%	167	8.2%	2.22%	3.71
25-29	6	12.5%	261	14.8%	304	15.0%	9.01%	1.66
30-34	7	14.6%	267	15.1%	298	14.7%	15.52%	0.95
35-39	6	12.5%	215	12.2%	243	12.0%	21.13%	0.57
40-44	0	0.0%	143	8.1%	163	8.0%	18.28%	0.44
45-54	6	12.5%	128	7.3%	155	7.6%	19.96%	0.38
55-64	1	2.1%	45	2.6%	49	2.4%	7.85%	0.31
65/over	1	2.1%	14	0.8%	17	0.8%	3.43%	0.24
Not stated	1		45		75			

Source: WSP, DOL

Figure 8-4 shows a 5-year trend of motorcyclist collisions by various age groups. The percentage of total collisions by motorcyclists between the ages of 21 and 29 has shown a slight decrease over the past five years. Younger motorcyclists (20 and younger) have accounted for a decreasing percentage of total collisions over the past five years, from 27.9% in 1988 to 18.8% in 1992. Motorcyclists 30 and older have shown increases over the last five years, from 34.3% to 47.3% of total collisions.

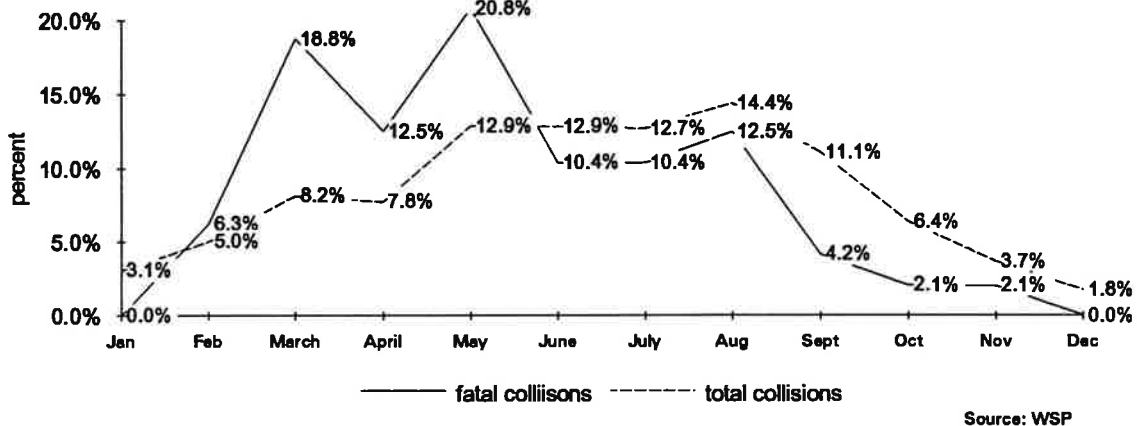
**Figure 8-4: Percent of total motorcycle collisions by age groups
Five-year trends**



Motorcycle collisions by month, day and hour

The months of May and March recorded the greatest percentages of fatal motorcycle collisions in 1992 with 20.8% and 18.8% respectively. Total motorcycle collisions were most prevalent during the months of May through September (Figure 8-5).

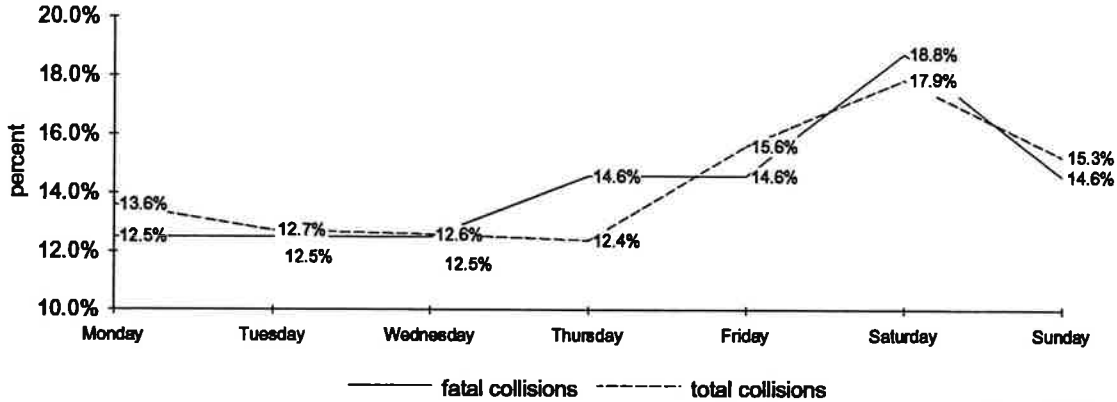
**Figure 8-5: Motorcycle fatal collisions and total collisions
Percentage by month - 1992**



VIII / Motorcyclists

Weekend days of Friday, Saturday and Sunday accounted for nearly half of motorcycle collisions. Saturdays recorded the highest percentages, with 18.8% of fatal crashes and 17.9% of total crashes (Figure 8-6).

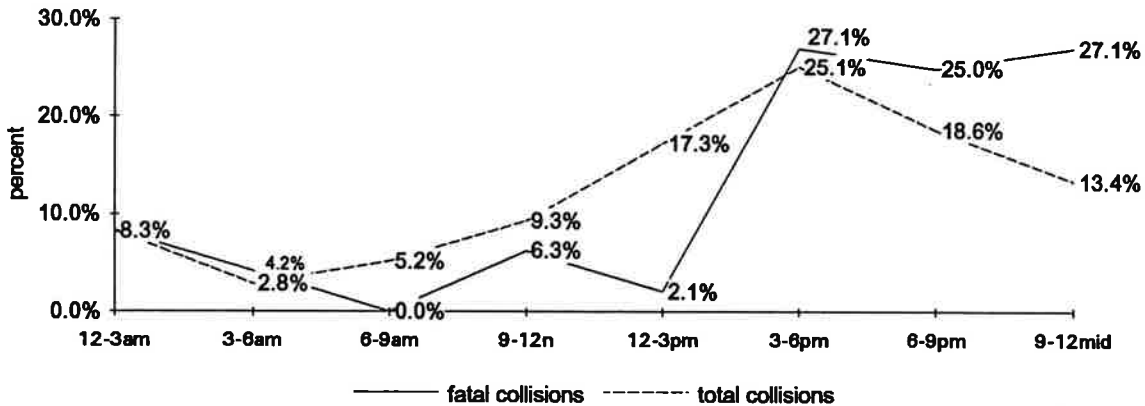
**Figure 8-6: Motorcycle fatal collisions and total collisions
Percentage by day of week - 1992**



Source: WSP

More than 75% of fatal motorcycle crashes occurred from 3:00 p.m. to 12 midnight. Total motorcycle collisions peaked during the 3:00 to 6:00 p.m. period with 25.1%, followed by the 6:00 to 9:00 p.m. period with 18.6% (Figure 8-7).

**Figure 8-7: Motorcycle fatal collisions and total collisions
Percentage by hour of the day - 1992**



Source: WSP

Contributing circumstances in motorcycle collisions

Table 8-8 reveals that speeding ("speed too fast for conditions" and "speed over legal limit") was the leading contributing factor (38.9%) in motorcycle collisions. Driving while under the influence was also noted as a frequent violation, contributing to 15.4% of the total.

Table 8-8: Motorcyclist violations in investigated collisions
By age - 1992

violation	all age	%	20/undr	21-24	25-29	30-34	35-44	45-54	55/ovr	n/statd
Speed - conditions	396	27.0%	89	81	55	59	69	27	8	8
Speed - over legal	174	11.9%	41	46	29	22	24	5	2	5
Failed to yield	85	5.8%	22	16	15	7	7	6	6	6
D.W.I.	225	15.4%	19	42	51	47	53	10	1	2
Following too closely	112	7.6%	23	18	15	20	21	8	3	4
Improper passing	82	5.6%	9	18	10	13	17	7	3	5
Defective equipment	93	6.3%	26	16	12	13	15	5	5	1
Disregd signs/signals	52	3.5%	13	6	8	11	11	1	1	1
Over center line	35	2.4%	13	5	5	7	4	0	0	1
Other violations	211	14.4%	39	41	27	25	44	19	5	11
Total	1,465	100.0%	294	289	227	224	265	88	34	44

Source: WSP

VIII / Motorcyclists

Helmet use in collisions

In 1992, there were 1,946 crash-involved motorcyclists who had worn helmets and 153 not using helmets. Among the helmeted riders, 2.2% died and 22.7% received disabling injuries as compared to 3.3% fatalities and 33.3% disabling injuries among the non-helmeted riders. Helmet use has increased dramatically since the enactment of the mandatory helmet law in mid 1990. In 1989, less than half of the crash-involved riders had worn helmets, while more than 90% were helmeted in 1992 (Table 8-9).

Table 8-9: Motorcyclist injuries by helmet use
Four-year comparison

helmet use / injury type	1992*		1991*		1990+		1989 ⁻	
	number	%	number	%	number	%	number	%
Total (inc use not stated)	2,267	100.0%	2,358	100.0%	2,489	100.0%	2,960	100.0%
Fatal	48	2.1%	42	1.8%	60	2.4%	69	2.3%
Disabling	518	22.8%	596	25.3%	623	25.0%	875	29.6%
Non-disabling	1,402	61.8%	1,409	59.8%	1,437	57.7%	1,636	55.3%
No injury	296	13.1%	306	13.0%	340	13.7%	346	11.7%
Injury status unknown	3	0.1%	5	0.2%	29	1.2%	34	1.1%
Helmet used	1,946	100.0%	1,741	100.0%	1,744	100.0%	1,276	100.0%
Fatal	43	2.2%	31	1.8%	43	2.5%	21	1.6%
Disabling	442	22.7%	448	25.7%	458	26.3%	354	27.7%
Non-disabling	1,229	63.2%	1,061	60.9%	1,023	58.7%	734	57.5%
No injury	231	11.9%	197	11.3%	216	12.4%	164	12.9%
Injury status unknown	1	0.1%	4	0.2%	4	0.2%	3	0.2%
Helmet not used	153	100.0%	162	100.0%	490	100.0%	1,362	100.0%
Fatal	5	3.3%	3	1.9%	16	3.3%	46	3.4%
Disabling	51	33.3%	54	33.3%	137	28.0%	466	34.2%
Non-disabling	83	54.2%	86	53.1%	271	55.3%	728	53.5%
No injury	14	9.2%	19	11.7%	65	13.3%	120	8.8%
Injury status unknown	0	0.0%	0	0.0%	1	0.2%	2	0.1%

* Helmet law in effect during full year of 1991 and 1992.

Source: WSP

+ Helmet law in effect during the last half of 1990.

- Helmet law not in effect during 1989.

Motorcycle collisions by county and city

Motorcyclist fatalities, injuries and collisions are summarized for counties and cities in Table 8-10 and 8-11. Among jurisdictions with sufficient numbers to calculate a meaningful rate, Pierce County and the city of Tukwila have injury rates substantially above other jurisdictions.

Table 8-10: Motorcyclists killed and injured
Collisions by county - 1992

county	registered	m/cyclists killed		m/cyclists injured		total m/c collisions	
	motorcycles	numbr	rate*	numbr	rate*	numbr	rate*
Adams	206	0	0.00	4	194.17	3	145.63
Asotin	343	0	0.00	8	233.24	2	58.31
Benton	2,274	2	8.80	42	184.70	46	202.29
Chelan	1,727	4	23.16	33	191.08	37	214.24
Clallam	1,240	0	0.00	24	193.55	29	233.87
Clark	3,842	0	0.00	15	39.04	20	52.06
Columbia	100	0	0.00	3	300.00	3	300.00
Cowlitz	1,564	2	12.79	37	236.57	33	211.00
Douglas	725	0	0.00	11	151.72	12	165.52
Ferry	109	0	0.00	3	275.23	3	275.23
Franklin	684	1	14.62	11	160.82	9	131.58
Garfield	20	0	0.00	1	500.00	1	500.00
Grant	1,201	0	0.00	13	108.24	14	116.57
Grays Harbor	1,132	1	8.83	19	167.84	20	176.68
Island	1,151	0	0.00	23	199.83	18	156.39
Jefferson	629	0	0.00	17	270.27	12	190.78
King	29,555	10	3.38	566	191.51	638	215.87
Kitsap	4,861	1	2.06	85	174.86	89	183.09
Kittitas	888	1	11.26	24	270.27	24	270.27
Klickitat	314	0	0.00	14	445.86	13	414.01
Lewis	1,192	0	0.00	32	268.46	28	234.90
Lincoln	163	0	0.00	6	368.10	4	245.40
Mason	838	2	23.87	22	262.53	22	262.53
Okanogan	803	0	0.00	15	186.80	13	161.89
Pacific	259	0	0.00	5	193.05	3	115.83
Pend Oreille	190	2	105.26	3	157.89	5	263.16
Pierce	9,996	3	3.00	279	279.11	262	262.10
San Juan	362	0	0.00	10	276.24	8	220.99
Skagit	2,236	2	8.94	36	161.00	38	169.95
Skamania	143	0	0.00	6	419.58	5	349.65
Snohomish	10,714	3	2.80	180	168.00	179	167.07
Spokane	7,100	3	4.23	144	202.82	141	198.59
Stevens	573	1	17.45	17	296.68	18	314.14
Thurston	3,715	4	10.77	66	177.66	71	191.12
Wahkiakum	28	0	0.00	2	714.29	1	357.14
Walla Walla	884	1	11.31	20	226.24	21	237.56
Whatcom	2,928	2	6.83	66	225.41	77	262.98
Whitman	623	0	0.00	12	192.62	13	208.67
Yakima	2,819	1	3.55	50	177.37	53	188.01
Total	98,131	46	4.69	1,924	196.06	1,988	202.59

Source: WSP, DOL

* Traffic deaths/injuries/total collisions per 10,000 registered vehicles

VIII / Motorcyclists

Table 8-11: Motorcyclists killed and injured*
Collisions by city population - 1992

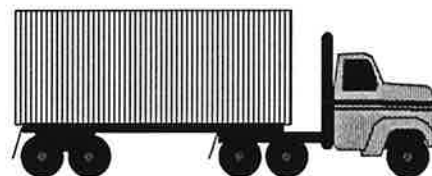
city	population	m/cyclists killed		m/cyclists injured		total m/c collisions	
		number	rate+	number	rate+	number	rate+
250,000 and over							
Seattle	522,000	7	0.13	277	5.31	323	6.19
100,000 to 250,000							
Spokane	180,800	2	0.11	71	3.93	77	4.26
Tacoma	179,000	0	0.00	98	5.47	94	5.25
50,000 to 100,000							
Bellevue	88,580	0	0.00	19	2.14	19	2.14
Everett	75,840	1	0.13	42	5.54	46	6.07
Federal Way	72,350	0	0.00	17	2.35	18	2.49
Yakima	58,706	0	0.00	27	4.60	27	4.60
Bellingham	54,270	0	0.00	32	5.90	36	6.63
25,000 to 50,000							
Vancouver	47,340	0	0.00	15	3.17	20	4.22
Kennewick	44,490	1	0.22	15	3.37	20	4.50
Renton	43,090	0	0.00	21	4.87	29	6.73
Kirkland	41,390	0	0.00	19	4.59	24	5.80
Kent	40,300	1	0.25	22	5.46	25	6.20
Redmond	39,040	0	0.00	15	3.84	15	3.84
Bremerton	38,990	0	0.00	26	6.67	32	8.21
Olympia	35,689	0	0.00	22	6.16	22	6.16
Auburn	34,260	1	0.29	12	3.50	13	3.79
Richland	33,550	0	0.00	8	2.38	7	2.09
Longview	32,030	0	0.00	13	4.06	12	3.75
Edmonds	30,749	0	0.00	7	2.28	5	1.63
Lynnwood	29,052	0	0.00	17	5.85	18	6.20
Walla Walla	28,134	1	0.36	10	3.55	11	3.91
Puyallup	25,400	0	0.00	7	2.76	6	2.36
15,000 to 25,000							
Pullman	23,190	0	0.00	5	2.16	6	2.59
Sea Tac	22,830	1	0.44	8	3.50	12	5.26
Wenatchee	22,710	0	0.00	11	4.84	14	6.16
Lacey	21,290	1	0.47	6	2.82	8	3.76
Mercer Island	21,210	0	0.00	1	0.47	1	0.47
Pasco	20,840	1	0.48	9	4.32	8	3.84
Mountlake Terrace	19,820	0	0.00	3	1.51	2	1.01
Mount Vernon	19,550	0	0.00	8	4.09	8	4.09
Oak Harbor	18,340	0	0.00	2	1.09	2	1.09
Des Moines	18,170	0	0.00	1	0.55	2	1.10
Port Angeles	18,030	0	0.00	10	5.55	12	6.66
Bainbridge Island	16,850	0	0.00	5	2.97	5	2.97
Aberdeen	16,630	0	0.00	2	1.20	5	3.01
10,000 to 15,000							
Tukwila	14,650	0	0.00	22	15.02	20	13.65
Mukilteo	13,420	0	0.00	5	3.73	5	3.73
Bothell	13,220	0	0.00	5	3.78	5	3.78
Marysville	13,030	0	0.00	2	1.53	2	1.53
Ellensburg	12,439	0	0.00	7	5.63	7	5.63
Centralia	12,330	0	0.00	7	5.68	7	5.68
Anacortes	12,110	0	0.00	0	0.00	0	0.00
Kelso	11,837	1	0.84	8	6.76	5	4.22
Moses Lake	11,530	0	0.00	3	2.60	3	2.60
Sunnyside	11,370	0	0.00	1	0.88	1	0.88
Tumwater	10,950	0	0.00	8	7.31	8	7.31
TOTAL	2,171,396	18	0.08	951	4.38	1,047	4.82

*Includes collisions occurring on the interstate system

Source: WSP, OFM

+Frequency per 10,000 population

IX. Heavy Trucks



In 1992, there were 5,683 heavy trucks (10,000 pound gross weight and over) involved in traffic collisions, down 9.2% from the previous 4-year average. Registration of heavy trucks was up 7.7%. The heavy truck collision rate (collisions per 10,000 registered heavy trucks) was 462.9, down 15.9% from the 4-year average (Table 9-1).

Table 9-1: Heavy trucks (10,000 lbs & greater) in collisions
Five-year comparison

severity/exposure & rates	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Total trucks in collisions	5,683	5,811	6,725	6,345	6,149	6,258	-9.2%
Trucks in fatal collisions	51	59	81	79	79	75	-31.5%
Trucks registered*	122,764	122,084	115,500	112,000	106,400	113,996	7.7%
Total collision rate**	462.9	476.0	582.3	566.5	577.9	551	-15.9%
Fatal collision rate**	4.2	4.8	7.0	7.1	7.4	6.58	-36.9%

* Estimated by DOT and DOL

Source: WSP, DOL, DOT

** Collisions per 10,000 registered trucks

Heavy truck collisions by first harmful event

Heavy trucks were involved in 4,195 collisions involving other moving motor vehicles. This figure represents 73.8% of all heavy truck collisions in 1992. In addition, heavy trucks were involved in 335 collisions in which the other vehicle was parked, and in 536 collisions with fixed or other objects. There were 280 collisions in which a truck overturned. All collision types except "other collisions" were down from the previous 4-year average (Table 9-2).

Table 9-2: Heavy truck collisions by first harmful event
Five-year comparison

type of collision	1992	1991	1990	1989	1988	prev 4-yr avg	'92 vs prev 4-yr avg
Clsn w/other moving motor veh	4,195	4,236	4,769	4,728	4,388	4,530	-7.4%
Collision with fixed/other object	536	548	755	667	677	662	-19.0%
Collision with parked vehicle	335	358	423	412	353	387	-13.3%
Overturning	280	298	321	379	349	337	-16.9%
Other non-collision	109	103	139	113	105	115	-5.2%
All other collisions*	75	74	79	75	70	74.5	0.7%
Total	5,530	5,617	6,486	6,374	5,942	6,105	-9.4%

* Pedestrians, pedalcyclists, RR train & animal.

Source: WSP

IX / Heavy Trucks

Heavy truck defects

Defective brakes were present in 33.4% of the 401 trucks determined to have defective equipment in investigated collisions. Worn or smooth tires contributed 8.0% of total defects, tire punctures or blowouts were 6.0% of the total, defective rear lights were 4.5%, defective steering mechanisms were 2.7%, and all other defects were 44.1%. There was a 24.3% decrease in the number of defects reported in 1992 investigated collisions compared to the previous 4-year average (Table 9-3).

Table 9-3: Defects of heavy trucks in collisions
Five-year comparison

condition of vehicle	1992	1991	1990	1989	1988	92 vs	
						prev 4-yr avg	prev 4-yr avg
Defective brakes	134	175	210	206	236	207	-35.2%
Worn or smooth tires	32	40	60	57	74	58	-44.6%
Defective rear lights	18	13	26	27	37	26	-30.1%
Puncture or blowout	24	22	26	14	24	22	11.6%
Defective steering	11	11	19	18	32	20	-45.0%
Defective headlights	5	2	4	6	6	5	11.1%
Other defects	177	181	185	233	175	194	-8.5%
Total	401	444	530	561	584	530	-24.3%

Source: WSP

Age of drivers involved in heavy truck collisions

In 1992 heavy truck collisions, 20.7% of the drivers were 20-29 years of age. This group made up 15.51% of all classified drivers, creating an over-representation ratio of 1.37. The 30 and older age groups were all under-represented in total collisions (Table 9-4).

Table 9-4: Drivers in heavy truck collisions by age
And number of classified drivers - 1992

age	% of lic dvrs *	fatal collisions		injury collisions		total collisions		
		number	%	number	%	number	%	ratio +
19 & under	0.15%	0	0.0%	22	1.4%	42	0.8%	5.69
20-29	15.1%	13	26.5%	331	21.3%	1,045	20.7%	1.37
30-39	34.0%	14	28.6%	540	34.8%	1,691	33.6%	0.99
40-49	28.3%	14	28.6%	359	23.1%	1,237	24.5%	0.87
50-59	16.6%	5	10.2%	208	13.4%	767	15.2%	0.92
60 & over	5.9%	3	6.1%	92	5.9%	258	5.1%	0.87

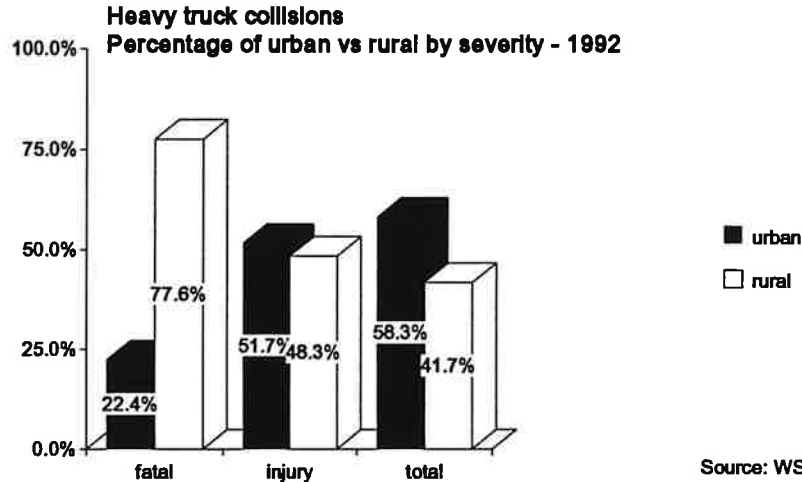
Source: WSP, DOL

- *Percent of WA drivers in age group with classified endorsement
(Required only for operators of larger trucks & truck combinations)
- +Percent of collision involvement to percent of licensed drivers

Location of heavy truck collisions

During 1992, 77.6% of fatal heavy truck collisions occurred in rural areas. Injury collisions during 1992 were almost equally divided between urban and rural. Of the total numbers of collisions, 58.3% occurred in urban areas (Figure 9-1).

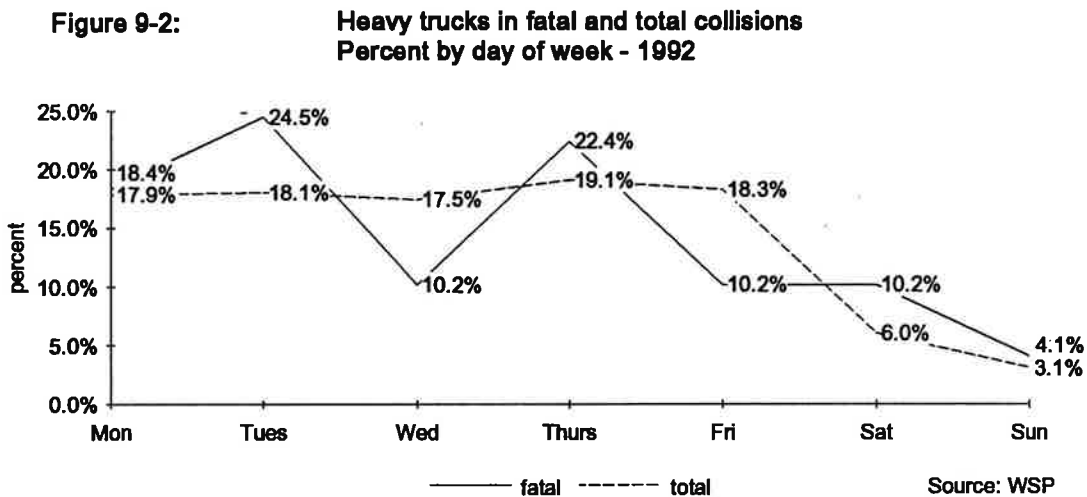
Figure 9-1:



Heavy truck collisions by day of week and hour of day

The percentages of collisions were roughly equivalent for weekdays. Saturday and Sunday had dramatically lower percentages with 6.0% and 3.1% respectively (Figure 9-2).

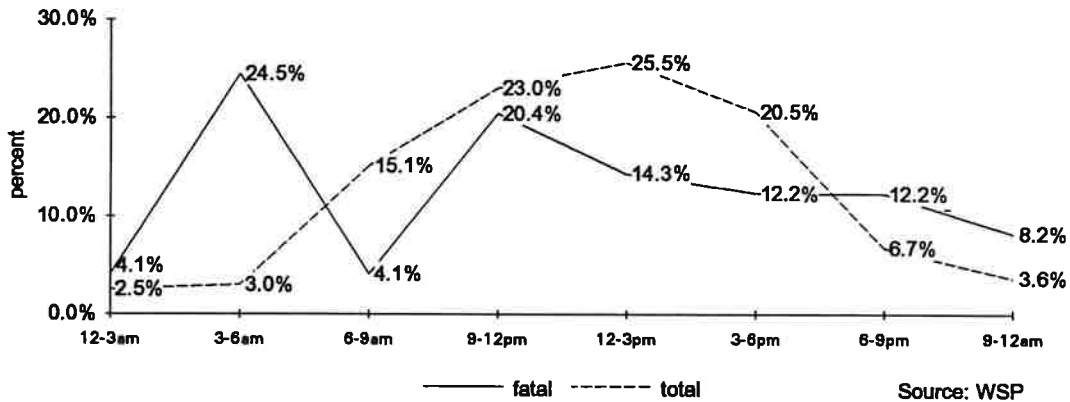
Figure 9-2:



IX / Heavy Trucks

The majority of heavy truck collisions occurred between 9:00 a.m. and 6:00 p.m. Fatal collisions most frequently occurred during the two time periods of 3:00 to 6:00 a.m. and 9:00 a.m. to 12 noon (Figure 9-3).

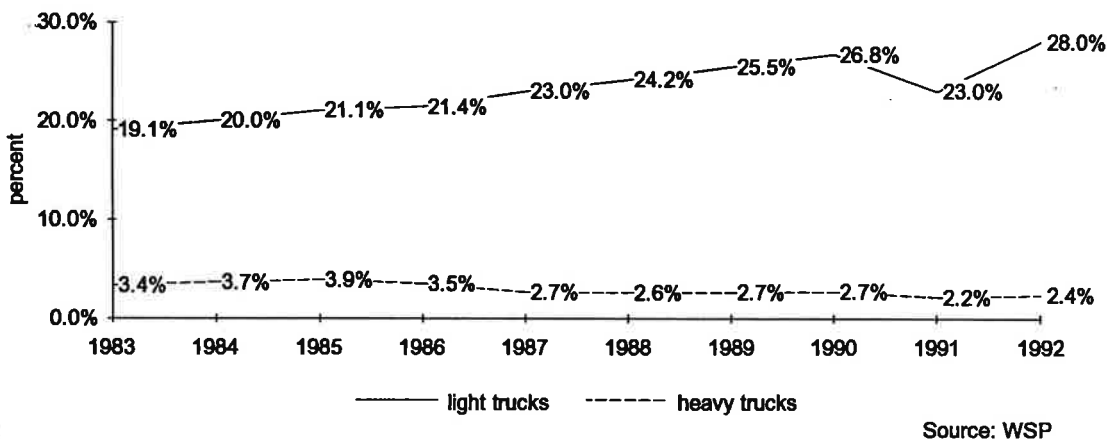
**Figure 9-3: Heavy trucks in fatal and total collisions
Percentage by time (3-hour intervals) - 1992**



Light and heavy truck collisions

Figure 9-4 shows percentages of the total number of Washington collisions that involved light trucks (gross weight of under 10,000 pounds) and heavy trucks over the 10-year period 1983 to 1992. Collisions involving Light trucks have increased from 1983 (19.1%) to a 10-year high of 28.0% in 1992. Heavy truck collisions have decreased slightly since 1985.

**Figure 9-4: Percentage of light and heavy trucks in total collisions
Ten-year comparison**



X. Pupil Transportation



During the 1991-1992 school year, there were 348 school bus collisions reported in which 192 persons were injured. Of 107 school bus occupants injured, 85 were pupils, 20 were drivers and 2 were occupants other than students. None of those injuries were disabling injuries. There were no fatalities in 1991-1992 school bus collisions, and 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.

School bus registration totaled 7,349 vehicles in 1991-1992. Total school-bus travel was computed at nearly 88 million miles during the school year, an increase of nearly 5 million miles over the previous year (Table 10-1).

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

Severity, exposure & rates	91-92	90-91	89-90	88-89	87-88	91-92 vs	
						prev 4-yr avg	prev 4-yr avg
Total collisions	348	340	325	371	311	337	3.3%
Fatal collisions	0	4	1	1	1	2	-100.0%
Injury collisions	92	92	98	121	115	107	-13.6%
Property damage collisions	256	244	226	249	195	229	12.0%
Total persons killed	0	4	1	1	1	2	
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	2	1	0	1	1	
Occupants/other vehicles involved	0	2	0	1	0	1	
Total persons injured	192	189	232	216	268	226	-15.1%
Pupils	85	82	85	66	116	87	-2.6%
School bus drivers	20	16	17	21	28	21	-2.4%
Other occupants of school bus	2	1	1	1	0	1	166.7%
Pedestrian/bicyclist	3	4	6	5	7	6	-45.5%
Occupants/other vehicles involved	82	86	123	123	117	112	-26.9%
Total school bus occupant injuries	107	77	82	41		67	60.5%
Major injury	0	1	6	1		3	-100.0%
Minor injury	16	6	27	11		15	9.1%
Possible injury	91	70	49	29		49	84.5%
School bus registration	7,349	7,113	6,906	6,627	6,427	6,768	8.6%
Registration collision rate*	47.4	47.8	47.1	56.0	48.4	50	-4.9%
Miles traveled (in thousands)	87,972.7	83,060.5	78,127.9	73,799.7	72,816.2	76,951	14.3%
Mileage collision rate**	0.40	0.41	0.42	0.50	0.43	0	-9.8%

* Collisions per 1,000 registered vehicles

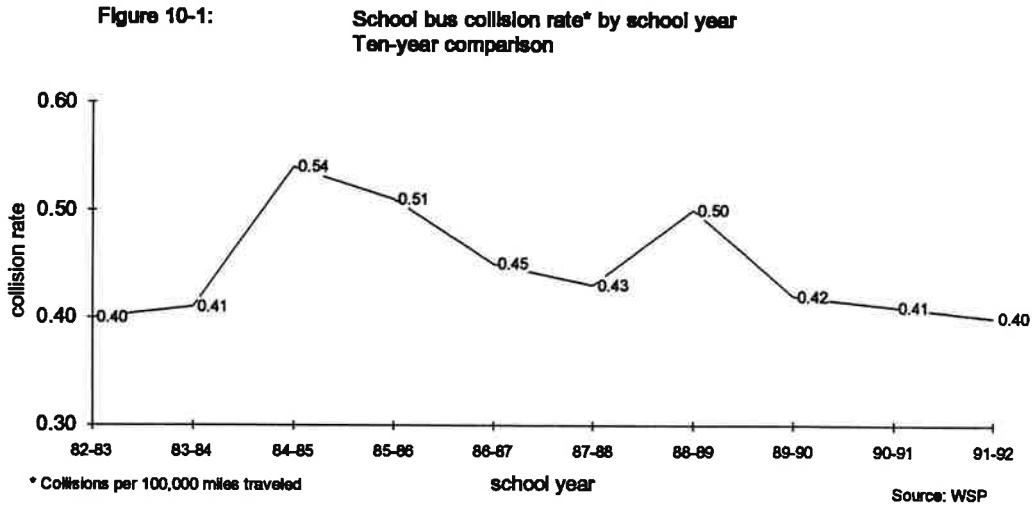
Note: shaded area data not available

Source: WSP, SPI

** Collisions per 100,000 miles traveled

X / Pupil Transportation

The school bus collision rate for the 1991-1992 school year was computed at 0.40 collisions per 100,000 miles traveled. There appears to be a downward trend which began in the 84-85 school year (Figure 10-1).



XI. Vehicle Defects



In investigated collisions in 1992, the most common vehicle defect noted was defective brakes, found in 1,486 vehicles. Worn or smooth tires was found in 1,211 vehicles. These numbers represent decreases of 11.2% and 40.8% respectively in those categories compared to their previous 4-year averages (Table 11-1).

Table 11-1: Vehicle condition in investigated collisions
Five-year comparison

description	1992	1991	1990	1989	1988	prev	'92 vs
						4-yr avg	prev 4-yr avg
Defective brakes	1,486	1,485	1,682	1,671	1,859	1,674	-11.2%
Worn or smooth tires	1,211	1,497	1,948	2,165	2,577	2,047	-40.8%
Puncture or blowout	293	309	399	405	442	389	-24.6%
Defective rear lights	236	283	305	387	423	350	-32.5%
Defective steering	236	196	272	279	306	263	-10.4%
Defective headlights	97	121	112	164	156	138	-29.8%
Other lights/reflectors	71	71	97	114	106	97	-26.8%
All other defects	1,617	1,539	1,501	1,971	1,683	1,674	-3.4%
Total defects	5,247	5,501	6,316	7,156	7,552	6,631	-20.9%
No defects noted	168,706	159,398	170,881	161,829	164,102	164,053	2.8%

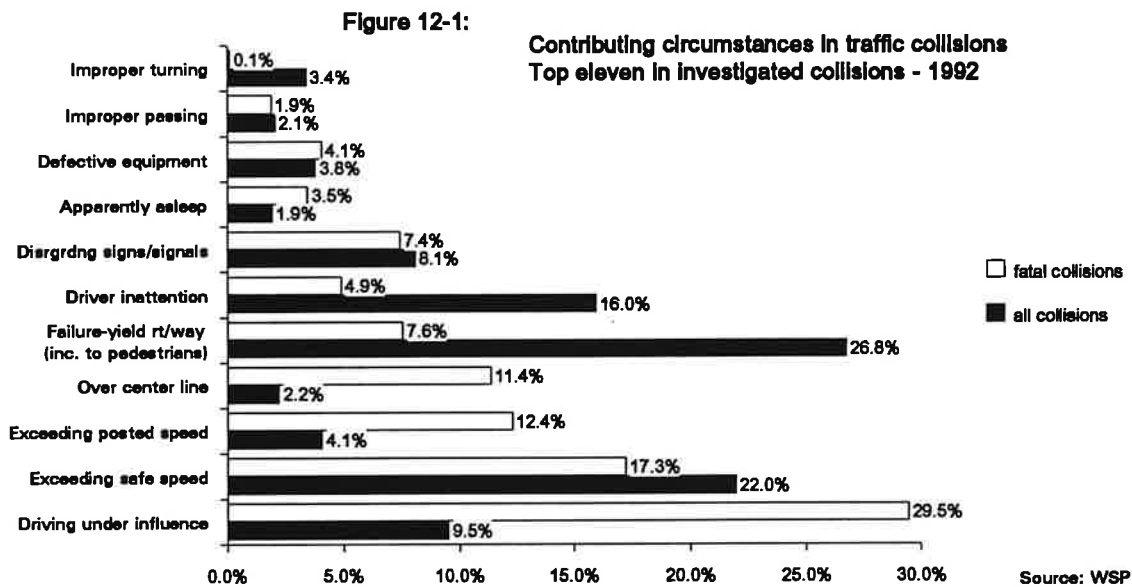
Source: WSP

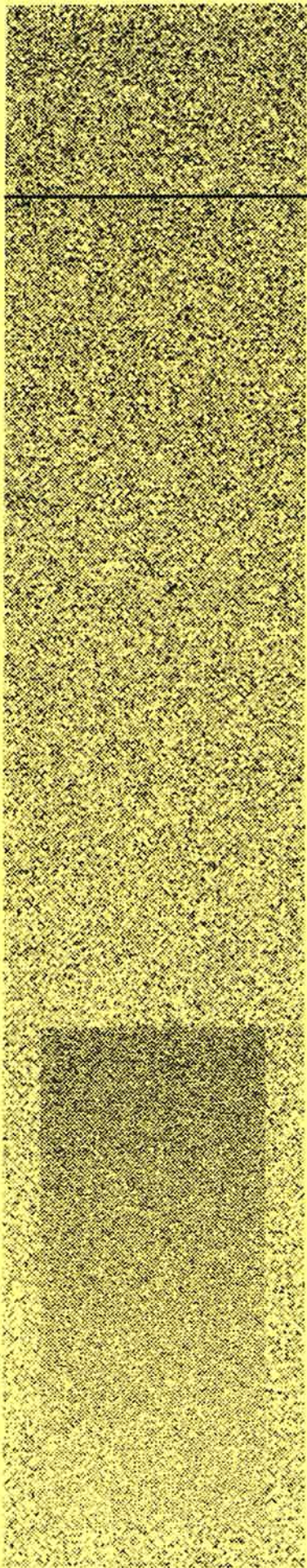
XII. Contributing Driver Violations



Percentages of contributing driver violations for fatal and total collisions in 1992 are shown in Figure 12-1. For fatal collisions, "driving under the influence" was the highest factor, appearing in 29.5% of the cases. The next most prevalent contributing driver violations in fatal collisions were "exceeding safe speed" with 17.3%, and "exceeding posted speed" with 12.4%.

In all collisions, the highest percentage of contributing circumstances was "failure to yield the right of way," with 26.8%. The next highest were "exceeding safe speed" with 22.0% and "driver inattention" with 16.0%. These percentages are based on investigated collisions where contributing driver violations were noted (Figure 12-1).





Appendix

Data
Summary and
Highway
Safety
Problem
Analysis

Glossary



Collisions

Collision - A crash involving one or more motor vehicles on a 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. (There can be more than one "fatality" in a single "fatal collision.")

Disabling / incapacitating injury - An injury other than fatal that prevents the injured person from continuing normal activities.

Non-disabling / non-incapacitating / evident injury - Any injury not disabling but evident to others at the scene.

Possible injury - Any injury reported or claimed which is not a fatal, disabling, or non-disabling injury but 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.

Calculations of economic loss

The calculable costs of motor vehicle collisions are wage loss, medical expense, 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 costs for 1991 as follows:

▪ Death	\$450,000
▪ Disabling injury	\$ 42,400
▪ Non-disabling injury	\$ 10,700
▪ Possible injury	\$ 3,300
▪ Property damage only	\$ 4,200

Persons Involved in Collisions (Status)

Occupant - Any person who is part of a motor vehicle in transport including drivers and occupants.

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 occupant of a pedalcycle in transport, including bicycles and tricycles; not including motor-driven cycles.

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

Senior driver - Drivers 55 years and older.

Youthful driver - Drivers 24 years of age and younger.

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

DWI / driving while intoxicated - Driving 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.

DUI / driving under the influence - Same as DWI/driving while intoxicated.

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 or motorized bicycles

Heavy truck - 10,000 pound gross weight and higher

Light truck - Under 10,000 pounds gross weight

Milestones in Washington Traffic Safety

- 1963** Driver Education Act.
- 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.
Motorcycle helmet law repealed.
- 1979:** DWI law modified to make .10% BAC illegal per se.
Mandatory day in jail for first DWI offense.
- 1982:** "Day in Jail" changed to mean 24 consecutive hours.
Alcohol assessment and education/treatment required for DWI.
- 1983:** Vehicular homicide and assault statute.
Open container law for alcoholic beverages.
Mandatory child restraint law.
- 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.
- 1988:** Vehicle registration cancelation for driving with a suspended drivers license.
- 1989:** DWI youth (under 19) lose license for 90 days or until age 19 (the 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.
- 1993:** Age requirement for child safety seat raised from 1 to 2 years.
Most protective pedestrian crosswalk law in nation.

Traffic Safety Resource Material*

Accident Facts

National Safety Council
 Statistics Department (Chicago, Illinois).
 444 N. Michigan Ave, Chicago, IL 60611
 + Includes one 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 some 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 are updated annually.

The Counties of Washington State

