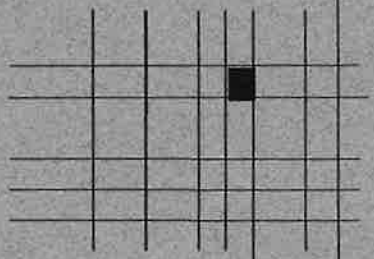
1990 Traffic Collisions in Washington State

Data Summary and Problem Analysis



August, 1991

Washington Traffic Safety Commission
1000 South Cherry Street, MS/PD-11, Olympia, WA 98504

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DATA SUMMARY AND PROBLEM ANALYSIS

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Appendix

Introduction

The Data Summary and Problem Analysis is a yearly publication which documents and analyzes traffic impact problems in the State of Washington. This 1990 edition outlines factors that contribute to the occurrence of traffic collisions and the resultant fatalities, injuries and property damage.

The analysis of impact problems gives traffic safety program specialists the information needed to design more effective countermeasures. Programs currently implemented are outlined in the biennial Highway Safety Plan published by the Washington Traffic Safety Commission.

The impact problems analyzed in this document identify traffic safety problem areas accounting for the majority of traffic deaths, injuries and property damage. The current year's data is compared to that of recent years for trend identification. Over/under-representation ratios are used to compare the collision involvement of various subgroups relative to their percentage of the population.

Sources of data reported in this document include Traffic Accident 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), and Highway/Roadway Information (Washington State Department of Transportation).

An appendix has been added to this year's document. It includes a glossary of terms, historical information, resource material, and a map of Washington.

I. Overview

Eight hundred and twenty five (825) persons were killed in 726 fatal traffic collisions in the state of Washington during 1990. This was a 5.1% increase in traffic deaths and a 3.8% increase in fatal crashes compared to the previous 3-year average (1987-1989). All reported injuries totaled 76,064, up 6.6% from the previous average. However, disabling injuries and non-disabling injuries recorded decreases of 7.7% and 3.3% respectively. Slight/possible injuries recorded an increase of 17.0% compared to the previous 3-year year average. Total reported collisions increased 3.8% over the same period. Property damage only collisions increased 2.9%, and injury collisions increased 5.4% (Table 1-1).

Table 1-1

SEVERITY OF COLLISIONS
Four-Year Comparison

Impact	Year 1990	1989	1988	1987	Previous 3-Year Average	% of Change 90 - 3-Year Average
Total Collisions	132,056	128,800	125,920	126,807	127,176	3.8%
Fatal Collisions	726	694	706	699	700	3.8%
Total Killed	825	781	785	790	785	5.1%
Injury Collisions	51,713	50,747	49,482	46,968	49,066	5.4%
Total Injured	76,064	73,993	72,449	67,665	71,369	6.6%
Disabling Injury	7,653	8,044	8,318	8,506	8,289	-7.7%
Non-Disabling	25,722	26,974	26,496	26,328	26,599	-3.3%
Possible Injury	42,689	38,974	37,635	32,831	36,480	17.0%
Property Damage Only Collisions*	79,617	77,359	75,732	79,140	77,410	2.9%

Source: WSP

* Oct. 1, 1987 the reporting level for motor vehicle traffic collisions increased from $300 to $500. Fatal and injury collisions were not affected by this change in the law, but property damage only collisions were reduced by 4.3% in 1988.

Exposure

Motor vehicle travel increased 8.4% in 1990 as compared to the 1987-1989 baseline average. Increases were recorded in all other exposure criteria as well, with motor vehicle registration up 7.5%; licensed drivers up 3.4%, and the state's population up 6.5% over the baseline average (Table 1-2).

Table 1-2

VEHICLES AND DRIVERS
Four-Year Comparison

Exposure	Year 1990	1989	1988	1987	Previous 3 - Year Average	% of Change 90 - 3-Year Average
Motor Vehicle Travel*	44,694	43,449	41,698	38,520	41,222	8.4%
Motor Veh Registration	4,233,854	4,084,367	3,896,828	3,833,058	3,938,084	7.5%
Licensed Drivers	3,366,146	3,350,324	3,264,065	3,156,600	3,256,996	3.4%
State's Population	4,866,692	4,660,700	4,565,000	4,481,100	4,568,933	6.5%

*In millions of miles

Source: WSDOT, DOL, OFM

Rates

The 1990 motor vehicle traffic death rate was 1.85 per 100 million vehicle miles traveled; down 3.1% from the 1.91 rate for the 1987-89 baseline average, but up slightly from the all-time low of 1.80 recorded in 1989. The 1990 injury rate of 170.19 injuries per 100 million vehicle miles traveled did reach a record low for our state; it was down 1.8% from the 3-year baseline average and down slightly from last year's record low of 170.3% (Table 1-3).

Table 1-3

DEATH AND INJURY RATES
Four-Year Comparison

Rates	Year 1990	1989	1988	1987	Previous 3-Year Average	% of Change 90 - 3-Year Average
Death Rate*	1.85	1.80	1.88	2.05	1.91	-3.4%
Injury Rate*	170.19	170.30	173.75	175.66	173.24	-1.8%

* Deaths and injuries per 100 million vehicle miles

Source: WSP, WSDOT

Fatalities By Status

More than one-half of all persons killed in traffic crashes were the drivers (438 drivers killed out of 825 total fatalities). Passengers made up the next largest segment with 28.1% of the total, and pedestrians contributed 9.8% of the total. Motorcyclists recorded the largest decrease in deaths compared to previous years and were computed at 7.3% of total deaths (Table 1-4).

Table 1-4

PERSONS KILLED BY STATUS
Four-Year Comparison

Status	Year 1990	1989	1988	1987	Previous 3-Year Average	% of Change 90 - 3-Year Average
Drivers (no motorcyclists)	438	420	394	386	400	9.5%
Passengers	232	174	206	204	195	19.2%
Pedestrians	81	110	97	93	100	-19.0%
Pedalcyclists	14	8	12	18	13	10.5%
Motorcyclists	60	69	76	89	78	-23.1%
TOTAL	825	781	785	790	785	-0.6%

Source: WSP

Traffic Deaths, Injuries, Travel and Death/Injury Rate

Figures 1-1 through 1-4 depict the trend lines for traffic deaths, miles traveled, death rate and reported collisions and injuries from 1981 through 1990. While motor vehicle travel has increased substantially year by year over the past decade, traffic deaths have varied from a high of 872 deaths in 1981 to a low of 705 in 1983, creating a gradual decline in the death rate from 2.87 in 1981 to 1.85 in 1990. Washington's rate has been consistently lower than the national rate.

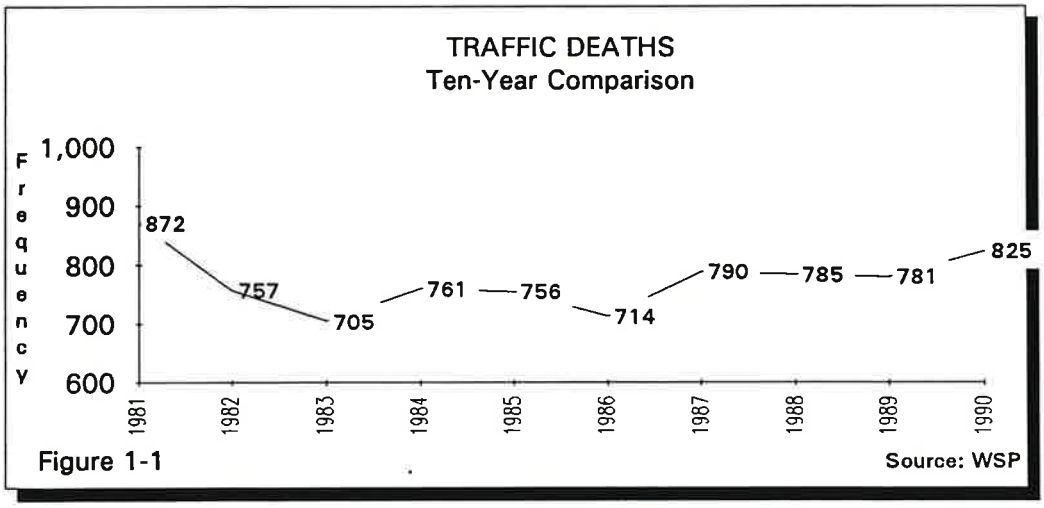


Figure 1-1

Source: WSP

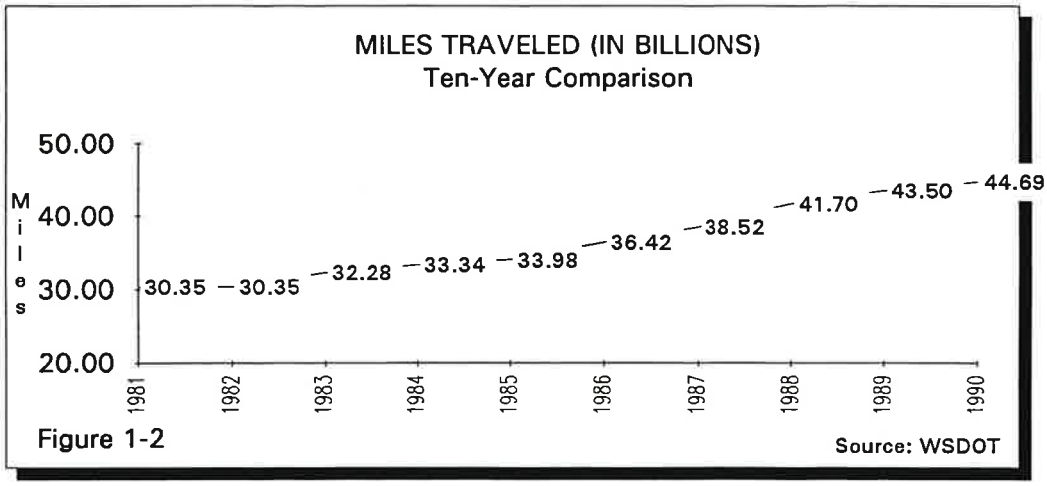


Figure 1-2

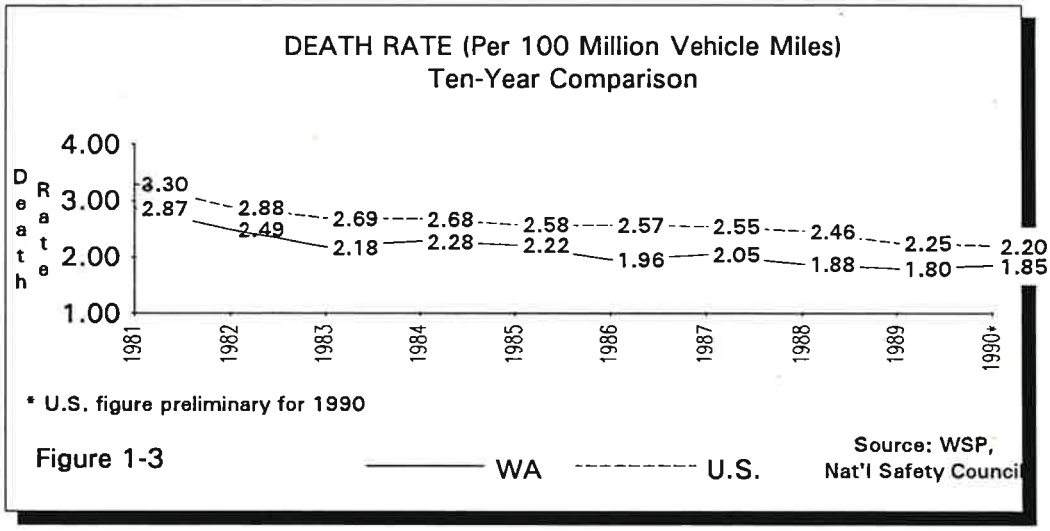


Figure 1-3

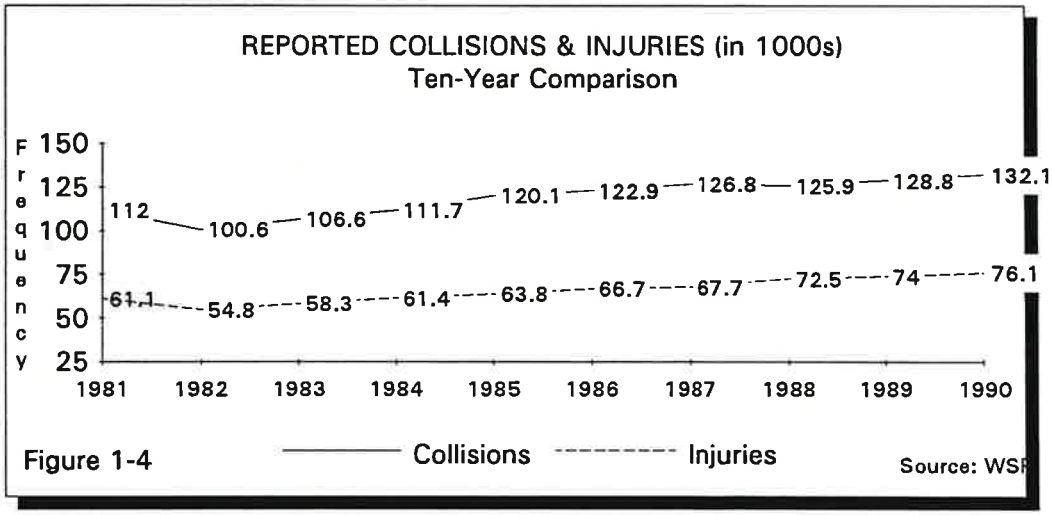


Figure 1-4

Traffic Deaths and Injuries by Location, Time and Status

The interstate system is the safest of all roadways in the state with a death rate of 0.92 deaths per 100 million vehicle miles in 1990. Travel on the interstate system increased 2.2% over 1989. Twenty eight percent (28.2%) of travel in the state occurred on other state routes with a death rate of 2.58 per 100 million miles of travel. County roads were traveled an estimated 10.852 billion miles and recorded a death rate of 2.72 in 1990, an increase over the previous year's 2.56 rate. Estimated miles on city streets totaled an estimated 8.854 billion miles in 1990 with a death rate of 1.25, up from the 1.18 rate for 1989. Total motor vehicle travel in the state increased from 43.449 billion miles in 1989 to 44.694 billion in 1990, an increase of 2.87% (Table 1-5).

Table 1-5

HIGHWAYS, TRAVEL, AND COLLISIONS
By Type of Highway - 1990

Type of Highways	Highways		Miles Traveled +		Collisions		
	Miles	% of Total	Miles (Millions)	% of Total	Total Collisions	Total Fatalities	Death Rate*
Interstate System	762	0.9%	10,774	24.1%	13,942	99	0.92
All Other State Highways	6,212	7.6%	13,098	29.3%	30,256	318	2.43
County Roads	41,744	51.3%	10,397	23.3%	27,469	283	2.72
City Streets	11,149	13.7%	8,854	19.8%	59,441	111	1.25
All Other Traffic Ways**	21,433	26.4%	1,571	3.5%	948	14	0.89
TOTAL	81,300	100.0%	44,694	100.0%	132,056	825	1.85

Source: WSP, WSDOT

+ Preliminary Estimates

*Fatalities per hundred million vehicle miles, based on roadway travel as reported by WSDOT

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

Eighty-one pedestrians were killed and 1,861 were injured in 1990. Older persons (65 and over) contributed to 34.6% of all pedestrians killed; 28.3% of the pedestrians injured were 14 years and younger. Forty-two percent of the pedalcyclists injured were 5 to 15 years (Table 1-6).

Table 1-6

PERSONS KILLED AND INJURED - 1990
By Age and By Status

Age	Total		Occupants		Pedestrians		Pedalcyclists	
	Killed	Injured*	Killed	Injured	Killed	Injured	Killed	Injured
0 - 4	20	1,537	16	1,447	3	75	1	15
5 - 9	17	2,158	8	1,743	7	225	2	189
10 - 14	15	2,461	11	1,857	0	226	4	377
15 - 19	98	11,359	90	10,963	5	203	3	191
20 - 24	138	11,438	133	11,100	5	170	0	163
25 - 34	199	18,155	190	17,622	9	312	0	213
35 - 44	121	12,360	113	12,049	7	205	1	95
45 - 54	73	6,444	62	6,290	11	117	0	35
55 - 64	41	3,727	33	3,627	6	82	2	16
65 - 74	35	2,648	23	2,560	11	80	1	8
75/Older	66	1,499	49	1,404	17	90	0	5
Not Stated	2	2,278	2	2,157	0	76	0	42
Total	825	76,064	730	72,819	81	1,861	14	1,349

Source: WSP

* Total injured includes 35 where the status of the injured was unknown.

January and February recorded the biggest increases in traffic deaths in 1990 compared to the previous years: 50% and 60.6% respectively. However, the month of August recorded the highest number of deaths, recording 92, or 27.8% above the previous year (Table 1-7).

Table 1-7

COMPARISON OF TRAFFIC DEATHS BY MONTH
Three-Year Comparison

Month	1990		1989		1988		1990 Change From 1989	
	Month Total	Year To Date	Month Total	Year To Date	Month Total	Year To Date	Month Total	Year To Date
January	63	63	42	42	40	40	50.0%	50.0%
February	53	116	33	75	42	82	60.6%	54.7%
March	61	177	53	128	70	152	15.1%	38.3%
April	55	232	52	180	55	207	5.8%	28.9%
May	75	307	74	254	69	276	1.4%	20.9%
June	82	389	65	319	82	358	26.2%	21.9%
July	85	474	76	395	86	444	11.8%	20.0%
August	92	566	72	467	79	523	27.8%	21.2%
September	80	646	85	552	70	593	-5.9%	17.0%
October	62	708	81	633	66	659	-23.5%	11.8%
November	56	764	71	704	66	725	-21.1%	8.5%
December	61	825	77	781	60	785	-20.8%	5.6%

Source: WSP

Fifty-one percent of the fatal collisions occurred on week-end days (Friday, Saturday and Sunday). Forty-four percent of the total reported collisions occurred during the weekend (Table 1-8).

Table 1-8

COLLISIONS BY HOUR - 1990

Hour	Collisions			Monday - Thursday			Friday - Sunday		
	Total	Injury	Fatal	Total	Injury	Fatal	Total	Injury	Fatal
Midnight	3,403	1,341	39	1,267	493	16	2,136	848	23
1:00 a.m.	2,995	1,255	45	1,012	419	19	1,983	836	26
2:00 a.m.	2,871	1,213	37	951	408	13	1,920	805	24
3:00 a.m.	1,504	618	14	526	191	3	978	427	11
4:00 a.m.	1,060	435	17	400	161	6	660	274	11
5:00 a.m.	1,532	575	20	850	303	8	682	272	12
6:00 a.m.	3,048	1,165	12	2,116	808	9	932	357	3
7:00 a.m.	5,466	2,118	20	3,969	1,565	12	1,497	553	8
8:00 a.m.	4,833	1,752	16	3,364	1,238	8	1,469	514	8
9:00 a.m.	4,194	1,504	13	2,562	933	7	1,632	571	6
10:00 a.m.	5,230	1,896	14	3,072	1,080	8	2,158	816	6
11:00 a.m.	6,499	2,387	13	3,776	1,346	9	2,723	1,041	4
Noon	7,774	2,907	20	4,347	1,604	9	3,427	1,303	11
1:00 p.m.	8,136	3,073	25	4,399	1,634	12	3,737	1,439	13
2:00 p.m.	9,243	3,619	40	5,326	2,080	23	3,917	1,539	17
3:00 p.m.	10,535	4,144	45	6,398	2,493	26	4,137	1,651	19
4:00 p.m.	11,096	4,517	41	6,744	2,706	23	4,352	1,811	18
5:00 p.m.	11,351	4,659	53	7,078	2,963	27	4,273	1,696	26
6:00 p.m.	7,800	3,248	41	4,394	1,831	19	3,406	1,417	22
7:00 p.m.	5,794	2,319	41	3,061	1,183	24	2,733	1,136	17
8:00 p.m.	4,625	1,847	35	2,490	994	19	2,135	853	16
9:00 p.m.	4,730	1,881	36	2,453	976	16	2,277	905	20
10:00 p.m.	4,307	1,690	44	2,090	817	23	2,217	873	21
11:00 p.m.	4,030	1,550	45	1,735	680	16	2,295	870	29
TOTAL	132,056	51,713	726	74,380	28,906	355	57,676	22,807	371

Source: WSP

Traffic Deaths and Death Rates By County

Fifteen counties recorded a lower death rate than the statewide average of 1.85 deaths per 10,000 registered vehicles. Garfield and Wahkiakum did not record a single fatal crash in 1990, while King County recorded 170 traffic deaths. King County's death rate was below average at 1.28. Ferry County recorded the highest death rate in the state at 21.11, based upon nine deaths (Table 1-8a).

Table 1-8a

TRAFFIC DEATHS AND DEATH RATES*
By County

County	Deaths	Death Rate	County	Deaths	Death Rate
Adams	9	5.82	Lewis	26	4.29
Asotin	1	0.69	Lincoln	2	1.82
Benton	22	2.38	Mason	11	3.21
Chelan	12	2.27	Okanogan	11	3.71
Clallam	17	3.14	Pacific	2	1.23
Clark	36	1.73	Pend Oreille	3	3.64
Columbia	3	6.66	Pierce	85	1.90
Cowlitz	23	2.96	San Juan	1	1.00
Douglas	9	4.33	Skagit	24	2.90
Ferry	9	21.11	Skamania	2	3.57
Franklin	13	4.49	Snohomish	76	1.82
Garfield	0	0.00	Spokane	39	1.31
Grant	24	4.74	Stevens	16	6.50
Grays Harbor	15	2.61	Thurston	17	0.99
Island	8	1.83	Wahkiakum	0	0.00
Jefferson	3	1.67	Walla Walla	7	2.04
King	170	1.28	Whatcom	21	1.88
Kitsap	39	2.57	Whitman	7	2.54
Kittitas	11	4.51	Yakima	38	2.38
Klickitat	13	8.17			

* Traffic deaths per 10,000 registered vehicles

Source: WSP, DOL

Traffic Safety Statistics: 1972 to 1990

Exposure statistics, which includes total licensed drivers, population, vehicle registration and travel, have increased annually (average increases have been 1% to 5%). Motor vehicle collision and injury totals have followed a similar pattern. The annual traffic death total, on the other hand, has recorded a low of 761 deaths in 1974 to a high of 1,034 deaths in 1979. The fatality death rate (deaths per 100 million miles traveled) has decreased over the years, recording a high rate of 3.82 in 1972 and a low of 1.80 in 1989 (Table 1-8b).

Table 1-8b

TRAFFIC SAFETY STATISTICS
1972-1990

Year	Licensed Drivers	Population	Vehicle		Traffic			
			Registration	Millions of Miles*	Collisions**	Injuries	Deaths+	Fatality Rate++
1972	2,011,893	3,418,800	2,315,310	22,363.0	101,002	55,454	855	3.82
1973	2,113,460	3,424,300	2,453,880	23,457.0	105,515	58,039	776	3.31
1974	2,122,131	3,448,100	2,545,975	22,585.0	106,242	57,716	761	3.37
1975	2,176,505	3,493,990	2,640,944	24,023.0	120,635	64,145	771	3.21
1976	2,324,697	3,571,591	2,785,500	25,932.0	120,864	66,309	825	3.18
1977	2,339,215	3,661,975	2,952,383	27,449.0	119,058	71,356	927	3.38
1978	2,485,248	3,774,300	3,042,265	29,378.0	116,923	64,669	1,006	3.42
1979	2,579,368	3,911,200	3,186,898	29,122.0	118,686	65,399	1,034	3.55
1980	2,662,659	4,132,353	3,293,065	28,696.0	113,751	61,532	985	3.43
1981	2,732,722	4,250,200	3,408,871	30,346.0	111,993	61,083	872	2.87
1982	2,774,212	4,264,000	3,313,348	30,353.0	100,644	54,789	757	2.49
1983	2,867,032	4,285,100	3,372,966	32,275.0	106,597	58,317	705	2.18
1984	2,973,468	4,328,100	3,459,772	33,344.0	111,655	61,366	761	2.28
1985	2,980,717	4,384,100	3,546,152	33,978.0	120,056	63,806	756	2.22
1986	3,029,375	4,419,700	3,651,102	36,416.0	122,918	66,707	714	1.96
1987	3,156,600	4,481,100	3,833,058	38,520.0	126,807	67,665	790	2.05
1988	3,264,065	4,565,000	3,896,828	41,698.0	125,920	72,449	785	1.88
1989	3,350,324	4,660,700	4,084,367	43,449.3	128,800	73,993	781	1.80
1990	3,366,146	4,866,692	4,233,853	44,694.0	132,056	76,064	825	1.85

Source: WSP, OFM, DOL, WSDOT

* Estimated for 1990

** 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.

Collisions By Age Group

Drivers 20 years and under comprised 6.8% of all licensed drivers in the state last year, yet this group was involved in 14.7% of the fatal crashes and 16.2% of total collisions in 1990. This was a collision over-representation rate of 2.40 for these drivers. The 21-24 age group was involved in 12.0% of the total collisions while comprising 7.5% of all licensed drivers, producing an over-representation factor of 1.59. Senior drivers 55 years and older were involved in 13.79% of the collisions while comprising 22.2% of all licensed drivers, producing an under-representation ratio of 0.62 (Table 1-9).

Table 1-9

DRIVER DISTRIBUTION
By Age Group & Sex - 1990

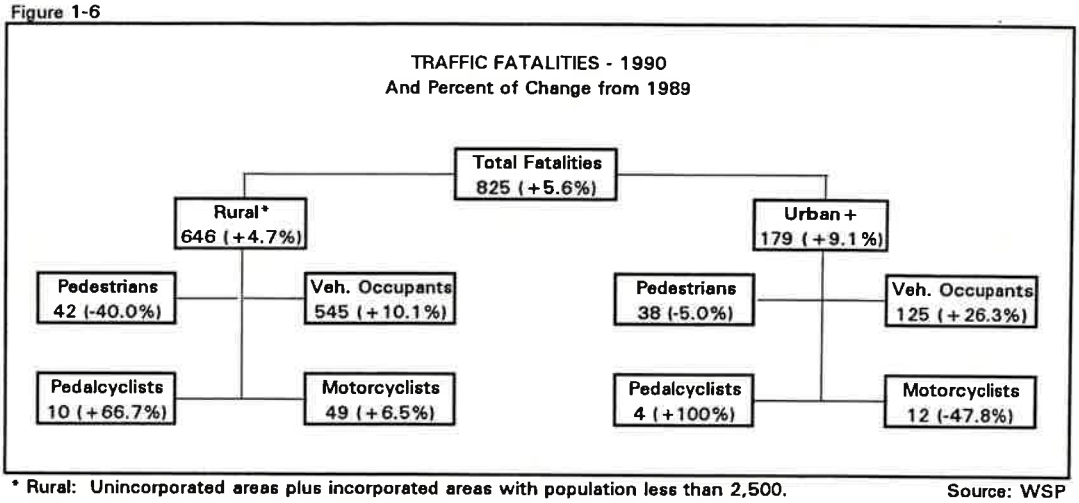
Age Group	Involved in Collisions				Total Licensed Drivers		Over/Under Ratio	
	Total		Fatal					
	Number	%	Number	%	Number	%	Total	Fatal
Under 16	644	0.32%	7	0.66%	0	0.00%	****	****
16	4,405	2.16%	18	1.71%	22,205	0.66%	3.28	2.59
17	6,162	3.02%	25	2.37%	39,789	1.18%	2.56	2.01
18	7,266	3.57%	41	3.89%	48,168	1.43%	2.49	2.72
19	7,451	3.66%	26	2.47%	59,215	1.76%	2.08	1.40
20	7,153	3.51%	38	3.61%	59,057	1.75%	2.00	2.06
21	6,650	3.26%	35	3.32%	63,830	1.90%	1.72	1.75
22	6,241	3.06%	45	4.27%	63,798	1.90%	1.62	2.25
23	5,875	2.88%	23	2.18%	65,315	1.94%	1.49	1.13
24	5,698	2.80%	26	2.47%	60,314	1.79%	1.56	1.38
25-29	28,997	14.23%	163	15.48%	376,324	11.18%	1.27	1.38
30-34	26,638	13.07%	135	12.82%	422,477	12.55%	1.04	1.02
35-39	22,556	11.07%	113	10.73%	422,457	12.55%	0.88	0.86
40-44	18,184	8.93%	101	9.59%	385,389	11.45%	0.78	0.84
45-49	12,742	6.25%	60	5.70%	284,642	8.46%	0.74	0.67
50-54	8,977	4.41%	40	3.80%	211,546	6.28%	0.70	0.60
55-59	7,113	3.49%	45	4.27%	177,657	5.28%	0.66	0.81
60-64	6,152	3.02%	24	2.28%	169,059	5.02%	0.60	0.45
65-69	5,387	2.64%	27	2.56%	161,511	4.80%	0.55	0.53
70 & Over	9,451	4.64%	61	5.79%	273,393	8.12%	0.57	0.71
TOTAL*	203,742	100.00%	1,053	100.00%	3,366,146	100.00%		
Male	137,187	62.53%	814	77.01%	1,747,522	51.91%	1.20	1.48
Female	82,200	37.47%	243	22.99%	1,618,624	48.09%	0.78	0.48
TOTAL**	219,387	100.00%	1,057	100.00%	3,366,146	100.00%		

Source: WSP, DOL

*Total does not include 30,473 drivers in total collisions and 16 drivers in fatal collisions whose age was not stated.

**Total does not include 14,828 drivers in total collisions and 12 drivers in fatal collisions whose sex was not stated.

Figure 1-6



* Rural: Unincorporated areas plus incorporated areas with population less than 2,500.

\+ Urban: Cities with population 2,500 and greater.

Source: WSP

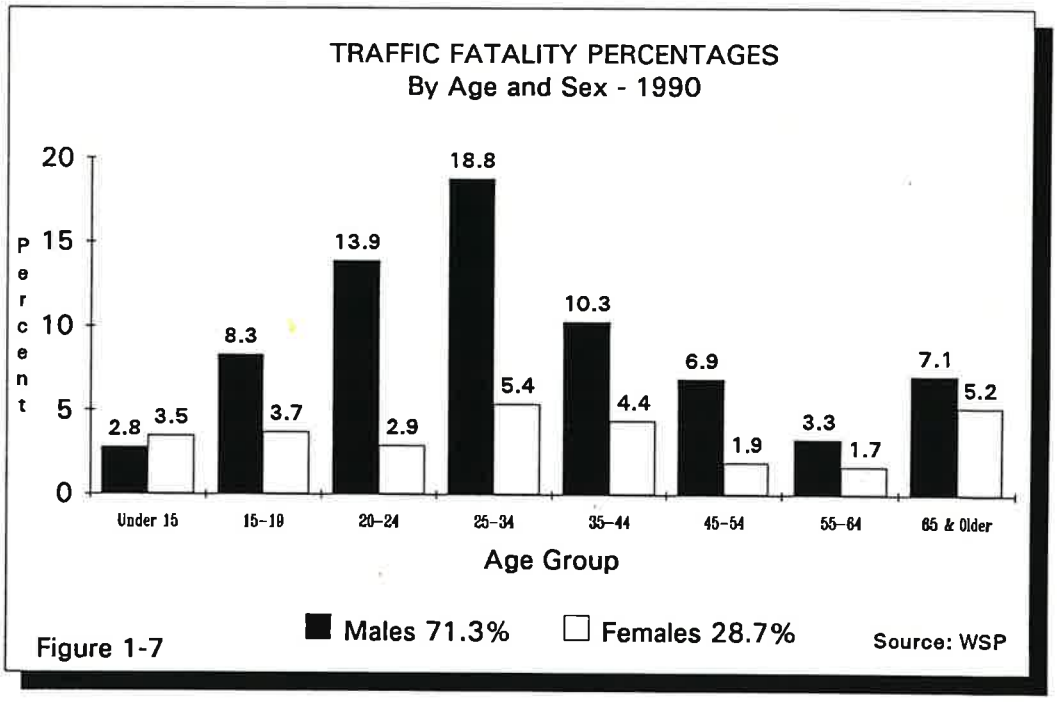


Figure 1-7

Source: WSP

Collisions By Type

Single-vehicle collisions and vehicle-pedestrian collisions have remained relatively constant over the past seven years, with 27,000 and 1,700 respectively in 1990. Multiple vehicle collisions have increased steadily from 1982 to1990, recording 99,949 collisions in 1990. Vehicle-pedalcyclist collisions have ranged from a low of 1,056 in 1982 to a high of 1,575 in 1987. There were 1,364 collisions in 1990 (Figures 1-9, 1-10, 1-11).

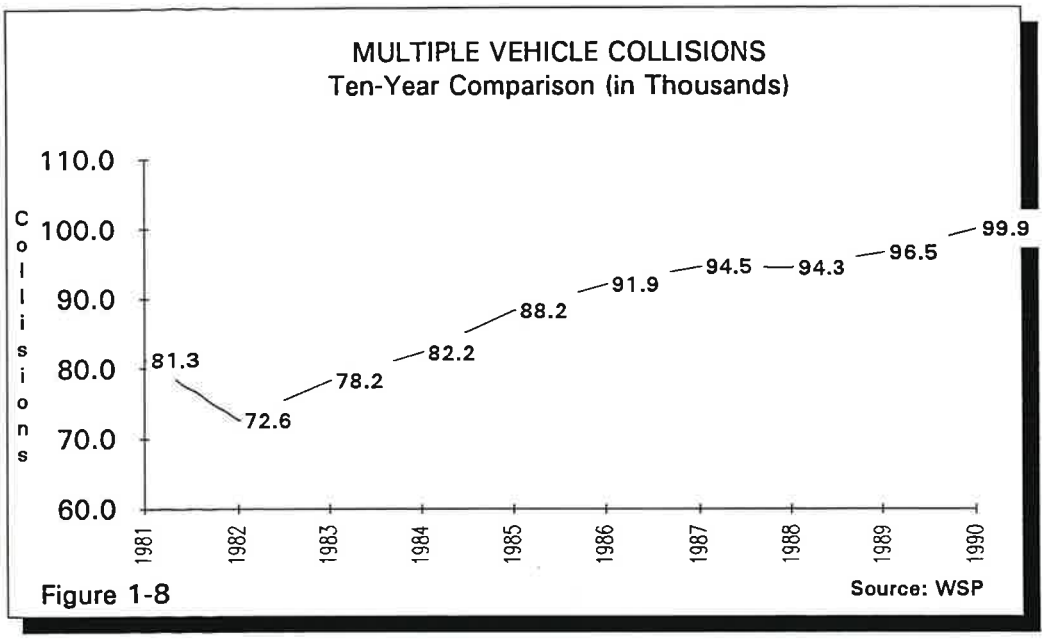


Figure 1-8

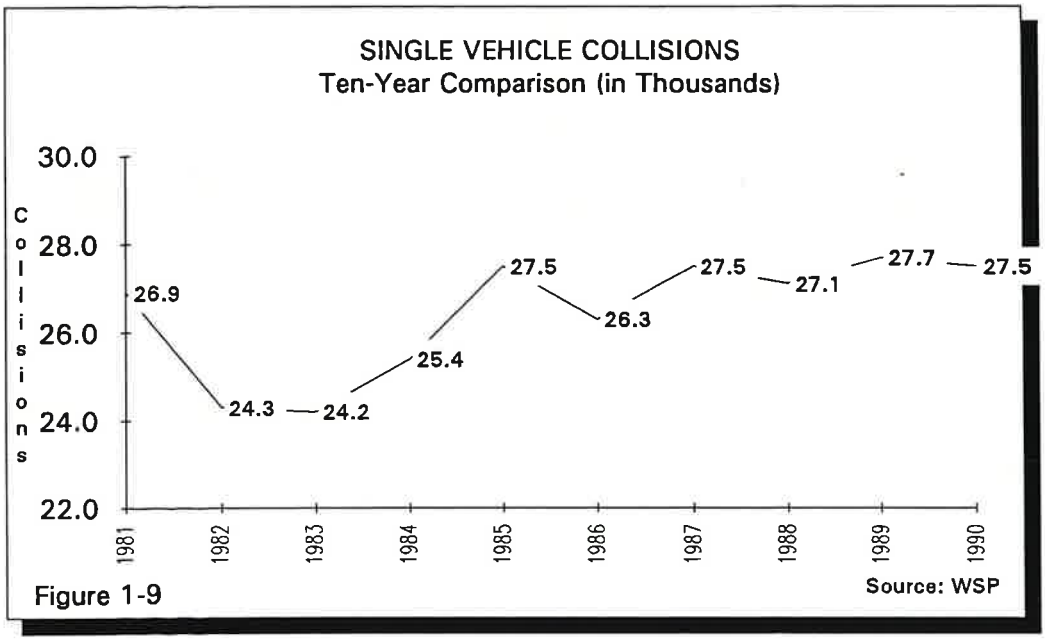


Figure 1-9

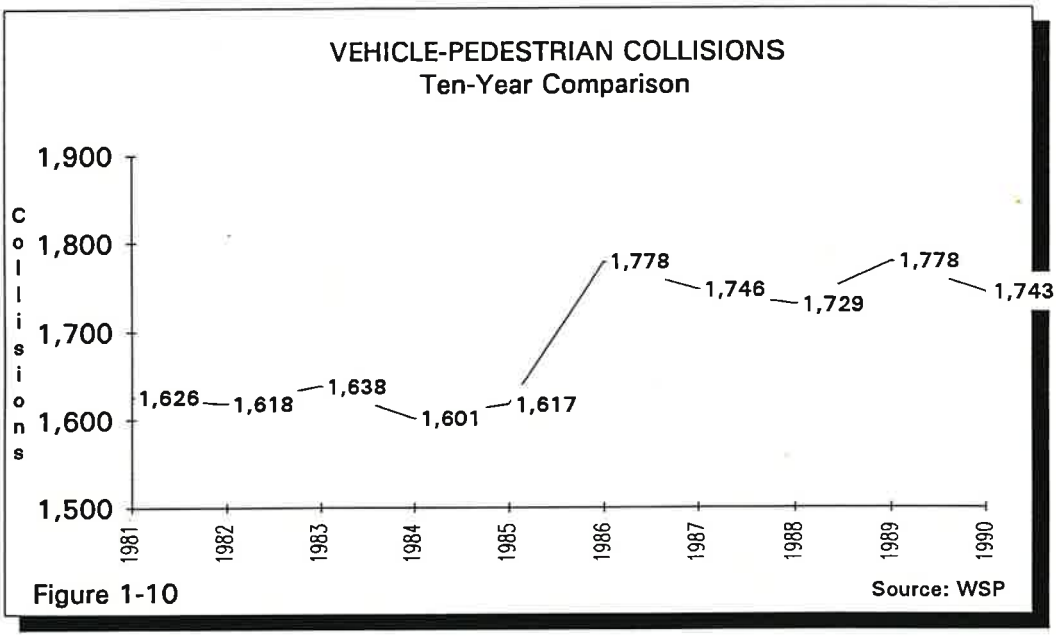


Figure 1-10

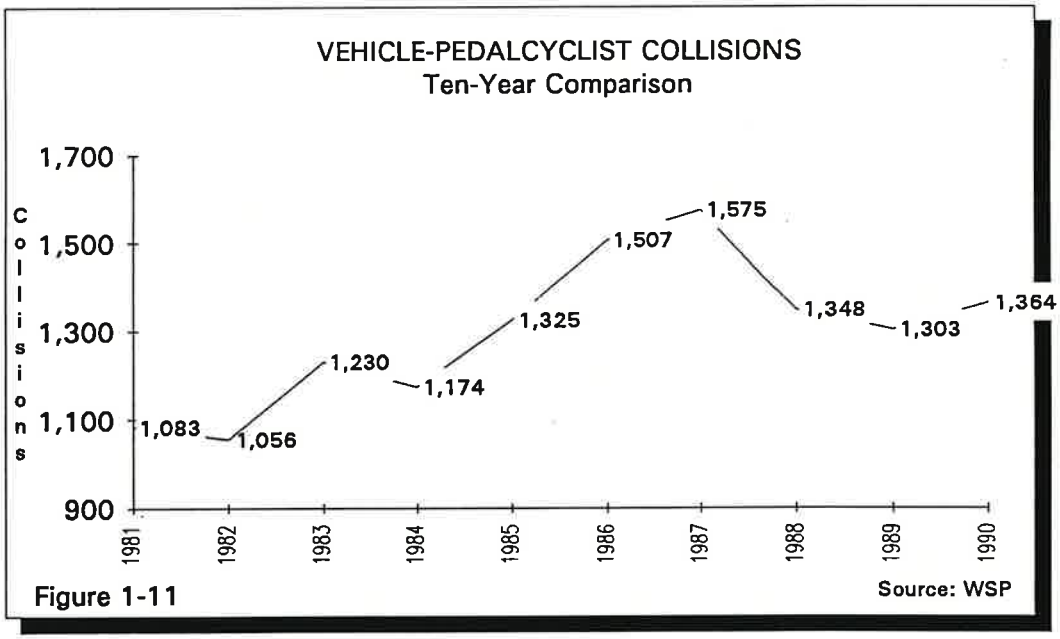


Figure 1-11

Collision Rates By County/City Population

Population collision rates ranged from a low of 12.44 collisions per 1,000 population in Asotin County to a high of 41.53 in Kittitas County for 1990. In the cities of 10,000 population and greater, Oak Harbor recorded the lowest rate at 14.21, while the city of Tukwila recorded the highest rate with 134.83. Note: Collisions on the interstate system were not included in the city totals (Tables 1-10, 1-11).

Table 1-10

COLLISION RATES BY COUNTY POPULATION - 1990

County	Population	Traffic Deaths		Traffic Injuries		Total Collisions	
		Number	Rate*	Number	Rate**	Number	Rate**
Over 1,000,000							
1. King	1,507,319	170	11.28	27,362	18.15	49,666	32.95
250,000 to 750,000							
1. Pierce	586,203	85	14.50	10,620	18.12	15,906	27.13
2. Snohomish	465,642	76	16.32	7,477	16.06	12,248	26.30
3. Spokane	361,364	39	10.79	5,077	14.05	8,850	24.49
100,000 to 250,000							
1. Clark	238,053	36	15.12	3,263	13.71	5,449	22.89
2. Kitsap	189,731	39	20.56	2,591	13.66	4,444	23.42
3. Yakima	188,823	38	20.12	2,412	12.77	4,241	22.46
4. Thurston	161,238	17	10.54	2,269	14.07	4,196	26.02
5. Whatcom	127,780	21	16.43	1,848	14.46	3,344	26.17
6. Benton	112,560	22	19.55	1,103	9.80	2,126	18.89
50,000 to 100,000							
1. Cowlitz	82,119	23	28.01	1,161	14.14	2,164	26.35
2. Skagit	79,555	24	30.17	1,285	16.15	2,225	27.97
3. Grays Harbor	64,175	15	23.37	798	12.43	1,714	26.71
4. Island	60,195	8	13.29	548	9.10	950	15.78
5. Lewis	59,358	26	43.80	875	14.74	1,739	29.30
6. Clallam	56,464	17	30.11	634	11.23	1,155	20.46
7. Grant	54,758	24	43.83	685	12.51	1,032	18.85
8. Chelan	52,250	12	22.97	754	14.43	1,373	26.28
25,000 to 50,000							
1. Walla Walla	48,439	7	14.45	533	11.00	963	19.88
2. Whitman	38,775	7	18.05	421	10.86	744	19.19
3. Mason	38,341	11	28.69	548	14.29	943	24.60
4. Franklin	37,473	13	34.69	430	11.47	766	20.44
5. Okanogan	33,350	11	32.98	386	11.57	669	20.06
6. Stevens	30,948	16	51.70	352	11.37	540	17.45
7. Kittitas	26,725	11	41.16	543	20.32	1,110	41.53
8. Douglas	26,205	9	34.34	264	10.07	449	17.13
10,000 to 25,000							
1. Jefferson	20,146	3	14.89	290	14.39	502	24.92
2. Pacific	18,882	2	10.59	223	11.81	426	22.56
3. Asotin	17,605	1	5.68	108	6.13	219	12.44
4. Klickitat	16,616	13	78.24	254	15.29	348	20.94
5. Adams	13,603	9	66.16	221	16.25	380	27.94
6. San Juan	10,035	1	9.97	75	7.47	156	15.55
Under 10,000							
1. Pend Oreille	8,915	3	33.65	137	15.37	210	23.56
2. Lincoln	8,864	2	22.56	118	13.31	179	20.19
3. Skamania	8,289	2	24.13	167	20.15	211	25.46
4. Ferry	6,295	9	142.97	101	16.04	181	28.75
5. Columbia	4,024	3	74.55	58	14.41	115	28.58
6. Wahkiakum	3,327	0	0.00	33	9.92	73	21.94
7. Garfield	2,248	0	0.00	40	17.79	50	22.24
TOTAL	4,866,692	825	16.95	76,064	15.63	132,056	27.13

*Frequency per 100,000 population

**Frequency per 1,000 population

Source: WSP, OFM

Table 1-10a

TRAFFIC COLLISIONS AND COLLISIONS RATES IN UNINCORPORATED AREAS
By County & Population - 1990

County	Unincorp. Population	Total Collisions		Traffic Fatalities		Traffic Injuries		Pedestrians		Pedalcyclists	
		Number	Rate**	Number	Rate*	Number	Rate**	Fatals & Injuries	Rate*	Fatals & Injuries	Rate*
Over 100,000											
1. King	513,345	10,385	20.23	86	16.75	6,496	12.65	164	31.95	100	19.48
2. Pierce	339,920	7,011	20.63	55	16.18	4,888	14.38	78	22.95	58	17.06
3. Snohomish	259,757	5,531	21.29	61	23.48	3,851	14.83	41	15.78	8	3.08
4. Clark	173,879	3,624	20.84	32	18.40	2,386	13.72	29	16.68	39	22.43
5. Spokane	165,442	2,981	18.02	32	19.34	1,927	11.65	17	10.28	25	15.11
6. Kitsap	138,676	2,813	20.28	34	24.52	1,837	13.25	22	15.86	29	20.91
25,000 to 100,000											
1. Thurston	93,987	1,766	18.79	14	14.90	1,093	11.63	8	8.51	13	13.83
2. Yakima	88,241	1,710	19.38	37	41.93	1,225	13.88	10	11.33	9	10.20
3. Whatcom	59,187	1,583	26.75	18	30.41	1,057	17.86	12	20.27	8	13.52
4. Island	40,797	249	6.10	4	9.80	137	3.36	2	4.90	1	2.45
5. Skagit	37,797	1,145	30.29	23	60.85	736	19.47	13	34.39	8	21.17
6. Lewis	35,829	1,051	29.33	24	66.98	584	16.30	5	13.96	5	13.96
7. Cowlitz	33,117	796	24.04	17	51.33	435	13.14	3	9.06	3	9.06
8. Clallam	32,235	587	18.21	15	46.53	390	12.10	5	15.51	2	6.20
9. Mason	31,100	723	23.25	11	35.37	451	14.50	8	25.72	1	3.22
10. Benton	27,842	423	15.19	16	57.47	259	9.30	5	17.96	4	14.37
11. Grant	26,395	645	24.44	21	79.56	480	18.19	2	7.58	3	11.37
10,000 to 25,000											
1. Grays Harbor	24,987	834	33.38	13	52.03	493	19.73	8	32.02	3	12.01
2. Chelan	22,757	677	29.75	12	52.73	419	18.41	4	17.58	4	17.58
3. Stevens	22,644	477	21.07	16	70.66	330	14.57	2	8.83	5	22.08
4. Douglas	19,958	449	22.50	9	45.09	264	13.23	6	30.06	7	35.07
5. Okanogan	19,347	608	31.43	11	56.86	347	17.94	5	25.84	3	15.51
6. Franklin	14,712	211	14.34	10	67.97	148	10.06	0	0.00	0	0.00
7. Walla Walla	14,388	341	23.70	7	48.65	235	16.33	3	20.85	4	27.80
8. Jefferson	13,145	396	30.13	3	22.82	256	19.48	0	0.00	4	30.43
9. Pacific	12,356	382	30.92	2	16.19	207	16.75	6	48.56	2	16.19
10. Klickitat	10,791	329	30.49	13	120.47	241	22.33	2	18.53	0	0.00
11. Kittitas	10,417	896	86.01	11	105.60	456	43.77	1	9.60	0	0.00
Under 10,000											
1. Asotin	9,871	86	8.71	1	10.13	60	6.08	2	20.26	0	0.00
2. San Juan	8,543	156	18.26	1	11.71	75	8.78	3	35.12	3	35.12
3. Skamania	6,711	211	31.44	2	29.80	167	24.88	0	0.00	0	0.00
4. Whitman	6,677	359	53.77	6	89.86	267	39.99	2	29.95	2	29.95
5. Adams	6,466	302	46.71	9	139.19	187	28.92	2	30.93	0	0.00
6. Pend Oreille	6,114	210	34.35	3	49.07	137	22.41	1	16.36	0	0.00
7. Ferry	5,355	181	33.80	9	168.07	101	18.86	2	37.35	2	37.35
8. Lincoln	3,669	179	48.79	2	54.51	118	32.16	2	54.51	1	27.26
9. Wahkiakum	2,819	73	25.90	0	0.00	33	11.71	0	0.00	0	0.00
10. Columbia	1,386	96	69.26	3	216.45	58	41.85	0	0.00	0	0.00
11. Garfield	855	50	58.48	0	0.00	40	46.78	0	0.00	1	116.96
TOTAL	2,341,514	50,526	21.58	643	27.46	32,871	14.04	475	738.72	357	555.21

Source: WSP, OFM

*Frequency per 100,000 population
**Frequency per 1,000 population

Table 1-11

COLLISION RATES* BY CITY POPULATION - 1990

City	Population	Traffic Deaths		Traffic Injuries		Total Collisions	
		Number	Rate**	Number	Rate+	Number	Rate+
250,000 and Over							
1. Seattle	516,259	42	8.14	11,673	22.61	22,263	43.12
100,000 to 250,000							
1. Spokane	177,196	7	3.95	3,105	17.52	5,769	32.56
2. Tacoma	176,664	21	11.89	4,907	27.78	7,263	41.11
50,000 to 100,000							
1. Bellevue	86,874	4	4.60	1,523	17.53	3,047	35.07
2. Everett	69,961	11	15.72	1,823	26.06	3,157	45.13
3. Federal Way	67,304	9	13.37	1,152	17.12	1,803	26.79
4. Yakima	54,827	1	1.82	942	17.18	1,961	35.77
5. Bellingham	52,174	3	5.75	709	13.59	1,550	29.71
25,000 to 50,000							
1. Vancouver	46,380	3	6.47	741	15.98	1,550	33.42
2. Kennewick	42,159	1	2.37	536	12.71	1,043	24.74
3. Renton	41,688	5	11.99	1,021	24.49	2,177	52.22
4. Kirkland	40,052	1	2.50	717	17.90	1,382	34.51
5. Bremerton	38,142	5	13.11	591	15.49	1,270	33.30
6. Kent	37,960	7	18.44	1,127	29.69	1,997	52.61
7. Redmond	35,800	3	8.38	497	13.88	1,057	29.53
8. Olympia	33,840	1	2.96	673	19.89	1,408	41.61
9. Auburn	33,102	4	12.08	750	22.66	1,370	41.39
10. Richland	32,315	2	6.19	279	8.63	589	18.23
11. Longview	31,499	1	3.17	492	15.62	883	28.03
12. Edmonds	30,744	0	0.00	296	9.63	543	17.66
13. Lynnwood	28,695	3	10.45	755	26.31	1,529	53.28
14. Walla Walla	26,478	0	0.00	264	9.97	572	21.60
15,000 to 25,000							
1. Puyallup	23,875	3	12.57	376	15.75	762	31.92
2. Pullman	23,478	1	4.26	147	6.26	344	14.65
3. Sea Tac	22,694	0	0.00	585	25.78	874	38.51
4. Wenatchee	21,839	0	0.00	300	13.74	633	28.98
5. Mercer Island	20,816	2	9.61	184	8.84	370	17.77
6. Pasco	20,337	3	14.75	282	13.87	555	27.29
7. Mountlake Terrace	19,320	0	0.00	194	10.04	402	20.81
8. Lacey	19,279	0	0.00	302	15.66	625	32.42
9. Port Angeles	17,710	2	11.29	201	11.35	400	22.59
10. Mount Vernon	17,647	1	5.67	278	15.75	488	27.65
11. Des Moines	17,283	0	0.00	177	10.24	325	18.80
12. Oak Harbor	17,176	1	5.82	107	6.23	244	14.21
13. Aberdeen	16,565	2	12.07	204	12.32	606	36.58
10,000 to 15,000							
1. Ellensburg	12,361	0	0.00	87	7.04	214	17.31
2. Centralia	12,101	2	16.53	201	16.61	441	36.44
3. Bothell	11,986	0	0.00	129	10.76	270	22.53
4. Tukwila	11,874	7	58.95	958	80.68	1,601	134.83
5. Kelso	11,820	5	42.30	214	18.10	440	37.23
6. Anacortes	11,451	0	0.00	78	6.81	196	17.12
7. Sunnyside	11,238	0	0.00	81	7.21	165	14.68
8. Moses Lake	11,235	3	26.70	162	14.42	289	25.72
9. Marysville	10,328	1	9.68	207	20.04	427	41.34
TOTAL	2,062,526	167	8.10	40,027	19.41	74,854	36.29

*Does not include collisions occuring on the interstate system

Source: WSP, OFM

**Frequency per 100,000 population

+Frequency per 1,000 population

II. Alcohol Involvement

The number of drivers involved in alcohol-related investigated collisions has decreased from 12.3% in 1986 to 10.8% in 1990 (Figure 2-1). Drivers involved in alcohol-related injury collisions decreased from 13.7% during the previous 3-year average to 13.0 in 1990. Drivers involved in fatal crashes, however, increased from the previous 3-year average of 37.3% to 37.9%, a 1.5% increase (Tables 2-1, 2-1b).

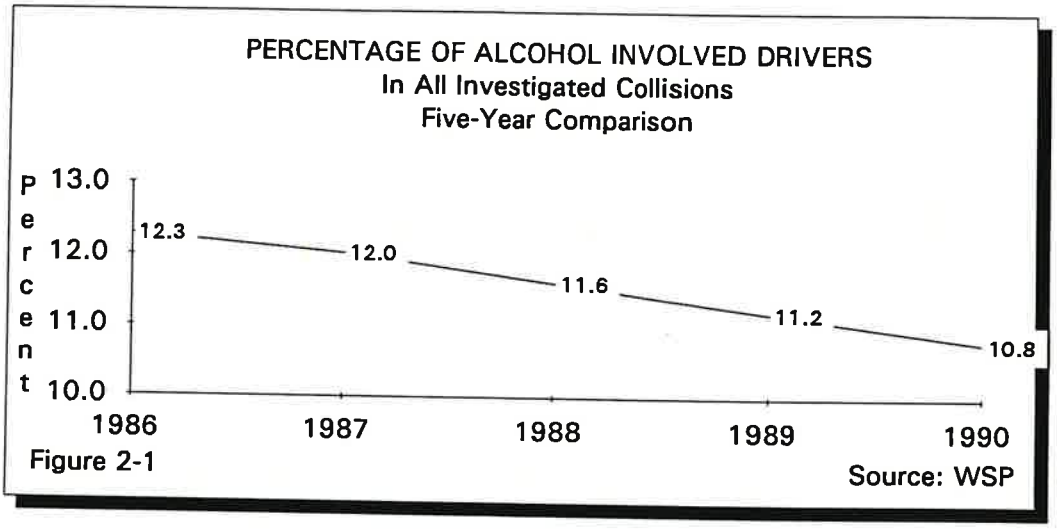


Figure 2-1

Table 2-1

SOBRIETY OF DRIVERS IN FATAL COLLISIONS
Comparisons with Previous Years

Sobriety of Driver	Year 1990	Year 1989	Previous 3 -Year Average	1990 Change From 1989	1990 Change From 3-Year Avg
Had been drinking - ability impaired	324	309	315	4.9%	2.9%
Had been drinking - ability not impaired	41	33	39	24.2%	4.2%
Had been drinking - sobriety unknown	23	12	17	91.7%	35.3%
Had not been drinking	636	657	624	-3.2%	1.9%
Not stated	45	37	41	21.6%	8.9%
Total drivers drinking	388	354	371	9.6%	4.5%
Total drivers - excluding not stated	1,024	1,011	996	1.3%	2.8%
Total drivers	1,069	1,048	1,037	2.0%	3.1%
Number drinking drivers per 100 involved	37.9	35.0	37.3	8.2%	1.5%
Number drunk drivers per 100 involved	31.6	30.6	31.6	3.5%	0.0%

Source: WSP

Table 2-1a

SOBRIETY OF DRIVERS INVOLVED IN INJURY COLLISIONS
Comparisons with Previous Years

Sobriety of Driver	Year		Previous 3 -Year Average	1990 Change	
	1990	1989		From 1989	From 3-Year Avg
Had been drinking - ability impaired	5,669	5,677	5,364	-0.1%	5.7%
Had been drinking - ability not impaired	1,547	1,620	1,665	-4.5%	-7.1%
Had been drinking - sobriety unknown	1,868	1,796	2,087	4.0%	-10.5%
Had not been drinking	60,603	58,541	57,695	3.5%	5.0%
Not stated	6,454	5,812	5,355	11.0%	20.5%
Total drivers drinking	9,084	9,093	9,116	-0.1%	-0.4%
Total drivers - excluding not stated	69,687	67,634	66,812	3.0%	4.3%
Total drivers	76,141	73,446	72,167	3.7%	5.5%
No. drinking drivers per 100 involved	13.0	13.4	13.7	-3.0%	-4.6%
No. drunk drivers per 100 involved	8.1	8.4	8.0	-3.1%	1.3%

Source: WSP

Table 2-1b

SOBRIETY OF DRIVERS INVOLVED IN INVESTIGATED COLLISIONS
Comparisons with Previous Years

Sobriety of Driver	Year		Previous 3-Year Average	1990 Change	
	1990	1989		From 1989	From 3-Year Avg
Had been drinking - ability impaired	9,973	9,901	9,629	0.7%	3.6%
Had been drinking - ability not impaired	3,118	3,184	3,367	-2.1%	-7.4%
Had been drinking - sobriety unknown	3,669	3,671	4,703	-0.1%	-22.0%
Had not been drinking	138,604	132,731	134,533	4.4%	3.0%
Not stated	21,569	19,181	17,580	12.4%	22.7%
Total drivers drinking	16,760	16,756	17,699	0.0%	-5.3%
Total drivers - excluding not stated	155,364	149,487	152,232	3.9%	2.1%
Total drivers	176,933	168,668	169,812	4.9%	4.2%
Number drinking drivers per 100 involved	10.8	11.2	11.6	-3.8%	-7.2%
Number drunk drivers per 100 involved	6.4	6.6	6.3	-3.1%	1.4%

Source: WSP

Alcohol Involvement By Age Group

Drivers under 30 years of age continue to be over-represented in alcohol-related collisions. The 16-20 year old group composed 6.8% of the licensed drivers in the state in 1990, but they were involved in 13.1% of the alcohol-related collisions, creating an over-representation rate of 1.97 (Figure 2-2). The over-involvement ratio for drivers aged 21-24 was 2.35 in 1990, down slightly over the past five years. The age groups of 30-54, 55-64 and 65-and-older were all under-represented (Figures 2-5, 2-6, 2-7).

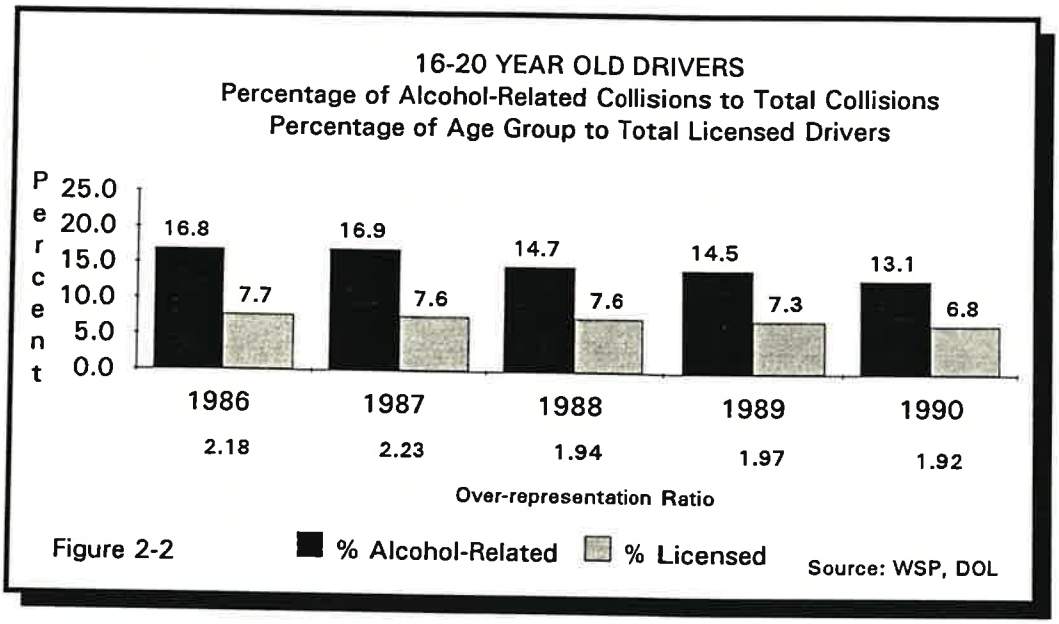


Figure 2-2

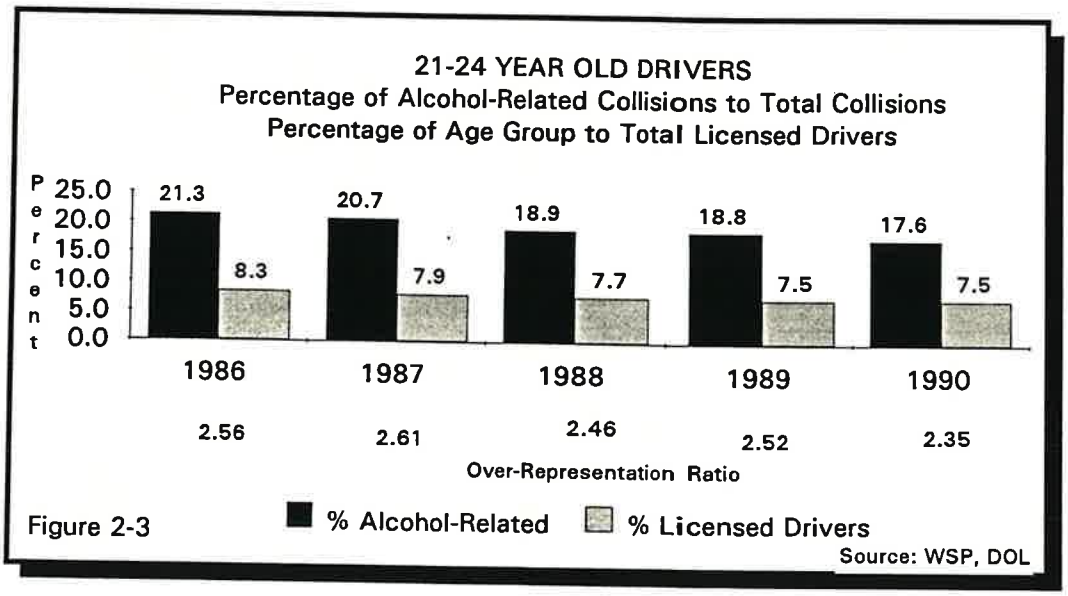


Figure 2-3

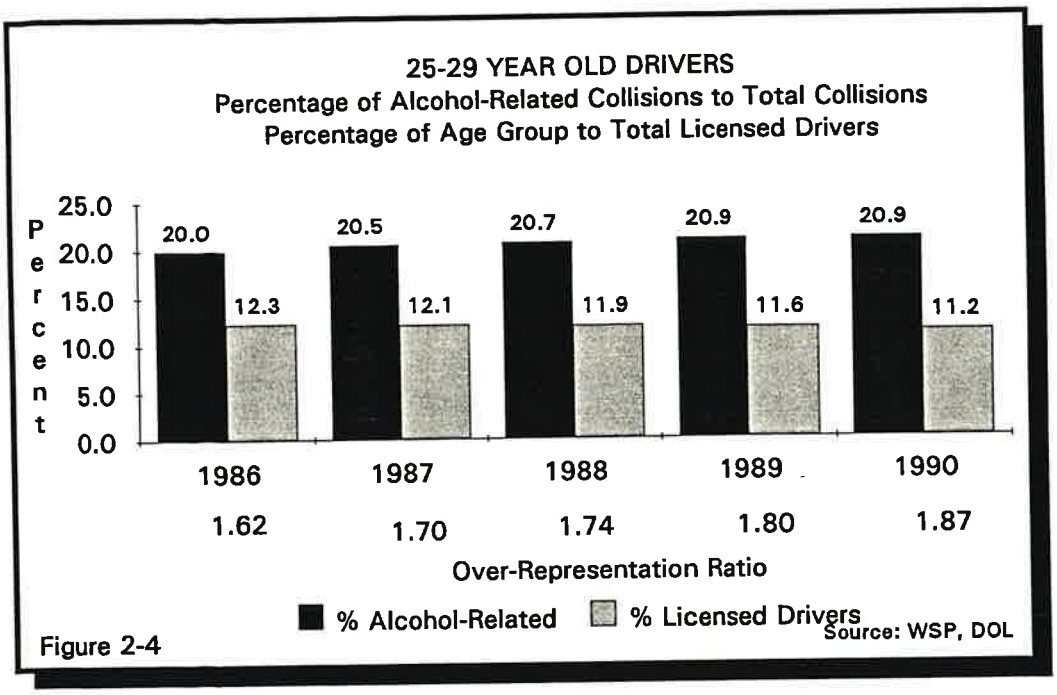


Figure 2-4

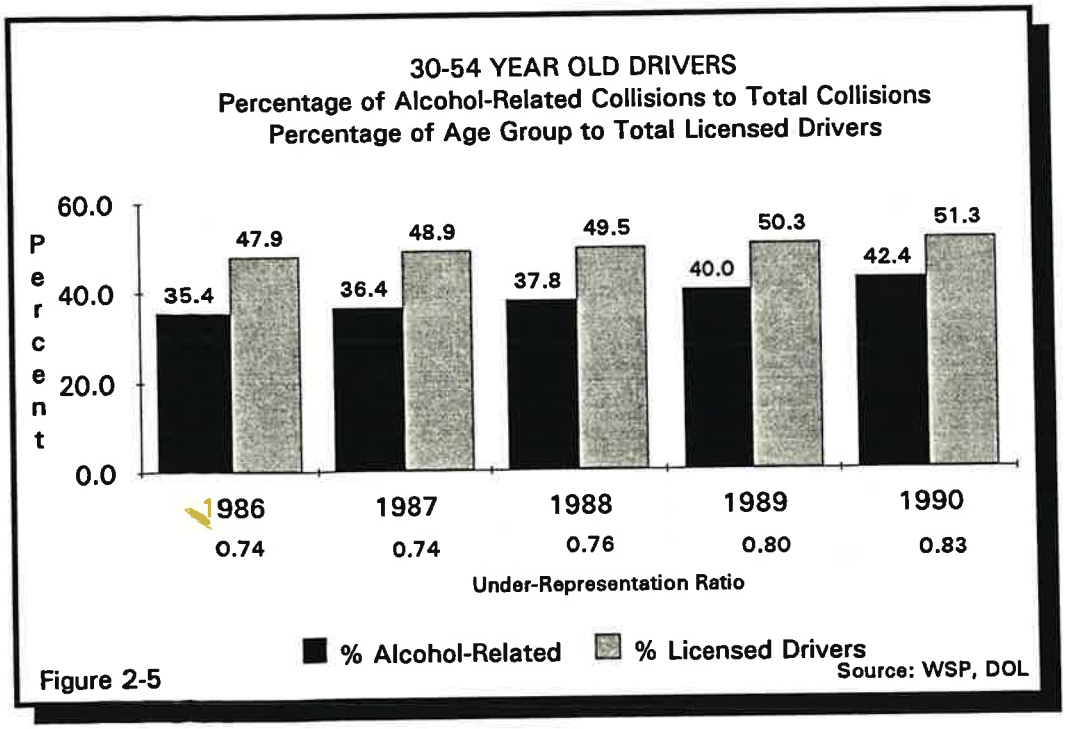


Figure 2-5

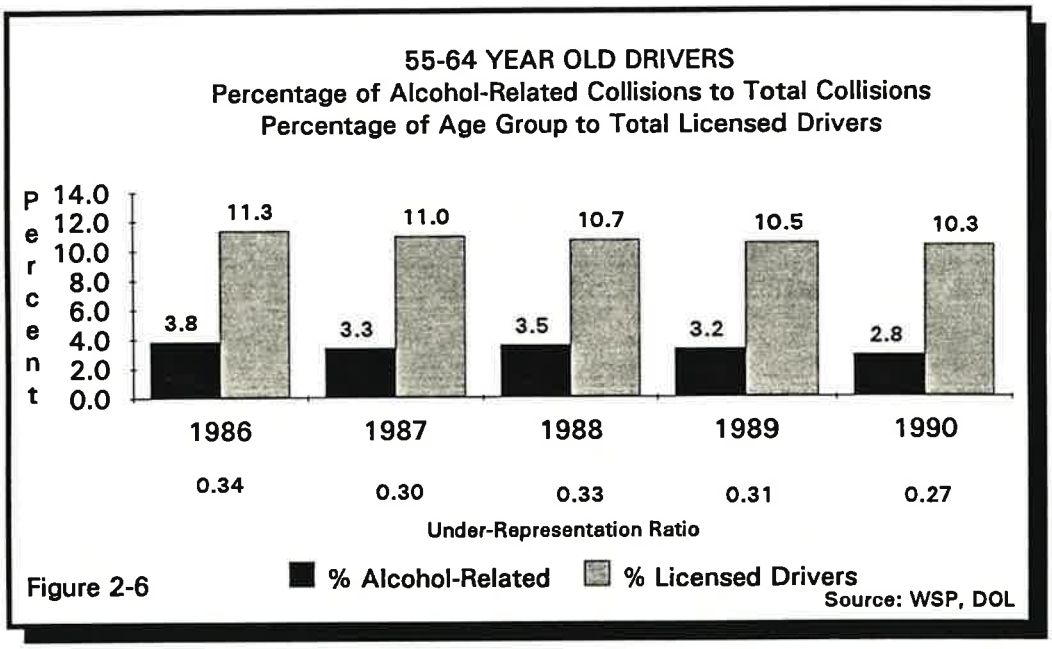


Figure 2-6

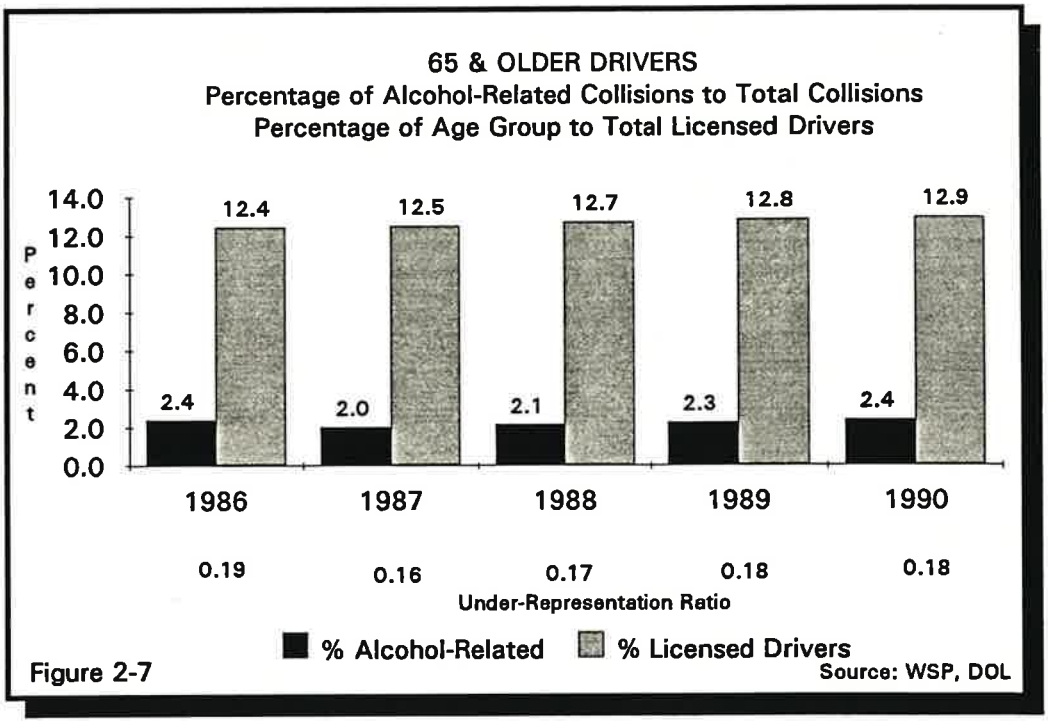


Figure 2-7

Collision Severity By Extent of Alcohol Involvement

Table 2-3 presents a summary of persons killed and injured, number of property-damage only collisions, and total investigated collisions for drivers under the influence (legally drunk: BAC of .10 or greater), all drinking drivers (including drunk drivers), and non-drinking drivers. Increases were recorded in all injury categories for 1990 with the exception of disabling injuries for drivers under the influence, and disabling injuries and non-disabling injuries for drivers who had been drinking, and in non-drinking driver collisions (Table 2-3).

Table 2-3

PERSONS KILLED & INJURED IN ALCOHOL-RELATED COLLISIONS
Two-Year Comparison

	Driver Under Influence			Driver-Had Been Drinking*			Non-Drinking Driver***		
Status	1990	1989	% of Chng	1990	1989	% of Chng	1990	1989	% of Chng
Persons Killed	371	353	5.1%	431	392	9.9%	398	389	2.3%
Persons Injured:									
Disabling	1,801	1,840	-2.1%	2,476	2,595	-4.6%	5,094	5,280	-3.5%
Non-Disabling	4,322	4,316	0.1%	6,486	6,516	-0.5%	17,748	17,927	-1.0%
Possible Injury	2,893	2,742	5.5%	4,787	4,549	5.2%	28,478	25,956	9.7%
Total Injured	9,016	8,898	1.3%	13,749	13,660	0.7%	51,320	49,163	4.4%
Prop. Damage**	3,963	3,888	1.9%	6,959	7,000	-0.6%	51,898	48,920	6.1%
Total Collisions	9,887	9,816	0.7%	15,998	16,061	-0.4%	86,344	82,237	5.0%

*Including drivers Under the Influence

**Minimum damage: $500

***Investigated collisions only

Source: WSP

DWI Convictions

DWI convictions increased for the second consecutive year after a seven year decrease. DWI drivers involved in investigated collisions has been increasing slightly eash year since 1985 (Figure2-8).

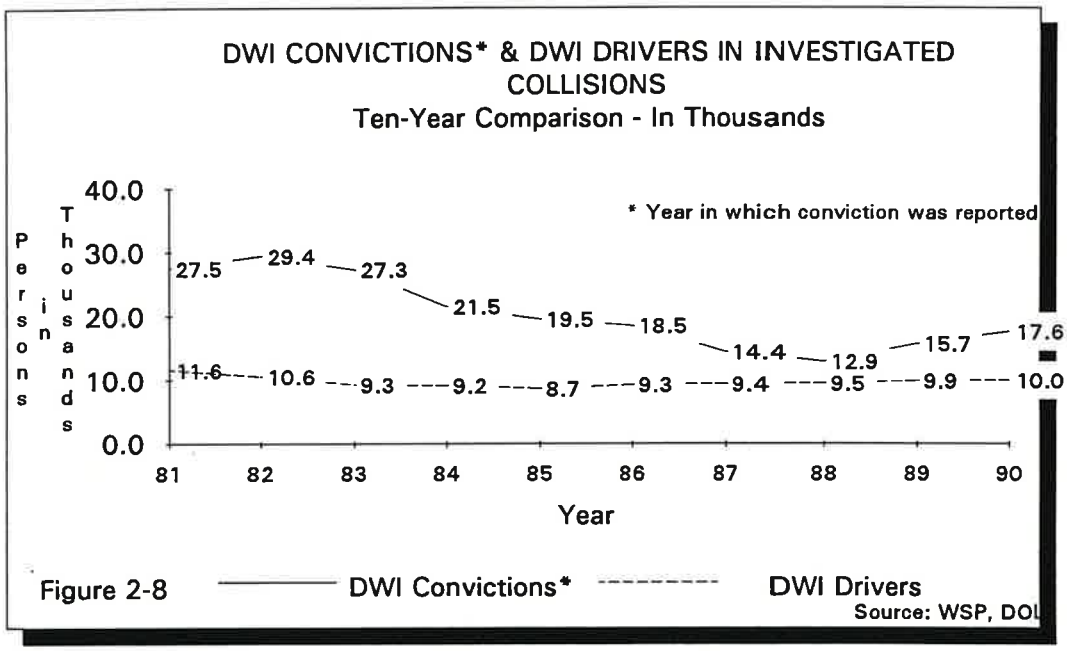


Figure 2-8

Location of Alcohol-Related Collisions - Multiple and Single

Alcohol-related collisions decreased in rural areas and increased in urban areas during 1990. During that year, 52.5% of the alcohol-related collisions occurred in rural areas and 47.5% occurred in urban areas (Figure 2-9). Multiple-vehicle collisions comprised 66.2% of collisions occurring in the urban areas (Figure 2-10), while single-vehicle collisions made up 64.0% of collisions occurring in rural areas (Figure 2-11).

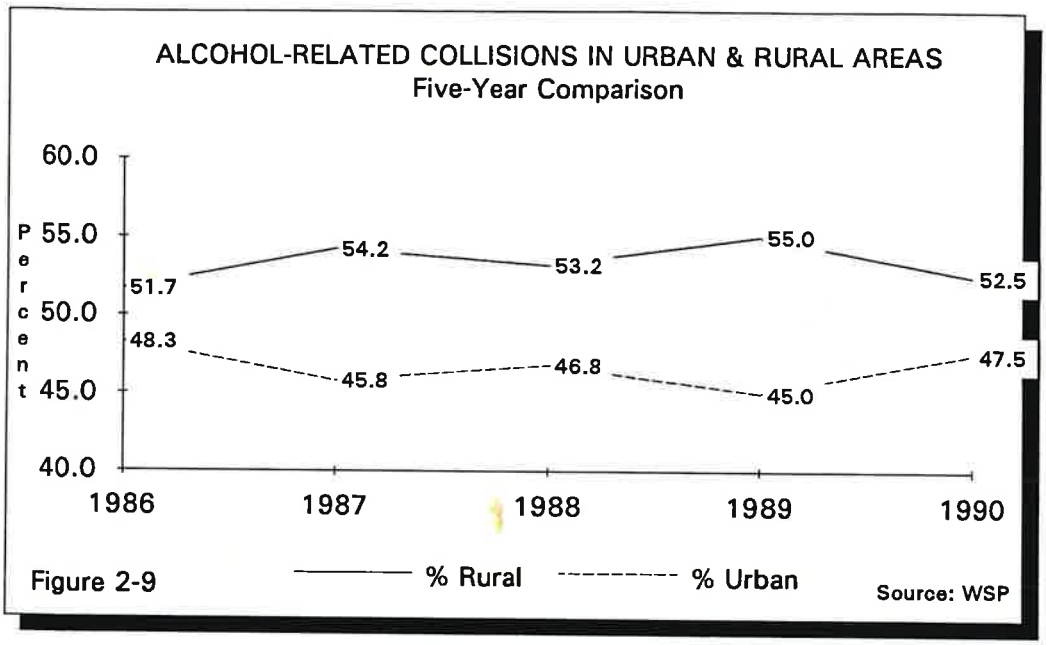


Figure 2-9

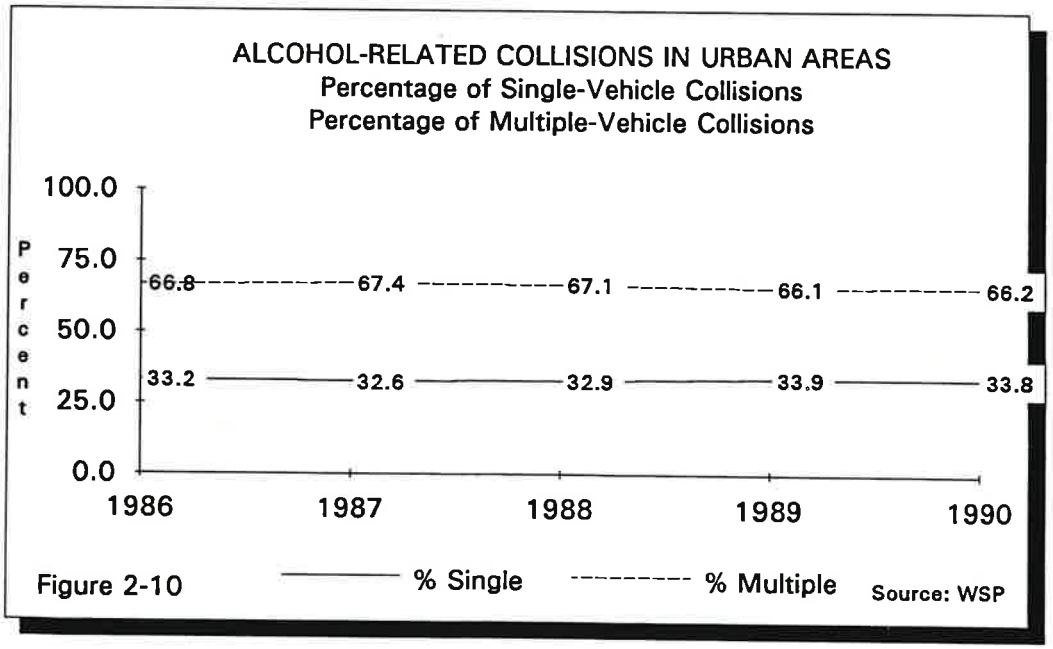


Figure 2-10

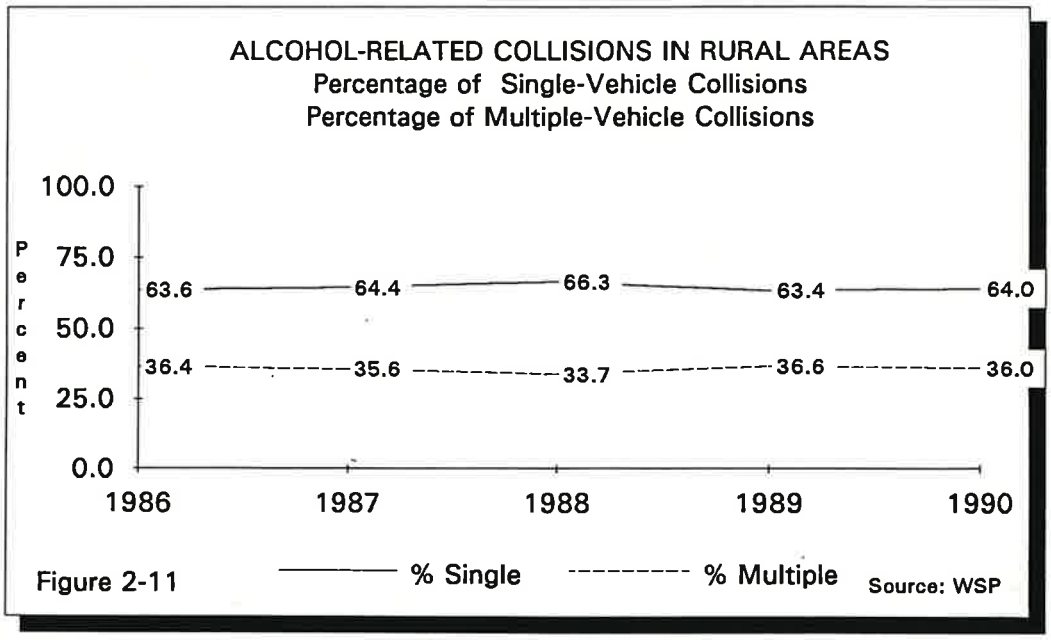


Figure 2-11

Single-Vehicle Alcohol-Involved Collisions

Figure 2-12 shows that over-involvement of single-vehicle alcohol-involved collisions are 2.36 times greater than recorded for all single-vehicles involved in all investigated collisions.

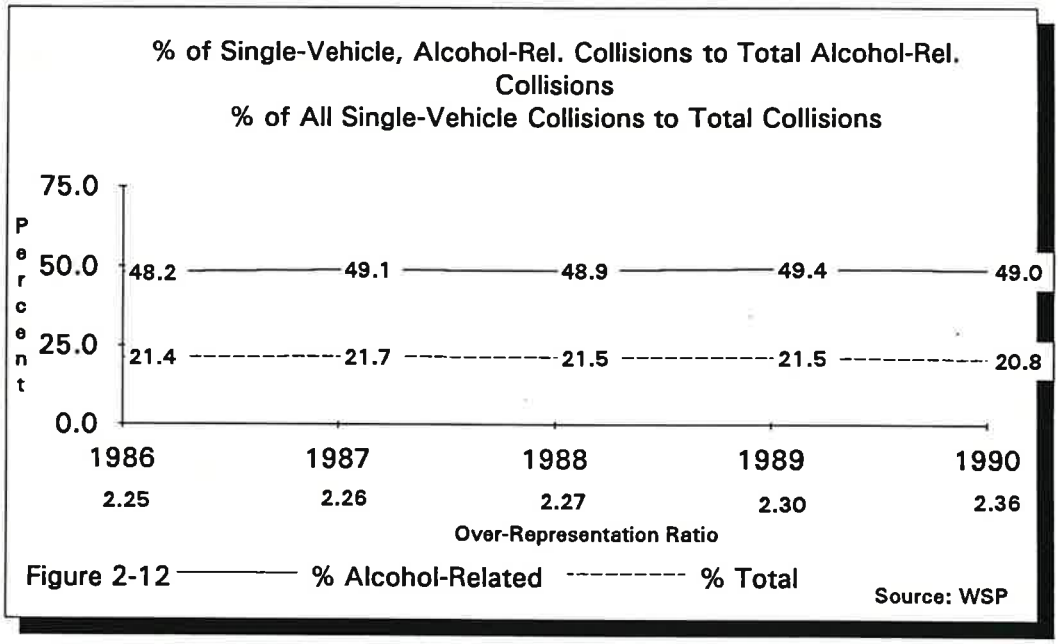


Figure 2-12

Weekend Alcohol Involvement

Figure 2-13 shows that the alcohol-related driver involvement in weekend collisions are 1.66 times greater than non-alcohol-related weekend collisions. A further breakdown compares the precentage of alcohol-involved collisions occurring on Friday and Saturday between the hours of 8 p.m. and 3 a.m. to the percentages of the total week's collisions occurring during the same time frame. This comparison shows that alcohol-related collisions were over-represented by 3.14 times during 1990. This is slightly above the over-representation ratio recorded for the previous four years (Figure 2-14).

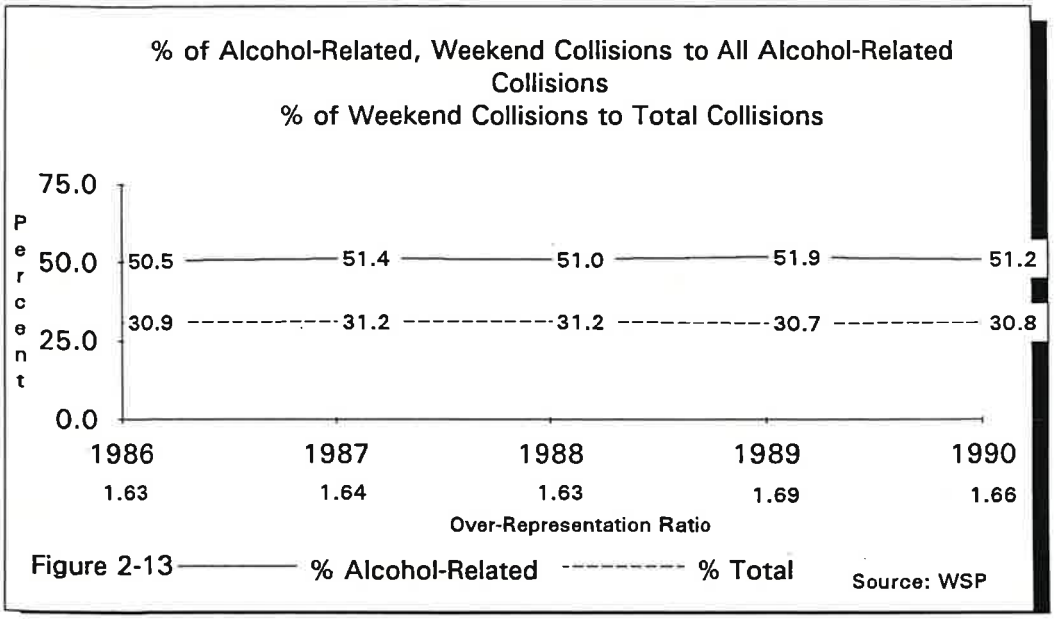


Figure 2-13

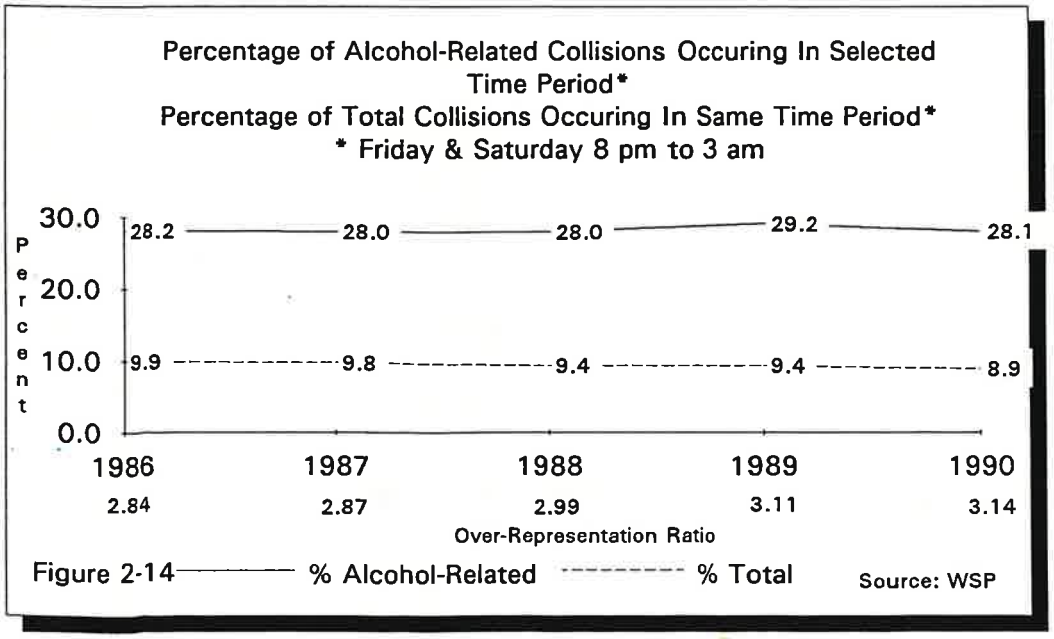


Figure 2-14

Fatal Alcohol-Involved Collisions Occurring At Night

The ratio of all nighttime fatal crashes involving alcohol to all alcohol-related fatal crashes decreased during 1990 as compared to the previous two years. All nighttime fatal crashes composed 51.0% of the year's total fatal crashes, while alcohol-related nighttime fatal crashes decreased to 71.0% of all nighttime fatals. Alcohol-related fatal crashes at night over-represent all nighttime fatal crashes by a ratio of 1.39, down from the previous two-year period ratio (Figure 2-15).

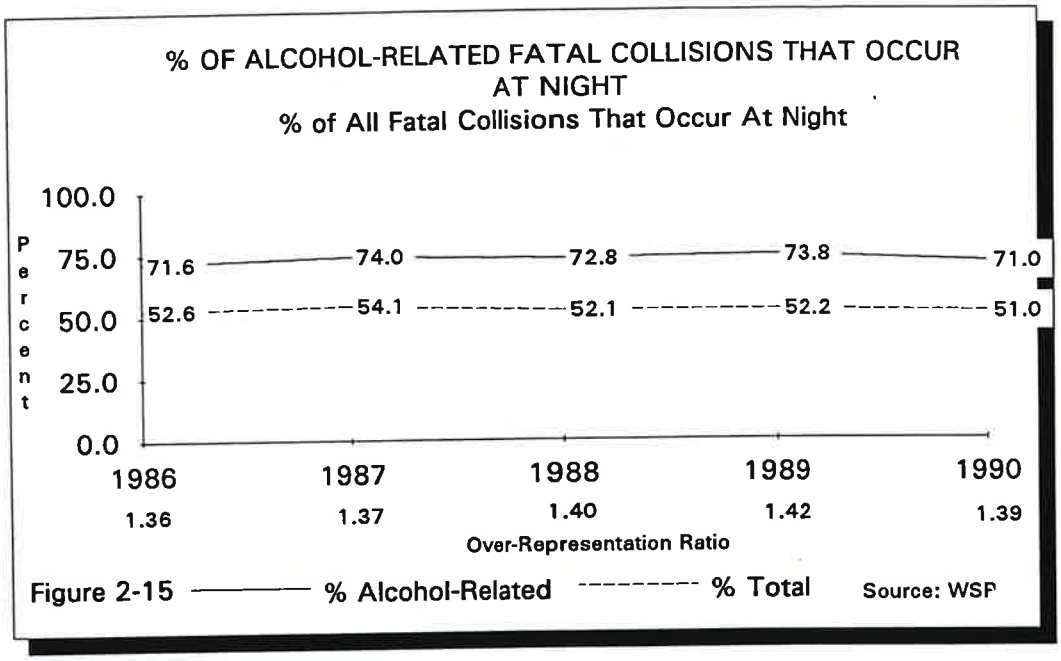


Figure 2-15

Drinking/DWI Drivers In Fatal Collisions By Roadway Type

Of all drivers involved in fatal crashes in 1990, 37.9% had been drinking prior to the crash. This is up from the 35.0% recorded for the previous year, but down substantially from the 47.6% recorded for 1981 (Figure 2-16). During 1990, the ratio of drinking drivers involved in traffic collisions compared to all drivers involved decreased from 18.2 drivers per 100 in 1981 to 10.8 per 100 in 1990 (Figure 2-17).

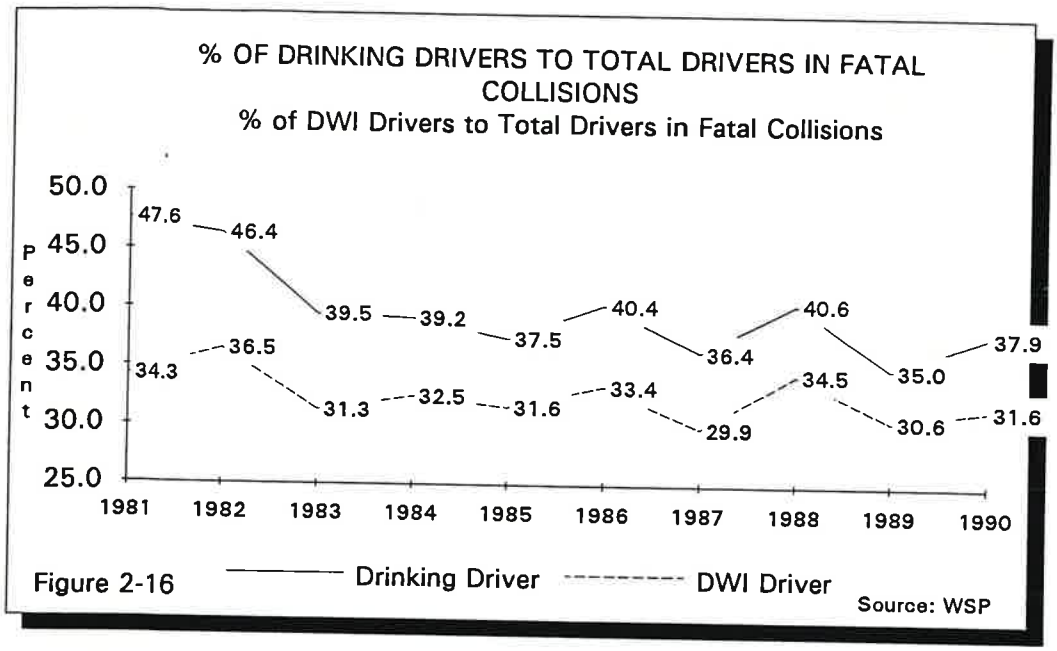


Figure 2-16

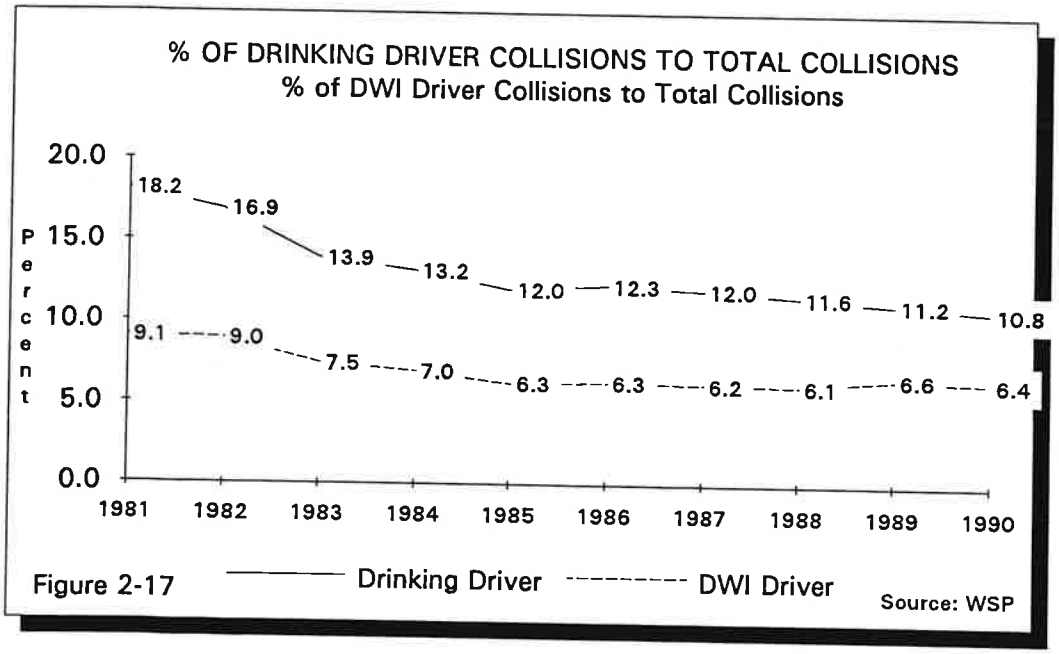


Figure 2-17

BAC Data

The total frequency of particular blood-alcohol concentration (BAC) levels in fatal and serious injury collisions for 1990 by age group is presented in Table 2-4. The 16-20 age group evidenced the greatest incidence of involvement for .05-.19 BAC. At the .10-.19 BAC range, the 21-24 age group, the 25-29 age group and the 30-34 age group had the highest frequency of occurrences. The higher BAC level (.20-.24) were displayed by the 25-29 age group and the 30-34 age group (Table 2-4).

Table 2-4

CHEMICAL TEST FOR INTOXICATION IN FATAL & SERIOUS INJURY COLLISIONS
1990

Age	Alcohol Level							Test Given No Results	Total Tested	Test Refused
	.00-.04	.05-.09	.10-.14	.15-19	.20-.24	.25-.29	.30 & Up			
16-20	23	73	87	73	22	6	1	131	416	32
21-24	27	50	119	127	59	13	1	163	559	87
25-29	18	38	120	126	84	36	10	191	623	159
30-34	19	30	75	125	93	25	11	147	525	148
35-39	10	14	55	56	53	19	10	105	322	97
40-44	4	10	29	49	31	12	5	55	195	54
45-49	4	5	13	18	20	7	6	43	116	26
50-54	2	4	12	15	8	5	1	12	59	24
55-59	0	1	9	9	10	4	0	15	48	9
60-64	1	2	6	9	4	4	1	10	37	5
65-69	2	2	1	4	3	4	1	10	27	5
Over 69	2	6	9	8	5	0	0	7	37	4
TOTAL	112	235	535	619	392	135	47	889	2,964	650

Source: WSP

Roadway Type By Day of Week/By Year

An analysis of roadway type by day of occurrance for fatal and serious injury collisions indicates that Saturdays recorded the highest incidence an all types of roadways. Sunday was the second highest alcohol involvement on county roads, while city streets recorded the second highest involvement on Fridays (Table 2-5). Figure 2-18 compares alcohol-related fatal and serious injury collisions by roadway type for the last three years.

Table 2-5

FATAL & SERIOUS INJURY COLLISIONS INVOLVING ALCOHOL
Roadway Type by Day of Week - 1990

Roadway Type	Day of Week								%Total Weekly Collisions
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	
County Roads	201	189	235	273	380	617	422	2,317	35.5%
City Streets	177	193	196	214	342	420	312	1,854	28.4%
U.S. & State Rts	189	158	158	200	293	409	341	1,748	26.8%
Interst & Full Cntrl	53	53	56	64	70	126	110	532	8.2%
Other Routes	3	4	9	4	11	24	13	68	1.0%
Total	623	597	654	755	1,096	1,596	1,198	6,519	100.0%
% of Total	9.6%	9.2%	10.0%	11.6%	16.8%	24.5%	18.4%	100.0%	

Source: WSP

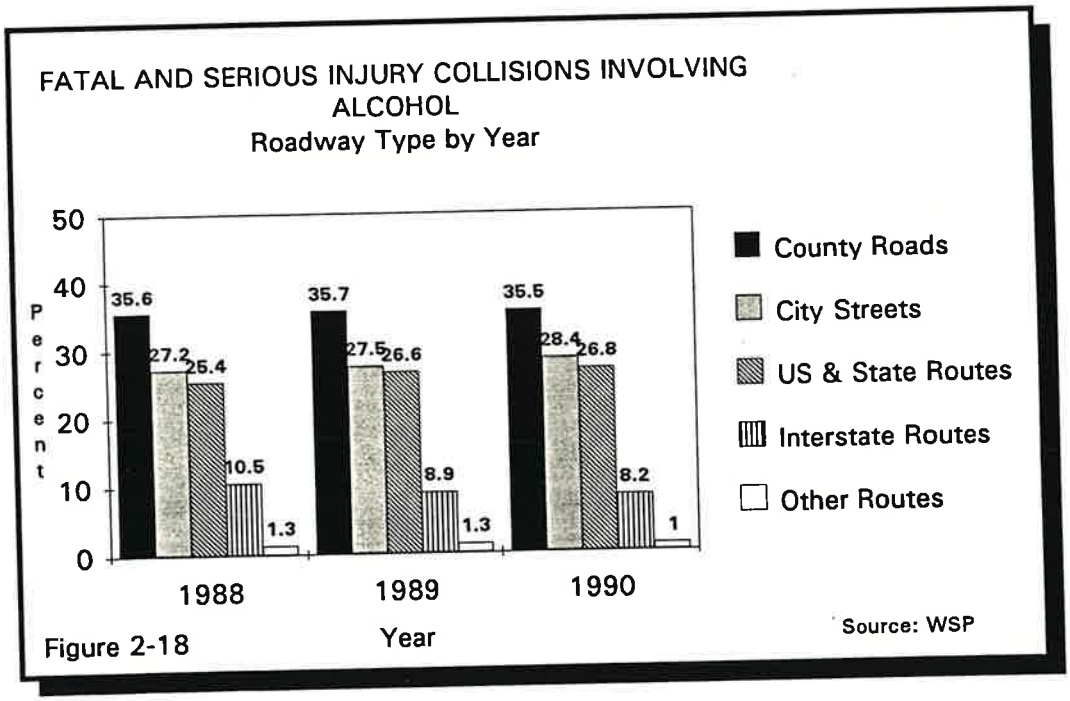


Figure 2-18

Alcohol-Related Collisions By Month

Table 2-6 shows figures of persons killed and injured in alcohol-related collisions by month. The summer months of June, July, August and September recorded 37.4% of persons injured in alcohol-related collisions. Forty-five persons were killed in alcohol-involved collisions during the month of July 1990 .

Table 2-6

PERSONS KILLED & INJURED IN ALCOHOL-RELATED COLLISIONS
Three-Year Comparison by Month

	Drivers "Under the Influence"						Drivers Who "Had Been Drinking"					
	Persons Killed			Persons Injured			Persons Killed			Persons Injured		
Month	1990	1989	1988	1990	1989	1988	1990	1989	1988	1990	1989	1988
January	31	25	17	715	617	491	34	26	18	1,086	976	866
February	27	11	27	608	433	554	30	11	28	889	702	876
March	34	19	42	725	566	669	37	20	47	1,107	920	1,053
April	28	25	27	700	689	684	31	29	36	1,046	1,066	1,130
May	32	42	39	726	784	785	39	46	47	1,126	1,196	1,284
June	34	24	47	850	782	722	40	27	50	1,287	1,185	1,133
July	38	40	37	763	864	842	45	42	45	1,229	1,335	1,372
August	31	31	30	869	744	715	41	36	35	1,373	1,202	1,170
September	37	40	35	923	825	687	41	45	38	1,256	1,264	1,173
October	31	33	27	745	842	756	34	43	32	1,152	1,261	1,321
November	23	32	30	679	862	684	30	33	35	1,119	1,292	1,126
December	25	31	18	713	890	770	29	34	22	1,079	1,261	1,220
TOTAL	371	353	376	9,016	8,898	8,359	431	392	433	13,749	13,660	13,724

Source: WSP

III. Youth Involvement

The number of youthful drivers (24 years of age and younger) involved in traffic collisions has decreased for the fourth consecutive year. The number of youth-involved collisions during 1990 was 57,545, down 5.7% from the previous four-year average. However, fatal and injury collisions increased 6.0% and 16.3% respectively. The total collision rate (youthful drivers involved per 100 licensed) increased 1.53% over 1989 but was down 3.7% from the previous four-year average (Table 3-1).

Table 3-1

YOUTHFUL DRIVERS (24 YEARS & YOUNGER) INVOLVED IN COLLISIONS
Five-Year Comparison

Collisions & Rates (Youth Only)	Year					Previous 4-Year Average	% of Change 90 - 4-Year Average
	1990	1989	1988	1987	1986		
Total Collisions	57,545	58,410	60,695	63,531	61,568	61,051	-5.7%
Fatal Collisions	284	268	290	286	283	282	0.8%
Injury Collisions	29,326	25,209	25,809	22,834	25,462	24,829	18.1%
Licensed Drivers	481,691	496,433	497,527	490,144	485,889	492,498	-2.2%
Fatal Clsn Ratio*	4.94	4.59	4.78	4.50	4.60	5	6.9%
Fatal Rate**	0.59	0.54	0.58	0.58	0.58	1	3.0%
Total Clsn Rate***	11.95	11.77	12.20	12.96	12.67	12	-3.7%

* Fatal Collisions per 1,000 total collisions
** Fatal Collisions per 1,000 licensed drivers
*** Youthful drivers involved per 100 licensed

Source: WSP, DOL

Youthful Drivers In Collisions By First Harmful Event

In 1990, 75.9% of youthful drivers involved in collisions collided with other moving vehicles. This type of collision resulted in the greatest percentage of fatal crashes (40.6%) and injury collisions (73.4%). Single vehicle collisions with fixed objects were the second highest percentage of driver involvement in total, fatal and injury collisions at 14.7%, 31.8% and 15.7% respectively (Table 3-2).

Table 3-2

COLLISIONS INVOLVING YOUTHFUL DRIVERS
By First Harmful Event - 1990

Type of Collision	Total Collisions		Fatal Collisions		Injury Collisions	
	Number	%-Total	Number	%-Total	Number	%-Total
Collision with other moving motor vehicles	38,624	75.9%	106	40.6%	16,001	73.4%
Collision with parked vehicle	1,648	3.2%	4	1.5%	405	1.9%
Collision with fixed/other object	7,466	14.7%	83	31.8%	3,416	15.7%
Overturning & other non-collision	2,300	4.5%	43	16.5%	1,351	6.2%
Collisions with pedestrians & pedalcyclists	596	1.2%	20	7.7%	569	2.6%
Other collisions - animal & R.R. train	272	0.5%	5	1.9%	56	0.3%
TOTAL	50,906	100.0%	261	100.0%	21,798	100.0%

Source: WSP

Collision Involvement By Driver Age

The 16-20 year old age group was involved in 15.9% of all collisions. This group makes up 6.8% of the state's licensed drivers, which creates an over-representation ratio of 2.35, down slightly from the previous four years (Figure 3-1). The 21 to 24 year age group also decreased its over-representation ratio from 1.63 in 1989 to 1.60 in 1990 (Figure 3-2). The 25-29 year age group recorded an over-representation ratio of 1.27, up from the previous four years (Figure 3-3). All older age groups were under-represented (Figures 3-4, 3-5).

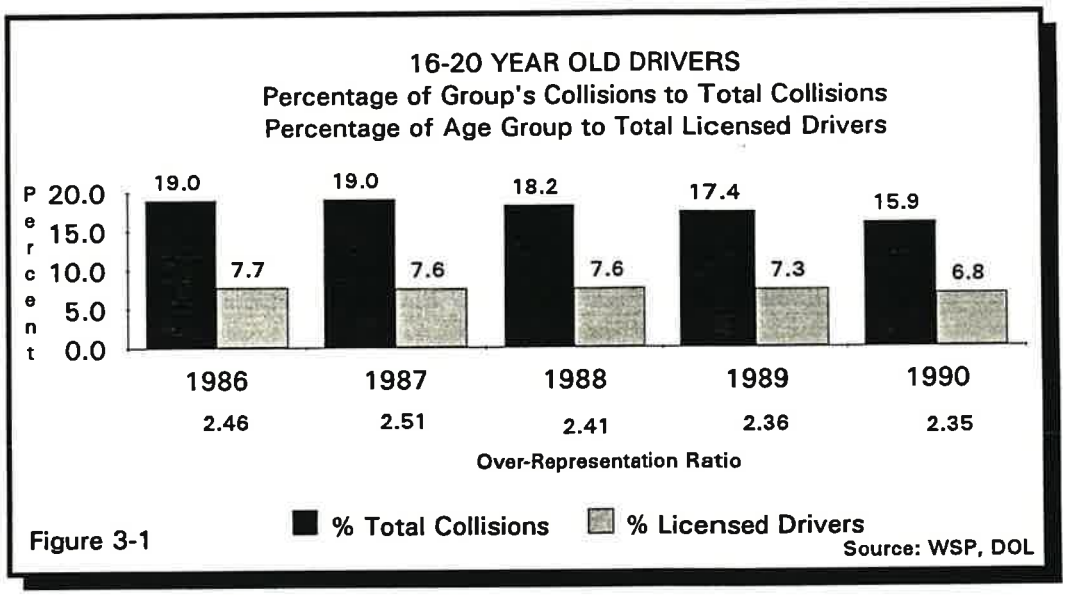


Figure 3-1

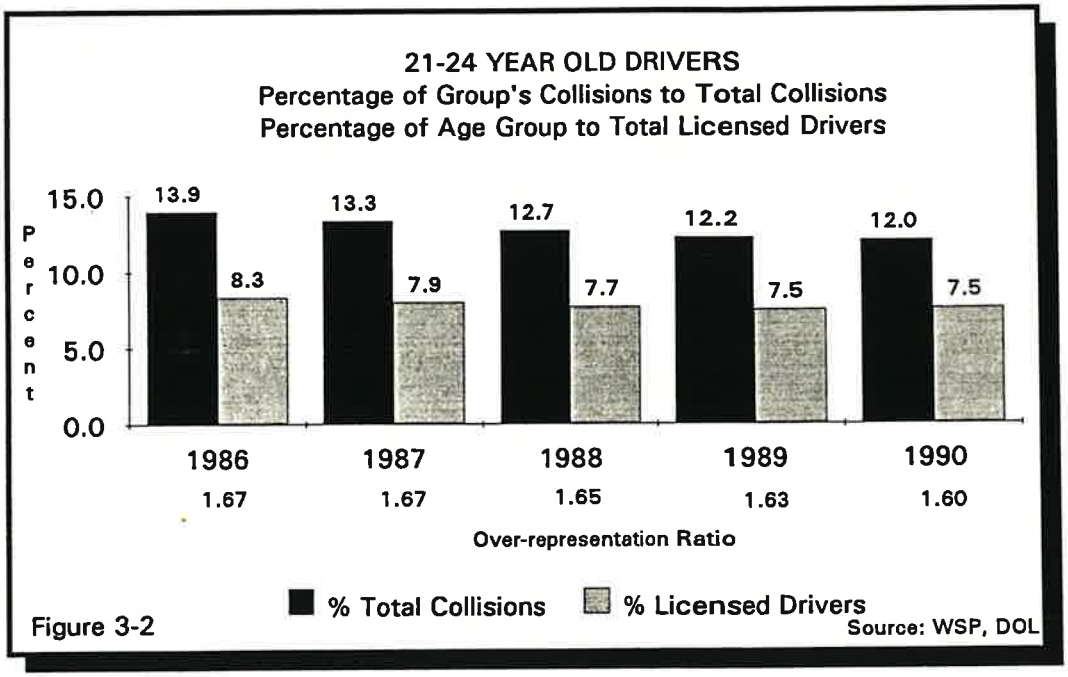


Figure 3-2

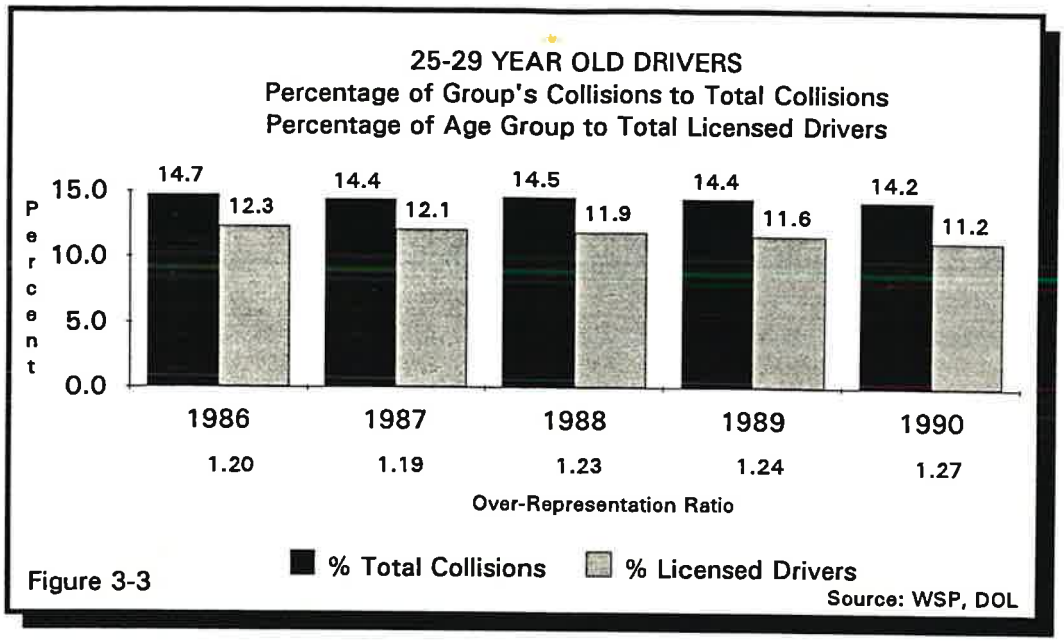


Figure 3-3

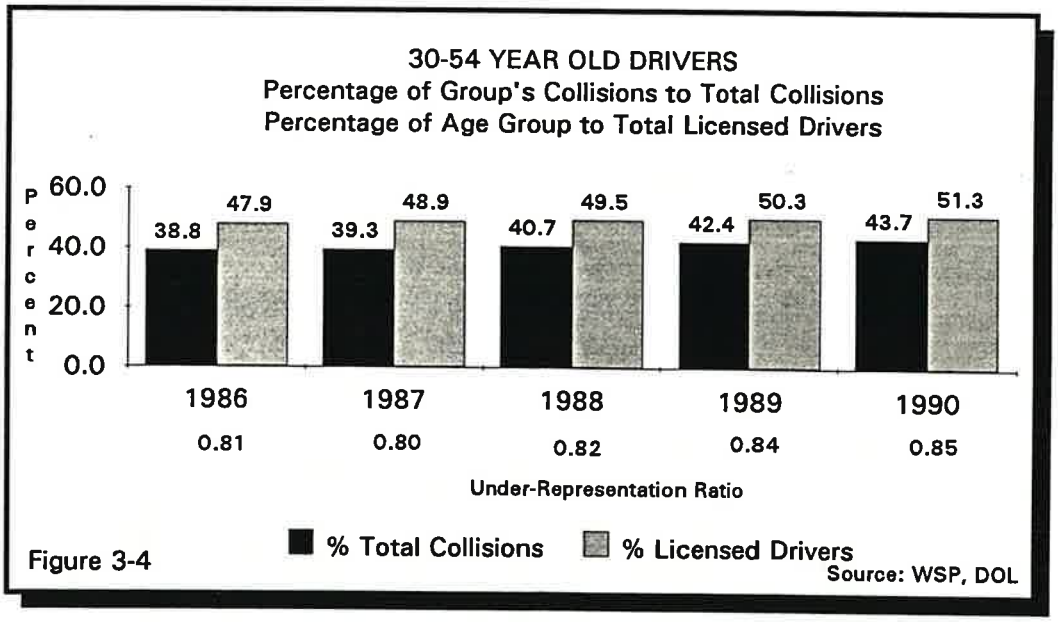


Figure 3-4

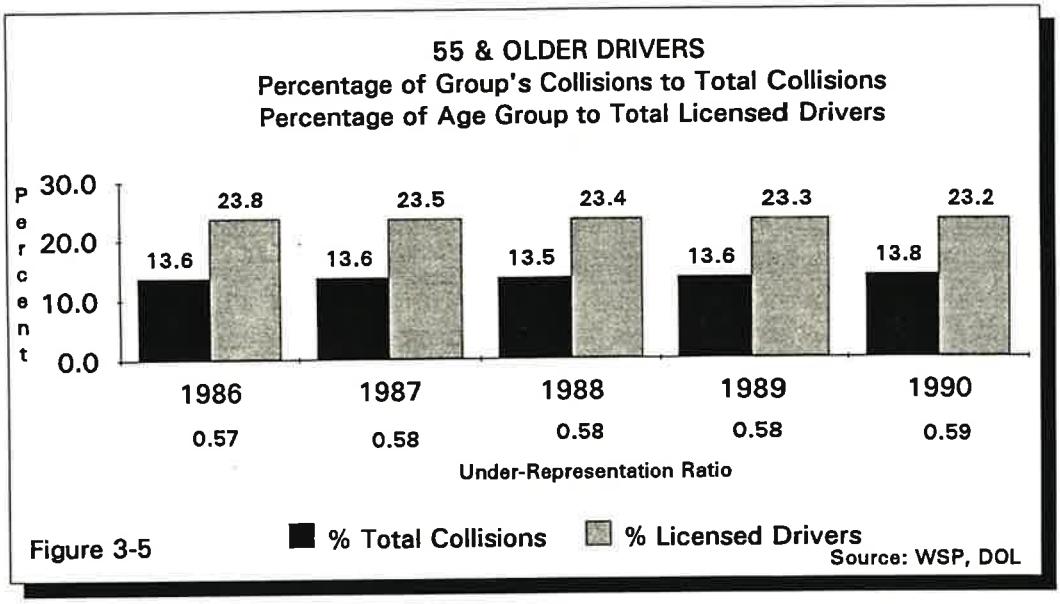


Figure 3-5

Collision Severity By Area For Youthful Drivers

Sixty percent of all youthful driver collisions occurred in urban areas, up from each of the previous four years (figure 3-6). Of the youthful injury collisions, 56.4% occurred in urban areas (Figure 3-7). Of the youthful driver fatal crashes, 78.5% occurred in rural areas, down slightly from the 1989 percentage, but up from the years 1986 through 1988 (Figure 3-8).

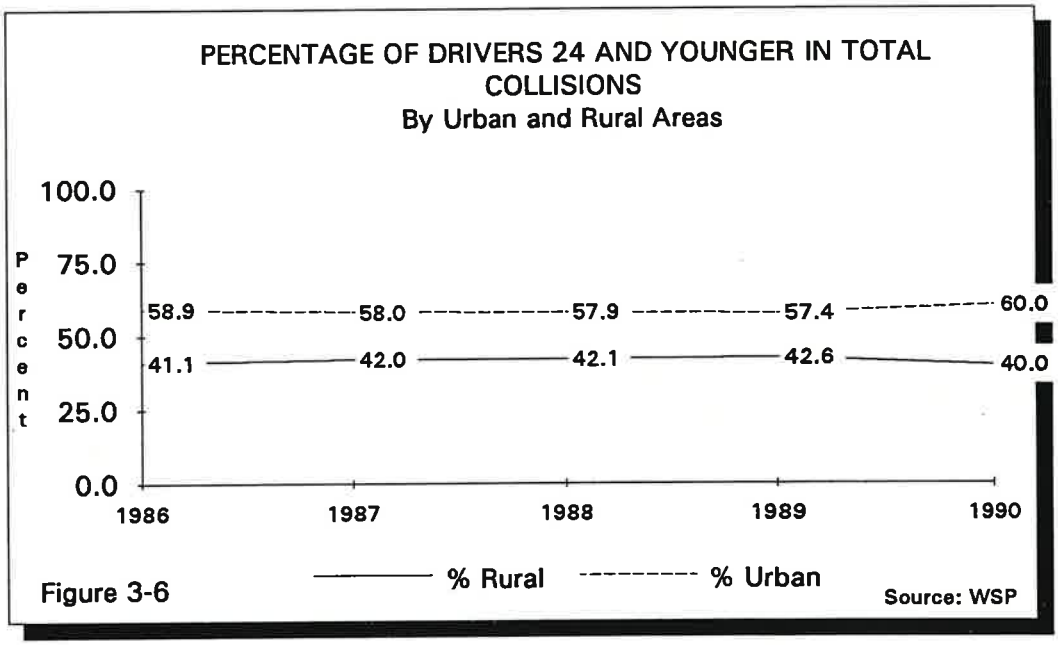


Figure 3-6

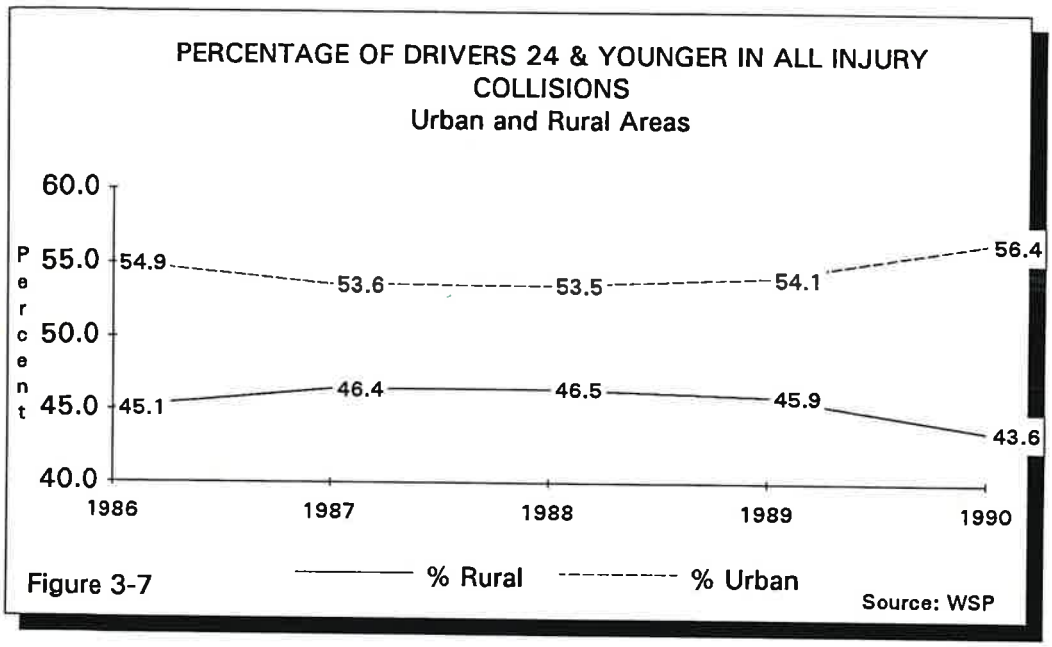


Figure 3-7

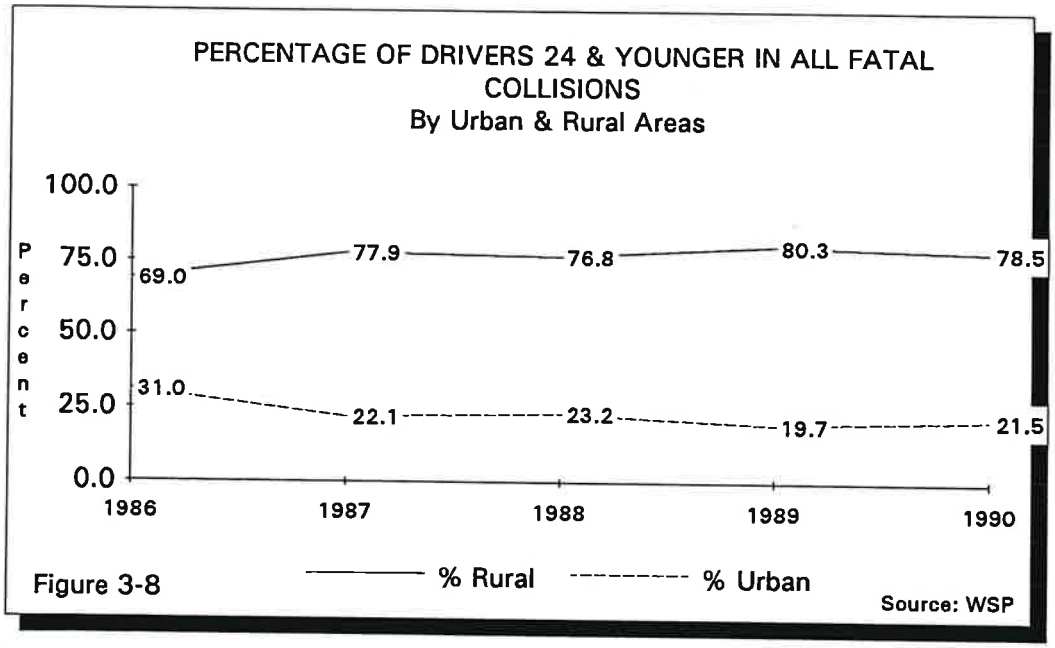


Figure 3-8

Youthful Driver Involvement By Day Of Week

The highest number of fatal crashes involving youthful drivers in both rural and urban areas occurred on Saturday. Regarding total crashes, however, most youthful driver involvement occurred on Friday in both rural and urban areas (Figures 3-9, 3-10).

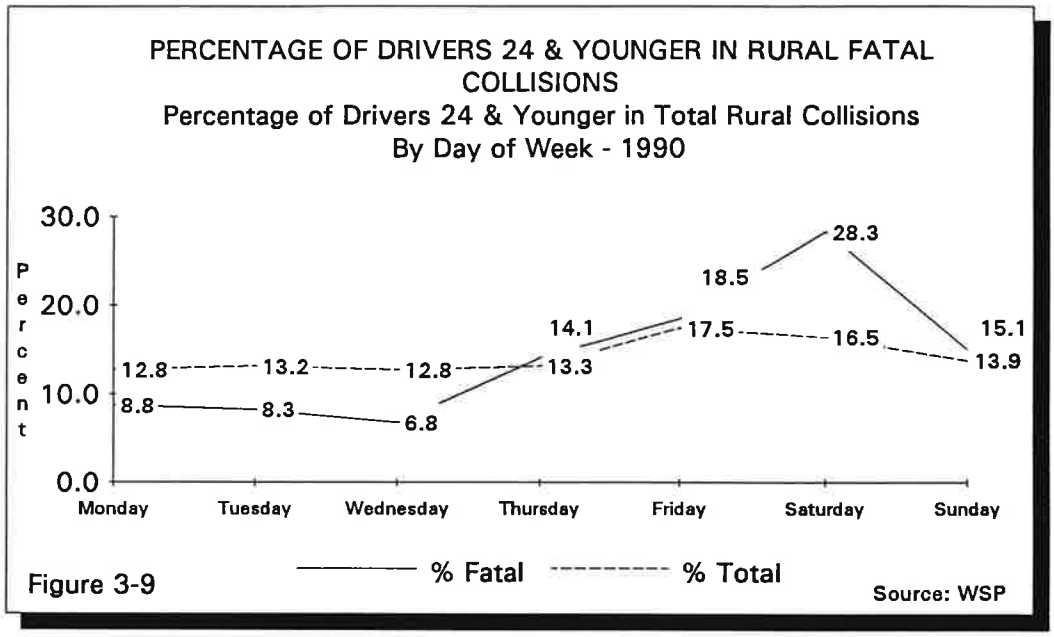


Figure 3-9

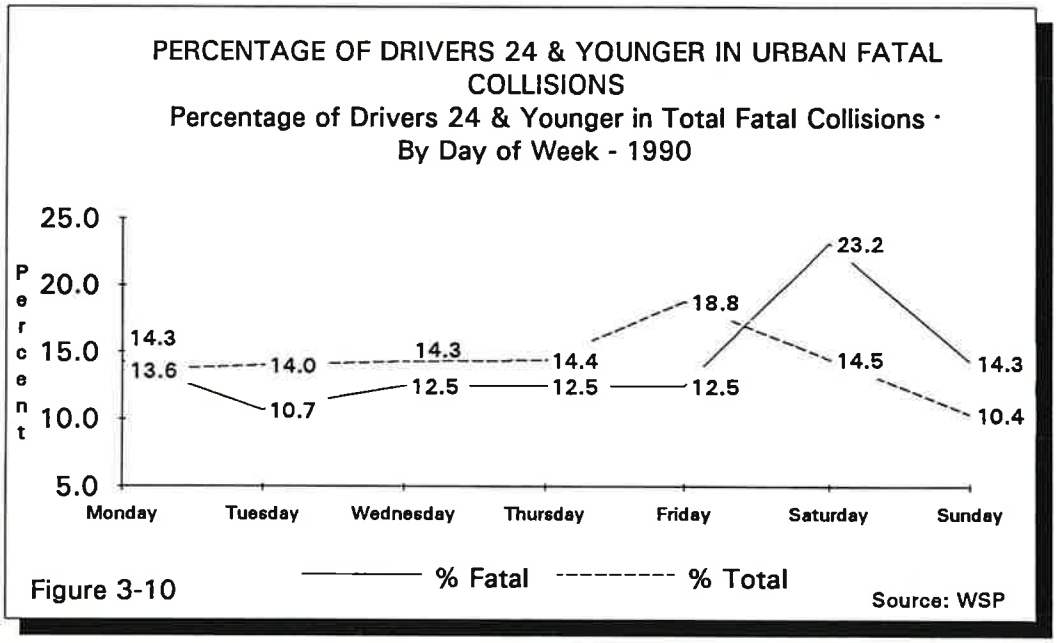


Figure 3-10

Youthful Driver Involvement By Time

Most collisions involving youthful drivers occurred between 3 p.m. and 6 p.m. in both urban and rural areas (Figure 3-11). Most fatal collisions involving youthful drivers occurred between midnight and 3 a.m. in both urban and rural areas (Figure 3-12).

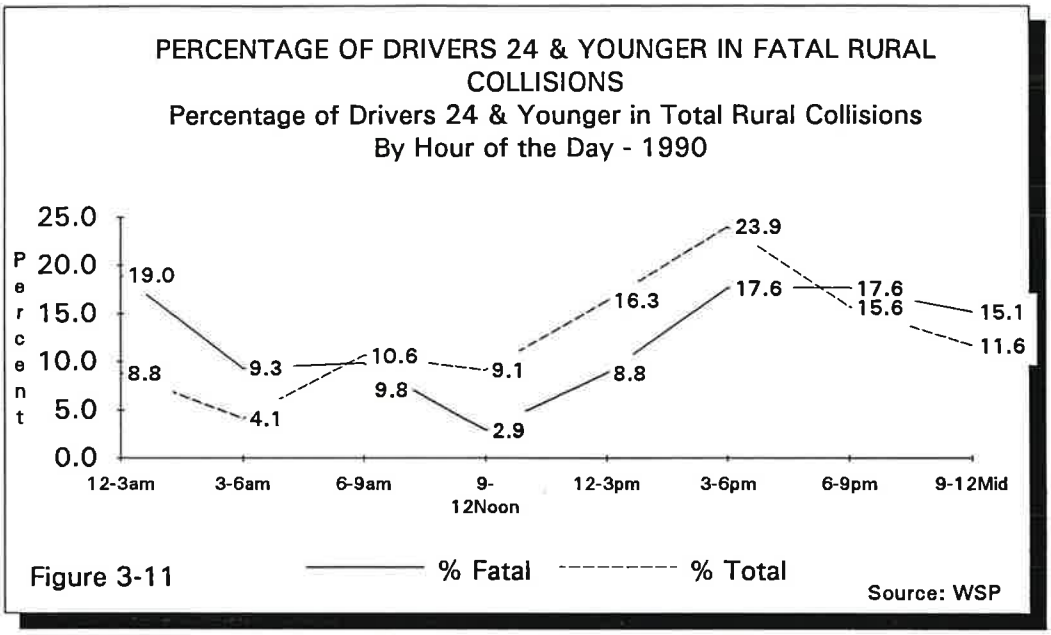


Figure 3-11

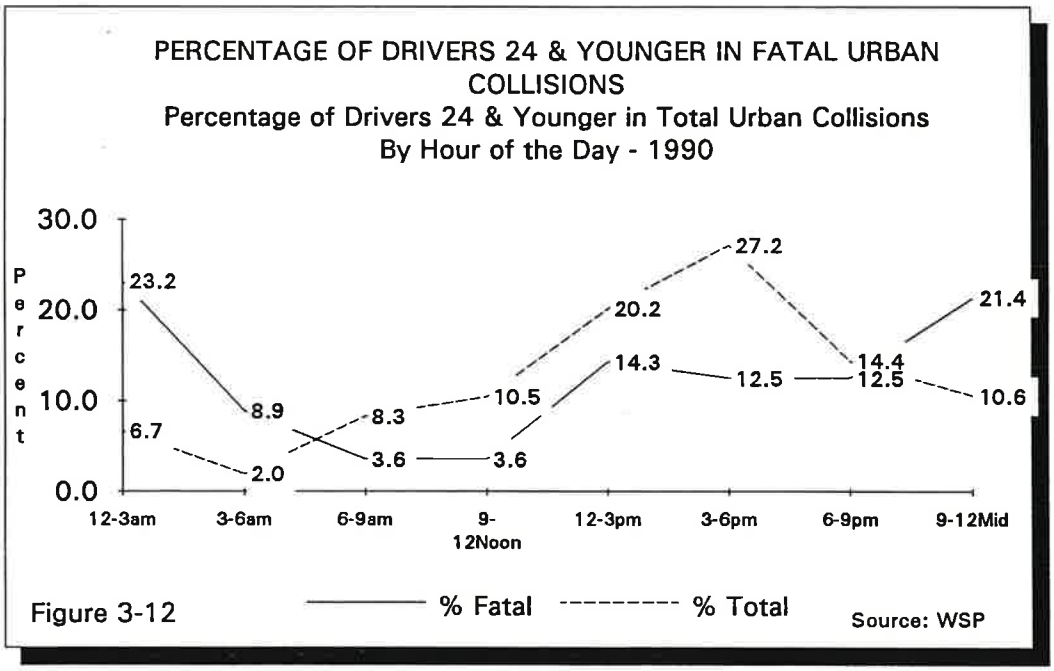


Figure 3-12

IV. Safety-Restraint Use

Most restraint usage rates in this summary are based upon data collected by enforcement officers during collision investigations. 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, the human tendency to report compliance, when in fact no belt was worn, artificially inflates the usage rate. Rates based upon observational studies, on the other hand, tend to be somewhat low due to difficulties in viewing belt use. Table 4-1a displays results of observational studies performed during the past several years. Each year's fatality and disabling injury rate are also displayed.

Table 4-1a

SEATBELT USE, DEATHS AND INJURIES

	1990	1989	1988	1987	1986
Observed SB Use Rate	NA**	55%	53%	51%	36%
Fatal Rate*	1.85	1.80	1.88	2.05	1.96
Disabling Injury Rate*	17.12	18.51	19.95	22.08	22.92
Deaths	825	781	785	790	714
Disabling Injuries	7,653	8,044	8,318	8,506	8,348
Motor Vehicle Travel	44,694	43,449	41,698	38,520	36,416

Source: WSP, WSDOT, WTSC

*Fatalities/disabling injuries per 100,000,000 miles of travel

**1990 observational survey not performed; May 1991 survey result: 66%.

During 1990, 84.9% of the occupants involved in investigated traffic collisions indicated that they were wearing a safety restraint at the time of the crash. The data indicated that out of 207,595 occupants involved in total investigated collisions, 176,241 were using restraints. The usage rate has been increasing since 1981, when only 15.9% of occupants were belted. The highest increase occurred in 1986 when the mandatory seat belt law was implemented (Table 4-1). Last year, 458 occupants who were not using any type of restraint died and 2,450 were seriously injured. Based on 1989 investigated collision data, it is estimated that an occupant who does not "buckle up" is fifteen times as likely to be killed and over four-and-one-half times as likely to be seriously injured than one who does (Table 4-2).

Table 4-1

RESTRAINT USAGE RATE*
Five-Year Comparison

Status	1990	%	1989	%	1988	%	1987	%	1986**	%
Restraints Used	176,241	84.9%	159,592	80.8%	161,667	80.0%	152,413	77.6%	102,751	54.5%
No Restraints Us	31,354	15.1%	37,802	19.2%	40,387	20.0%	44,081	22.4%	85,669	45.5%
TOTAL	207,595	100.0%	197,394	100.0%	202,054	100.0%	196,494	100.0%	188,420	100.0%

Source: WSP

* Percent of occupants using restraints among all occupants involved in collisions where usage is known.
**Seat belt law was implemented in June, 1986.

Table 4-2

RESTRAINT USAGE & INJURIES SUSTAINED* - 1990

Type	Restraints Used		Child Restraints**		No Restraints		Total Occupants +	
	Number	%	Number	%	Number	%	Number	%
Deaths	165	0.1%	3	0.1%	458	1.5%	623	0.3%
Disabling Injuries	2,925	1.7%	20	0.7%	2,450	7.8%	5,375	2.6%
Evident Injuries	12,669	7.2%	169	5.5%	6,780	21.6%	19,449	9.4%
Possible Injuries	24,452	13.9%	200	6.6%	4,957	15.8%	29,409	14.2%
No Injuries	136,009	77.2%	2,661	87.2%	16,695	53.3%	152,704	73.6%
TOTAL	176,220	100.0%	3,053	100.0%	31,340	100.0%	207,560	100.0%

Source: WSP

*Excludes cases where injury severity was not stated or where restraint use was unknown.
**Included with Restraints Used Category.
+ Does not include 35 occupants where the injury data was unknown.

Restraint Use By Sex And Age

In 1990 investigated collisions, 89.4% of the female drivers used their restraints, while 85.5% of the male drivers used theirs. This represents an increase in both groups over 1989. Male passengers used the restraints at a 76.4% rate, while female passengers used them at an 83.4% rate (Table 4-3). The 0-5 age group had the highest restraint use rate of any age group at 89.1%, followed by the 35-64 group with a usage rate of 89.0%. Both groups increased their usage from 85.8% during 1989.

The 16-19 year-old group, which has recorded low usage rates in past years, recorded the lowest rate at 79.7%. All groups showed increases in their respective usage rates when compared to previous years (Table 4-4). One-year-old infants recorded the highest individual age rate, 92.8%, and the 65 and over group was next at 90.5%. Fifteen-year-old occupants only buckled up at a 73.4% rate (Table 4-5).

Table 4-3

USAGE RATES BY SEX*
Five-Year Comparison

Occupant	Percent Used Restraints				
	1990	1989	1988	1987	1986
Male Driver	85.5	81.4	80.3	77.8	54.0
Female Driver	89.4	86.0	85.5	83.3	59.6
Male Passenger	76.4	71.9	70.9	69.0	46.7
Female Passenger	83.4	79.0	78.5	75.9	55.0

*Excludes occupants where restraint use was unknown Source: WSP

Table 4-4

USAGE RATES BY AGE*
Five-Year Comparison

Occupant	Percent Used Restraints				
	1990	1989	1988	1987	1986
Age 0-5	89.1	85.8	86.6	85.6	81.0
Age 6-15	79.9	75.3	74.2	72.5	51.5
Age 16-19	79.7	74.8	74.5	71.6	44.2
Age 20-24	81.6	76.4	75.8	72.7	47.5
Age 25-34	84.2	80.6	79.5	77.4	55.3
Age 35-64	89.0	85.8	85.0	82.9	60.6
Age 65 & Up	88.5	85.1	84.5	82.6	58.2

Source: WSP

*Excludes occupants where restraint use was unknown

Table 4-5

RESTRAINT USE IN COLLISIONS
By Occupant Age - 1990

Age	Restraint Type					Restraints Used		Restraints Not Used	
	Lap Belt	Shoulder Belt	Lap & Shoulder Belt	Child Restraint	Air Bag Activtd	Number	Percent Used	Number	Percent Not Used
Under 1	59	12	202	581	--	854	90.0%	95	10.0%
1	110	14	151	947	--	1,222	92.8%	95	7.2%
2	368	12	294	681	--	1,355	89.5%	159	10.5%
3	441	15	354	305	--	1,115	87.4%	161	12.6%
4	570	18	471	161	--	1,220	88.1%	165	11.9%
5	541	18	479	47	--	1,085	85.7%	181	14.3%
6	496	21	458	21	--	996	86.5%	155	13.5%
7	427	15	407	--	--	849	83.7%	165	16.3%
8	423	24	454	--	--	901	85.2%	157	14.8%
9	387	14	399	--	--	800	81.1%	187	18.9%
10	371	14	437	--	--	822	82.5%	174	17.5%
11	320	17	427	--	--	764	81.6%	172	18.4%
12	320	9	416	--	--	745	81.2%	172	18.8%
13	300	16	444	--	1	761	78.5%	208	21.5%
14	418	23	642	--	1	1,084	75.0%	362	25.0%
15	549	59	1,220	--	4	1,832	73.4%	664	26.6%
16	1,069	157	3,788	--	4	5,018	80.4%	1,222	19.6%
17	1,032	181	4,669	--	5	5,887	80.0%	1,476	20.0%
18	1,009	223	5,033	--	6	6,271	79.0%	1,667	21.0%
19	934	186	5,050	--	3	6,173	79.5%	1,593	20.5%
20	848	183	4,679	--	6	5,716	79.8%	1,447	20.2%
21 - 24	2,712	583	15,883	--	21	19,199	82.0%	4,228	18.0%
25 - 29	2,961	631	17,639	--	21	21,252	83.4%	4,219	16.6%
30 - 64	9,476	2,210	61,548	--	74	73,308	87.9%	10,125	12.1%
65 & Over	1,373	420	10,174	--	13	11,980	90.5%	1,252	9.5%
Unknown	544	104	2,175	266	2	3,091	81.6%	697	18.4%
TOTAL	28,058	5,179	137,893	3,009	161	174,300	84.8%	31,198	15.2%

Source: WSP, WSDOT

Restraint Use By Driver Occupation

Law enforcement officers and military personnel recorded the highest restraint usage rates for 1990 with 96.6% and 94.4% respectively. Farmers and farm laborers recorded the lowest rate with 72.1% (Figure 4-1).

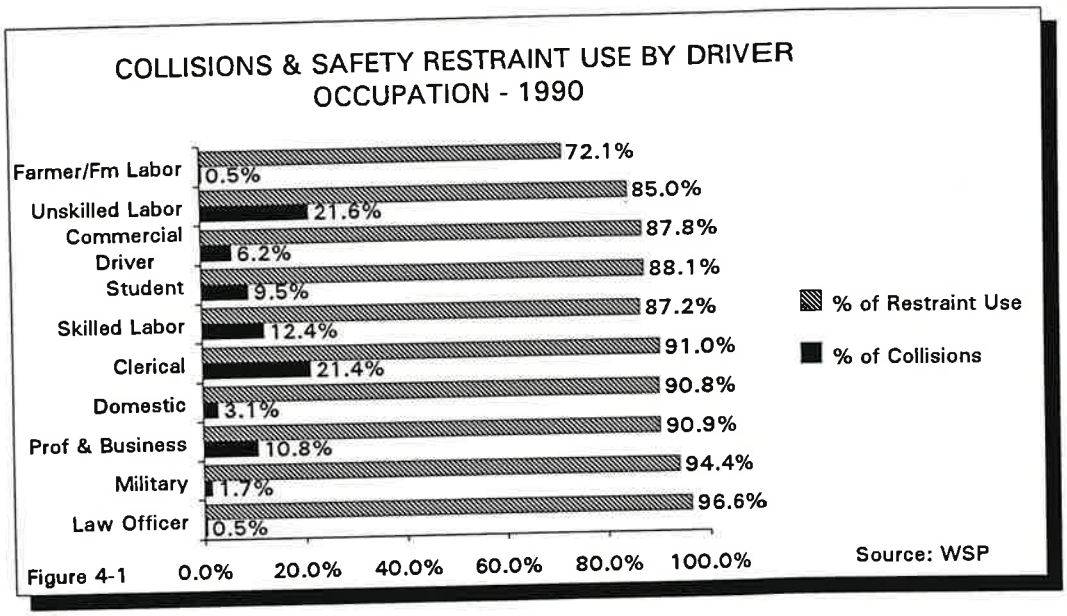


Figure 4-1

Restraint Use By County

King County recorded the highest usage rate with 89.1%, up from 83.7% the previous year. Garfield County not only had the lowest usage rate of any county for 1990, but also recorded a substantial decrease from its 65.7% of 1989. San Juan and Asotin Counties recorded 52.7% and 54.9% respectively, and were also down from the previous year's rates (Table 4-5b).

Table 4-5b

PERCENTAGE OF SEAT BELT USE IN INVESTIGATED COLLISIONS
Four-Year Comparison - By County

County	1987	1988	1989	1990	County	1987	1988	1989	1990
Adams	71.6	74.4	71.4	75.6	Lewis	69.8	72.6	77.1	81.6
Asotin	57.2	54.2	57.8	54.9	Lincoln	72.1	71.0	73.9	80.7
Benton	71.9	75.3	75.0	82.2	Mason	65.6	68.9	70.0	76.7
Chelan	77.7	79.9	81.3	83.7	Okanogan	54.0	53.9	62.0	67.6
Clallam	70.7	75.6	76.8	82.1	Pacific	65.4	78.4	71.9	75.0
Clark	68.1	72.8	75.0	80.4	Pend Oreille	57.3	65.6	58.8	67.6
Columbia	46.0	74.0	67.7	67.9	Pierce	79.2	82.3	80.0	85.2
Cowlitz	66.6	68.3	72.9	76.2	San Juan	47.3	54.1	56.8	52.7
Douglas	75.7	77.8	77.7	79.4	Skagit	75.3	72.8	77.6	81.9
Ferry	57.9	53.9	63.2	73.4	Skamania	62.3	55.5	70.7	70.9
Franklin	56.1	65.1	68.5	70.6	Snohomish	77.1	79.2	80.2	85.1
Garfield	62.3	59.7	65.7	47.6	Spokane	78.2	80.7	82.4	84.8
Grant	70.8	73.8	69.3	75.4	Stevens	57.5	70.8	57.5	67.0
Grays Harbor	63.2	64.0	67.5	74.3	Thurston	76.2	81.6	82.6	85.1
Island	81.6	85.1	85.4	89.2	Wahkiakum	71.1	71.2	81.8	82.9
Jefferson	73.0	75.3	75.4	79.3	Walla Walla	68.6	71.5	72.0	76.6
King	83.7	85.0	86.0	89.1	Whatcom	75.3	79.4	81.6	86.7
Kittitas	72.5	79.4	78.2	81.4	Whitman	76.6	77.8	79.4	81.7
Kitsap	86.6	78.9	81.2	84.2	Yakima	64.8	66.8	68.7	76.0
Klickitat	62.0	68.0	72.7	72.5					

Source: WSP

Restraint Use By Road Type

The interstate system had the highest safety-restraint usage rate by vehicle occupants at 90.4%. Occupants of vehicles traveling on city streets and on state routes recorded rates of 85.8% and 85.0% respectively. The occupant usage rates in 1990 increased on all types of roadways, particularly in the "all other" group, which includes forest service roads and recreational roads that are open to the public; that category jumped from 60.9% in 1989 to 68.2% in 1990. This remains the lowest rate of all the roadway types, however (Table 4-6).

Table 4-6

RESTRAINT USAGE IN COLLISIONS
By Functional Class of Roadway

Functional Class	1990	1989	1988	1987	1986
Interstate	90.4%	87.0%	86.5%	84.6%	66.8%
Other State Routes	85.0%	81.5%	79.8%	82.0%	56.0%
County Roads	79.9%	75.9%	75.0%	72.5%	50.5%
City Streets	85.8%	81.5%	80.7%	77.9%	52.6%
All Others	68.2%	60.9%	64.0%	63.6%	41.8%

Source: WSP, WSDOT

Restraint Use By Vehicle Type

Examination of safety-restraint use by vehicle type reveals that occupants of heavy trucks recorded the highest increase from the previous year, going from a 75.8% rate in 1989 to an 82.2% rate in 1990. Occupants of passenger vehicles had the highest usage rate with 86.0% (Table 4-7). In 1990, 94.7% of the occupants were using safety restraints in state government registered vehicles, up substantially from the 81.0% rate of the previous year. Usage rate by county government vehicle dropped to a 78.6% rate, the lowest in this group (Table 4-8).

Table 4-7

RESTRAINT USAGE RATE BY OCCUPANTS IN COLLISIONS
By Type of Vehicle

Type of Vehicle	1990	1989	1988	1987	1986
Passenger Car	86.0%	82.1%	81.6%	78.9%	56.6%
Light Trucks	82.5%	78.0%	76.2%	73.1%	48.8%
Heavy Trucks	82.2%	75.8%	71.7%	67.7%	49.9%
All Others	74.6%	73.2%	68.3%	69.5%	52.9%

Source: WSP, WSDOT

Table 4-8

RESTRAINT USAGE RATE IN GOVERNMENT VEHICLE COLLISIONS
Five-Year Comparison

Type of Government Vehicle	1990	1988	1988	1987	1986
State registered vehicles	94.7%	81.0%	87.8%	93.8%	76.3%
County registered vehicles	78.6%	80.7%	75.8%	78.2%	63.8%
Municipal registered vehicles	88.1%	87.4%	79.4%	85.9%	66.3%
Other government registered vehicles	82.6%	94.3%	93.8%	87.6%	84.1%

Source: WSP, WSDOT

Usage Rate By Proximity

Drivers residing within 15 miles of the collision scene recorded the lowest safety-restraint usage rate with 86.7%. Drivers residing in another state recorded the highest rate with 88.7%. All categories continued to record increases in restraint usage over previous years (Table 4-9).

Table 4-9

RESTRAINT USAGE RATE IN COLLISIONS BY PROXIMITY OF DRIVER RESIDENCE
Five-Year Comparison

Residence Proximity	1990	1989	1988	1987	1986
Resided within 15 miles of collision	86.7%	82.7%	81.9%	79.7%	55.5%
Resided over 15 miles	87.6%	84.4%	84.0%	80.4%	58.1%
Residing in other state	88.7%	85.6%	83.4%	79.1%	60.0%

Source: WSP, WSDOT

Restraint Use By Seat Position

Drivers continued to be the most frequent users of safety restraints, with an 86.8% rate, followed by occupants riding in the right back seat with 82.8% and occupants in the right-front with 82.5% Mid-front and mid-back occupants continue to have the lowest rates, except for the "other" position, which includes positions in non-designated areas (back of station wagons, truck beds, etc.) (Table 4-10). Children aged 0-4 sitting in the left-back, right-back, and middle-back seats recorded the highest usage rates at 97.6%, 94.4% and 92.9% respectively. The 5-9 age group also used safety-restraints most frequently in the right-back position, followed by the right-front and then left-back. Right-front occupants 65 and over recorded the highest usage rate during 1990, 91.3%, followed by drivers 65 and over with a 90.6% use rate (Table 4-11).

Table 4-10

RESTRAINT USAGE RATE BY OCCUPANT SEAT POSITION
Five-Year Comparison

Occupants	1990	1989	1988	1987	1986
Driver	86.8%	82.9%	82.1%	79.7%	55.9%
Mid-front	62.1%	57.0%	54.8%	51.8%	34.0%
Right-front	82.5%	78.3%	78.0%	74.9%	51.9%
Left-back	81.3%	78.4%	77.7%	74.9%	58.1%
Mid-back	73.0%	68.9%	66.7%	62.4%	44.4%
Right-back	82.8%	78.4%	77.8%	74.1%	58.0%
Other	39.2%	31.6%	29.0%	28.8%	21.5%
TOTAL	85.0%	80.9%	80.1%	77.6%	54.5%

Source: WSP, WSDOT

Table 4-11

RESTRAINT USAGE RATE IN COLLISIONS
By Occupant Age & Seat Position - 1990

Seat Position	Age Group							
	0-4	5-9	10-14	15-20	21-24	25-29	30-64	65/Over
Driver	-	-	-	83.4%	84.3%	85.2%	88.8%	90.6%
Mid-front	77.9%	75.1%	68.0%	47.3%	54.1%	50.3%	63.0%	79.4%
Right-front	88.1%	87.8%	83.4%	77.7%	78.7%	79.5%	85.3%	91.3%
Left-back	97.6%	87.7%	82.3%	69.1%	70.8%	69.9%	77.6%	88.3%
Mid-back	92.9%	81.4%	71.3%	49.4%	49.6%	53.8%	62.2%	77.4%
Right-back	94.4%	88.4%	85.1%	73.4%	69.8%	73.9%	81.3%	87.2%
Other	49.5%	52.7%	37.2%	22.8%	26.8%	21.6%	36.2%	62.5%
Unknown	76.4%	71.3%	74.5%	49.3%	47.4%	43.6%	67.0%	84.6%

Source: WSP, WSDOT

Restraint Use By Severity Of Collision

Of the 623 occupants killed in vehicle collisions in 1990, 458 (73.5%) were not using restraints. Of the 5,375 persons sustaining disabling injuries in investigated collisions, 45.6% were using no restraints. Of occupants who were reported to be using restraints in collisions, 88.9% sustained no injuries (Table 4-12).

Table 4-12

TYPES OF RESTRAINTS USED
By Severity of Injury - 1990

Type	Number Used		Deaths		Disabling Injury		Evident Injury		Possible Injury		No Injury	
	#	%	#	%	#	%	#	%	#	%	#	%
Lap Belt	28,387	13.7%	30	4.8%	475	8.8%	2,360	12.1%	3,323	11.3%	22,199	14.5%
Shoulder Belt	5,211	2.5%	4	0.6%	95	1.8%	396	2.0%	572	1.9%	4,144	2.7%
Lap & Shoulder	139,400	67.2%	127	20.4%	2,327	43.3%	9,709	49.9%	20,328	69.1%	106,909	70.0%
Child Restraint	3,053	1.5%	3	0.5%	20	0.4%	169	0.9%	200	0.7%	2,661	1.7%
Air Bag*/Belted	117	0.1%	0	0.0%	6	0.1%	32	0.2%	22	0.1%	57	0.0%
Air Bag*/No Blt	52	**	1	**	2	**	3	**	7	**	39	**
No Restraints	31,340	15.1%	458	73.5%	2,450	45.6%	6,780	34.9%	4,957	16.9%	16,695	10.9%
Total Occupant	207,560	100.0%	623	100.0%	5,375	100.0%	19,449	100.0%	29,409	100.0%	152,704	100.0%

* Activated

**Less than 1/10 of 1 percent

Source: WSP

Restraint Use By Sobriety

Of all drivers involved in 1990 collisions, those who had been drinking were less likely to be wearing restraints than those who had not been drinking. The restraint usage rate for the non-drinking category was computed at 85.1%. Those drinking had a much lower rate, with 44.5% for drivers under the influence of intoxicating liquor (DUI) and 53.4% for drivers who had been drinking (HBD) (Figure 4-3).

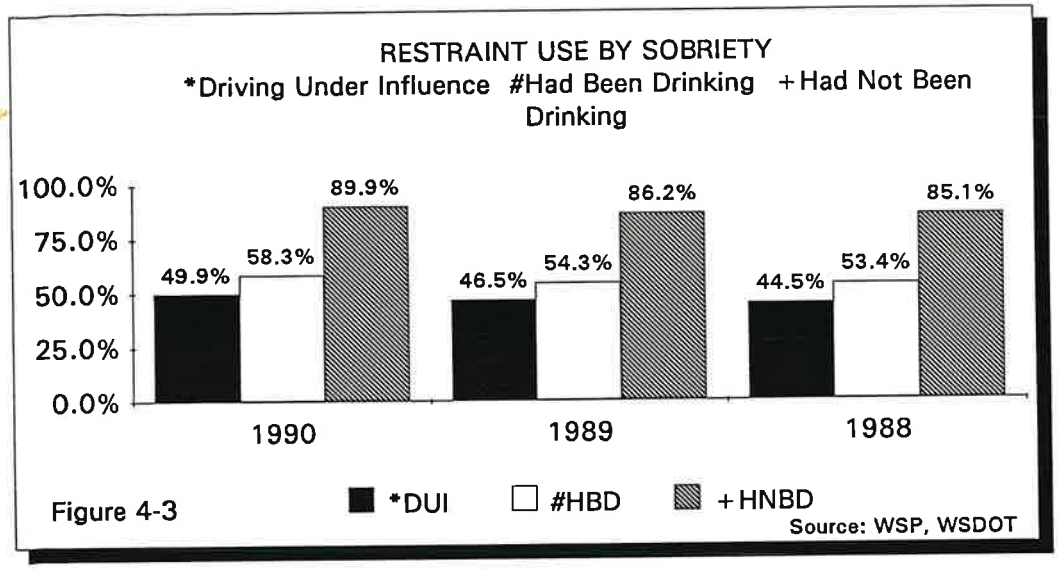


Figure 4-3

V. Motorcycle Collisions

Motorcycle fatalities, injuries and collisions decreased during 1990 compared to 1989 and also to the previous four-year baseline average. Motorcycle registration dropped from 118,685 during the four-year average to 103,537 in 1990, a decrease of 12.76%. The 1990 total collision registration rate of 2.09 per 100 registered motorcycles was down 18.08% from the four-year baseline average. The fatal registration rate (deaths per 1,000 registered motorcycles) dropped 11.10% compared to the four-year average. The total killed in motorcycle crashes for 1990 was 62, which was down 23.22% from the baseline average of 81 deaths per year. Fifty-five motorcycle drivers, 5 motorcycle passengers, and 2 pedestrians were killed in motorcycle crashes in 1990 (Table 5-1).

Table 5-1

MOTORCYCLE COLLISIONS SUMMARY
Five-Year Comparison

Severity/Exposure/Rates	Year 1990	1989	1988	1987	1986	Previous 4-Year Average	90 Change from 4-Year Avg
Total Collisions	2,167	2,516	2,773	3,379	3,508	3,044	-28.81%
Fatal Collisions	60	70	72	88	80	78	-22.58%
Fatal Collision Ratio*	27.7	27.8	26.0	26.0	22.8	26	7.96%
Motorcycle Registration	103,537	110,617	117,155	124,215	122,751	118,685	-12.76%
Collision Regstn Rate**	2.09	2.27	2.37	2.72	2.86	2.55	-18.08%
Fatal Regstn Rate***	0.580	0.633	0.615	0.708	0.652	0.652	-11.10%
Total Persons Killed	62	75	77	90	81	81	-23.22%
Total Persons Injured	2,223	2,724	2,896	3,497	3,673	3,198	-30.48%
M/C Drivers Killed	55	59	66	86	71	71	-21.99%
M/C Drivers Injured	1,789	2,119	2,320	2,729	2,909	2,519	-28.99%
M/C Passengers Killed	5	10	10	3	9	8	-37.50%
M/C Passengers Injured	272	392	383	513	518	452	-39.76%

*Fatal Collisions per 1,000 motorcycle collisions
**Motorcycle involved per 100 registered
***Fatal Collisions per 1,000 motorcycles registered

Source: WSP, DOL

Motorcycle Collisions By Age Group

The 16-18 year-old motorcycle rider continues to be over-represented in the accident population compared to the percentage of licenced motorcycle drivers comprising that age group. The 16-18 age group was involved in 7.2% of total collisions, but they comprise less than one-half of one percent of motorcycle-endorsed drivers. The 25-29 year-old motorcycle riders were involved in the largest percentage of fatal, injury, and total reported collisions (16.7%, 17.9% and 17.6% respectively). This group made up only 11.5% of all licensed operators with motorcycle endorsement. Operators in the age 30 and older group contributed to 42.1% of motorcycle collisions, but they made up 81.9% of all licensed operators with motorcycle endorcement (Table 5-2).

Table 5-2

MOTORCYCLE DRIVER COLLISIONS
By Age Group to All Licensed Motorcyclists - 1990

Age	Fatal Collisions		Injury Collisions		Total Collisions		Percent of Licensed Cyclists	Over/Under Ratio in Total Collisions
	Number	%	Number	%	Number	%		
Under 16	1	1.7%	39	2.1%	42	2.0%	0.00%	---
16	1	1.7%	22	1.2%	24	1.2%	0.03%	38.68
17-18	1	1.7%	108	6.0%	125	6.0%	0.35%	17.27
19-20	5	8.3%	243	13.4%	268	13.0%	1.18%	10.98
21-22	8	13.3%	174	9.6%	203	9.8%	2.14%	4.59
23-24	4	6.7%	156	8.6%	173	8.4%	2.81%	2.98
25-29	10	16.7%	325	17.9%	363	17.6%	11.59%	1.51
30-34	8	13.3%	275	15.2%	312	15.1%	18.28%	0.83
35-39	9	15.0%	160	8.8%	198	9.6%	20.88%	0.46
40-44	6	10.0%	135	7.4%	157	7.6%	16.04%	0.47
45-54	6	10.0%	128	7.1%	140	6.8%	16.16%	0.42
55-64	1	1.7%	34	1.9%	42	2.0%	7.20%	0.28
65/Over	0	0.0%	16	0.9%	21	1.0%	3.33%	0.30

Source: WSP, DOL

Motorcycle Collisions By Location

Forty-eight fatal motorcycle collisions occurred in rural areas, while 12 occurred in urban areas of the state. This was an increase of 1 for the rural areas and a decrease of 11 in the urban areas compared to 1989. The urban areas recorded 1,011 injury collisions in 1990 while the rural areas recorded 829 for a total of 1,840, which was down 331 from the previous year. Total reported collisions totalled 2,167 for 1990. The urban/rural breakdown was 1,207 urban and 960 rural. Both areas recorded decreases from the previous year (Table 5-3).

Table 5-3

MOTORCYCLE COLLISIONS BY LOCATION
Two-Year Comparison

Severity	1990			1989		
	Urban	Rural	Statewide	Urban	Rural	Statewide
Total Collisions	1,207	960	2,167	1,417	1,099	2,516
Fatal Collisions	12	48	60	23	47	70
Injury Collisions	1,011	829	1,840	1,206	965	2,171
Property-damage-only Clsns	184	83	267	188	87	275
All Persons Killed	13	49	62	25	50	75
All Persons Injured	1,188	1,035	2,223	1,485	1,239	2,724
Motorcyclists Killed	12	48	60	23	46	69
Motorcyclists Injured	1,106	955	2,061	1,376	1,135	2,511

Source: WSP

Motorcycle Collisions By Type Of Road

During 1990, the greatest number of persons killed in motorcycle crashes (26) were on county roads. City streets, however, recorded the most collisions (1,128) and the most injuries (1,117). On state routes, 281 motorcycle crashes occurred with 21 persons killed and 308 persons injured. On the interstate system, 4 motorcyclists were killed and 138 were injured out of 143 reported collisions during 1990 (Table 5-4). The total frequency of motorcycle collisions occurring on city streets, county roads and all state routes decreased during 1990, continuing a four-year trend (Figure 5-1).

Table 5-4

MOTORCYCLE COLLISIONS
By Location - 1990

Location	Collisions				Persons	
	Total	Fatal	Injury	PD only*	Killed	Injured
Interstate System	143	3	123	17	4	138
U.S. Route No.**	48	1	41	6	1	59
State Route No.**	233	20	195	18	20	249
County Roads	586	25	511	50	26	622
City Streets***	1,128	10	944	174	10	1,117
Other Traffic Ways	29	1	26	2	1	38
Total	2,167	60	1,840	267	62	2,223

Source: WSP

*Property Damage Only
**Excluding city streets
***Including U.S. and State Routes in cities

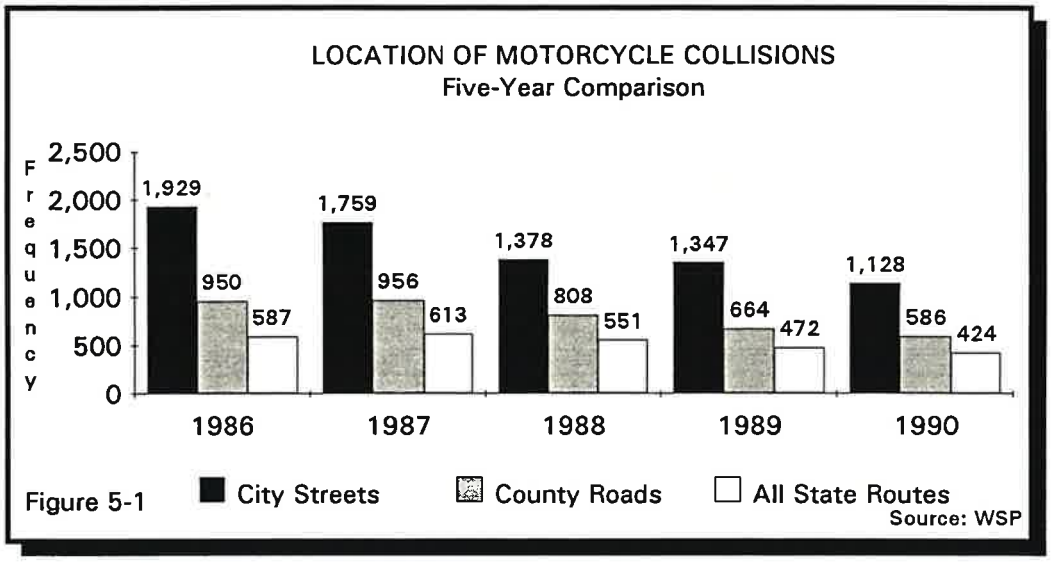


Figure 5-1

Motorcycle Violations

Speed too fast for conditions was the most noted violation in motorcycle collisions with drivers of all age groups, contributing to 26.6% of the year's motorcycle violations in investigated collisions. This violation contributed to 29.4% of the 30-34 year-old operator and 27.6% of the 20 and younger operator violations. Driving while under the influence was the second most prominent violation, contributing to 15.9% of total motorcycle driver violations in collisions. This violation comprised 26.4% of all 30-34 year-old operator violations and 21.3% of 35-44 year-old operator violations (Table 5-5).

Table 5-5

MOTORCYCLIST VIOLATIONS BY AGE
Investigated Collisions Only - 1990

Violation	Violations		Age of Violator							Age Not Stated
	Total	%	20/Undr	21-24	25-29	30-34	35-44	45-54	55/Ovr	
Speed - Conditions	433	26.6%	114	80	75	69	53	17	8	17
Speed - Over Legal	193	11.9%	56	49	40	22	14	6	0	6
Failed to Yield	103	6.3%	44	18	11	9	7	4	6	4
D.W.I.	258	15.9%	33	50	53	62	45	13	2	0
Following Too Closely	88	5.4%	25	15	18	15	7	5	2	1
Improper Passing	88	5.4%	19	21	16	7	17	2	3	3
Defective Equipment	86	5.3%	27	15	9	13	11	6	5	0
Disregd Signs/Signals	65	4.0%	19	14	12	7	8	2	0	3
Over Centerline	32	2.0%	10	10	4	2	4	2	0	0
Other Violations	280	17.2%	65	48	49	29	45	21	9	14
Total	1,626	100.0%	412	320	287	235	211	78	35	48

Source: WSP

Motorcycle Collisions By First Harmful Event

The most common first harmful event in single-motorcycle collisions was overturning. This event predominated in collisions for all age groups. In multiple-vehicle collisions involving motorcycles, rear-end collisions were the most prevalent at 14.5% followed by angular direction collisions with 14.2%. Collisions occurring while entering or leaving a driveway contributed to 11.4% of the total (Table 5-6).

Table 5-6

MOTORCYCLISTS INVOLVED IN TRAFFIC COLLISIONS
By First Harmful Event - 1990

Type of Collision	Collisions		Age of Motorcyclist						
	Total	%	20/Undr	21-24	25-29	30-34	35-44	45-54	55/Ovr
Single Motorcycle Collisions									
Struck Fixed Object	254	12.3%	56	53	44	46	35	16	4
Struck Other Object	9	0.4%	5	0	2	0	1	1	0
Overturned	522	25.2%	100	97	103	72	87	46	17
Motorcycle-Pedestrian	15	0.7%	1	5	5	1	1	2	0
Motorcycle-R.R. Train	0	0.0%	0	0	0	0	0	0	0
Motorcycle-Pedalcyclist	6	0.3%	2	0	0	0	3	1	0
Motorcycle-Animal	56	2.7%	11	10	4	8	16	3	4
Non-Collision	14	0.7%	9	1	1	2	1	0	0
Total Single Motorcycle Clsns	876	42.4%	184	166	159	129	144	69	25
Multiple Vehicle Collisions									
Head-on	16	0.8%	3	4	2	2	2	2	1
Rear-end	300	14.5%	61	47	52	56	59	16	9
Sideswipe	116	5.6%	24	20	18	16	29	8	1
Angular Direction	293	14.2%	80	47	57	42	43	15	9
Enter/Leave Driveway	236	11.4%	49	47	41	35	42	10	12
One Left/One Straight-Opp Dir	136	6.6%	34	25	26	19	19	10	3
Other Multiple Vehicle Clsns	95	4.6%	24	20	8	13	17	10	3
Total Multiple Vehicle Clsns	1,192	57.6%	275	210	204	183	211	71	38
Total Motorcycle Collisions	2,068	100.0%	459	376	363	312	355	140	63

Source: WSP

Motorcycle Helmet Use In Collisions

The mandatory helmet use law was enacted on July 1, 1990. Table 5-7 contains motorcycle collision statistics in a format enabling comparison of the last six months of 1989 (when the helmet law was not in effect) with the last six months of 1990 (when the law was in effect). From the last six months of 1989 to the same period in 1990, the rate of helmet use in collisions almost doubled, increasing from 42.0% to 81.5%. Comparing those same time periods, the percentage of motorcyclist fatalities in collisions decreased from 2.4% in 1989 to 2.2% in 1990. The percentage of motorcyclist disabling injuries was 30.6% in the last half of 1989, decreasing to 24.1% in the last half of 1990. Motorcyclist non-disabling injuries and non-injuries were 65.6% for the last six months of 1989, increasing to 72.2% for the last six months of 1990 (Table 5-7).

Table 5-7

MOTORCYCLIST INJURIES BY HELMET USE
Two-Year Comparison In Six-Month Intervals*

	Helmet Use - First 6 Months 1989				Helmet Use - Last 6 Months 1989			
Injury Type	Used	Not Used	Unknown	Total	Used	Not Used	Unknown	Total
Fatal	13	14	1	28	8	32	1	41
%	2.3%	2.5%	0.8%	2.3%	1.1%	4.0%	0.5%	2.4%
Disabling	141	188	19	348	213	278	36	527
%	25.5%	33.9%	14.4%	28.1%	29.5%	34.4%	18.9%	30.6%
Non-Disabling	324	299	79	702	410	429	95	934
%	58.5%	54.0%	59.8%	56.6%	56.8%	53.1%	50.0%	54.3%
None	75	53	23	151	89	67	39	195
%	13.5%	9.6%	17.4%	12.2%	12.3%	8.3%	20.5%	11.3%
Unknown	1	0	10	11	2	2	19	23
%	0.2%	0.0%	7.6%	0.9%	0.3%	0.2%	10.0%	1.3%
Total	554	554	132	1240	722	808	190	1720
%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	Helmet Use - First 6 Months 1990				Helmet Use - Last 6 Months 1990*			
Injury Type	Used	Not Used	Unknown	Total	Used	Not Used	Unknown	Total
Fatal	16	12	1	29	27	4	0	31
%	2.7%	3.2%	0.9%	2.7%	2.4%	3.6%	0.0%	2.2%
Disabling	164	112	9	285	294	25	19	338
%	27.3%	29.6%	8.5%	26.2%	25.7%	22.5%	12.8%	24.1%
Non-Disabling	347	204	64	615	676	67	79	822
%	57.7%	53.8%	60.4%	56.6%	59.1%	60.4%	53.0%	58.6%
None	74	50	25	149	142	15	34	191
%	12.3%	13.2%	23.6%	13.7%	12.4%	13.5%	22.8%	13.6%
Unknown	0	1	7	8	4	0	17	21
%	0.0%	0.3%	6.6%	0.7%	0.3%	0.0%	11.4%	1.5%
Total	601	379	106	1086	1143	111	149	1403
%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: WSP

* Mandatory motorcycle helmet use law enacted July 1, 1990.

Motorcycle Collisions By Month, Day and Hour

The summer months (June-September) of 1990 recorded the greatest percentage of motorcycle collisions. Twenty percent (20%) of fatalities occurred during the month of August, followed by 16.7% in July and 13.1% in September (Figure 5-3). Friday and Saturday experienced the greatest numbers of motorcycle collisions compared to other days of the week. This pattern follows the previous four-year average for days of the week (Figure 5-4). Breaking down motorcycle collisions by hour of the day reveals that weekday hours from 2 p.m. to 10 p.m. were the most hazardous period of the day. The noon to 10:00 p.m. time period was the highest risk period for weekend motorcyclists (Figure 5-5).

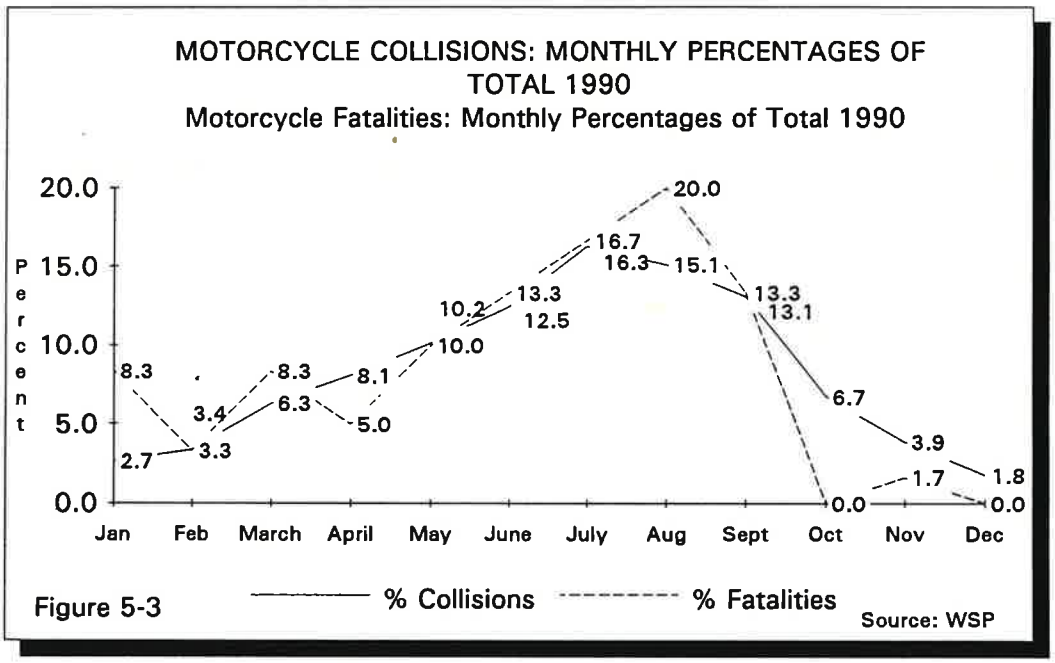


Figure 5-3

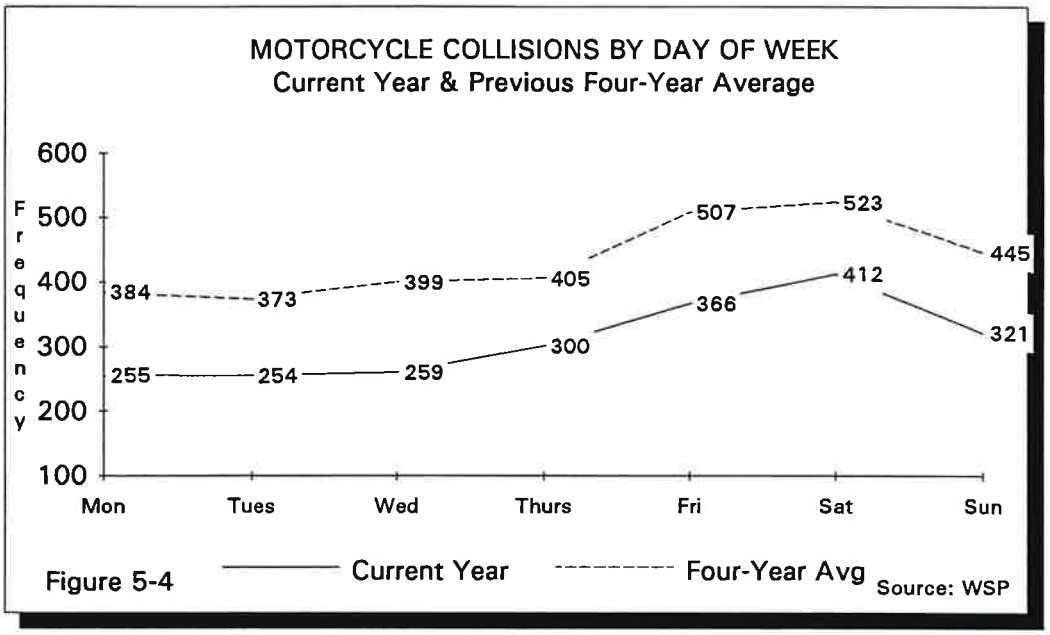


Figure 5-4

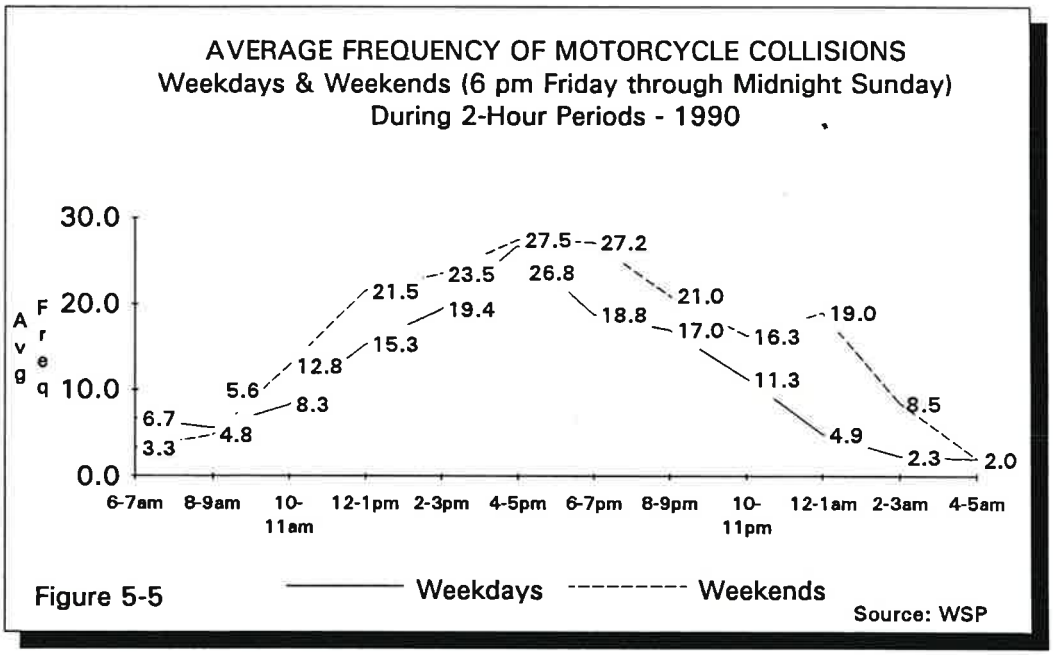


Figure 5-5

VI. Pedalcycles

Total pedalcycle collisions decreased 4.8% from the previous four-year average in 1990. The number of pedalcyclists killed totaled 14 in 1990, up 1 from the previous four-year average and up 6 from 1989. The number injured decreased 95, or 6.5%, from the previous four-year period, but was up 31 from the 1989 total (Table 6-1).

Table 6-1

PEDALCYCLE TRAFFIC COLLISIONS
Five-Year Comparison

Severity	Year 1990	1989	1988	1987	1986	Previous 4 -Year Average	% Change 90 - 4-Year Average
Statewide:							
Total Collisions	1,364	1,303	1,348	1,575	1,507	1,433	-4.83%
Persons Killed*	14	8	12	18	12	13	12.00%
Persons Injured*	1,362	1,331	1,375	1,584	1,538	1,457	-6.52%
Rural Areas:							
Total Collisions	377	392	439	550	491	468	-19.4%
Persons Killed*	10	6	6	15	6	8	21.2%
Persons Injured*	379	402	450	559	510	480	-21.1%
Urban Areas:							
Total Collisions	987	911	909	1,025	1,016	965	2.3%
Persons Killed*	4	2	6	3	6	4	-5.9%
Persons Injured*	983	929	925	1,025	1,028	977	0.6%

*In pedalcycle collisions by first harmful event Source: WSP

Pedalcycle Collisions By Rural/Urban Areas

Urban areas recorded 72.4% of the total reported car-pedalcycle crashes, up slightly from the previous four years. The rural areas of the state accounted for 27.6% of car-pedalcycle crashes, which continued a three-year downward trend (Figure 6-1).

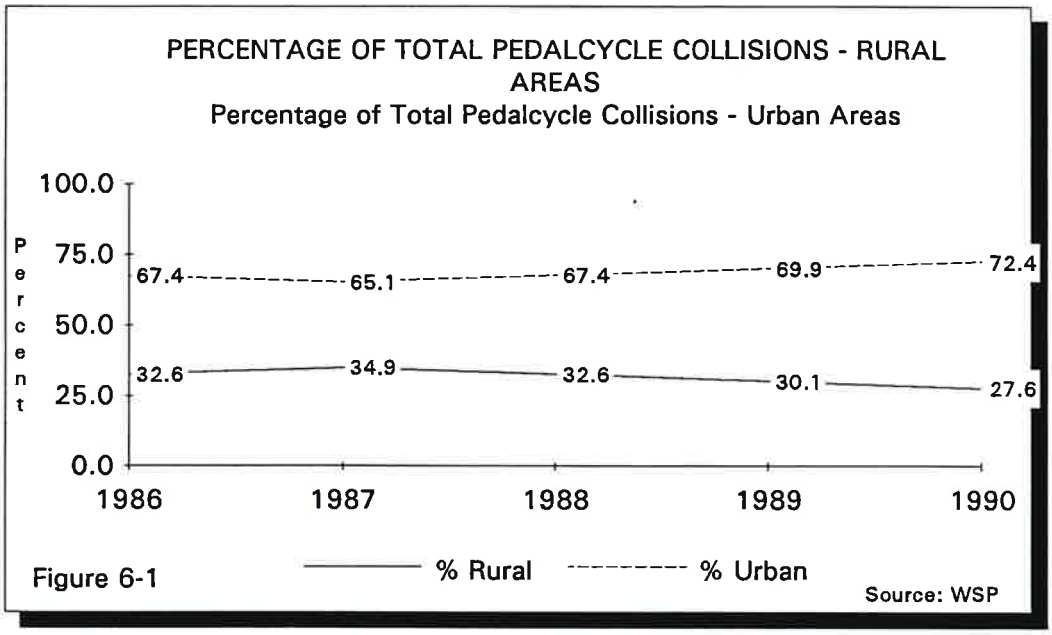


Figure 6-1

Pedalcyclists Killed and Injured By Age

In 1990, 28.0% of pedalcyclists killed and injured were between 10 to 14 years old; this was the highest representation of any age group. The new highest representation was the 25-34 age group with 16.1% of total collisions, a 24.4% increase from the previous four year average. The 35-44 age group recorded the highest percentage of increase in pedalcycle deaths and injuries, 46.6% over the previous four-year average and 39.1% over 1989 (Table 6-2).

Table 6-2

PEDALCYCLISTS KILLED AND INJURED BY AGE
Five-Year Comparison

Age	Year 1990	1989	1988	1987	1986	Previous 4-Year Average	% of Change 90 - 4-Year Average
0-4	16	14	23	23	20	20.0	-20.0%
5-9	191	233	215	288	268	251.0	-23.9%
10-14	381	355	368	447	446	404.0	-5.7%
15-19	194	215	253	304	297	267.3	-27.4%
20-24	163	130	155	157	177	154.8	5.3%
25-34	213	185	158	169	173	171.3	24.4%
35-44	96	69	73	64	56	65.5	46.6%
45-54	35	31	33	22	18	26.0	34.6%
55-64	18	14	18	14	12	14.5	24.1%
65-74	9	7	9	17	7	10.0	-10.0%
75 & Older	5	3	4	2	2	2.8	---
Not Stated	42	51	49	63	43	51.5	---
TOTAL	1,363	1,307	1,358	1,570	1,519	1,438.5	-5.2%

Source: WSP

Pedalcyclists Killed and Injured By Month

The months of May through September accounted for 62.7% of all persons killed and injured in pedalcycle-related collisions in 1990 (Figure 6-2).

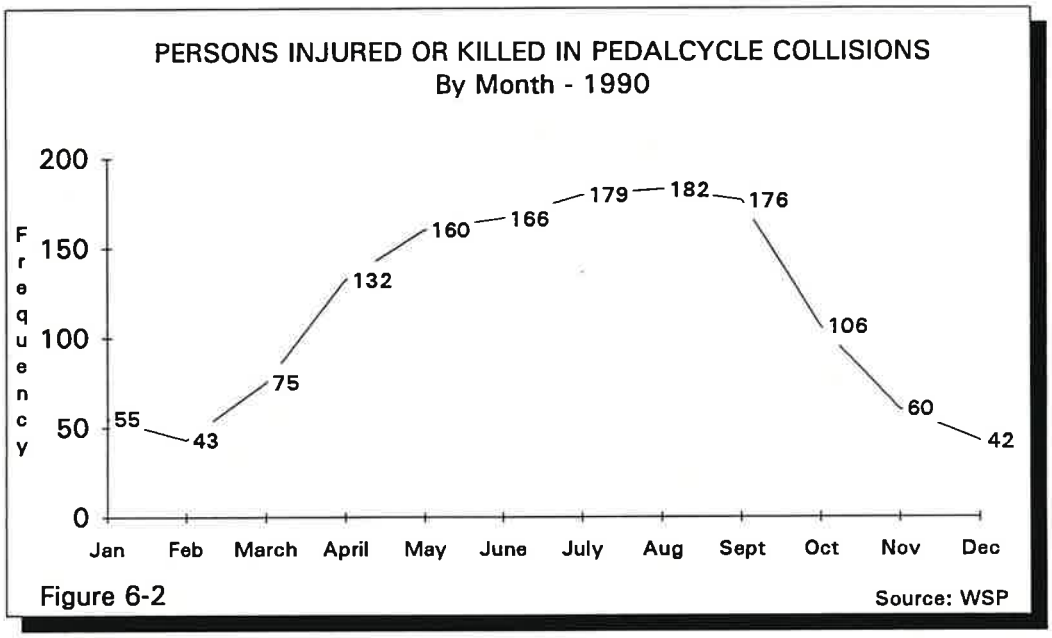


Figure 6-2

Pedalcycle Collision Rates By City Population

The city of Port Angles recorded the highest pedalcycle collision rate in the state during 1990 with 67.76 collisions per 100,000 population. Bellingham was second highest in this category with 59.42, followed by Seattle with 54.54 and Walla Walla with 52.87 collisions per 100,000 population (Table 6-3).

Table 6-3

PEDALCYCLE COLLISION RATE BY POPULATION
Cities 15,000 Population & Greater - 1990

City	1990 Population	Pedalcycle Deaths		Pedalcycle Injuries		Totl Ped Clsns	
		Number	Rate*	Number	Rate*	Number	Rate*
250,000 and Over							
1. Seattle	516,259	0	0.00	277	53.66	281	54.43
100,000 to 250,000							
1. Spokane	177,196	0	0.00	79	44.58	79	44.58
2. Tacoma	176,664	0	0.00	89	50.38	89	50.38
50,000 to 100,000							
1. Bellevue	86,874	0	0.00	46	52.95	46	52.95
2. Everett	69,961	0	0.00	34	48.60	35	50.03
3. Federal Way	67,304	1	1.49	21	31.20	22	32.69
4. Yakima	54,827	0	0.00	19	34.65	19	34.65
5. Bellingham	52,174	0	0.00	32	61.33	31	59.42
25,000 to 50,000							
1. Vancouver	46,380	0	0.00	17	36.65	16	34.50
2. Kennewick	42,159	0	0.00	7	16.60	7	16.60
3. Renton	41,688	0	0.00	9	21.59	8	19.19
4. Kirkland	40,052	0	0.00	10	24.97	11	27.46
5. Bremerton	38,142	0	0.00	10	26.22	9	23.60
6. Kent	37,960	1	2.63	18	47.42	18	47.42
7. Redmond	35,800	0	0.00	9	25.14	9	25.14
8. Olympia	33,840	0	0.00	9	26.60	9	26.60
9. Auburn	33,102	1	3.02	15	45.31	17	51.36
10. Richland	32,315	0	0.00	5	15.47	5	15.47
11. Longview	31,499	0	0.00	14	44.45	13	41.27
12. Edmonds	30,744	0	0.00	6	19.52	6	19.52
13. Lynnwood	28,695	0	0.00	14	48.79	14	48.79
14. Walla Walla	26,478	0	0.00	13	49.10	14	52.87
15,000 to 25,000							
1. Puyallup	23,875	0	0.00	10	41.88	11	46.07
2. Pullman	23,478	0	0.00	12	51.11	12	51.11
3. Sea Tac	22,694	0	0.00	8	35.25	7	30.85
4. Wenatchee	21,839	0	0.00	10	45.79	10	45.79
5. Mercer Island	20,816	0	0.00	5	24.02	4	19.22
6. Pasco	20,337	0	0.00	8	39.34	8	39.34
7. Mountlake Terrace	19,320	0	0.00	4	20.70	4	20.70
8. Lacey	19,279	0	0.00	9	46.68	9	46.68
9. Port Angeles	17,710	1	5.65	12	67.76	12	67.76
10. Mount Vernon	17,647	0	0.00	5	28.33	5	28.33
11. Des Moines	17,283	0	0.00	9	52.07	9	52.07
12. Oak Harbor	17,176	0	0.00	1	5.82	1	5.82
13. Aberdeen	16,565	0	0.00	9	54.33	8	48.29
TOTAL	1,958,132	4	0.20	855	43.66	858	43.82

Source: WSP, OFM

* Frequency per 100,000 population

VII. Pedestrians

During 1990, 80 pedestrians were killed and 1,861 were injured in the state. This was a decrease of 18.8% in the number killed, and an increase of 1.3% in the number injured compared to the previous four-year average. There were similar numbers of pedestrians killed in rural and urban areas, 42 in rural areas and 38 in urban areas. However, many more pedestrian injuries occurred in urban areas than in rural areas, with 1,398 in urban areas and 463 in rural areas (Table 7-1).

Table 7-1

PEDESTRIANS KILLED & INJURED IN VEHICLE COLLISIONS
Five-Year Comparison

Severity by Area	Year 1990	1989	1988	1987	1986	Previous 4 -Year Average	% Change 90 - 4-Year Average
Statewide:							
Pedestrians Killed	81	110	97	93	94	99	-17.77%
Pedestrians Injured	1,861	1,858	1,820	1,830	1,843	1,838	1.27%
Rural Areas:							
Pedestrians Killed	43	70	51	39	52	55	-21.34%
Pedestrians Injured	463	493	497	468	468	482	-3.84%
Urban Areas:*							
Pedestrians Killed	38	40	46	54	42	46	-16.48%
Pedestrians Injured	1,398	1,365	1,323	1,362	1,375	1,356	3.08%

*2,500 population and greater

Source: WSP

Pedestrians Killed and Injured By Age

Seven pedestrians in the age group 5-9 were killed. Ten pedestrians killed were nine years of age or younger. By contrast, 17 pedestrians killed were 75 year of age or older. A total of 28 pedestrians killed were 65 years or older. The largest decrease in pedestrian deaths was in the 20-44 age group, from 40 deaths in 1989 to 21 in 1990. The 10-19 year-old age group experienced an even greater reduction, recording 5 deaths in 1990 compared to 18 in 1989. The total number of pedestrians killed in the state during 1990 was 81, down 29 from 1989's total of 110, and down 16 from the baseline average (Table 7-2). Pedestrian injuries have stayed relatively constant during the past four years. The largest percentage decrease occurred in the 0-4 age group which experienced a 14.3% reduction. The biggest increase in pedestrian injuries was in the 45 54 age group which was up 12.2% over the baseline period (Table 7-3).

Table 7-2

PEDESTRIANS KILLED
Five-Year Comparison By Age

Age	Year 1990	1989	1988	1987	1986	Previous 4-Year Average	% Change 90 - 4-Year Average
0-4	3	5	10	5	2	6	-45.45%
5-9	7	6	4	5	4	5	47.37%
10-14	0	5	3	6	2	4	-100.00%
15-19	5	13	10	7	10	10	-50.00%
20-24	5	10	3	2	7	6	-9.09%
25-34	9	19	15	14	12	15	-40.00%
35-44	7	11	12	11	13	12	-40.43%
45-54	11	10	7	11	7	9	25.71%
55-64	6	8	7	11	10	9	-33.33%
65-74	11	5	8	7	8	7	57.14%
75 & Older	17	18	15	14	14	15	11.48%
Not Stated	0	0	3	0	0	1	-100.00%
TOTAL	81	110	97	93	89	97	-16.71%

Source: WSP

Table 7-3

PEDESTRIANS INJURED*
Five-Year Comparison By Age

Age	Year 1990	1989	1988	1987	1986	Previous 4-Year Average	% Change 90 - 4-Year Average
0-4	75	83	97	92	78	88	-14.29%
5-9	225	235	234	251	234	239	-5.66%
10-14	226	226	197	196	202	205	10.11%
15-19	203	218	190	206	219	208	-2.52%
20-24	170	185	149	166	162	166	2.72%
25-34	312	288	295	289	311	296	5.49%
35-44	205	219	210	196	191	204	0.49%
45-54	117	95	95	108	119	104	12.23%
55-64	82	87	96	84	80	87	-5.48%
65-74	80	78	74	83	73	77	3.90%
75 & Older	90	74	91	76	102	86	4.96%
Not Stated	76	70	92	83	72	79	-4.10%
TOTAL	1,861	1,858	1,820	1,830	1,843	1,838	1.27%

Source: WSP

* In all traffic collisions.

Pedestrian Collisions By City Population

Table 7-4 presents numbers and rates for 1990 pedestrian traffic deaths, injuries, and total collisions. For Washington cities of 15,000 population or more, Aberdeen had the highest rate for pedestrian fatalities at 12.07 per 100,000 population, based on 2 pedestrian deaths. Regarding pedestrian injuries, Seattle had the highest rate with 98.01 injuries per 100,000 population. Everett had the next highest rate with 78.62 and Wenatchee was third with 77.84. Seattle, Aberdeen and Everett had the three highest pedestrian collision rates with 94.91, 78.48, and 72.90 collisions per 100,000 population.

Table 7-4

PEDESTRIAN COLLISION RATE BY POPULATION
Cities 15,000 Population & Greater

City	1990 Population	Pedestrian Death		Pedestrian Inj		Total Ped Clsns	
		Number	Rate*	Number	Rate*	Number	Rate*
250,000 and Over							
1. Seattle	516,259	14	2.71	506	98.01	490	94.91
100,000 to 250,000							
1. Spokane	177,196	1	0.56	102	57.56	100	56.43
2. Tacoma	176,664	3	1.70	111	62.83	112	63.40
50,000 to 100,000							
1. Bellevue	86,874	3	3.45	39	44.89	41	47.19
2. Everett	69,961	1	1.43	55	78.62	51	72.90
3. Federal Way	67,304	3	4.46	23	34.17	25	37.14
4. Yakima	54,827	0	0.00	39	71.13	35	63.84
5. Bellingham	52,174	0	0.00	26	49.83	26	49.83
25,000 to 50,000							
1. Vancouver	46,380	0	0.00	25	53.90	24	51.75
2. Kennewick	42,159	0	0.00	16	37.95	15	35.58
3. Renton	41,688	0	0.00	8	19.19	8	19.19
4. Kirkland	40,052	0	0.00	10	24.97	10	24.97
5. Bremerton	38,142	1	2.62	28	73.41	27	70.79
6. Kent	37,960	1	2.63	25	65.86	24	63.22
7. Redmond	35,800	0	0.00	5	13.97	4	11.17
8. Olympia	33,840	0	0.00	21	62.06	20	59.10
9. Auburn	33,102	1	3.02	13	39.27	13	39.27
10. Richland	32,315	0	0.00	7	21.66	7	21.66
11. Longview	31,499	1	3.17	13	41.27	14	44.45
12. Edmonds	30,744	0	0.00	9	29.27	9	29.27
13. Lynnwood	28,695	2	6.97	12	41.82	12	41.82
14. Walla Walla	26,478	0	0.00	9	33.99	8	30.21
15,000 to 25,000							
1. Puyallup	23,875	0	0.00	9	37.70	9	37.70
2. Pullman	23,478	0	0.00	6	25.56	6	25.56
3. Sea Tac	22,694	0	0.00	9	39.66	9	39.66
4. Wenatchee	21,839	0	0.00	17	77.84	15	68.68
5. Mercer Island	20,816	0	0.00	3	14.41	3	14.41
6. Pasco	20,377	1	4.91	11	53.98	10	49.07
7. Mountlake Terrace	19,320	0	0.00	2	10.35	2	10.35
8. Lacey	19,279	0	0.00	12	62.24	10	51.87
9. Port Angeles	17,710	0	0.00	12	67.76	10	56.47
10. Mount Vernon	17,647	0	0.00	6	34.00	6	34.00
11. Des Moines	17,283	0	0.00	1	5.79	1	5.79
12. Oak Harbor	17,176	0	0.00	3	17.47	2	11.64
13. Aberdeen	16,565	2	12.07	11	66.41	13	78.48

*Frequency per 100,000 population

Source: WSP, OFM

Actions Of Pedestrians Killed and Injured By Location

In urban areas, 50.1% of all pedestrians killed and injured were struck while crossing the roadway at an intersection, and 31.6% were killed or injured while crossing at a location other than at an intersection. Most pedestrians 65 years and older who were killed or injured in urban areas were crossing at an intersection (67.7%). Most pedestrians in the 0-4 age group who were killed or injured were crossing at a a location other than an intersection (59.7%).

In rural areas, 36.4% of pedestrians killed and injured were in the 25-64 year-old age group. Of this group, 22.8% were struck while crossing the roadway at a non-intersection location. Pedestrians in the 5-14 age group accounted for 27.9% of those killed and injured in rural areas. Of this group, 56.7% were struck while crossing the roadway at a non-intersection location (Table 7-5).

Table 7-5

ACTIONS OF PEDESTRIANS KILLED & INJURED
Urban and Rural Areas - 1990

Action	Killed		Killed/Injured		Age					Age Not Stated
	#	%	#	%	0-4	5-14	15-24	25-64	65+	
Urban:										
Crossing at intersection	13	34.2%	721	50.1%	14	132	122	316	111	26
Not at intersection	17	44.7%	455	31.6%	37	145	80	134	40	19
Walking with traffic	0	0.0%	11	0.8%	0	1	6	3	1	0
Walking against traffic	0	0.0%	8	0.6%	0	2	1	5	0	0
Standing/working in roadwy	2	5.3%	74	5.1%	2	4	13	44	4	7
Playing in roadway	0	0.0%	17	1.2%	4	12	0	1	0	0
Lying in roadway	1	2.6%	6	0.4%	0	0	3	3	0	0
Not in roadway	0	0.0%	79	5.5%	2	11	25	31	3	7
Other & Not Stated	5	13.2%	68	4.7%	3	11	15	30	6	3
TOTAL URBAN	38	100.0%	1,439	100.0%	62	318	265	567	165	62
% of Total Killed or Injured					4.3%	22.1%	18.4%	39.4%	11.5%	4.3%
Rural:										
Crossing, entering roadway at intersection	5	11.9%	92	18.2%	2	24	13	35	12	6
Not at intersection	12	28.6%	174	34.5%	8	80	30	42	10	4
Walking with traffic	7	16.7%	28	5.5%	3	4	10	7	4	0
Walking against traffic	1	2.4%	12	2.4%	0	4	3	5	0	0
Standing/working in roadwy	5	11.9%	66	13.1%	0	6	16	38	4	2
Playing in roadway	0	0.0%	13	2.6%	1	10	2	0	0	0
Lying in roadway	4	9.5%	9	1.8%	0	0	4	5	0	0
Not in roadway	7	16.7%	79	15.6%	1	8	28	39	2	1
Other & Not Stated	1	2.4%	32	6.3%	1	5	11	13	1	1
TOTAL RURAL	42	100.0%	505	100.0%	16	141	117	184	33	14
% of Total Killed or Injured					3.2%	27.9%	23.2%	36.4%	6.5%	2.8%

Source: WSP

Pedestrian Collisions By Day Of Week/Hour Of Day

Monday, Saturday and Sunday had the highest percentages of pedestrian fatalities by day of the week, with 17.7% occurring on Mondays and 16.5% occurring on both Saturdays and Sundays. Wednesday, Thursday and Friday recorded the highest percentages of total pedestrian collisions with 16.9%, 16.0% and 18.0% respectively (Figure 7-1). By time, the period 3:00 p.m. to 6:00 p.m. had the highest percentage of both fatal and total pedestrian collisions with 20.3% and 30.6% respectively (Figure 7-2).

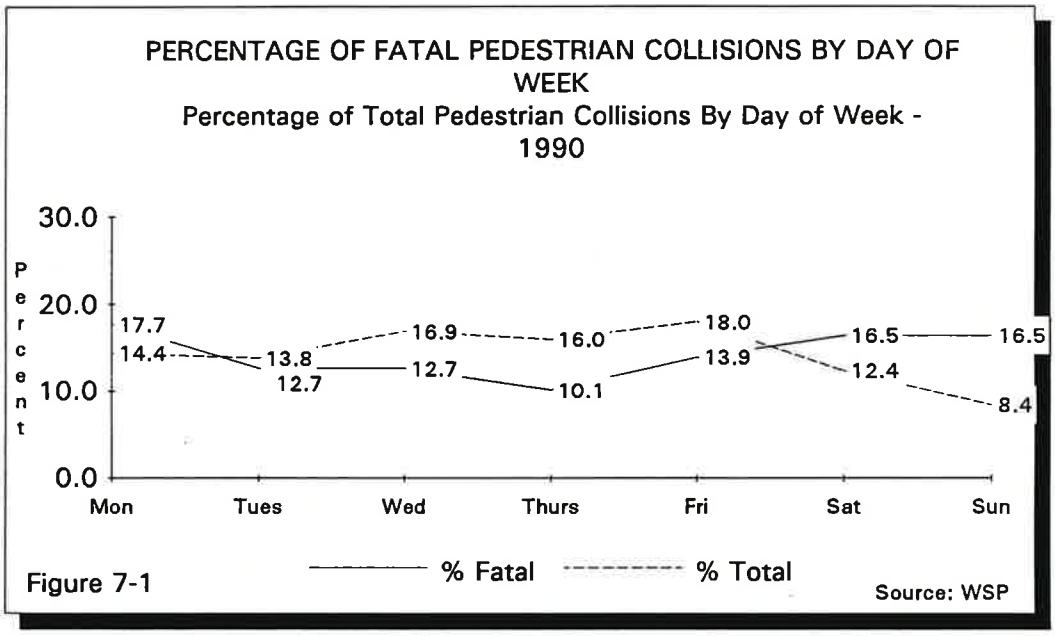


Figure 7-1

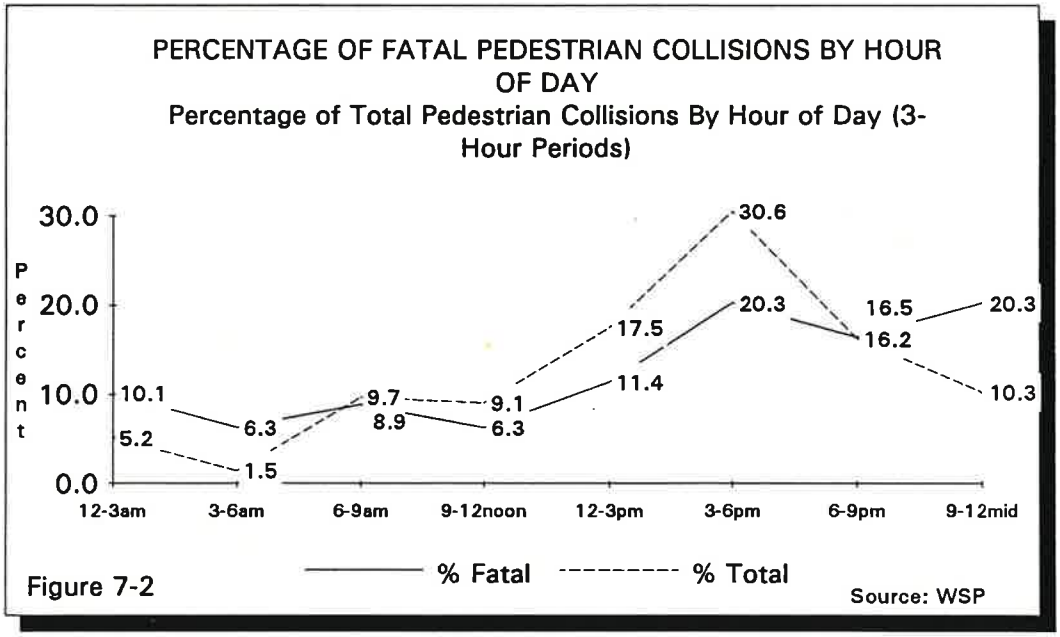


Figure 7-2

VIII. Heavy Trucks

In 1990, 6,725 heavy trucks (10,000 pound gross weight and over) were involved in collisions of which 81 were fatal. The heavy truck collision rate (collisions per 10,000 registered heavy trucks) was 582.3, down 7.98 from the baseline average. The fatal collision rate for heavy trucks was 7.0, which is equal to the baseline average and just under 1989's 7.1 rate (Table 8-1).

Table 8-1

HEAVY TRUCK COLLISION SUMMARY +
Five-Year Comparison

Severity/Exposure & Rates	Year 1990	1989	1988	1987	1986	Previous 4-Year Average	% Change 90 - 4-Yr Average
Total Trucks in Collisions	6,725	6,345	6,149	6,243	7,983	6,680	0.67%
Trucks in Fatal Collisions	81	79	79	71	66	74	9.83%
Registration of Heavy Trucks*	115,500	112,000	106,400	104,200	101,368	105,992	8.97%
Total Collision Rate**	582.3	566.5	577.9	599.1	787.5	632.8	-7.98%
Fatal Collision Rate**	7.0	7.1	7.4	6.8	6.5	7.0	0.89%

\+ 10,000 gross weight & greater
Source: WSP, DOL
* Estimated
**Collisions per 10,000 registered trucks

Age of Drivers Involved in Heavy Truck Collisions

Of drivers involved in heavy truck collisions, 57.6% were 39 years of age or under. This group makes up 39.7% of all classified drivers, which creates an over-representation ratio of 1.45. The age group of 40 and over contributed to 42.4% of heavy truck collisions. They make up 60.32% of drivers with a classified license, creating a .70 under-representation ratio (Table 8-2).

Table 8-2

DRIVERS INVOLVED IN HEAVY TRUCK COLLISIONS
By Age - 1990

Age	All Collisions Number	%	Fatal Collisions Number	%	Injury Collisions Number	%	% of Classified Drivers*	Over/ Under Ratio**
19 & Under	80	1.4%	0	0.0%	33	1.7%	0.05%	27.37
20-29	1,434	24.2%	8	10.5%	494	25.5%	10.91%	2.22
30-39	1,893	32.0%	25	32.9%	617	31.9%	28.73%	1.11
40-49	1,382	23.4%	25	32.9%	444	22.9%	28.07%	0.83
50-59	862	14.6%	17	22.4%	268	13.8%	17.31%	0.84
60 & Over	263	4.4%	1	1.3%	81	4.2%	14.94%	0.30

Source: WSP, DOL
* Classified Endorsement is required only for operators of larger trucks and truck combinations
** Percent of collision involvement to percent of licensed drivers

Heavy Truck Defects

Defective brakes were present in 39.6% of the 530 trucks determined to have defective equipment in investigated collisions. Other defects included 11.3% with worn or smooth tires, 4.9% for tire punctures or blowouts, 4.9% for defective rear lights, 3.6% for defective steering mechanism and 35.7% for all other defects. Overall, there has been a 17.3% decrease in the number of defects reported in investigated collisions over the past several years (Table 8-3).

Table 8-3

DEFECTS OF HEAVY TRUCKS INVOLVED IN COLLISIONS
Four-Year Comparison

	1990		1989		1988		1987	
Condition of Vehicle	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
Defective Brakes	210	39.6%	206	36.7%	236	40.4%	254	39.6%
Defective Headlights	4	0.8%	6	1.1%	6	1.0%	6	0.9%
Defective Rear Lights	26	4.9%	27	4.8%	37	6.3%	27	4.2%
Defective Steering	19	3.6%	18	3.2%	32	5.5%	30	4.7%
Puncture or Blowout	26	4.9%	14	2.5%	24	4.1%	23	3.6%
Worn or Smooth Tires	60	11.3%	57	10.2%	74	12.7%	79	12.3%
Other Defects	185	34.9%	233	41.5%	175	30.0%	222	34.6%

Source: WSP

Location of Heavy Truck Collisions

During 1990, 56.4% of the collisions involving heavy trucks occurred in the urban areas, while 43.6% occurred in the rural areas of the state. These percentages have been fairly constant over the past five years (Figure 8-1). Regarding fatal heavy truck collisions, 78.9% occurred in rural areas. This figure has varied from a low of 72.2% in 1989 to a high of 81.0% in 1988 (Figure 8-2). Heavy truck injury collisions are more equally divided between urban and rural areas. In 1990, 51.6% of the heavy truck injury collisions occurred in rural areas and 48.4% occurred in urban areas (Figure 8-3).

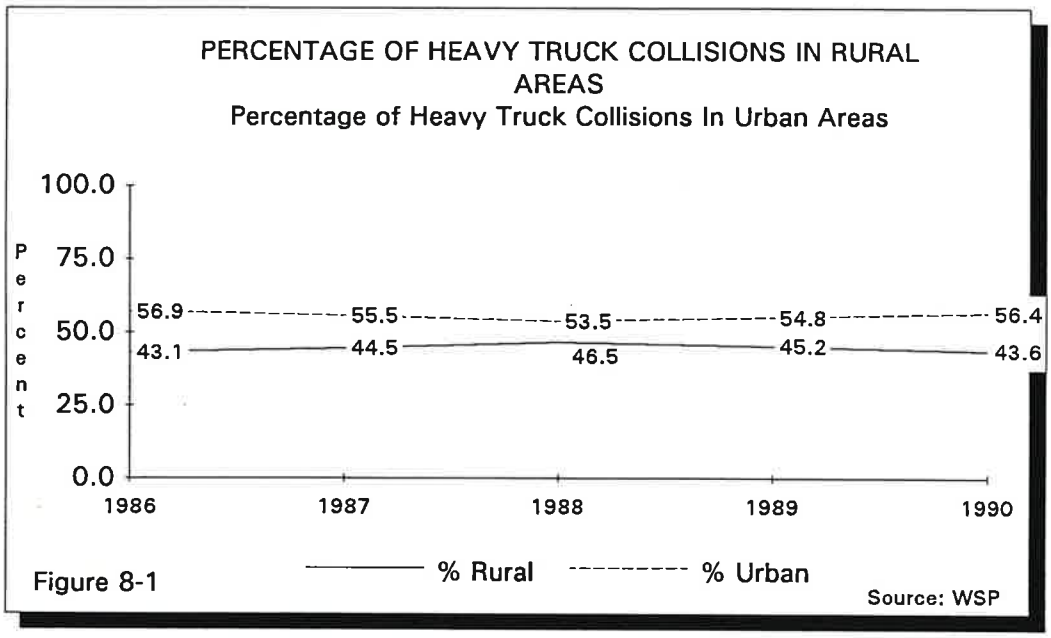


Figure 8-1

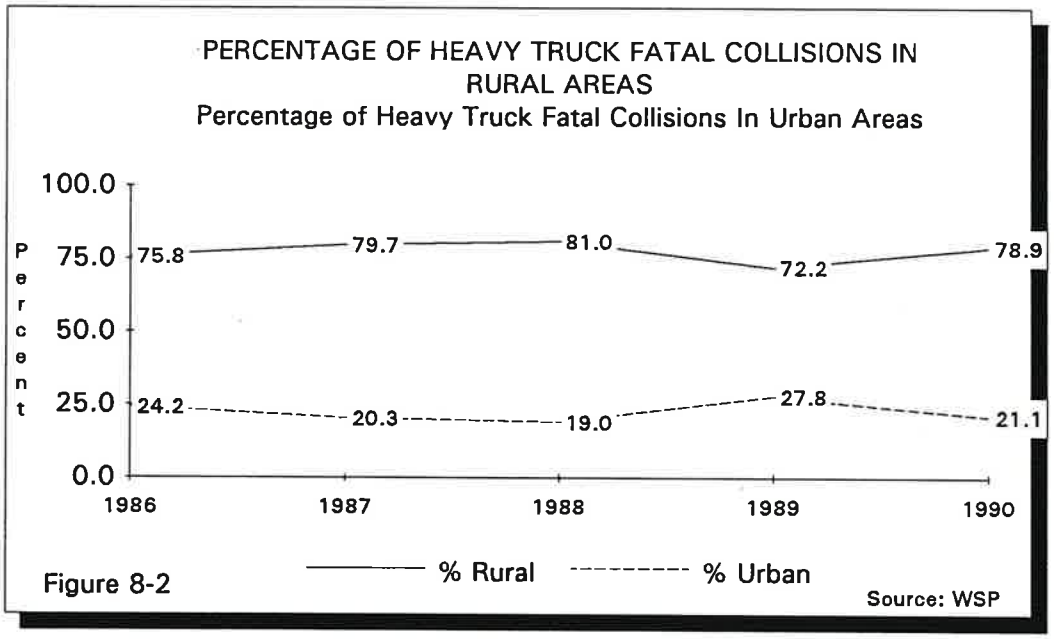


Figure 8-2

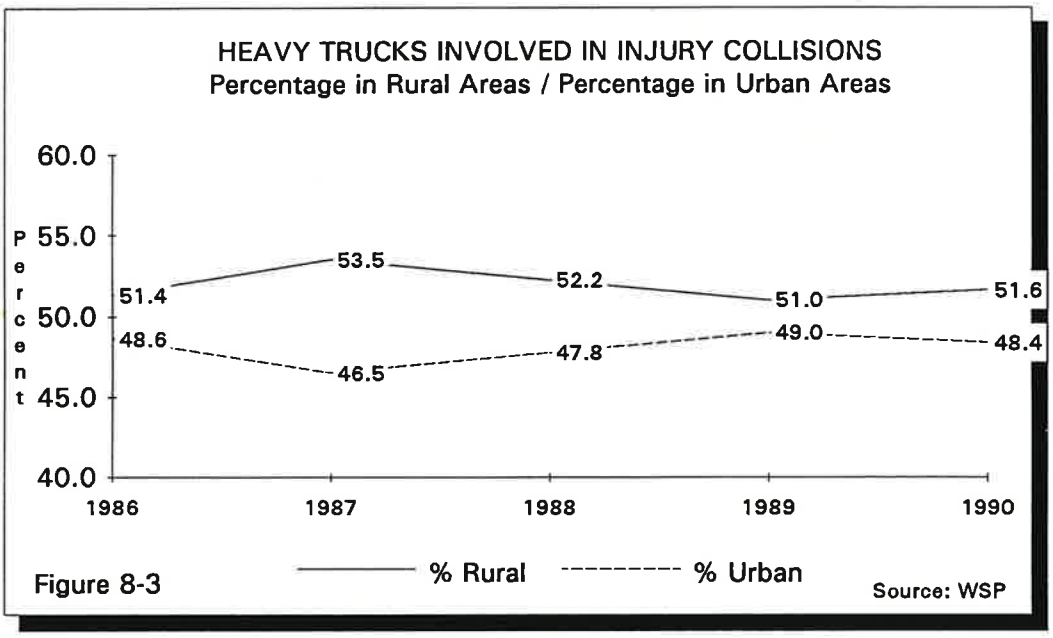


Figure 8-3

Heavy Truck Collisions By Day of Week

Friday recorded the highest number of heavy truck collisions with 1,248, followed by Monday with 1,161. The weekend days of Saturday and Sunday had dramatically lower figures with 448 and 246, respectively. There was little change between 1989 and 1990 (Figure 8-4).

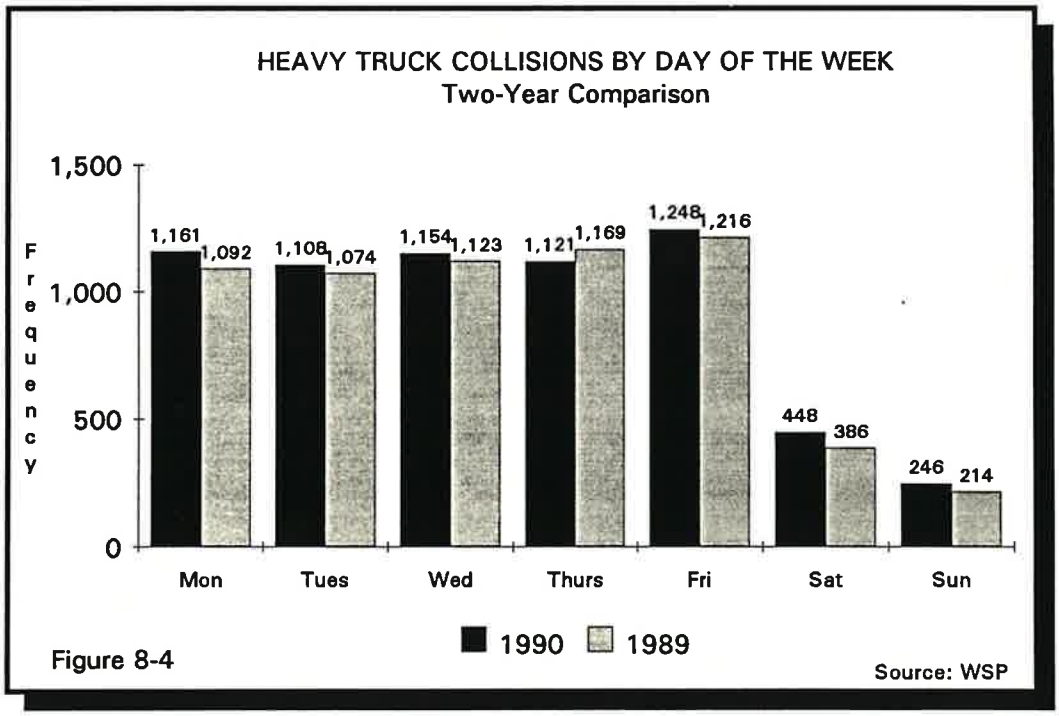


Figure 8-4

Heavy Truck Collisions By Hour Of Day

The peak heavy truck collision period was from noon to 3:00 p.m. during 1990, which was true for both fatal and total heavy truck collisions. Total collisions showed increases from 6:00 a.m. until 3:00 p.m. (Figure 8-5).

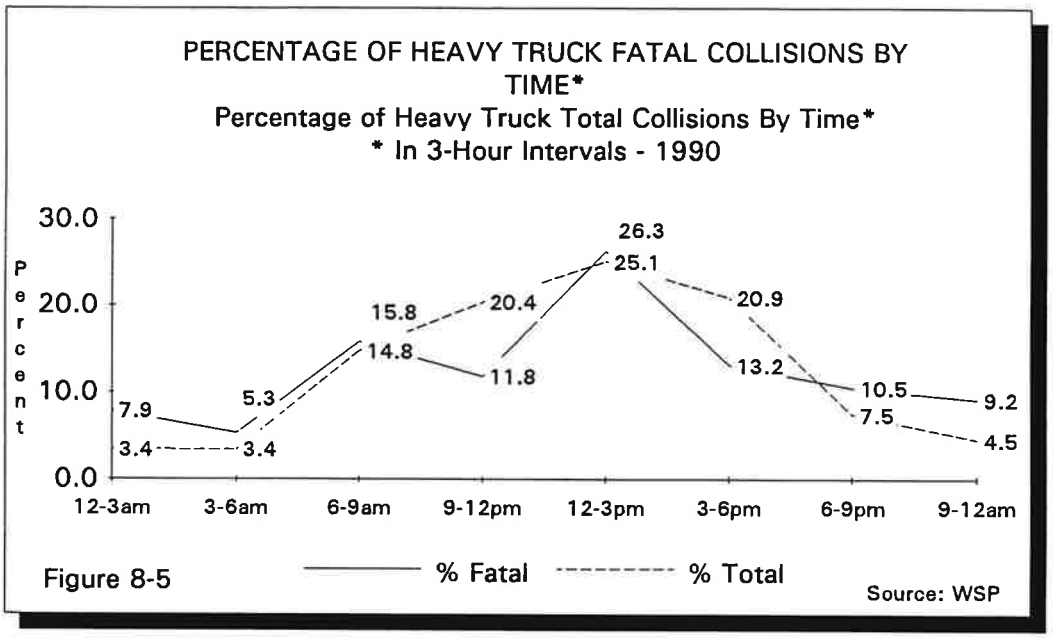


Figure 8-5

Light and Heavy Truck Collisions

Figure 8-6 shows the collision percentages of light trucks (gross weight of under 10,000 pounds) as compared to heavy trucks. During 1990, 90.7% of all truck collisions involved light trucks. The percentage of light truck registrations has been gradually increasing over heavy truck registrations over the past five years.

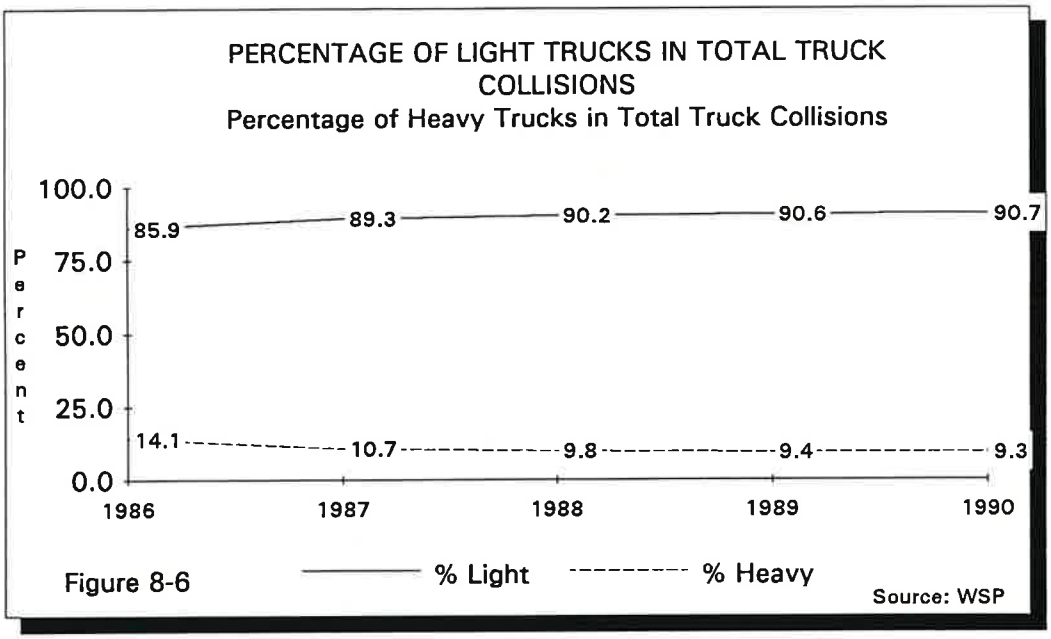


Figure 8-6

Heavy Truck Collisions By First Harmful Event

Heavy trucks were involved in 4,769 collisions involving other moving motor vehicles. This figure represents 73.5% of all heavy truck collisions in 1990. In addition, heavy trucks were involved in 423 collisions in which the other vehicle was parked, and in 755 collisions with fixed or other objects. All of the above events were more numerous in 1990 than in 1989. There were 321 collisions in which a truck overturned during 1990, which was 58 fewer occurances than in 1989 (Table 8-4).

Table 8-4

HEAVY TRUCK COLLISIONS BY FIRST HARMFUL EVENT
Four-Year Comparison

Type of Collision	1990 #	1990 % of Total	1989 #	1989 % of Total	1988 #	1988 % of Total	1987 #	1987 % of Total
Clsn w/other moving motor veh	4,769	73.5%	4,728	74.2%	4,388	73.8%	4,595	73.6%
Collision with parked vehicle	423	6.5%	412	6.5%	353	5.9%	440	7.0%
Collision with fixed/other object	755	11.6%	667	10.5%	677	11.4%	636	10.2%
Overturning	321	4.9%	379	5.9%	349	5.9%	379	6.1%
Other non-collision	139	2.1%	113	1.8%	105	1.8%	107	1.7%
All other collisions*	79	1.2%	75	1.2%	70	1.2%	86	1.4%

* Pedestrians, pedalcyclists, RR train & animal.

Source:WSP

IX. Pupil Transportation

During the 1989-1990 school year, there were 325 school bus collisions reported, in which 103 school bus occupants were injured and one pedestrian was struck and killed by the school bus. Of the 103 school bus occupants who were injured, 85 were pupils, 17 were drivers, and 1 was an occupant other than a student. Nine of the injuries were judged to be a major injury, 34 were minor injuries, and 66 were possible injuries (i.e. complaints of pain, etc.). School bus registration totalled 6,906 vehicles, and total travel was computed at 78.1 million miles during the school year (Table 9-1). The school bus collision rate for the 1989-1990 school year was computed at 0.42 collisions per 100,000 miles traveled. The 1989-1990 rate was the lowest since 1983-1984 (Figure 9-1).

Table 9-1

COLLISIONS INVOLVING SCHOOL BUSES
Four-Year Comparison

Severity, Exposure & Rates	School Year 89-90	88-89	87-88	86-87	Previous 3-Year Average	% Change 89-90 3-Yr Avg
Total Collisions	325	371	311	310	331	-1.71%
Fatal Collisions	1	1	1	5	2	-57.14%
Injury Collisions	98	121	115	92	109	-10.37%
Property Damage Collisions	226	249	195	213	219	3.20%
Number Killed	1	1	1	5	2	-57.14%
Persons Injured:						
Pupils	85	66	116	59	80	5.81%
School Bus Drivers	17	21	28	9	19	-12.07%
Other Occupants of School Bus	1	1	0	1	1	50.00%
Pedestrian/Bicyclist	6	5	7	7	6	-5.26%
Occupants/Other Vehicles Involved	123	123	117	93	111	10.81%
Total Injured	232	216	268	169	218	6.58%
Severity of School Bus Occupant Inj:						
Major Injury	9	3	4	1	3	237.50%
Minor Injury	34	19	75	9	34	-0.97%
Possible Injury	66	71	69	59	66	-0.50%
School Bus Registration	6,906	6,627	6,427	6,185	6,413	7.69%
Registration Collision Rate*	47.1	56.0	48.4	50.1	51.5	-8.62%
Miles Traveled (in thousands)	78,127.9	73,799.7	72,816.2	68,658.8	71,758.2	8.88%
Mileage Collision Rate**	0.42	0.50	0.43	0.45	0.460	-9.66%

* Collisions per 1,000 registered vehicles
** Collisions per 100,000 miles traveled

Source: WSP, SPI

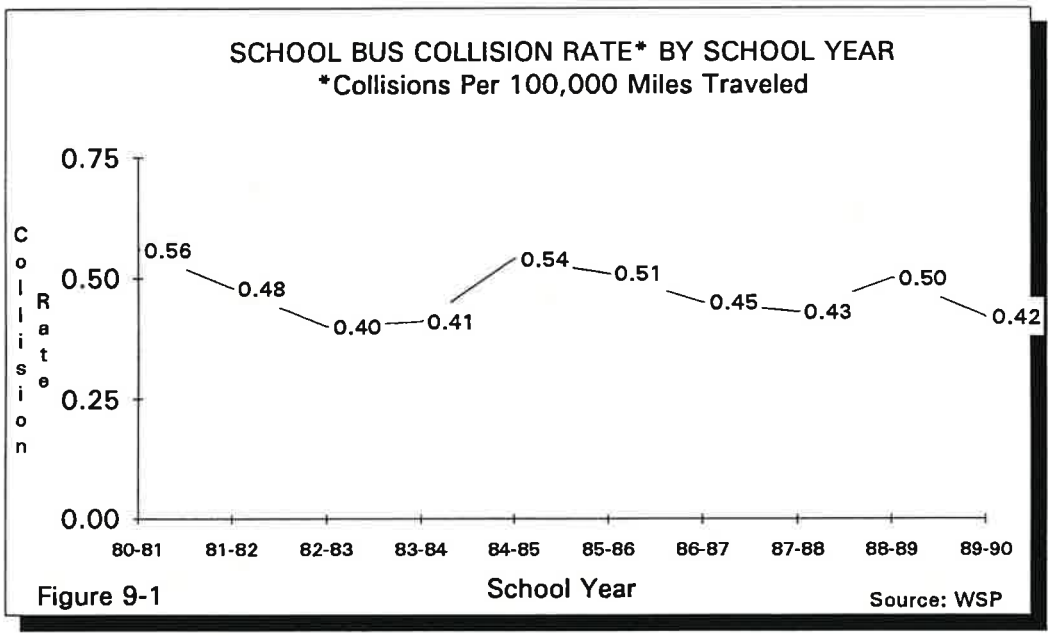

SCHOOL BUS COLLISION RATE* BY SCHOOL YEAR
*Collisions Per 100,000 Miles Traveled
Collision Rate
0.75
0.50
0.25
0.00
0.56
0.48
0.40
0.41
0.54
0.51
0.45
0.43
0.50
0.42
80-81
81-82
82-83
83-84
84-85
85-86
86-87
87-88
88-89
89-90
School Year
Source: WSP

Figure 9-1

X. Contributing Driver Violations

Driving while under the influence of intoxicating liquor and/or drugs made up 8.3% of the violations noted in all investigated crashes and a much larger 31.2% of all violations noted in fatal crashes. Failure to yield the right of way was the second most noted violation in all collisions, with 21.4%, but made up only 5.9% of violations noted in fatal collisions. Exceeding a reasonable safe speed contributed to 19.0% of the violations noted in all investigated collisions and 16.3% of fatal collisions. Exceeding the posted speed accounted for only 3.7% of violations noted in all collisions, but for fatal collisions 13.4% of violations noted were in this category (Figure 10-1).

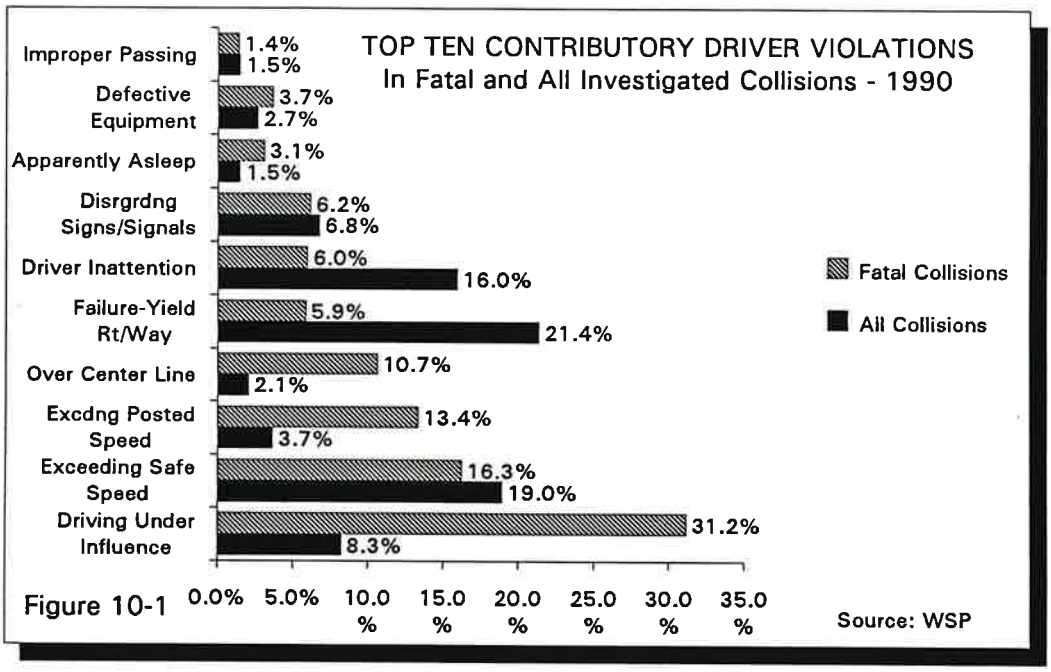


Figure 10-1

XI. Senior Driver Involvement

In 1990, 28,103 senior drivers (55 years and older) were involved in 25,907 reported collisions. There were 142 fatal collisions involving 157 senior drivers and 10,059 injury collisions involving 10,937 senior drivers. These figures indicate that senior driver involvement in 1990 increased over the previous four-year baseline period 6.3% in total collisions, 1.5% in fatal crashes and 9.5% involved in injury collisions. The number of driver licenses issued to seniors (781,620) increased 4.0% from the baseline period. The total collision rate for senior drivers (total collisions per 1,000 licensed senior drivers) was 3.60 for 1990, up 2.1% from the baseline period (Table 11-1).

Table 11-1

SENIOR DRIVERS (55 YEARS & OLDER) INVOLVED IN COLLISIONS
Five-Year Comparison

Collisions & Rates	Year 1990	1989	1988	1987	1986	Previous 4-Year Average	% Change 90 - 4-Year Average
Senior drivers involved in:							
Total Collisions	28,103	26,873	26,584	26,482	25,842	26,445	6.3%
Fatal Collisions	157	174	148	157	140	155	1.5%
Injury Collisions	10,937	10,559	10,197	9,634	9,560	9,988	9.5%
Senior Drivers Licenced	781,620	780,607	763,079	741,653	719,784	751,281	4.0%
Fatal Collision Ratio*	5.59	6.47	5.57	5.93	5.42	5.85	-4.4%
Fatal Rate +	0.20	0.22	0.19	0.21	0.19	0.20	-1.8%
Total Collision Rate**	3.60	3.44	3.48	3.57	3.59	3.52	2.1%

* Fatal collisions per 1,000 total collisions
\+ Fatal collisions per 1,000 licensed drivers
** Drivers involved per 100 licensed

Source: WSP, DOL

Senior Driver Collisions By First Harmful Event

Of all collisions involving senior drivers in 1990, 87.5% were with other moving vehicles. This type of collision accounted for 64.1% of fatal crashes and 85.8% of injury collisions. Single-vehicle collisions with fixed or other objects led to the next highest percentages of senior driver involvement in total, fatal and injury collisions, at 6.1%, 17.6% and 6.8% respectively. Collisions with pedestrians and bicycles contributed to only 1.8% of total senior driver collisions, but resulted in 11.3% of fatal and 4.3% of injury collisions involving senior drivers (Table 11-2).

Table 11-2

COLLISIONS INVOLVING SENIOR DRIVERS*
By First Harmful Event - 1990

Type of Collision	Total Collisions		Fatal Collisions		Injury Collisions	
	Number	% of Total	Number	% of Total	Number	% of Total
Collision w/other moving motor vehicles	22,665	87.5%	91	64.1%	8,634	85.8%
Collision with parked vehicle	602	2.3%	0	0.0%	121	1.2%
Collision with fixed/other object	1,573	6.1%	25	17.6%	681	6.8%
Overturning & other non collision	369	1.4%	10	7.0%	164	1.6%
Collisions with pedestrian & bicycles	455	1.8%	16	11.3%	437	4.3%
Other collisions inc. RR train, animal	243	0.9%	0	0.0%	22	0.2%
TOTAL	25,907	100.0%	142	100.0%	10,059	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 contributed to 49.8% of all driver violations in the 75 years and older age group. This violation was the leading contributing circumstance for all drivers 55 years and older in collisions. Speed too fast for conditions was the second leading driver violation for senior drivers ages 55-59, 60-64 and 65-69, with 16.0%, 13.2% and 12.1% respectively. Disregarding traffic signals/signs was second highest violation for the 70-74 and for the 75 and older age groups with 10.9% and 10.8%, respectively (Table 11-3).

Table 11-3

SENIOR DRIVER INVOLVEMENT IN INVESTIGATED COLLISIONS
Contributing Circumstances By Age Group - 1990

Contributing Circumstances	55-59		60-64		65-69		70-74		75 & Older	
	Number	%	Number	%	Number	%	Number	%	Number	%
Failure to Yield Right of Way	897	31.2%	858	34.0%	906	38.0%	853	39.5%	1,571	49.8%
Speed Too Fast For Conditions	460	16.0%	332	13.2%	288	12.1%	224	10.4%	227	7.2%
Disregard Traffic Signal/Signs	237	8.2%	215	8.5%	218	9.1%	236	10.9%	340	10.8%
Following Too Closely	282	9.8%	244	9.7%	228	9.6%	185	8.6%	190	6.0%
DWI	183	6.4%	151	6.0%	108	4.5%	61	2.8%	40	1.3%
Defective Equipment	79	2.7%	65	2.6%	43	1.8%	39	1.8%	35	1.1%
Crossing Over the Centerline	71	2.5%	54	2.1%	44	1.8%	44	2.0%	35	1.1%
Exceeding Legal Speed	21	0.7%	20	0.8%	16	0.7%	8	0.4%	12	0.4%
All Other Circumstances +	647	22.5%	584	23.1%	533	22.4%	507	23.5%	704	22.3%
TOTAL	2,877	100.0%	2,523	100.0%	2,384	100.0%	2,157	100.0%	3,154	100.0%

\+ Including driver inattention

Source: WSP

Senior Driver Collisions By Age Group

Figures 11-1 through 11-5 show that each senior driver age group has been under-represented in collisions compared to their percentage of licensed drivers. Furthermore, these under-representation rates have been evident for the last five years. To illustrate, the 55-59 age group was involved in 3.49% of the reported collisions, but they constituted 5.28% of the total licenced drivers, creating a 0.66 under-representation ratio (Figure 11-1). The largest change in these ratios during the last five years has been a reduction in the 75 and older group's under-representation rate from 0.58 in 1989 to 0.51 in 1990 (Figures 11-1 through 11-5).

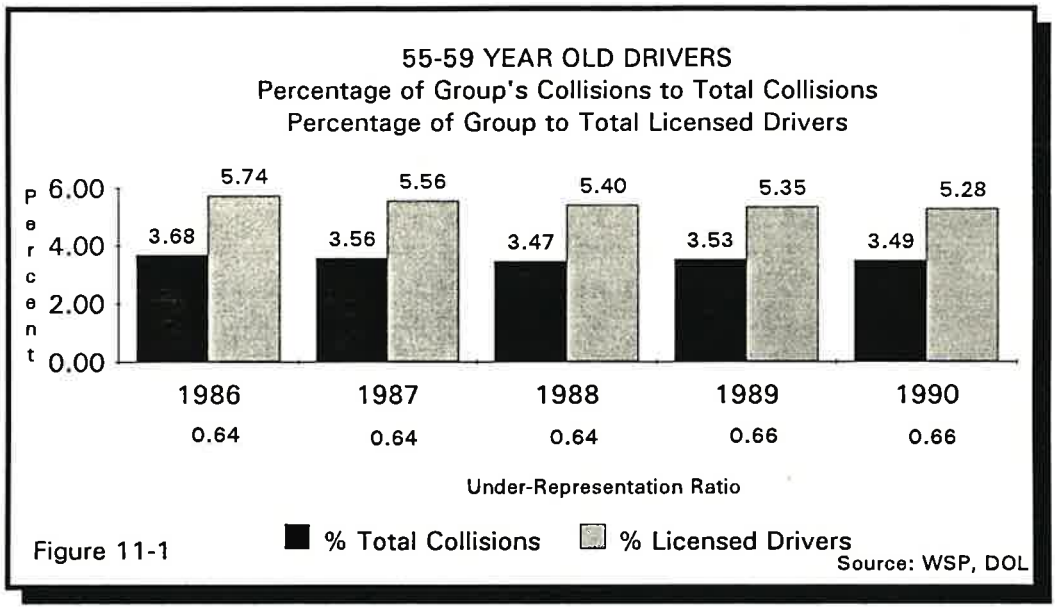


Figure 11-1

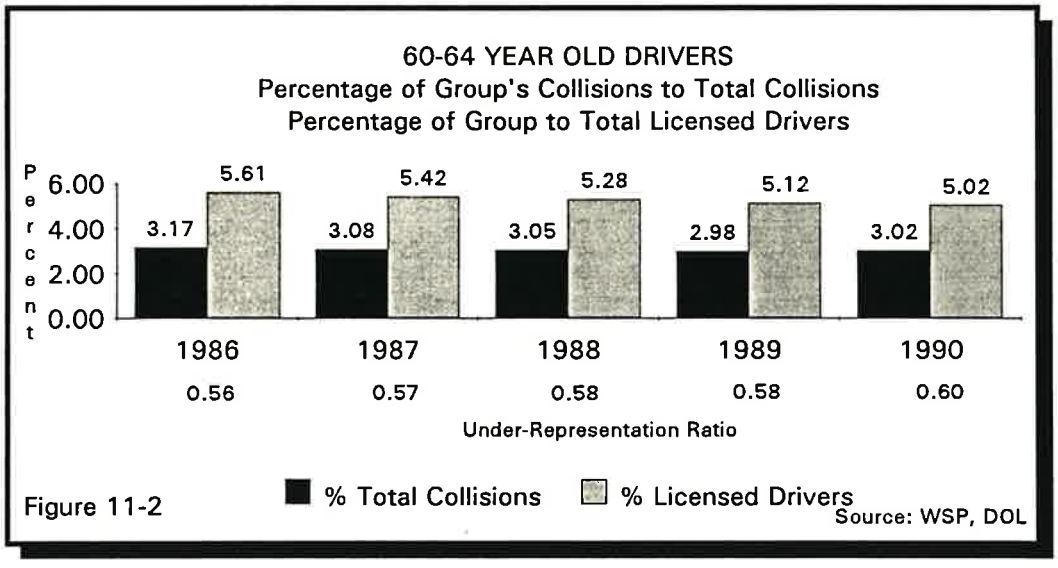


Figure 11-2

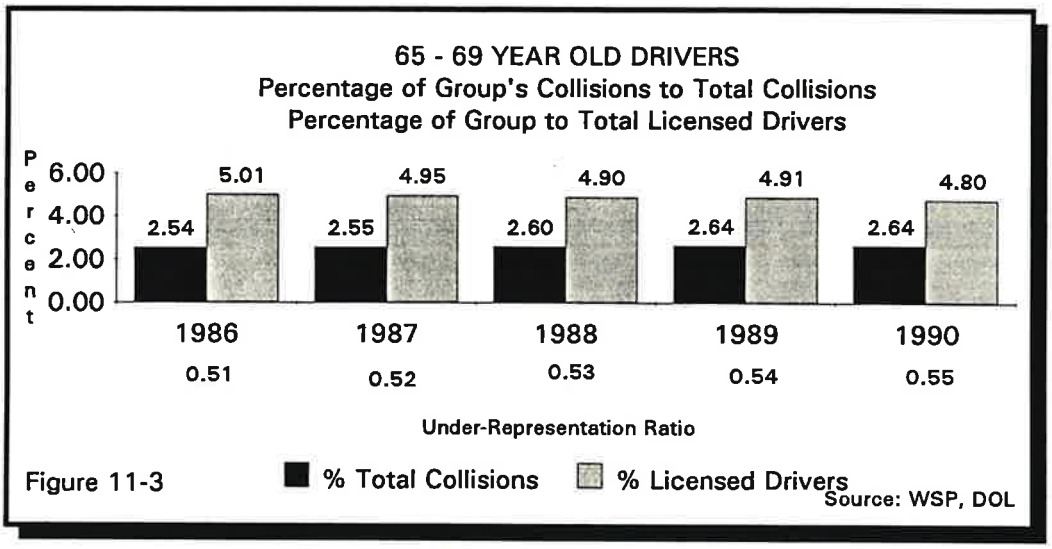


Figure 11-3

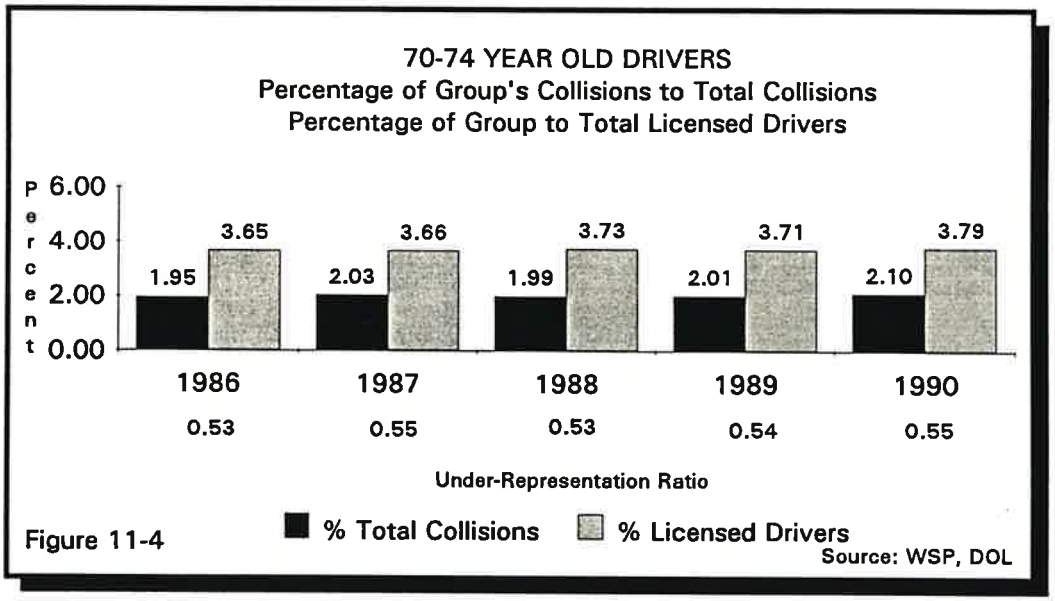


Figure 11-4

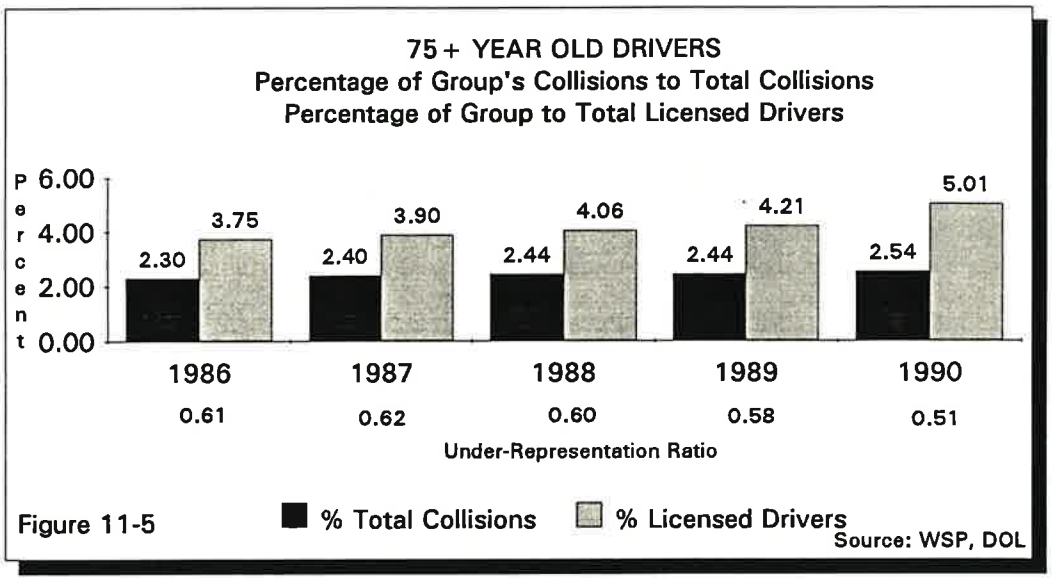


Figure 11-5

Senior Driver Collisions By Location and Severity

The urban/rural collision ratio involving senior drivers remained relatively constant during the past five years. In 1990, 66.0% of senior driver collisions occurred in urban areas and 34.0% occurred in rural areas (Figure 11-6). The senior driver injury collision urban/rural comparison has also remained fairly constant during the past five years. During 1990, 63.0% occurred in urban areas (Figure 11-7). The percentage of senior driver fatal collisions occurring in rural areas has been increased from 69.3% in 1986 to 77.7% in 1990 (Figure 11-8).

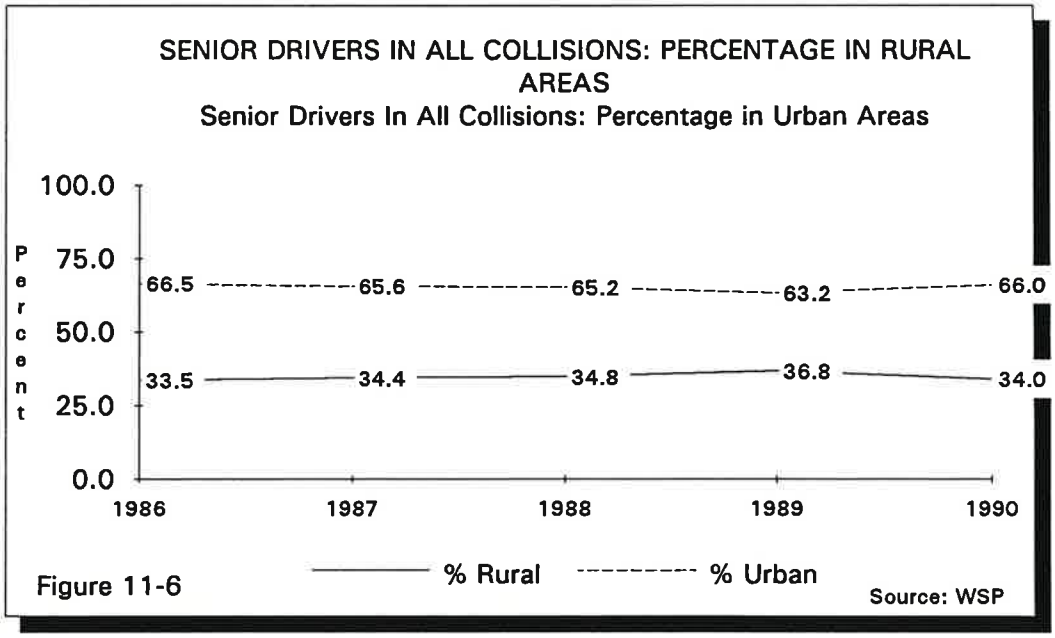


Figure 11-6

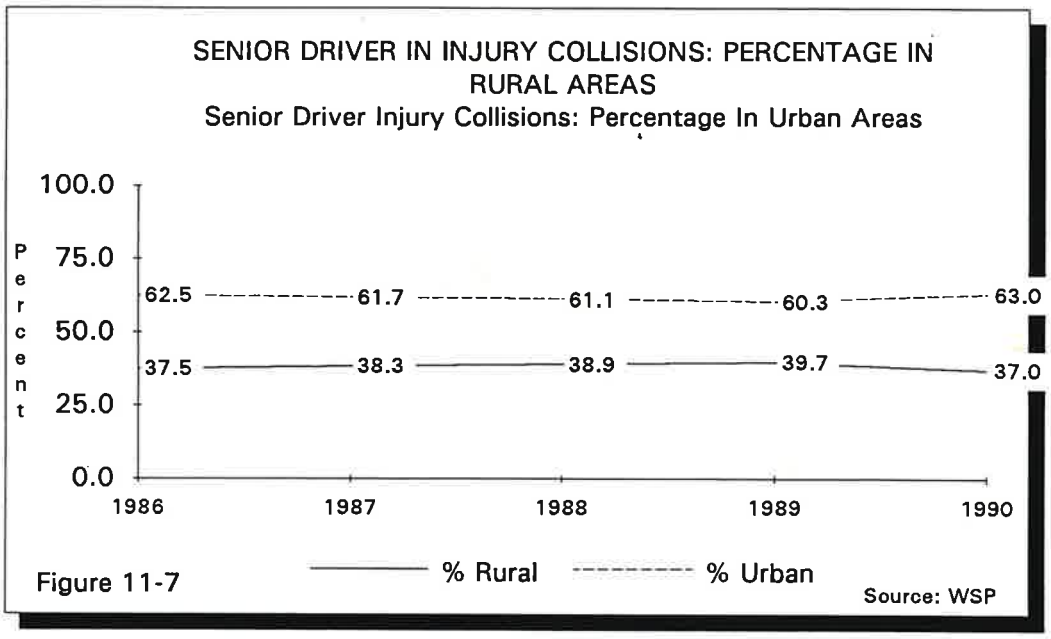


Figure 11-7

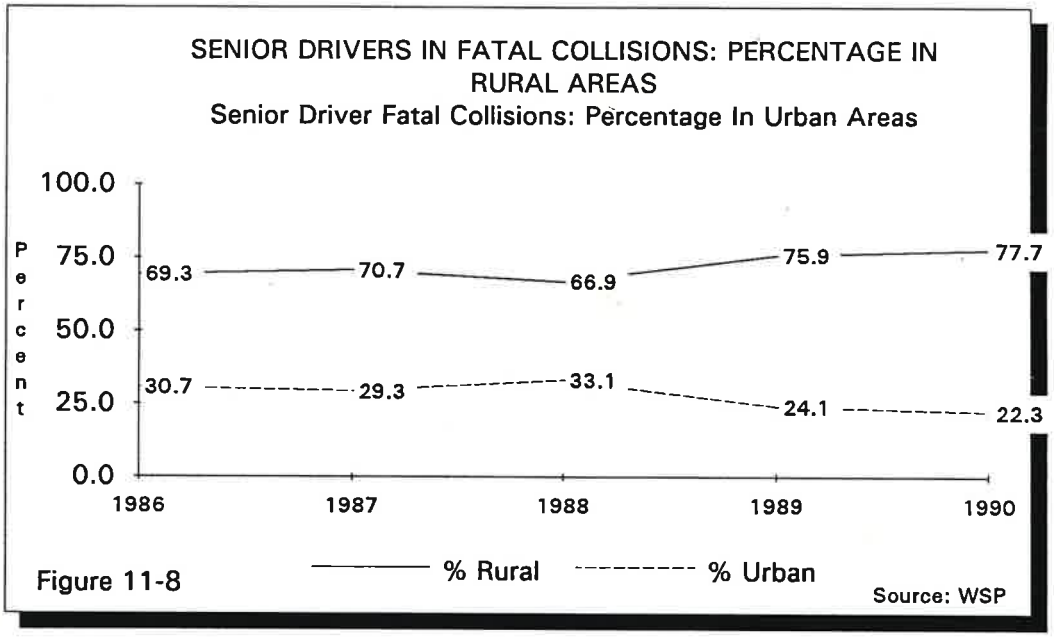


Figure 11-8

Senior Driver Collisions By Day Of Week And Location

In rural areas by days of the week, Thursday and Friday recorded the highest senior driver involvement in fatal collisions with 19.1% and 18.2% respectively. The week-end days of Saturday and Sunday recorded the fewest collisions in the rural areas with 13.2% and 10.7% of the week's totals (Figure 11-9). Urban areas followed a similar pattern in senior driver total collisions by day of the week. However, in senior driver fatal collisions, Tuesday and Wednesday had the highest percentages with 18.8% and 21.9% respectively (Figure 11-10).

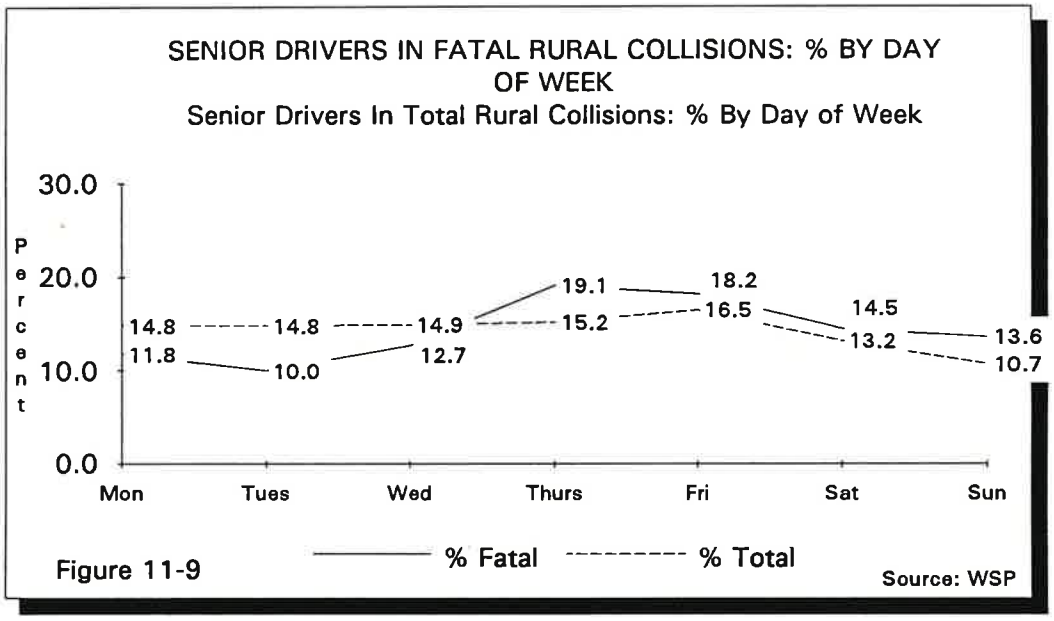


Figure 11-9

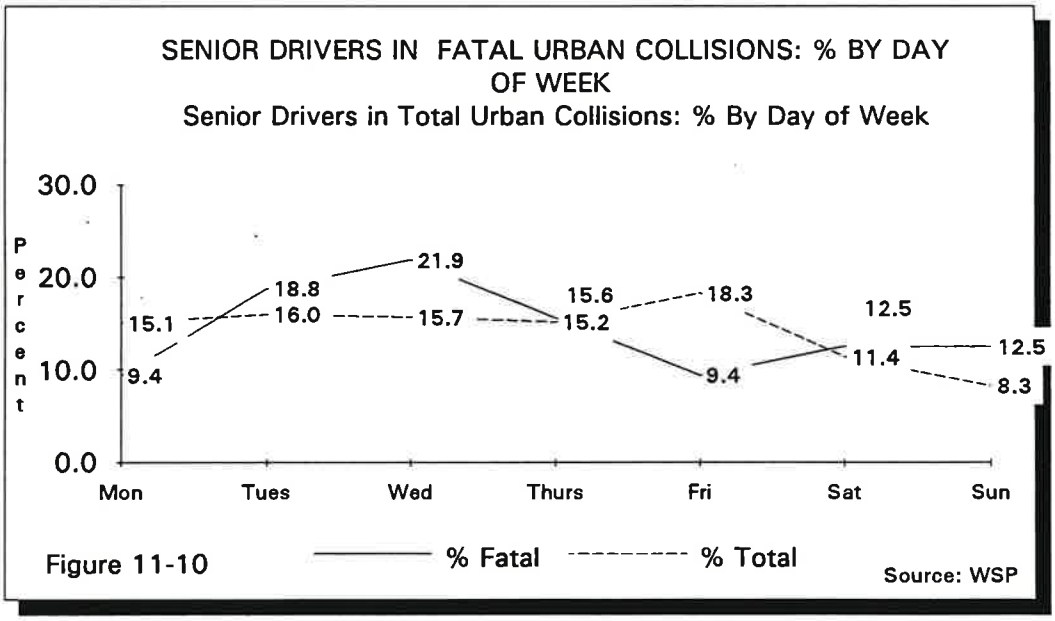


Figure 11-10

Senior Driver Collisions By Time Of Day and Location

In rural areas, the greatest percentage of fatal crashes involving senior drivers (37.3%) occurred from 3:00 p.m. to 6:00 p.m. The greatest percentage of total collisions for senior drivers (28.5%) also occurred during that same time period (Figure 11-11). In urban areas, the greatest involvement in fatal crashes (28.1%) was also from 3:00 p.m. to 6:00 p.m. The noon to 3:00 p.m. time period contributed to the greatest share of total urban collisions (29.2%) closely followed by 3:00 p.m. to 6:00 p.m. (28.8%) (Figure 11–12).

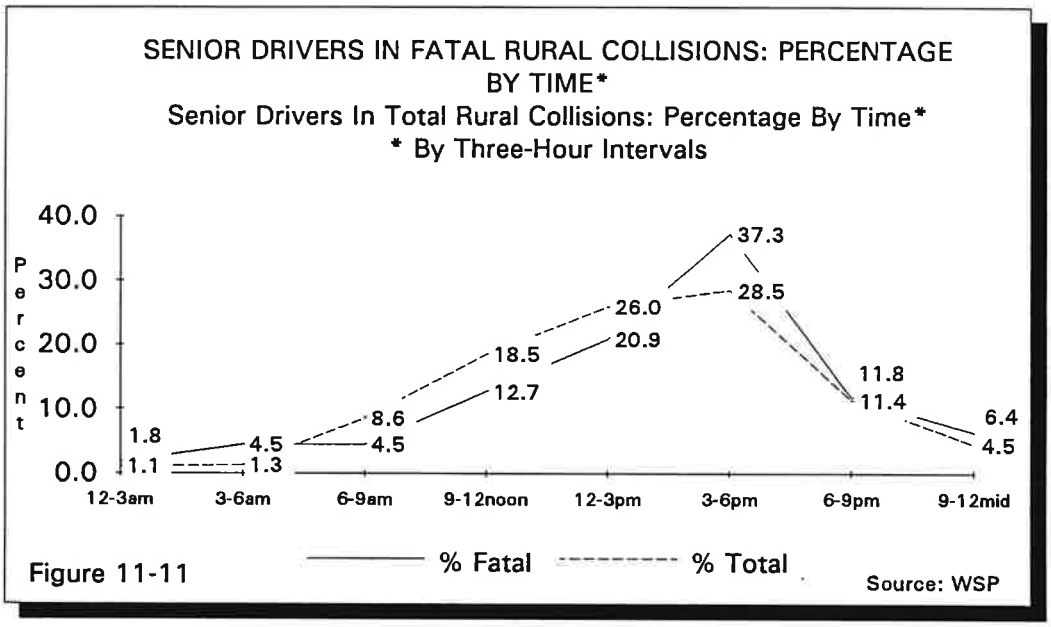


Figure 11-11

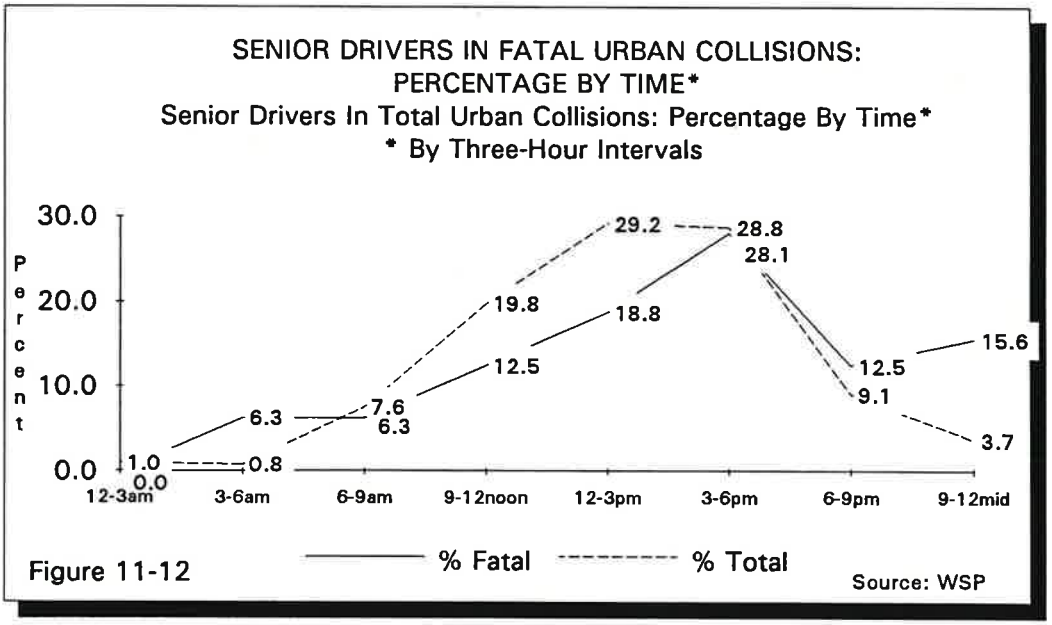


Figure 11-12

XII. Vehicle Defects

Of all vehicles involved in investigated collisions in 1990, 3.6% were found to have contributory vehicle defects. The most common defect was worn or smooth tires, a defect found in 1,948 collision-involved vehicles. This number represents a 27.0% decrease in this category compared to the previous four-year average. Defective brakes, the second most frequent contributing defect, were found in 1,682 vehicles in collisions. This number represents a 10.5% decrease when compared to the four-year baseline average (Table 12-1).

Table 12-1

VEHICLE CONDITION*
Five-Year Comparison

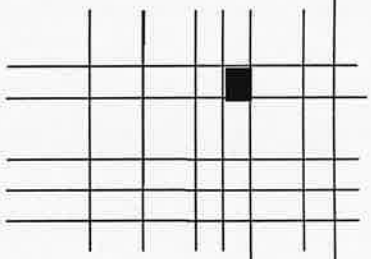
Description	Year 1990	1989	1988	1987	1986	Previous 4-Year Average	% Change 90-4-Yr Average
Defective Tires:							
Worn or Smooth Tires	1,948	2,165	2,577	2,806	3,129	2,669	-27.0%
Puncture or Blowout	399	405	442	469	343	415	-3.8%
Defective Brakes	1,682	1,671	1,859	1,961	2,026	1,879	-10.5%
Defective Lights:							
Headlights	112	164	156	144	167	158	-29.0%
Rear Lights	305	387	423	331	373	379	-19.4%
Other Lights/Reflectors	97	114	106	116	112	112	-13.4%
Defective Steering	272	279	306	339	287	303	-10.2%
All Other Defects	1,501	1,971	1,683	2,082	2,026	1,941	-22.6%
No Defects	170,881	161,829	164,102	161,595	156,360	160,972	6.2%
Total Vehicles Involved	177,197	168,985	171,654	169,843	164,823	168,826	5.0%

* Investigated Collisions

Source: WSP

Appendix

Data Summary and 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. Also referred to as a "fatal."
Investigated Collision - A collision that has been investigated by a law enforcement officer. Data relating to alcohol involvement, contributing circumstances (driver violations) and vehicle defects are only collected from investigated collisions. Currently, most data on safety-restraint use is 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.

Rates

Mileage Death Rate - Traffic deaths per 100 million vehicle miles of travel.
Vehicle Registration Death Rate - Traffic deaths per 10,000 vehicle registrations.
Injury Rate - Traffic injuries per 100 million miles of travel.
Calculations of Economic Loss - The calculable costs of motor vehicle collisions are wage loss, medical expense, insurance administration costs, and property damage. In 1989, the National Safety Council estimated the costs of all these items at $290,000 for each death, $32,000 for each disabling injury, $8,300 for each non-disabling injury, $2,600 for each possible injury, and $3,000 for each property-damage-only collision.

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.
DWUI/Driving While 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

State Agency Abbreviations

DOL - Department of Licensing
OAC - Office of the Administrator for the Courts
OFM - Office of Financial Management
SPI - Superintendent of Public Instruction
WSP - Washington State Patrol
WSDOT - Washington State Department of Transportation
WTSC - Washington Traffic Safety Commission

Milestones in Washington Traffic Safety

1967: Creation of Washington Traffic Safety Commission.
Mandatory motorcycle helmet law.

1968: Implied consent law.

1971: Habitual traffic offender law.

1973: Speed limit reduced to 55 mph.

1975: Negligent homicide statute.
Deferred prosecution statute.

1977: Property damage reporting threshold raised to $300 from $100.
Motorcycle helmet law repealed.

1979: DWI law modified to make .10% BAC illegal per se.
Mandatory day in jail for first DWI offense.

1980: Fatality reporting threshold changed from one year to 90 days from date of collision.

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.

1984: Mandatory child restraint law became chargeable traffic violation.

1986: Mandatory seat belt law.

1987: Mandatory seat belt law became a chargeable traffic violation.
Speed limit increased to 65 mph (60 mph for trucks) on rural interstate highways.
Motorcycle Helmets required for persons under 18 years of age.
Children under 5 years of age prohibited from riding on motorcycles.
Property damage reporting threshold raised to $500 from $300.

1988: Vehicle registration cancelation for driving with a suspended drivers license.

1989: Fatality reporting threshold changed from 90 days to 30 days from date of collision.
Youth under 19 years lose license for DWI for 90 days or until age 19 (whichever is longer).

1990: Mandatory insurance required.
Mandatory motorcycle helmet law.

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 Division.
Transportation Data Office, Transportation Building
Olympia, WA 98504-5201
+ 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., Olympia, WA 98504
+ 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, Campbridge, MA 02142
+ Statistics on nationwide traffic fatalities.

Population Trends for Washington State
Office of Financial Management (OFM), Forcasting Division.
300 Insurance Building, Olympia, WA 98504

Washington State Highway Accident Report
Washington State Department of Transportation
Planning, Research and Public Transportation Division.
Transportation Data Office, Transportation Building
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, Olympia, WA 98504

* Documents listed are updated annually.

The Counties of Washington State