

**State of Washington
Data Summary and Analysis
1987 Traffic Collisions**

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**Washington Traffic Safety Commission
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Part II
Overall Statewide Problem Analysis

Data Summary and
Highway Safety Plan ~~Part II~~
Overall Statewide Problem Analysis

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Statewide Summary

Overview

The number of persons killed on the state's highways in 1987 totalled 790, a 6.2% increase from the 1984-1986 three-year baseline average of 744. There was a 4.8% increase in the total number of fatal collisions for 1987 compared to the average for 1984-1986. Increases for 1987 over the three-year baseline period were recorded in the categories of total collisions, injury collisions, total number of persons injured and property damage only collisions (Table 1-1).

Table 1-1

SEVERITY OF COLLISIONS Four Year Comparison						
Impact	Years				Previous 3 Year Average (84-86)	% of Change 87 - 3 Year Average
	1987	1986	1985	1984		
Total Collisions	126,807	122,918	120,056	111,655	118,210	7.3%
Fatal Collisions	699	658	656	687	667	4.8%
Total Killed	790	714	756	761	744	6.2%
Injury Collisions	46,968	46,090	44,373	42,076	44,180	6.3%
Total Injured	67,665	66,707	63,806	61,366	63,960	5.8%
Property Damage Only Collisions	79,140	76,170	75,027	68,892	73,363	7.9%

Exposure

An 11.4% increase in motor vehicle miles travelled was recorded for 1987 over the 1984-1986 baseline period. Motor vehicle registration jumped by 7.9% over baseline while the number of licensed drivers was up 5.4%. In 1987 the state's population increased over the 1984-86 average by 2.4% to a total of 4,481,100 persons (Table 1-2).

Table 1-2

VEHICLES AND DRIVERS Four Year Comparison						
Exposure	Years				Previous 3 Year Average (84-86)	% of Change 87 - 3 Year Average
	1987	1986	1985	1984		
Motor Vehicle Travel* **	38,520	36,416	33,980	33,344	34,580	11.4%
Motor Vehicle Registration	3,833,058	3,651,102	3,546,152	3,459,772	3,552,342	7.9%
Licensed Drivers	3,156,600	3,029,375	2,980,717	2,973,468	2,994,520	5.4%
State's Population	4,481,100	4,419,700	4,384,100	4,328,100	4,377,300	2.4%

*In Millions

**Preliminary Estimate for 1986

Rates

The 1987 motor vehicle traffic death rate was the second lowest in the state's history; down 5.1% from the previous 3 year average, but up 4.6% from the 1986 rate of 1.96, the lowest on record. The rate of 1.76 injuries per one million vehicle miles in 1987 was down slightly from the 1.83 rate for 1986 and down from the 1.85 rate recorded for the baseline period (Table 1-3).

Table 1-3

DEATH AND INJURY RATES Four Year Comparison						
Rates	Years				Previous 3 Year Average (84-86)	% of Change 87 - 3 Year Average
	1987	1986	1985	1984		
Death Rate (Deaths per 100M vehicle miles)	2.05	1.96	2.22	2.28	2.16	-4.9%
Injury Rate (Injury per 1M vehicle miles)	1.76	1.83	1.88	1.84	1.85	-5.0%

Fatalities By Status

Drivers continued in 1987 as the most common status of those killed as a result of motor vehicle collisions. Fatalities in this classification increased from 353 in 1986 to 386 in 1987. The 1987 figure increased 4.6% from the average of the three previous years. The number of passengers killed also increased in 1987. Two hundred and four passengers were reported killed in 1987; up 29 or 16.6% over 1986 and up 12 or 6.4% over the 3-year baseline period. The 204 total was also down from the 192 average for the baseline period. The number of motorcycle drivers fatally injured in collisions increased from 71 in 1986 to 87 the following year. Last year's total was up 17 from the three year baseline (Table 1-4).

Table 1-4

PERSONS KILLED BY STATUS Four Year Comparison						
Status	Years				Previous 3 Year Average (84-86)	% of Change 87 - 3 Year Average
	1987	1986	1985	1984		
Drivers (no motorcyclists)	386	353	362	392	369	4.6%
Passengers	204	175	211	189	192	6.4%
Pedestrians	93	94	89	97	93	-0.4%
Bicyclists	18	12	12	11	12	54.3%
Motorcycle Drivers	86	71	75	62	69	24.0%
Motorcycle Passengers	3	9	7	10	9	-65.4%
TOTAL	790	714	756	761	744	6.2%

Traffic Collisions, Deaths, Injuries, Travel and Death Rate

The 790 traffic fatalities recorded in 1987 reversed an earlier downward trend experienced in 1985 and 1986. Figure 1-1 depicts the two extremes in recent history of traffic deaths with the high of 1,034 deaths recorded in 1979 and the record low in 1983 with 705 traffic fatalities. Motor vehicle travel in 1987 increased by 5.8% over 1986 to reach an all-time high of 38,520 billion miles (Figure 1-2).

The state's 1987 traffic fatality rate of 2.05 deaths per 100 million vehicle miles of travel continued below the national rate of 2.55 for the year. The 2.05 rate is up slightly from the 1.96 death rate recorded in the previous year of 1986 and was the lowest point in Washington's history. Total reported motor vehicle traffic collisions and injuries increased over 1986. Total collisions were up 3.2% while the number of persons injured rose by 1.4% (Figure 1-4).

Collision By Type

A 2.8% increase in multiple vehicle collisions over 1986 was recorded in 1987 (Figure 1-5). Single vehicle collisions were down 7.0% (Figure 1-6). Vehicle-pedestrian collisions decreased 1.8% from 1986 (Figure 1-7). Vehicle-pedalcyclist collisions, by contrast, increased by 4.5% in 1987. This is the fourth year where increases in pedalcycle collisions occurred during the past five years (Figure 1-8).

Traffic Deaths And Vehicle Registration Death Rates By County

In 1987 fatalities ranged from a high of 155 in King County, with a death rate of 1.28 (traffic deaths per 10,000 registered vehicles) to a low of zero deaths in Asotin, Skamania, and Wahkiakum counties. Garfield County recorded the highest death rate at 26.57, computed on seven fatalities, followed by Ferry County, which recorded a 14.03 death rate based on five traffic deaths (Figure 1-9).

Highways, Travel and Fatalities

The U.S. and State Numbered System (other than the Interstate System) was the most-traveled road system in the state, recording 11.004 billion miles. The interstate system continued to have the lowest death rate of all the state systems, with a 0.68 rate recorded in 1987, up slightly from the 0.66 rate recorded in 1986. Travel on city streets increased to 9.670 billion miles in 1987 and recorded a death rate of 1.20, down from 1.52 in 1986. County roads were traveled 8.076 billion miles and recorded a death rate of 3.36 in 1987, an increase from the previous year's 3.25 rate. Total motor vehicle travel in the state increased from 36.416 billion miles to 38.520 billion in 1987 (Table 1-5).

Table 1-5

HIGHWAYS, TRAVEL, AND ACCIDENTS By Type of Highway							
Type of Highways	Highways		Vehicle Miles Traveled+		Accidents		
	Miles	% of Total	Miles (Millions)	% of Total	Total Collisions	Total Fatalities	Death Rate for CMVM*
Interstate System**	755	0.95%	9,681	25.13%	11,624	66	0.68
All Other State Highways	6,220	7.82%	11,004	28.57%	27,992	330	3.00
County Roads	41,748	52.51%	8,076	20.97%	28,372	271	3.36
City Streets	11,245	14.14%	9,670	25.10%	57,911	116	1.20
All Other Traffic Ways***	19,541	24.58%	89	0.23%	908	7	7.87
TOTAL	79,509	100.00%	38,520	100.00%	126,807	790	2.05

+Preliminary Estimates

*Fatalities per hundred million vehicle miles, based on roadway travel as reported by the Dept. of Transportation.

**Does not include traveled way.

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

Figure 1-1

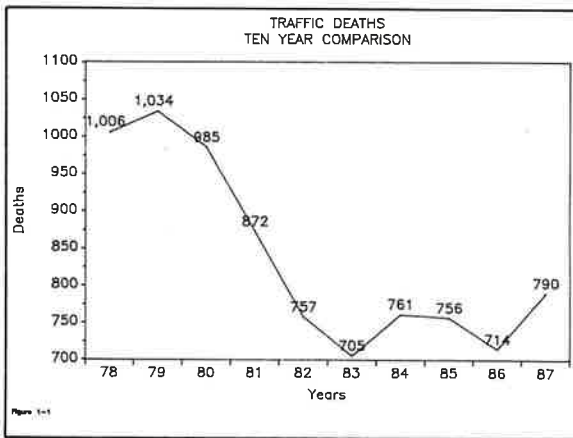


Figure 1-2

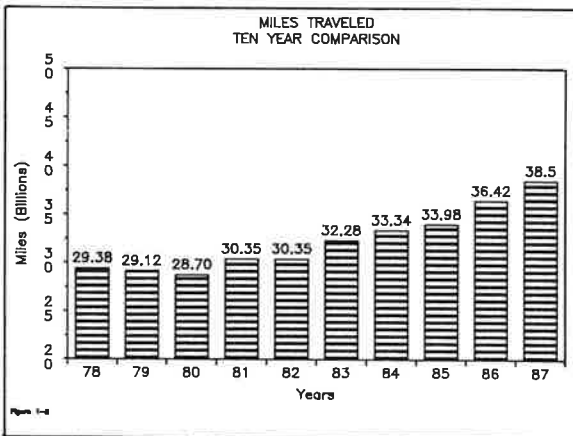


Figure 1-3

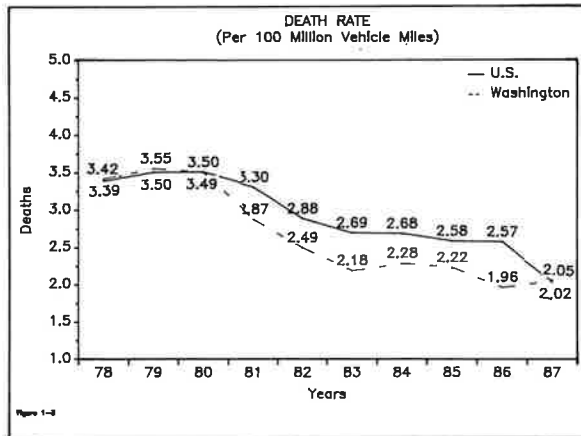


Figure 1-4

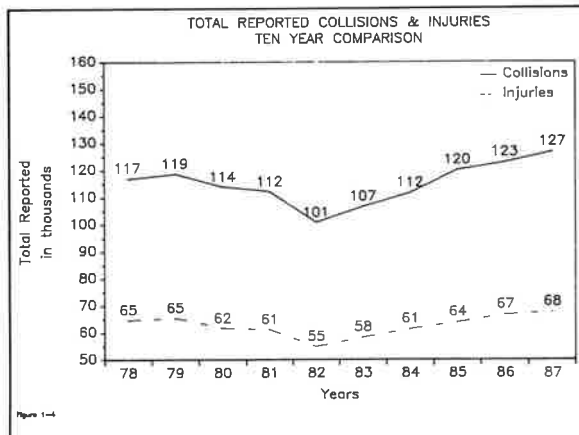


Figure 1-5

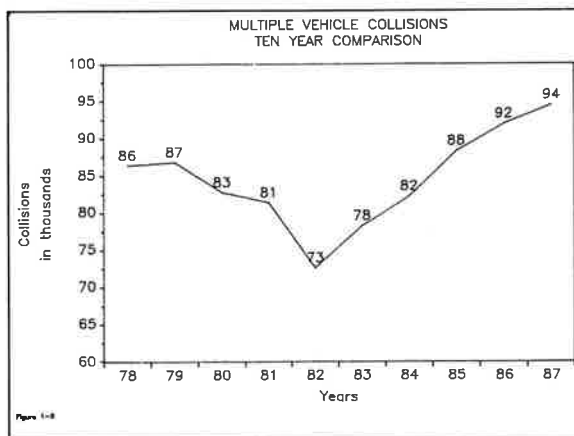


Figure 1-6

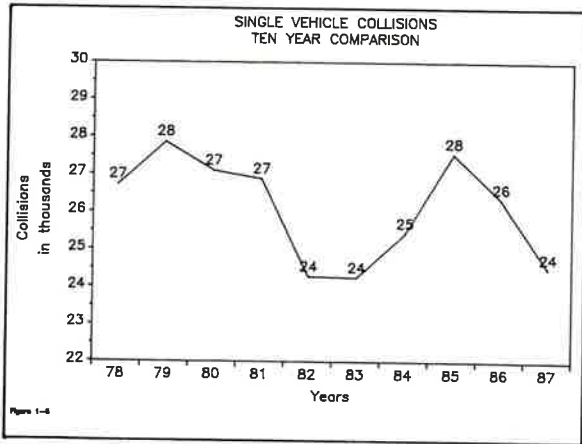


Figure 1-7

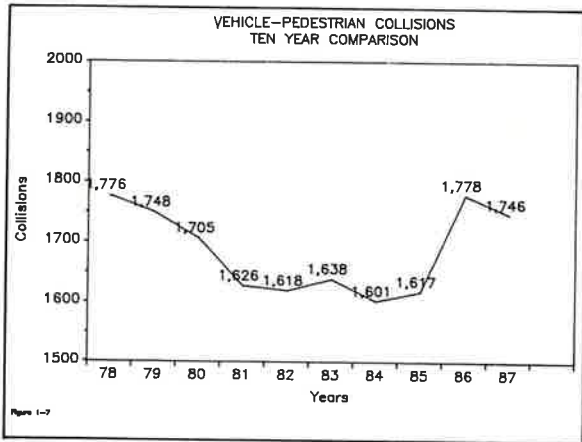


Figure 1-8

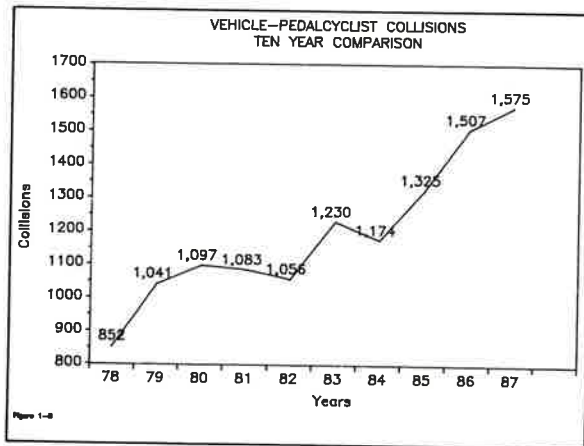


Figure 1-11

Traffic Fatalities

In 1987 and Percent of Change from 1986

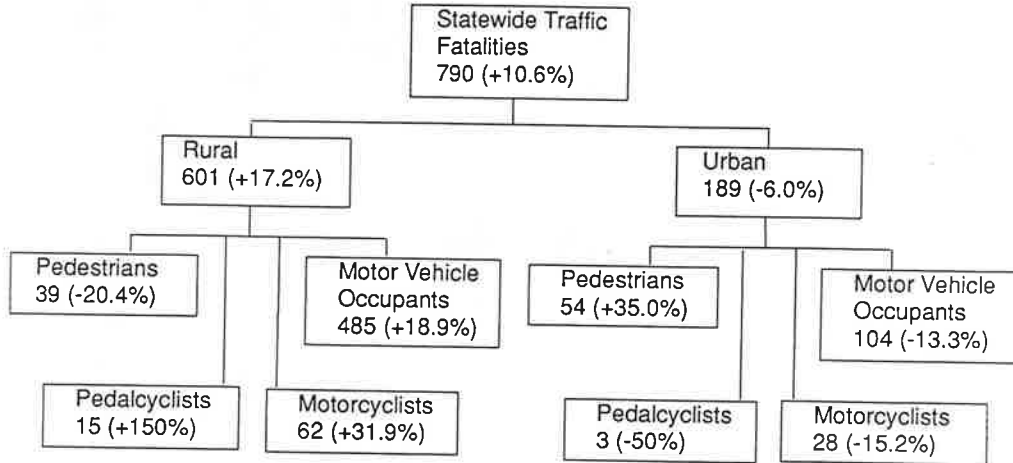


Figure 1-12

Traffic Fatalities by Age and Sex

1987

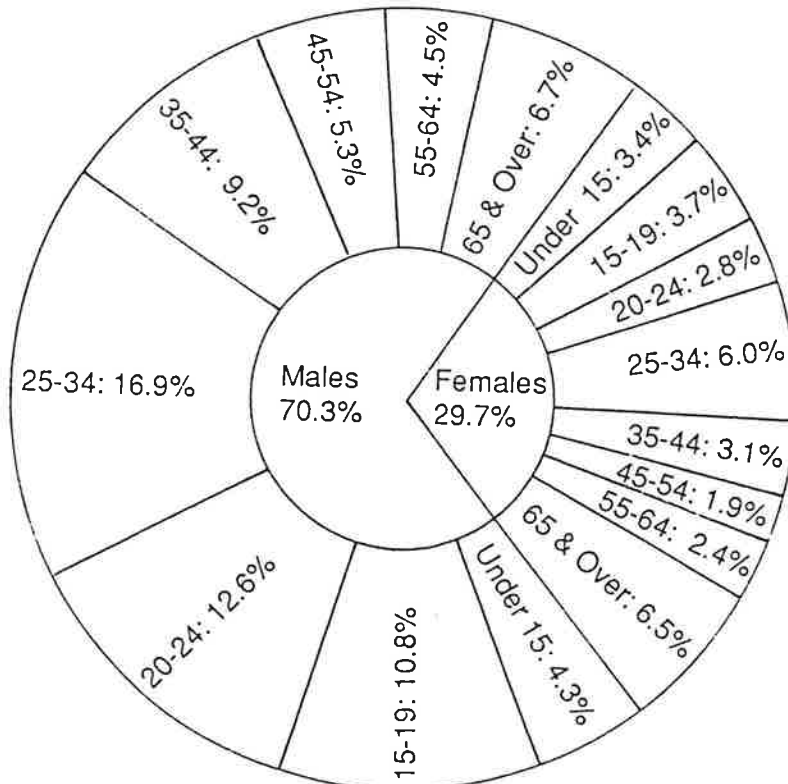


Table 1-6

PERSONS KILLED AND INJURED By Age By Status								
Age	Total		Occupants		Pedestrians		Pedalcyclists	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
0 - 4	22	1,106	17	988	5	92	0	23
5 - 9	24	1,887	15	1,351	5	251	4	284
10 - 14	15	2,086	6	1,443	6	196	3	444
15 - 19	114	12,044	105	11,536	7	206	2	302
20 - 24	121	11,148	117	10,825	2	166	2	155
25 - 34	180	15,691	163	15,224	14	289	3	166
35 - 44	96	9,627	84	9,360	11	196	1	63
45 - 54	57	4,856	44	4,725	11	108	2	20
55 - 64	54	3,318	42	3,217	11	84	1	13
65 - 74	42	2,309	35	2,208	7	83	0	17
75/Older	62	1,307	48	1,226	14	76	0	2
Not Stated	3	2,286	3	2,138	0	83	0	63
TOTAL*	790	67,665	679	64,241	93	1,830	18	1,552

*Total Injured includes 42 injured where the status of the injured was unknown

Table 1-7

COMPARISON OF TRAFFIC DEATHS BY MONTH Three Year Comparison								
Month	1987		1986		1985		% Change 87 to 86	
	Month Total	Year To Date	Month Total	Year To Date	Month Total	Year To Date	Month Total	Year To Date
January	54	54	42	42	43	43	28.6%	28.6%
February	52	106	28	70	48	91	85.7%	51.4%
March	62	168	56	126	52	143	10.7%	33.3%
April	55	223	60	186	61	204	-8.3%	19.9%
May	50	273	73	259	84	288	-31.5%	5.4%
June	77	350	73	332	67	355	5.5%	5.4%
July	73	423	70	402	87	442	4.3%	5.2%
August	84	507	69	471	63	505	21.7%	7.6%
September	90	597	51	522	66	571	76.5%	14.4%
October	69	666	67	589	66	637	3.0%	13.1%
November	73	739	64	653	56	693	14.1%	13.2%
December	51	790	61	714	63	756	-16.4%	10.6%

Table 1-8

COLLISIONS By Time									
Time Hour Reporting	Total			Monday - Thursday			Friday - Sunday		
	All	Injury	Fatal	All	Injury	Fatal	All	Injury	Fatal
Midnight	3,365	1,298	32	1,210	442	12	2,155	856	20
1:00	3,157	1,370	31	1,073	469	8	2,084	901	23
2:00	3,006	1,237	41	993	403	14	2,013	834	27
3:00	1,571	627	28	506	200	10	1,065	427	18
4:00	1,124	442	13	453	176	5	671	266	8
5:00	1,320	525	17	701	269	7	619	256	10
6:00	2,658	963	17	1,799	649	6	859	314	11
7:00	5,466	1,986	21	4,030	1,464	15	1,436	522	6
8:00	4,646	1,637	27	3,255	1,139	15	1,391	498	12
9:00	4,153	1,369	12	2,579	836	4	1,574	533	8
10:00	4,992	1,644	15	3,018	996	9	1,974	648	6
11:00	6,277	2,205	18	3,781	1,258	11	2,496	947	7
Noon	7,295	2,589	30	4,146	1,432	14	3,149	1,157	16
1:00	7,299	2,634	26	4,036	1,404	15	3,263	1,230	11
2:00	8,555	3,066	26	4,995	1,793	13	3,560	1,273	13
3:00	10,023	3,793	38	6,156	2,314	25	3,867	1,479	13
4:00	10,744	4,045	36	6,571	2,474	18	4,173	1,571	18
5:00	10,657	4,170	39	6,614	2,592	21	4,043	1,578	18
6:00	7,327	2,956	36	4,148	1,655	14	3,179	1,301	22
7:00	5,755	2,304	43	3,029	1,193	25	2,726	1,111	18
8:00	4,560	1,819	34	2,287	918	19	2,273	901	15
9:00	4,572	1,753	38	2,367	922	18	2,205	831	20
10:00	4,223	1,641	38	1,885	753	18	2,338	888	20
11:00	4,062	1,594	43	1,730	687	17	2,332	907	26
TOTAL	126,807	47,667	699	71,362	26,438	333	55,445	21,229	366

Table 1-9

COLLISION RATES BY COUNTY POPULATION 1987							
County	1987 Population	Traffic Deaths		Traffic Injuries		Total Collisions	
		Number	Rate*	Number	Rate**	Number	Rate**
Over 1,000,000							
1. King	1,384,600	155	11.19	24,391	17.62	48,232	34.83
250,000 to 500,000							
1. Pierce	538,000	75	13.94	9,310	17.30	15,744	29.26
2. Snohomish	393,600	71	18.04	6,049	15.37	10,833	27.52
3. Spokane	355,900	50	14.05	5,450	15.31	9,616	27.02
100,000 to 250,000							
1. Clark	209,900	24	11.43	2,639	12.57	4,800	22.87
2. Yakima	184,400	47	25.49	2,202	11.94	4,497	24.39
3. Kitsap	168,600	30	17.79	2,051	12.16	3,696	21.92
4. Thurston	145,500	17	11.68	1,983	13.63	3,876	26.64
5. Whatcom	117,200	21	17.92	1,604	13.69	2,819	24.05
6. Benton	104,100	20	19.21	911	8.75	2,019	19.39
50,000 to 100,000							
1. Cowlitz	79,200	18	22.73	1,041	13.14	1,948	24.60
2. Skagit	69,500	21	30.22	1,083	15.58	1,798	25.87
3. Grays Harbor	63,000	23	36.51	869	13.79	1,821	28.90
4. Lewis	57,100	24	42.03	773	13.54	1,582	27.71
5. Clallam	53,400	13	24.34	582	10.90	1,175	22.00
6. Grant	52,100	13	24.95	478	9.17	977	18.75
7. Island	52,100	7	13.44	531	10.19	803	15.41
25,000 to 50,000							
1. Chelan	48,700	22	45.17	617	12.67	1,382	28.38
2. Walla Walla	48,300	10	20.70	507	10.50	999	20.68
3. Whitman	39,200	6	15.31	379	9.67	713	18.19
4. Mason	36,000	15	41.67	482	13.39	877	24.36
5. Franklin	35,500	11	30.99	398	11.21	831	23.41
6. Okanogan	31,600	17	53.80	408	12.91	719	22.75
7. Stevens	30,200	7	23.18	354	11.72	504	16.69
8. Kittitas	25,000	15	60.00	525	21.00	1,062	42.48
10,000 to 25,000							
1. Douglas	23,500	7	29.79	225	9.57	466	19.83
2. Jefferson	18,100	11	60.77	237	13.09	437	24.14
3. Pacific	17,300	6	34.68	247	14.28	450	26.01
4. Asotin	17,200	0	0.00	123	7.15	239	13.90
5. Klickitat	16,500	7	42.42	206	12.48	350	21.21
6. Adams	14,000	1	7.14	251	17.93	386	27.57
Under 10,000							
1. Lincoln	9,700	6	61.86	158	16.29	192	19.79
2. San Juan	9,200	1	10.87	89	9.67	153	16.63
3. Pend Oreille	8,900	4	44.94	145	16.29	202	22.70
4. Skamania	7,800	0	0.00	119	15.26	210	26.92
5. Ferry	6,000	5	83.33	96	16.00	141	23.50
6. Columbia	4,100	3	73.17	66	16.10	108	26.34
7. Wahkiakum	3,600	0	0.00	53	14.72	97	26.94
8. Garfield	2,400	7	291.67	33	13.75	53	22.08
TOTAL	4,481,000	790	17.63	67,665	15.10	126,807	28.30

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

Table 1-10

COLLISION RATES BY CITY POPULATION* 1987							
City	1987 Population	Traffic Deaths		Traffic Injuries		Total Collisions	
		Number	Rate**	Number	Rate***	Number	Rate***
250,000 and Over							
1. Seattle	491,300	46	9.36	9,143	18.61	19,993	40.69
100,000 to 250,000							
1. Spokane	172,100	14	8.13	3,385	19.67	6,294	36.57
2. Tacoma	158,900	13	8.18	3,459	21.77	6,138	38.63
50,000 to 100,000							
1. Bellevue	82,070	5	6.09	949	11.56	2,359	28.74
2. Everett	60,100	11	18.30	1,146	19.07	2,295	38.19
25,000 to 50,000							
1. Yakima	49,600	3	6.05	788	15.89	1,915	38.61
2. Bellingham	46,360	2	4.31	601	12.96	1,328	28.65
3. Vancouver	43,390	1	2.30	588	13.55	1,380	31.80
4. Kennewick	37,320	3	8.04	351	9.41	843	22.59
5. Renton	35,360	4	11.31	711	20.11	1,702	48.13
6. Bremerton	32,390	4	12.35	506	15.62	1,123	34.67
7. Richland	30,280	1	3.30	247	8.16	547	18.06
8. Redmond	30,260	0	0.00	453	14.97	906	29.94
9. Auburn	30,260	1	3.30	512	16.92	1,058	34.96
10. Kent	30,090	5	16.62	886	29.44	1,502	49.92
11. Olympia	29,600	0	0.00	515	17.40	1,253	42.33
12. Longview	29,520	2	6.78	446	15.11	866	29.34
13. Edmonds	28,300	1	3.53	241	8.52	548	19.36
14. Walla Walla	25,420	2	7.87	258	10.15	625	24.59
15,000 to 25,000							
1. Lynnwood	24,260	1	4.12	648	26.71	1,265	52.14
2. Pullman	22,240	0	0.00	128	5.76	305	13.71
3. Mercer Island	20,760	0	0.00	70	3.37	218	10.50
4. Puyallup	19,830	0	0.00	307	15.48	714	36.01
5. Kirkland	19,430	2	10.29	269	13.84	616	31.70
6. Pasco	18,520	2	10.80	221	11.93	559	30.18
7. Wenatchee	18,480	4	21.65	214	11.58	614	33.23
8. Port Angeles	17,260	0	0.00	225	13.04	482	27.93
9. Aberdeen	17,000	3	17.65	152	8.94	592	34.82
10. Mountlake Terrace	16,060	0	0.00	135	8.41	263	16.38
12. Lacey	15,840	2	12.63	218	13.26	467	23.61
10,000 to 15,000							
1. Mount Vernon	14,400	1	6.94	210	9.79	374	20.28
2. Oak Harbor	13,960	0	0.00	101	9.89	208	27.94
3. Des Moines	13,790	1	7.25	141	7.32	292	15.08
4. Centralia	11,830	1	8.45	138	4.40	390	12.76
5. Ellensburg	11,500	1	8.70	52	14.52	151	29.91
6. Kelso	10,700	1	9.35	167	11.68	344	28.04
7. Moses Lake	10,600	0	0.00	125	11.79	300	28.30
8. Anacortes	10,160	1	9.84	61	6.00	130	12.80
TOTAL	1,749,240	138	7.89	28,767	16.45	60,959	34.85

*Does not include collisions on limited access roads or freeways
 **Frequency per 100,000 population
 ***Frequency per 1,000 population

Explanation of Problem Analysis Process

Explanation of Problem Analysis Process

In developing the Problem Identification section for the 1989 Highway Safety Plan (HSP), problem areas were classified into two basic types: impact problems and system support problems.

Impact problems are those whose factors contribute directly to the occurrence of collisions, fatalities and/or injuries and may be corrected through the implementation of countermeasures designed to reduce the effects of these factors.

System support problems are those deficiencies within vital traffic safety programs whose correction may not be directly reflected in a reduction in traffic collisions, injuries or fatalities.

The basis for impact and system support problem identification, analysis and selection for inclusion into the HSP was done in two ways.

1. Impact problem areas were based on identifying statewide experience in impact areas (where information was available) outlined in the Federal safety standards. Various statewide automated and manual traffic information systems were inventoried and analyzed. The data sources included: Traffic Accident Records, Fatal Accident Reporting System, Driver's Licensing Records, Vehicle Registration Records and Highway/Roadway Information. In most instances, four years' worth of data were gathered as a baseline to serve as a point of comparison to the current year's activity level.
2. The second source for problem identification inclusion in the HSP resulted from analysis by and for various state and local agencies with an interest in highway safety. The Washington Traffic Safety Commission made it known that the two main emphasis areas in FY 1989 were the non-use of occupant restraint systems, and alcohol-related collisions.

Data Analysis and Statistical Techniques

Data analysis was a key factor in the identification and selection of the traffic problem areas included in this Plan. The analyses were performed to ensure that the conclusions drawn from the data were valid and credible.

The most common data sources in the HSP were the statewide traffic collision records, which were used for identifying the specific traffic problem areas. Four

continuous years (1983-1986) of collision experience were used to serve as a baseline in analyzing traffic collision data. This baseline was used to obtain a better perspective to assess the current year's (1987) experience with traffic problem areas. The baseline also serves to negate short-term changes in collision patterns.

The development of over/under-representation ratios were the most frequently used methods of analysis. Where relevant exposure data were available, the generation of over-representation ratios allow for the comparisons of different subgroups relative to the percentage of the population they comprise. Additionally, county and city rankings were generated for different problem areas to compare geographical and political subdivisions.

Analysis of Selected Traffic Problems

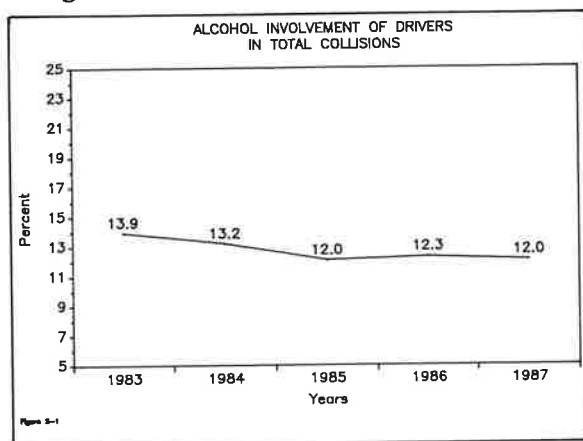
- Alcohol Involvement
 - Youth Involvement
 - Safety Restraint Usage
 - Motorcycle Collisions
 - Pedalcycles
 - Pedestrians
 - Heavy Trucks
 - Pupil Transportation
 - Contributory Driver Violations
 - Vehicle Defects
 - Senior Driver Involvement
-

Alcohol Involvement

Overview

In 1987, 12.0% of all drivers involved in traffic collisions had been drinking alcohol. This is a 2.4% decrease from 1986 and continues a downward trend (Figure 2-1).

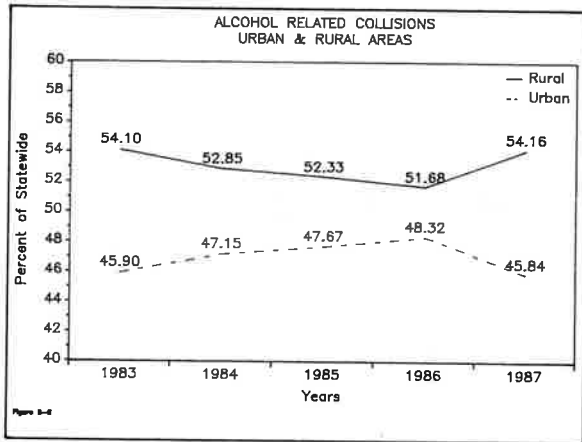
Figure 2-1



Location Of Alcohol Related Collisions

In 1987 the urban-rural breakdown of alcohol-related collisions reversed the trend established in 1984 with a decrease in rural areas and an increase in the urban areas. However, 1987 recorded a decrease in urban alcohol-related collisions and an increase in rural area collisions compared to 1986; 54.16% of the alcohol-related collisions occurred in rural areas and 45.84% in urban areas (Figure 2-2).

Figure 2-2



The predominant type of alcohol-related vehicle collisions continued to be multiple-vehicle mishaps in urban areas (Figure 2-3) with the opposite holding true in rural areas (Figure 2-4). Of the urban collisions, 67.4% involved two or more vehicles while only 35.6% were multiple vehicle collisions on rural roads.

Figure 2-3

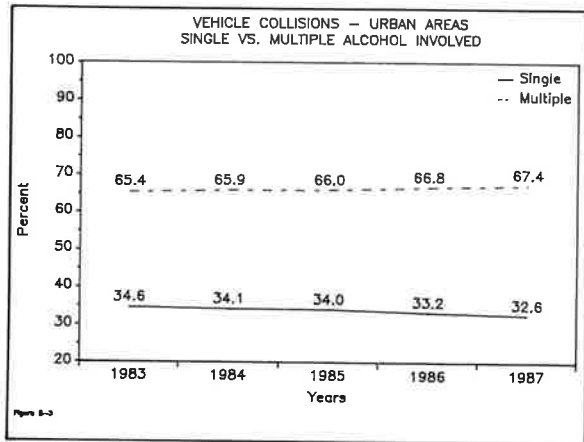
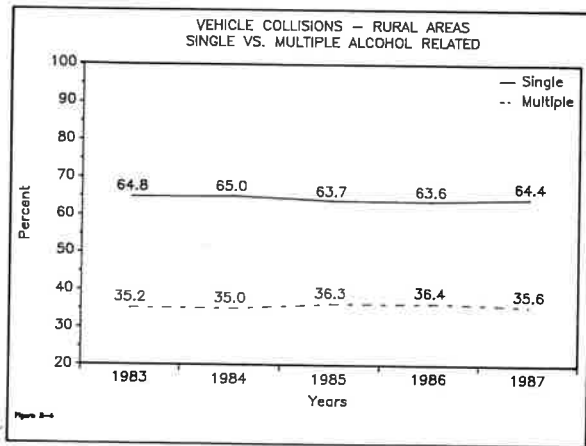


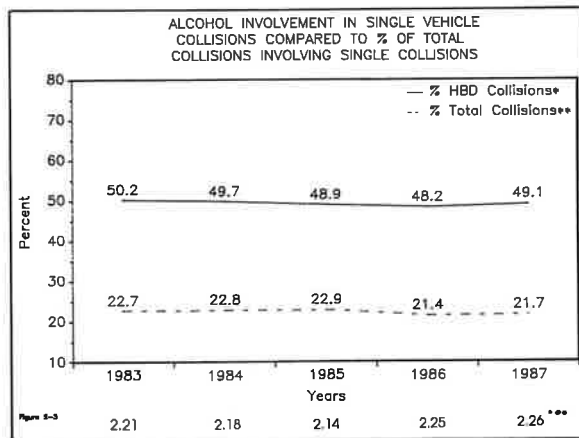
Figure 2-4



Single Vehicle Collisions Involving Alcohol

In 1987 the percentage of all single vehicle collisions where the driver had been drinking remained relatively stable at nearly 50% of the total alcohol involved collisions. By comparison the percentage of total collisions that the single vehicle collision represents was only 21.7% in 1986 (Figure 2-5). Comparing the percentage of alcohol involvement in single vehicle collisions to the percentage of total collisions the single vehicle collision represents allows for the generation of a ratio to express the over-representation of alcohol in single vehicle collisions. In 1987, this ratio increased slightly from 2.25 in 1986 to 2.26 in 1987.

Figure 2-5



* Had Been Drinking ** Represented By Single Vehicle *** Ratio

Figure 2-5 shows over-involvement of single vehicle alcohol-involved collisions compared to single vehicle collisions in total collisions.

Drivers Involved In Fatal Collisions

In 1987, 36.4% of the drivers involved in statewide fatal collisions had been drinking intoxicants. This is a decrease from the 40.4% involvement recorded in 1986 and down from the 39.1% baseline period. In rural areas, 37.7% of the drivers in fatal collisions had been drinking, down 5.8% from the 1983-86 average. In urban areas, 32.5 drivers out of every 100 had been drinking prior to being involved in a fatal collision. This is down 11.7% from the baseline period. (Tables 2-1, 2-1a, 2-1b)

Table 2-1

SOBRIETY OF DRIVERS INVOLVED IN FATAL COLLISIONS Statewide Comparison							
Condition of Driver (Sobriety)	Years					Previous 4 Year Average	% of Change 87 - 4 Year Average
	1987	1986	1985	1984	1983		
Had been drinking - ability impaired	296	306	292	307	260	291	1.63%
Had been drinking - ability not impaired	40	51	43	52	37	46	-12.57%
Had been drinking - sobriety unknown	24	13	11	11	31	17	45.45%
Had not been drinking	630	546	577	574	502	550	14.60%
Not stated	46	35	45	41	62	46	0.55%
Total drivers drinking	360	370	346	370	328	354	1.84%
Total drivers - excluding not stated	990	916	923	944	830	903	9.60%
Total drivers	1,036	951	968	985	892	949	9.17%
No. drinking drivers per 100 involved	36.4	40.4	37.5	39.2	39.5	39.1	-7.11%
No. drunk drivers per 100 involved	29.9	33.4	31.6	32.5	31.3	32.2	-7.21%

Table 2-1a

SOBRIETY OF DRIVERS INVOLVED IN FATAL COLLISIONS Rural Comparison							
Condition of Driver (Sobriety)	Years					Previous 4 Year Average	% of Change 87 - 4 Year Average
	1987	1986	1985	1984	1983		
Had been drinking - ability impaired	235	228	223	246	198	224	5.03%
Had been drinking - ability not impaired	29	30	29	35	28	31	-4.92%
Had been drinking - sobriety unknown	14	7	6	6	24	11	30.23%
Had not been drinking	460	377	433	422	360	398	15.58%
Not stated	23	16	21	24	32	23	-1.08%
Total drivers drinking	278	265	258	287	250	265	4.91%
Total drivers - excluding not stated	738	642	691	709	610	663	11.31%
Total drivers	761	658	712	733	642	686	10.89%
No. drinking drivers per 100 involved	37.7	41.3	37.3	40.5	41.0	40.0	-5.87%
No. drunk drivers per 100 involved	31.8	35.5	32.3	34.7	32.5	33.7	-5.61%

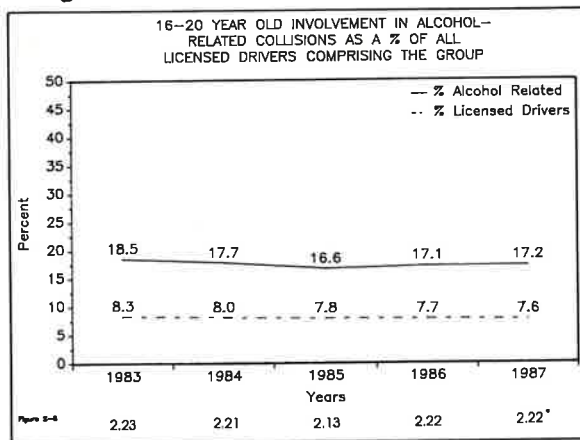
Table 2-1b

SOBRIETY OF DRIVERS INVOLVED IN FATAL COLLISIONS Urban Comparison							
Condition of Driver (Sobriety)	Years					Previous 4 Year Average	% of Change 87 - 4 Year Average
	1987	1986	1985	1984	1983		
Had been drinking - ability impaired	61	78	69	61	62	68	-9.63%
Had been drinking - ability not impaired	11	21	14	17	9	15	-27.87%
Had been drinking - sobriety unknown	10	6	5	5	7	6	73.91%
Had not been drinking	170	169	144	152	142	152	12.03%
Not stated	23	19	24	17	30	23	2.22%
Total drivers drinking	82	105	88	83	78	89	-7.34%
Total drivers - excluding not stated	252	274	232	235	220	240	4.89%
Total drivers	275	293	256	252	250	263	4.66%
No. drinking drivers per 100 involved	32.5	38.3	37.9	35.3	35.5	36.8	-11.47%
No. drunk drivers per 100 involved	24.2	28.5	29.7	26.0	28.2	28.1	-13.82%

Alcohol Involvement By Age Group

Drivers under 30 years of age continue to be over-represented in alcohol-related collision. The 16-20 year old group comprised 7.6% of all licensed drivers in the state in 1987 but were involved in 16.9% of all alcohol-related collisions. This was an over-representation ratio of 2.22, meaning this age group was involved in slightly more than two times more alcohol-related collisions than the percentage of licensed drivers it represented (Figure 2-6). The over-involvement ratio for drivers aged 21-24 in 1987 was 2.63. This age group's over-involvement ratio has climbed steadily since 1982 (Figure 2-7). In 1987 the 25-29 year age group was involved in 1.69 times more alcohol-related collisions than the percentage of licensed drivers the group represented (Figure 2-8). The age group 30-54 was under-represented by a ratio of .75 last year (Figure 2-9). The age group 55-64 was under-represented by a ratio of .30 last year (Figure 2-9a). The remaining age group 65 years and older was also under-represented by a ratio of .16 first year (Figure 2-9b).

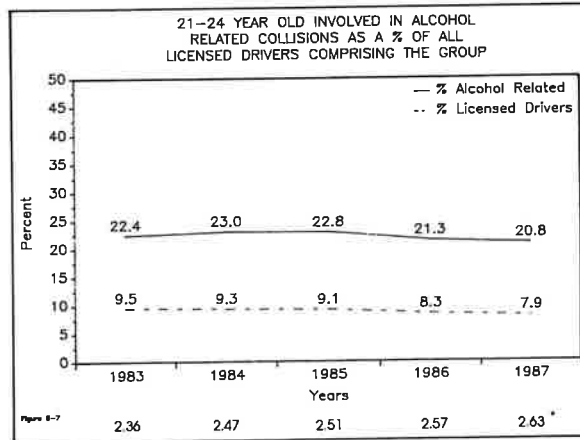
Figure 2-6



* Ratio:

Under-involvement in alcohol-related collisions compared to % of licensed drivers in the population.

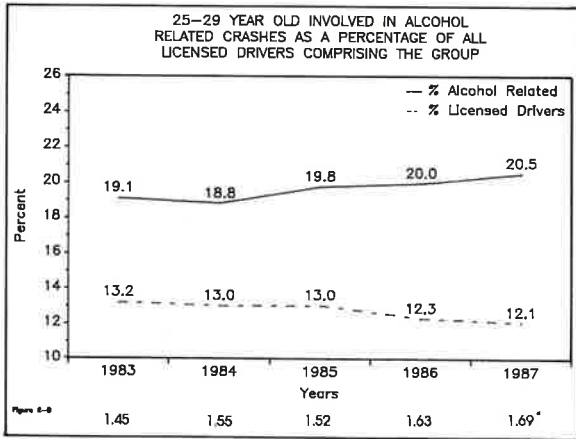
Figure 2-7



* Ratio:

Over-involvement in alcohol-related collisions compared to % of licensed drivers in the population.

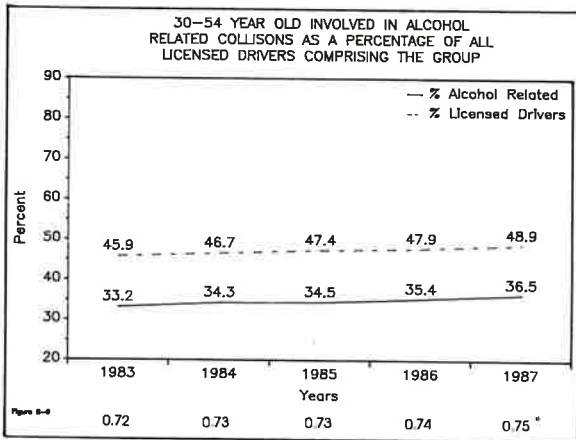
Figure 2-8



* Ratio:

Over-involvement in alcohol-related collisions compared to % of licensed drivers in the population.

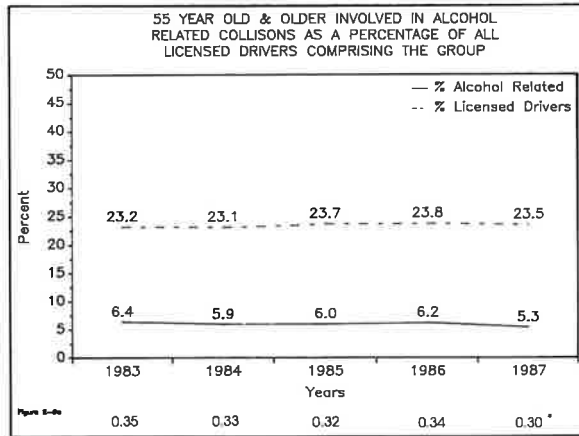
Figure 2-9



* Ratio:

Under-involvement in alcohol-related collisions compared to % of licensed drivers in the population.

Figure 2-9a



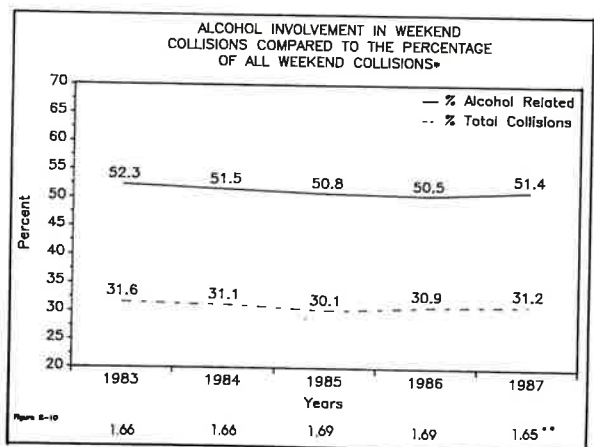
* Ratio:

Under-involvement in alcohol-related collisions compared to % of licensed drivers in the population.

Weekend Alcohol Involvement

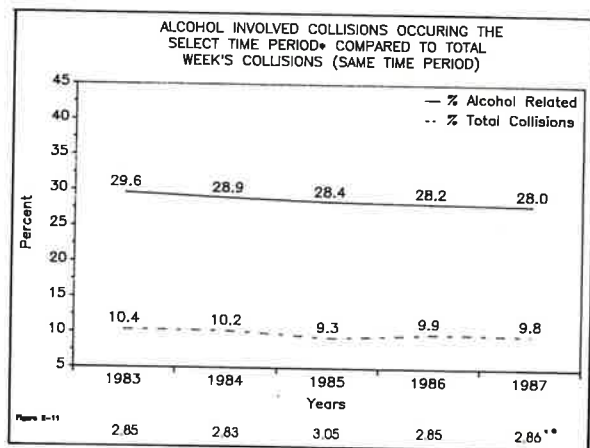
In 1987 the percentage of alcohol-related collisions occurred at a rate of 1.65 times greater than all weekend collisions (Friday 6 p.m. to Sunday midnight). This was down only slightly in the over-representation ratio registered for previous four years (Figure 2-10). In a further breakdown of weekend alcohol-related collisions comparing the percentage of alcohol-involved collisions occurring Friday and Saturday between the hours of 8 p.m. to 3 a.m. select time period to the percentage of the total week's collisions occurring in this time frame, the alcohol-related collisions are nearly 3 times over-represented. This over-representation is down slightly from in the over-representation ratio registered for the previous four years (Figure 2-11).

Figure 2-10



*Friday 6:00 p.m. through Sunday **Over-Involvement Ratio

Figure 2-11

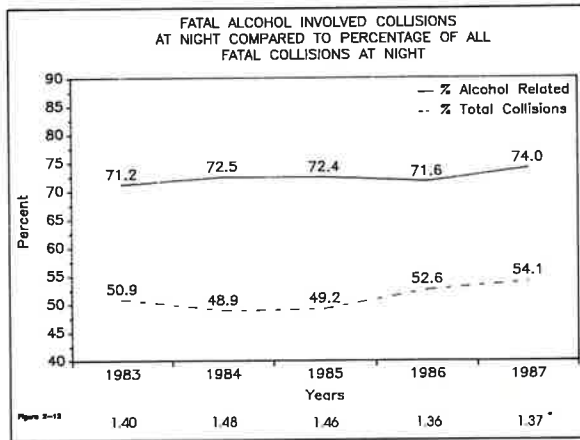


* Friday and Saturday 8:00 p.m. to 3:00 a.m. **Over-Involvement Ratio

Fatal Alcohol Involved Collisions Occurring At Night

The number of all nighttime fatal collisions involving alcohol expressed as a percentage of all alcohol-related fatal collisions increased during 1987 compared to the previous year and the previous four years, as did the percentage of all nighttime fatal collisions. All nighttime fatal collisions in 1987 comprised 54.6% of the year's total fatal collisions while alcohol-related nighttime fatal collisions reach 74.0%. In 1986 alcohol-related fatal collisions at night were over-represented when compared to all nighttime fatal collisions by a ratio of 1.37, down from the previous four-year period ratios (Figure 2-12).

Figure 2-12



* Ratio:

Over-involvement ratio is % nighttime alcohol fatal collisions to % nighttime fatal collisions.

Ratio of Drinking and Drunk Drivers Involved In Fatal Traffic Collisions

Over one-third (36.4%) of all drivers in fatal collisions in 1987 had been drinking prior to the collision. This is a substantial decrease from the previous year of 40.4% and the previous six year average of 41.8% (Figure 2-13). Twelve percent of the drivers involved in all investigated collisions had been drinking prior to the collision; down considerably from the 18.2 percent reported in 1981 (Figure 2-14).

Figure 2-13

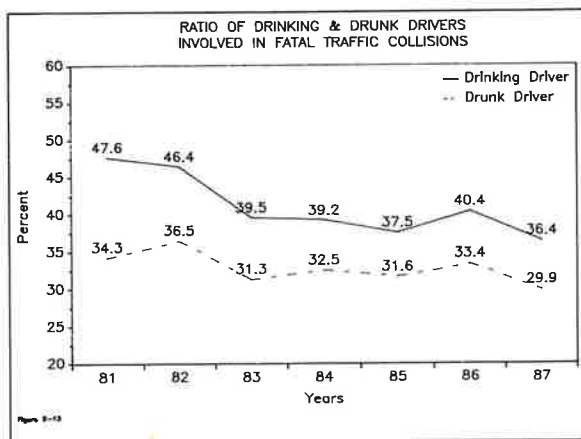
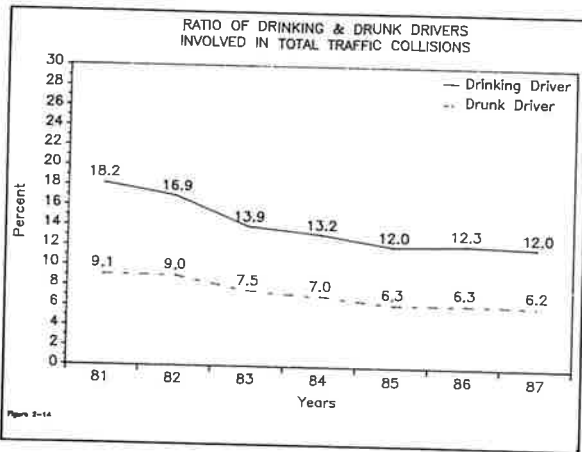


Figure 2-14



The total frequency of particular blood alcohol concentration (BAC) levels in fatal and serious injury collisions from 1983 through 1987 by age groups is presented in Table 2-2. The 16-20 and 21-24 age groups evidenced the greatest incidence of involvement for .05-.19 BAC levels. At the .16-.19 BAC range, the 21-24 age groups had the greatest frequency of occurrences. At the .20-.24 BAC levels, the 25-29 age groups had the greatest frequency of occurrences. At the 2.5 - .29 BAC levels, the 25-29 age group had the greatest frequency of occurrence followed closely by the 30-34 age group. Overall, the 16-20, 21-24, and 25-29 age groups display the highest incidence of involvement at all BAC levels.

Table 2-2

Age	Alcohol Level							Test Given No Results	Test Refused	Total Tested
	.00-.04	.05-.09	.10-.14	.15-.19	.20-.24	.25-.29	.30 & Up			
16-20	148	437	843	649	222	43	9	324	184	2,859
21-24	116	364	891	994	410	98	28	362	457	3,720
25-29	80	246	748	880	423	143	41	319	490	3,370
30-34	53	139	445	568	381	141	36	250	411	2,424
35-39	35	79	271	388	272	93	38	149	252	1,577
40-44	21	49	173	237	184	68	27	87	151	997
45-49	14	28	96	182	135	51	19	57	108	690
50-54	7	24	86	143	97	38	15	33	67	510
55-59	9	31	72	114	74	22	11	26	54	413
60-64	15	15	49	91	49	15	6	22	28	290
65-69	10	9	42	46	25	9	1	11	15	168
Over 69	11	17	42	39	20	8	0	17	9	163
TOTAL	519	1,438	3,758	4,331	2,292	729	231	1,657	2,226	17,181

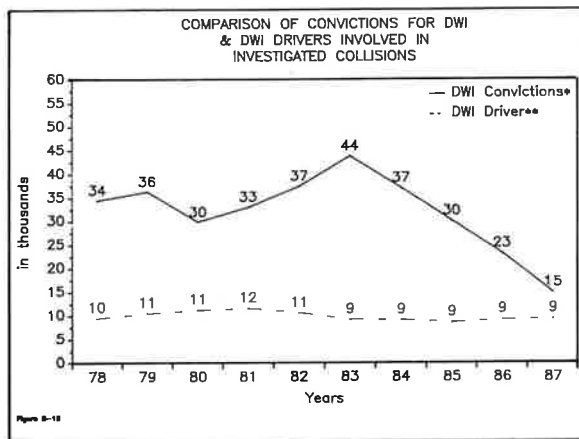
An analysis of roadway type by day of week on which alcohol-involved fatal and serious injury collisions occurred is given in Table 2-3. County roads accounted for 36.9% of the total weekly collisions compared to 27.5% for city streets. U.S. and state routes total 24.7% while the interstates and full-control access roads together contributed 9.9% of the weekly total of fatal and serious alcohol-involved collisions during 1987. The table also reveals that during this period of time, Saturday was the weekday with the greatest frequency of fatal and serious injury collisions involving alcohol. Sunday and Friday were the next highest days in that order.

Table 2-3

FATAL & SERIOUS INJURY COLLISIONS INVOLVING ALCOHOL Roadway Type by Day of Week											
Roadway Type	Day of Week								% of Total Weekly Collisions	% of Previous 4 Year Average	
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total			
County Roads	250	224	226	283	402	634	481	2,500	36.9%	34.2%	
City Streets	185	175	205	230	292	461	313	1,861	27.5%	31.2%	
U.S. & State Routes	160	157	160	190	253	428	327	1,675	24.7%	24.1%	
Interstate & Full Control	51	55	58	89	109	166	140	668	9.9%	9.6%	
Other Routes	5	6	4	8	14	21	7	65	1.0%	1.0%	
Total	651	617	653	800	1,070	1,710	1,268	6,769	100.0%	100.0%	
% of Total	9.6%	9.1%	9.6%	11.8%	15.8%	25.3%	18.7%	100.0%			
% Previous 4 Year Average	9.1%	9.2%	10.1%	11.1%	14.0%	25.6%	20.9%	100.0%			

In 1987 the number of convictions for alcohol-related traffic offenses declined for the fourth consecutive year. The 14,938 convictions in 1987 for DWI/Physical Control violations represented a drop of 65.6% from the 43,835 convictions recorded for the year of 1983. In 1987 the number of DWI drivers involved in investigated collisions increased to 9,455 the highest number recorded since 1982 when 10,609 drivers were involved (Figure 2-15).

Figure 2-15



* Fiscal Year ** Calendar Year

Note: Convictions for physical control of vehicle while under the influence decreased from 10,520 in FY 1979 to 1,866 convictions in FY 1980. DWI convictions increased from 25,788 in FY 1979 to 27,942 in FY 1980.

Data for all collision involvement by driver's age and percent of vehicle miles traveled for each age group reveal that the 16-17 year olds have the greatest over-representation in all reported collisions at 5.23. The 18-20 year olds were the second most over-represented group. The age group with the greatest under-representation based on miles traveled was the 55-64 category. Those in the 16-17 year old bracket also displayed the greatest over-representation in alcohol-related collisions based on miles traveled. Second in this ranking was again the 18-20 year old group. The age group 55-65 recorded the greatest under-representation in alcohol-involved collisions with a 0.29 ratio (Table 2-4).

Table 2-4

ALL REPORTED ACCIDENTS & ALCOHOL INVOLVED ACCIDENTS Comparison of Miles Traveled					
Driver Age	% of Vehicle Miles Traveled*	Drivers in All Accidents**		Alcohol Involved Accidents	
		%	Over/Under Ratio	%	Over/Under Ratio
16-17	1.44	7.55%	5.24%	4.14%	2.87%
18-20	5.55	11.55%	2.08%	12.80%	2.31%
21-24	12.58	13.33%	1.06%	20.75%	1.65%
25-34	29.24	26.91%	0.92%	34.96%	1.20%
35-44	21.18	17.87%	0.84%	15.87%	0.75%
45-54	12.97	9.13%	0.70%	6.16%	0.48%
55-64	11.58	6.66%	0.58%	3.34%	0.29%
65 & Over	5.34	7.00%	1.31%	1.99%	0.37%

* Source - Nationwide Personal Transportation Study - U.S. Dept. of Transportation, 1985

** Source - Accident Records Unit - Washington State Patrol

Table 2-5 presents a summary of the number of persons killed and injured, number of property damage collisions, and total investigated collisions for drivers under the influence, all drinking drivers, and non-drinking drivers. Most categories of non-drinking driver collisions showed increases over 1985. The exception is the number of persons receiving non-disabling injuries, this recorded a modest decrease. Drivers under the influence showed an increase in "Persons Receiving A Possible Injury." Total "DUI" Collisions recorded a 1.5% overall increase. Alcohol-related (Drivers Had Been Drinking) collisions showed a similar increase when compared to the previous year.

Table 2-5

SUMMARY OF PERSONS KILLED & INJURED IN ALCOHOL RELATED COLLISIONS Two Year Comparison									
Status	Drivers Under the Influence			Drivers Who Had Been Drinking*			Non-Drinking Driver Collisions		
	1987	1986	% of Change	1987	1986	% of Change	1987	1986	% of Change
Persons Killed	337	331	1.8%	396	382	3.7%	394	332	18.7%
Persons Injured	7,970	7,823	1.9%	13,555	13,517	0.3%	45,584	45,278	0.7%
Disabling	1,788	1,686	6.0%	2,665	2,642	0.9%	5,595	5,480	2.1%
Non-Disabling	3,897	3,835	1.6%	6,573	6,574	0.0%	17,288	17,358	-0.4%
Possible Injury	2,285	2,302	-0.7%	4,301	4,301	0.0%	22,717	22,440	1.2%
Property Damage Accidents	4,040	3,921	3.0%	8,496	8,205	3.5%	50,078	48,089	4.1%
TOTAL ACCIDENTS***	9,398	9,256	1.5%	17,590	17,305	1.6%	81,676	79,226	3.1%

*Including Drivers Under the Influence
 **Less than 1/10th of one percent
 ***Investigated Accidents Only

Table 2-6 displays the number of persons killed and injured by drivers "under the influence" and "who had been drinking" by months for 1985, 1986, and 1987. The summer months typically show a higher incidence of persons killed and injured for both categories of alcohol-involved drivers.

Table 2-6

PERSONS KILLED & INJURED IN ALCOHOL RELATED COLLISIONS BY MONTH Three Year Comparison												
Month	From Drivers "Under the Influence"						From Drivers Who "Had Been Drinking"					
	Persons Killed			Persons Injured			Persons Killed			Persons Injured		
	1987	1986	1985	1987	1986	1985	1987	1986	1985	1987	1986	1985
January	16	18	15	523	505	505	19	21	18	861	832	786
February	25	9	15	488	475	422	27	11	17	849	816	733
March	26	25	28	617	702	611	31	31	30	1,061	1,112	1,017
April	24	30	40	656	574	590	31	33	43	1,110	1,006	979
May	28	38	41	748	647	624	32	41	48	1,257	1,142	1,098
June	44	32	33	662	606	637	47	40	39	1,130	1,093	1,152
July	29	37	39	715	723	763	40	40	43	1,266	1,306	1,294
August	41	36	28	823	760	713	46	39	35	1,405	1,407	1,303
September	33	22	29	730	664	662	39	31	31	1,151	1,241	1,133
October	34	36	25	690	744	624	36	39	31	1,194	1,219	1,099
November	27	28	17	710	786	509	31	31	22	1,181	1,294	938
December	10	20	16	608	637	511	17	25	22	1,090	1,049	852
TOTAL	337	331	326	7,970	7,823	7,171	396	382	379	13,555	13,517	12,384

Youth Involvement

Overview

Drivers 20 years old and under comprised 7.4% of all licensed drivers in the state in 1987, yet this age group was involved in 19.4% of the total 1987 collisions. This was a collision over-representation rate 2.62 times higher than the percentage of licensed drivers comprising this group. The 21-24 age group was involved in 13.3% of the total collisions while comprising 8.0% of all licensed drivers, producing an over-representation factor of 1.66. The 25-29 year old group, comprising 14.4% of all licensed drivers, was involved in 12.1% for an over-representation of 1.19. All other age groups were under-represented when their percentages of collision involvement were compared to their percentages of total licensed drivers (Table 3-1).

Table 3-1

COMPARISON OF DRIVERS INVOLVED TO NUMBER LICENSED Driver Age Distribution				
Driver Age	Involved in Collisions		% of Licensed Drivers	Over/Under Ratio
	Number	% of Total		
Under 16	677	0.35%	0.00%	0.00
16	6,252	3.21%	0.85%	3.80
17-18	16,700	8.59%	3.22%	2.67
19-20	14,070	7.23%	3.37%	2.15
21-22	13,184	6.78%	3.68%	1.84
23-24	12,644	6.50%	4.28%	1.52
25-29	27,939	14.37%	12.09%	1.19
30-34	24,214	12.45%	12.95%	0.96
35-39	19,851	10.21%	12.20%	0.84
40-44	14,774	7.60%	10.29%	0.74
45-49	9,917	5.10%	7.55%	0.68
50-54	7,768	3.99%	5.98%	0.67
55-59	6,917	3.56%	5.57%	0.64
60-64	5,992	3.08%	5.43%	0.57
65-69	4,966	2.55%	4.96%	0.51
70 & Over	8,607	4.43%	7.57%	0.58

Youthful Drivers Involvement In Collisions By First Harmful Event

In 1987, 73.9% of those drivers age 24 years and younger who were involved in all collisions collided with other moving vehicles. This type of collision also

resulted in the greatest percentage of fatal collisions (45.2%) and injury collisions (69.5%). Single vehicle collisions with fixed objects led to the second largest percentage of youthful driver involvement in total, fatal and injury collisions, at 15.7%, 27.2% and 17.2% respectfully (Table 3-2).

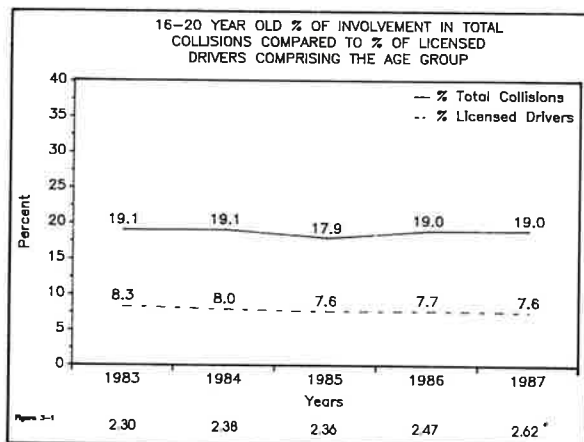
Table 3-2

YOUTHFUL DRIVER INVOLVEMENT IN COLLISIONS By First Harmful Event						
Type of Collision	Total Collisions		Fatal Collisions		Injury Collisions	
	Number	% of Total	Number	% of Total	Number	% of Total
Collision with other moving motor vehicles	40,719	73.9%	131	45.2%	15,383	69.5%
Collision with parked vehicle	1,963	3.6%	5	1.7%	484	2.2%
Collision with fixed/other object	8,655	15.7%	79	27.2%	3,809	17.2%
Overturning & other non collision	2,622	4.8%	39	13.4%	1,601	7.2%
Collisions with pedestrians & pedalcyclists	804	1.5%	32	11.0%	760	3.4%
Other collisions - animal & R.R. train	315	0.6%	4	1.4%	81	0.4%
TOTAL	55,078	100.0%	290	100.0%	22,118	100.0%

Youthful Collision Involvement By Age Group

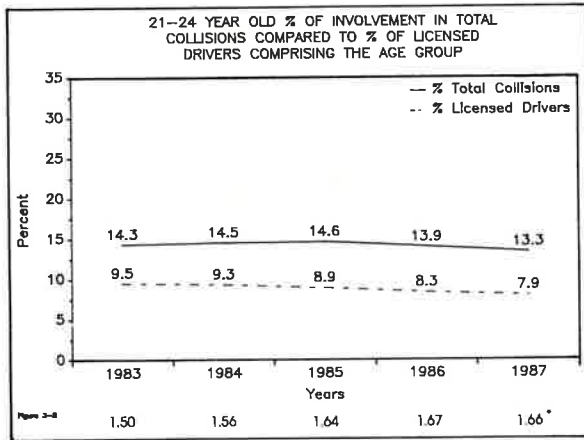
In 1987 the 16-20 year old age group was involved in 19.4% of all collisions. This group's over-representation ratio of 2.62 was up from the 2.47 ratio for 1986. It is also the highest over-representation ratio for any age group (Figure 3-1). The 21-24 year old age group decreased its over-representation ratio slightly from 1.67 to 1.66 (Figure 3-2). The 25-29 age group posted an over-representation ratio of 1.19, down from the previous year's 1.20 (Figure 3-3). The 30-54 age group continued to be under-represented in total collisions compared to this group's percentage of all licensed drivers, as are the 55 year old and older age group (Figure 3-4 & 3-4a).

Figure 3-1



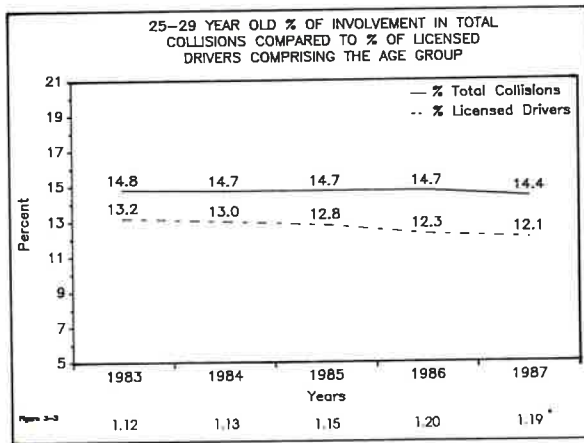
Ratio:
Over-representation ratio

Figure 3-2



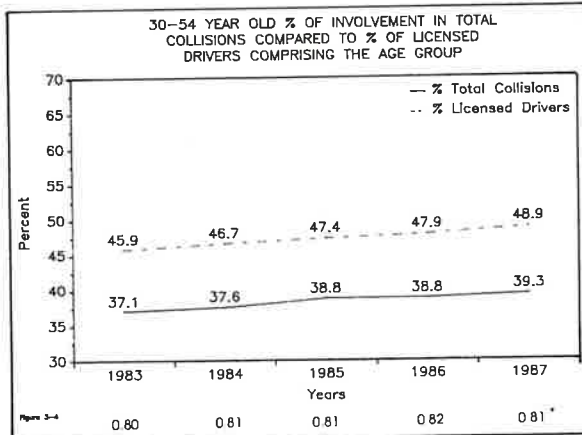
Ratio:
Over-representation ratio

Figure 3-3



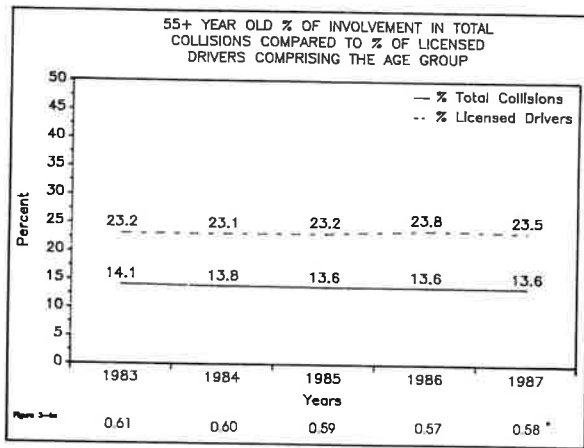
Ratio:
Over-representation ratio

Figure 3-4



Ratio:
Over-representation ratio

Figure 3-4a



Ratio:
Over-representation ratio

Collision Severity By Area For Youthful Drivers

In 1987, the urban area collisions decreased a percentage point in the urban and rural mix of collisions involving youthful drivers (24 years old and younger). The urban areas recorded 58.0% of the total and the rural areas contributing to 42.0% (Figure 3-5). In 1987, youthful driver injury collisions also decreased in the urban area recording 53.6% urban and 46.4% rural (Figure 3-6). Youthful driver fatal collisions continued to be far more common in rural areas. In 1987, 77.9% of the fatal collisions involving youthful drivers occurred in rural areas, an increase of nearly 9 percentage points over 1986 and 4 percentage points over 1985. The urban area recorded 22.1% of the fatal crashes in 1987, down from the 31% of the year earlier (Figure 3-7).

Figure 3-5

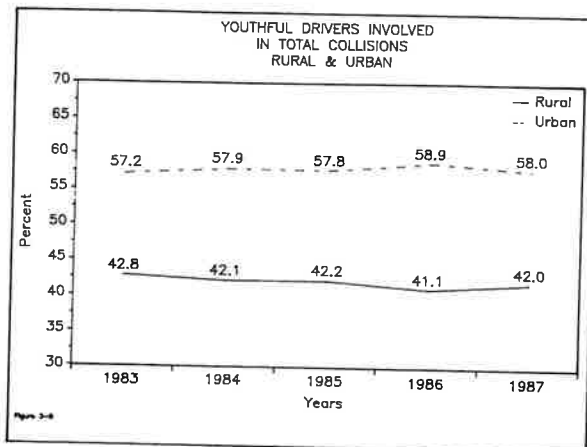


Figure 3-6

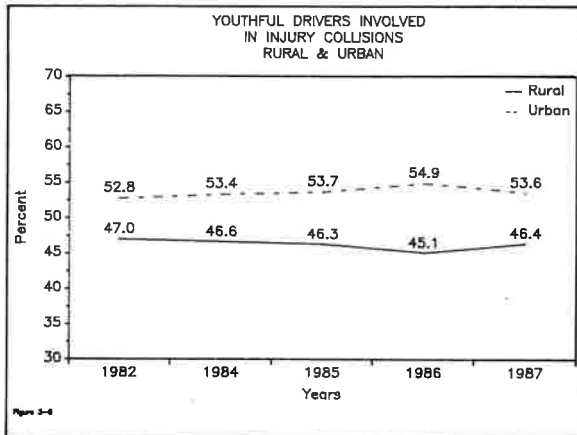
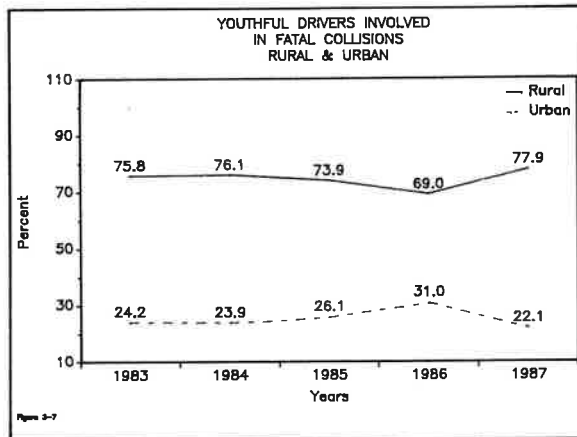


Figure 3-7



Youthful Driver Involvement By Time

In 1987, 20.4% of all the rural fatal collisions and 18.3% of all reported collisions involving youthful drivers occurred on Saturday (Figure 3-8). In urban areas, Saturday also had the highest occurrence of fatal collisions involving youthful drivers (25.0%), but Friday recorded the greatest percentage of total collisions (18.7%) for the group (Figure 3-9).

Figure 3-8

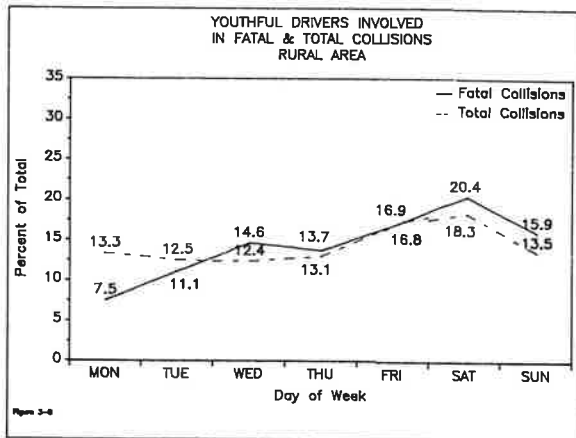
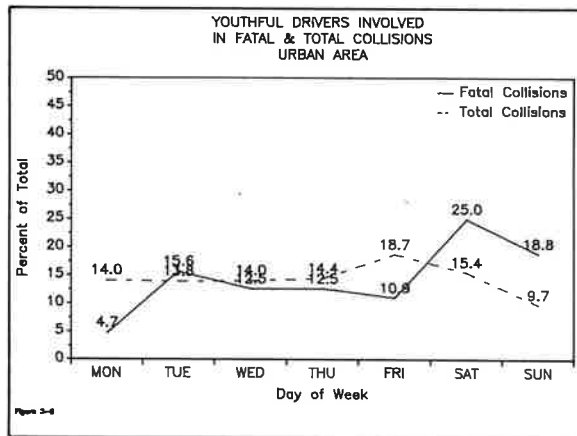


Figure 3-9



In rural areas, the greatest percentage (18.62) of youthful driver involvement in fatal collisions in 1987 occurred from 6:00 p.m. to 9:00 p.m.. The greatest percentage of total collision involvement (23.5%) for these drivers was from 3 p.m. to 6 p.m. (Figure 3-10). In the urban areas, the greatest youthful involvement by time period in fatal collisions was 20.3% in the 9:00 p.m. to midnight. The 3 p.m. to 6 p.m. time period recorded 26.3% of the youthful drivers involved in total urban collisions (Figure 3-11).

Figure 3-10

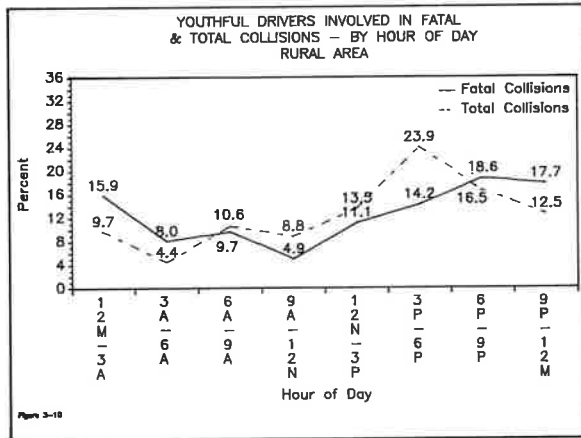
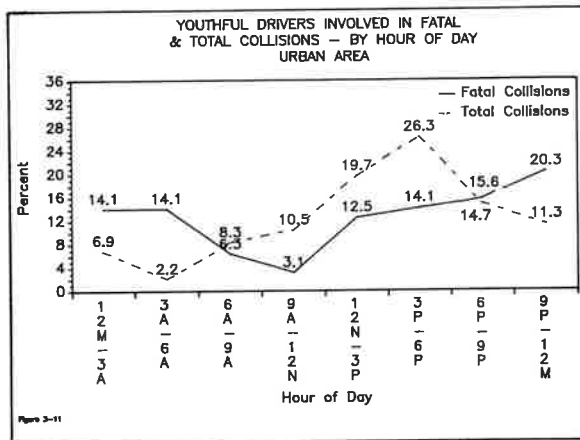


Figure 3-11



Safety Restraint Usage

Overview

In 1987, out of a total of 196,494 occupants involved in total investigated collisions, 152,413 were using safety restraints. This is a usage rate of 77.6% and marks the fifth consecutive year of increases in safety restraint usage since 1981 (Table 4-1).

Table 4-1

RESTRAINT USAGE RATE Five Year Comparison										
Status	1987 %		1986 %		1985 %		1984 %		1983 %	
Restraints Used	152,413	77.6%	102,751	54.5%	60,392	35.1%	45,214	28.0%	31,751	21.0%
No Restraints Used	44,081	22.4%	85,669	45.5%	111,885	64.9%	116,299	72.0%	119,670	79.0%
TOTAL	196,494	100.0%	188,420	100.0%	172,277	100.0%	161,513	100.0%	151,421	100.0%

In 1987, 152,413 persons out of a total 196,494 collision-involved occupants were using a restraining device. Child restraints were used by 2,503 collision-involved children (Table 4-2). Looking at all restraining devices by usage and non-usage categories, it appears that with the safety restraint usage, injuries were less likely to occur and those that did occur were less severe (Appendix C).

Table 4-2

RESTRAINT USAGE & INJURIES SUSTAINED* By Type								
Type	Restraints Used		Child Restraints**		No Restraints		Total Occupants	
	Number	%	Number	%	Number	%	Number	%
Deaths	140	0.1%	5	0.2%	398	0.9%	538	0.3%
Disabling Injuries	2,544	1.6%	8	0.3%	2,921	6.6%	5,465	2.7%
Evident Injuries	10,896	7.0%	116	4.6%	7,613	17.3%	18,509	9.3%
Possible Injuries	21,602	13.8%	146	5.8%	5,411	12.3%	27,013	13.5%
No Injuries	120,817	77.4%	2,228	89.0%	27,728	62.9%	148,545	74.2%
TOTAL	155,999	100.0%	2,503	100.0%	44,071	100.0%	200,070	100.0%

*Excludes cases where injury severity was not stated or where restraint use was unknown.

**Included with Restraints Used Category.

In 1987, 83.3% of the female drivers used their restraints while 77.8% of the male drivers used their restraints in collisions. Female passengers had a usage rate of 75.9% compared to 69.0% for male passengers. The 0-5 age group had the highest restraint usage of any age group at 85.6%. The age group with the lowest usage rate was the 16-19 year olds at 71.6% usage (Table 4-3 and 4-3a).

Table 4-3

USAGE RATES BY SEX*					
Five Year Comparison					
Occupant	Percent Used Restraints				
	1987	1986	1985	1984	1983
Male Driver	77.8	54.0	34.3	27.3	22.0
Female Driver	83.3	59.6	38.8	31.4	23.6
Male Passenger	69.0	46.7	29.4	26.4	14.8
Female Passenger	75.9	55.0	36.0	28.4	18.9

*Excludes occupants where restraint use was unknown

Table 4-3a

USAGE RATES BY AGE*					
Five Year Comparison					
Occupant	Percent Used Restraints				
	1987	1986	1985	1984	1983
Age 0-5	85.6	81.0	73.1	66.8	42.3
Age 6-15	72.5	51.5	31.3	24.9	14.8
Age 16-19	71.6	44.2	27.0	20.8	15.2
Age 20-24	80.4	47.5	28.5	22.0	16.3
Age 25-34	77.4	47.5	36.6	29.5	23.0
Age 35-64	82.9	55.3	39.7	32.0	23.3
Age 65 & Up	82.6	60.6	34.7	27.6	21.4

*Excludes occupants where restraint use was unknown

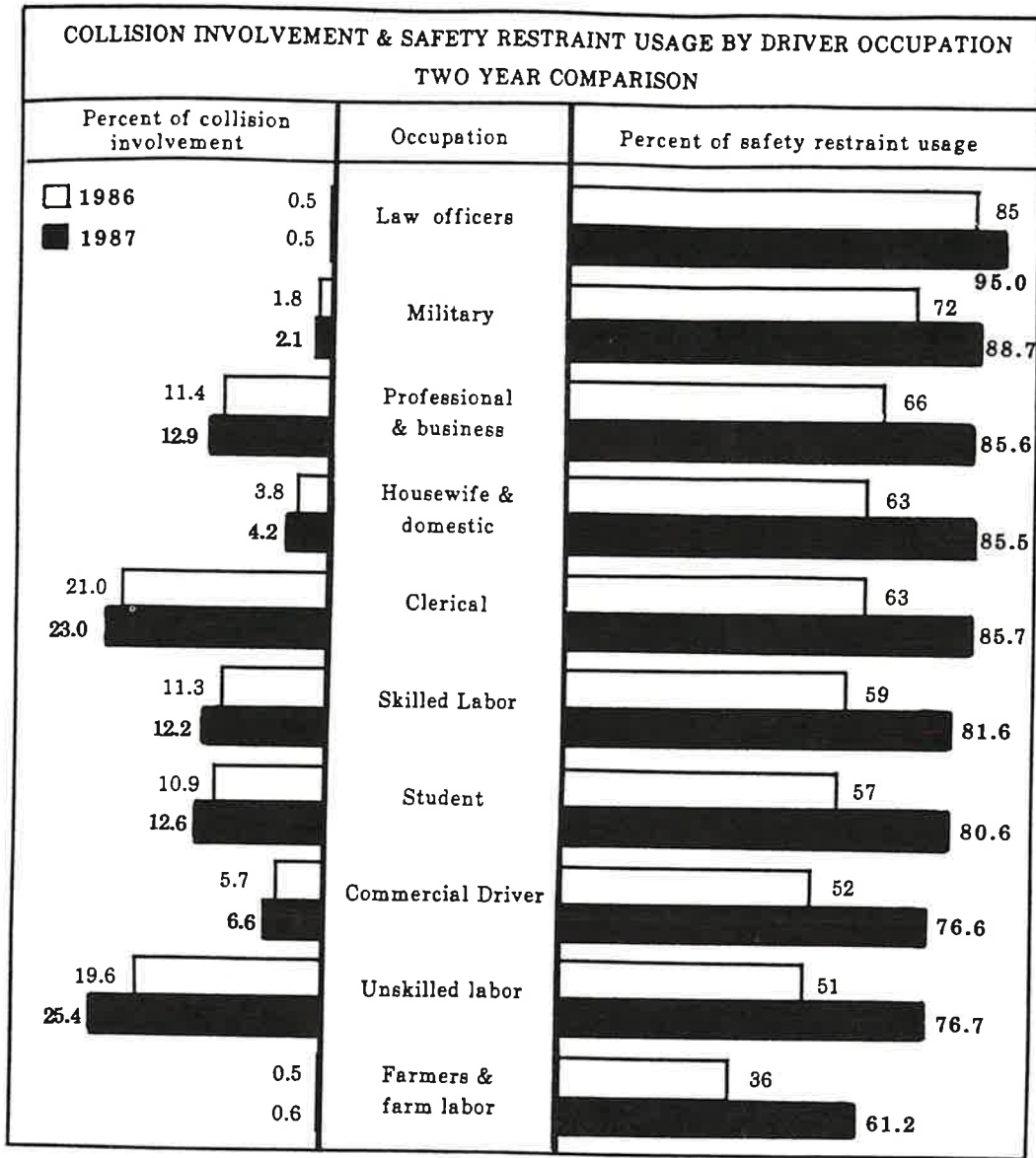
Examination of restraint usage by occupant age for 1987 reveals that the 1 year old and younger age group had the highest usage rate at 90.1%. The lowest rate of restraint usage (64.7%) was for 15 year old occupants. Teenage occupants recorded the lowest usage rate of any group with 69.8% (Table 4-4).

Table 4-4

SEAT BELT USAGE By Occupant Age									
Age	Seat Belt Type					Total Restraints Used		Restraints Not Used	
	Lap Belt	Shoulder Belt	Lap & Shoulder Belt	Child Restraint	Air Bag Activated	Number	% of Total	Number	% of Total
Under 1	31	2	59	446	0	538	86.1%	87	13.9%
1	107	9	114	745	2	977	90.1%	107	9.9%
2	328	7	228	537	0	1,100	85.6%	185	14.4%
3	446	17	338	294	0	1,095	86.4%	173	13.6%
4	461	22	380	123	1	987	84.2%	185	15.8%
5	513	12	374	61	0	960	81.9%	212	18.1%
6	447	20	356	18	0	841	81.7%	189	18.3%
7	385	18	310	7	0	720	78.3%	200	21.7%
8	344	20	267	3	0	634	77.8%	181	22.2%
9	307	9	266	1	0	583	76.0%	184	24.0%
10	307	18	295	1	0	621	79.1%	164	20.9%
11	241	19	236	2	0	498	72.8%	186	27.2%
12	266	20	294	0	0	580	76.0%	183	24.0%
13	262	18	345	0	0	625	71.0%	255	29.0%
14	335	37	446	0	1	819	66.4%	415	33.6%
15	602	66	976	0	0	1,644	64.7%	896	35.3%
16	1,502	252	4,071	0	1	5,826	73.4%	2,115	26.6%
17	1,738	330	4,686	0	0	6,754	71.9%	2,644	28.1%
18	1,656	278	4,237	0	2	6,173	70.4%	2,598	29.6%
19	1,319	242	3,823	0	0	5,384	70.7%	2,232	29.3%
20	1,095	215	3,389	0	0	4,699	71.1%	1,908	28.9%
21 - 24	3,801	713	13,196	0	1	17,711	73.0%	6,562	27.0%
25 - 29	3,923	718	13,734	0	4	18,379	75.7%	5,901	24.3%
30 - 64	11,264	2,450	46,013	0	9	59,736	81.8%	13,322	18.2%
65 & Over	2,067	479	7,821	0	5	10,372	85.5%	1,758	14.5%
Age Unknown	594	138	1,756	239	1	2,728	73.0%	1,010	27.0%
TOTAL	34,341	6,129	108,010	2,477	27	150,984	77.5%	43,852	22.5%

The usage rate of safety restraints by occupation of driver ranges from a high of 95.3% for law officers to a low of 61.2% for farmers and/or farm labor. Usage rates for all occupations showed substantial increases in 1987 over the rates for the preceding year (Figure 4-1).

Figure 4-1



Freeway travel (interstates) and other controlled access routes had the highest usage rate by vehicle occupants at 84.6%. Occupants of vehicles traveling on county roads had one of the lowest recorded usage rate at 72.5%. All other roadways, which include forest service roads and recreational roads which are open to public, recorded a 63.6% usage rate. (Table 4-5).

Table 4-5

RESTRAINT USAGE By Functional Class of Roadway					
Functional Class	1987	1986	1985	1984	1983
Interstate & limited	84.6%	66.8%	49.6%	41.0%	27.4%
Other state routes	82.0%	56.0%	34.9%	28.9%	21.1%
County Roads	72.5%	50.5%	31.6%	24.3%	17.7%
City Streets	77.9%	52.6%	32.1%	26.4%	20.1%
All others	63.6%	41.8%	29.7%	24.8%	19.8%

Examination of safety restraint usage by vehicle type reveals substantial increases in usage rates for all types of vehicles. The lowest usage rate (67.7%) in 1987 was recorded for those in heavy trucks (Table 4-6).

Table 4-6

RESTRAINT USAGE RATE BY TYPE OF VEHICLE DRIVERS Five Year Comparison					
Type of Vehicle	1987	1986	1985	1984	1983
Passenger car	78.9%	56.6%	36.8%	29.8%	22.4%
Light Trucks	73.1%	48.8%	29.8%	22.2%	16.2%
Heavy Trucks	67.7%	49.9%	27.3%	20.1%	16.0%
All others	69.5%	52.9%	34.6%	30.9%	21.5%

In 1987, 93.8% of the occupants were using safety restrains in "state government registered vehicles" involved in collisions. This is up 22.9% from the preceding year. The next highest usage rate was the 87.6% reported for "other government (federal agency) registered vehicles." Occupants of county registered vehicles had the lowest usage rate of occupants in all government owned vehicles recording at 78.2%. (Table 4-7).

Table 4-7

RESTRAINT USAGE RATE BY TYPE OF GOVERNMENT VEHICLES Five Year Comparison					
Type of Government Vehicle	1987	1986	1985	1984	1983
State registered vehicles	93.8%	76.3%	77.4%	68.3%	60.0%
County registered vehicles	78.2%	63.8%	49.5%	43.6%	32.3%
Municipal registered vehicles	85.9%	66.3%	49.9%	41.4%	35.1%
Other government registered vehicles	87.6%	84.1%	68.3%	58.6%	54.2%

Drivers residing in other states recorded the lowest seat belt usage rate in 1987. 79.1% of the in-state drivers residing over 15 miles of the collision scene recorded the highest usage rate of 80.4%. All categories continued to record increases in restraint usage rates over previous years (Table 4-8).

Table 4-8

RESTRAINT USAGE RATE BY PROXIMITY OF DRIVER RESIDENCE Five Year Comparison					
Residence Proximity	1987	1986	1985	1984	1983
Resided within 15 miles of collision	79.7%	55.5%	35.3%	28.2%	22.1%
Resided over 15 miles	80.4%	58.1%	38.9%	31.1%	23.7%
Residing in other state	79.1%	60.0%	41.3%	35.1%	28.6%

An examination of restraint usage by seat position in 1987 reveals that drivers were the most frequent users at 79.7%. Occupants in the right front and left back positions were the next two most frequent restraint users at 74.9% each. These

Table 4-9

RESTRAINT USAGE RATE BY OCCUPANT SEAT POSITION Five Year Comparison					
Occupants	1987	1986	1985	1984	1983
Driver	79.7%	55.9%	35.8%	28.6%	22.5%
Mid-front	51.8%	34.0%	21.2%	17.1%	10.6%
Right-front	74.9%	51.9%	31.9%	24.6%	17.0%
Left-back	74.9%	58.1%	42.6%	36.5%	22.2%
Mid-back	62.4%	44.4%	33.3%	25.7%	14.9%
Right-back	74.1%	58.0%	40.8%	34.6%	21.9%
Other	28.8%	21.5%	20.3%	13.0%	4.8%
TOTAL	77.6%	54.5%	35.1%	27.9%	21.0%

positions include the greatest usage of child restraints. Seat position occupants showing the least usage of restraints were those riding in the mid-front, were 51.8% were reported using restraints (Table 4-9).

Table 4-10 presents 1987 restraint usage by occupant age and seat position. The right-back and left-back for the 0-4 age group had the highest reported usage at 92.2% and 92.1%, respectively. For the 5-9 age group, the most frequent safety restraint usage also occurred in the right-back (85.8%) and left-back (84.9%) seat positions. The positions with the lowest reported usage rates for the 25-29 age group were the mid-back seats--18.2%. The mid-back restraints were the lesser used in the 21-24 age group. The driver continued to "buckle up" more than any other occupant for those aged 15 through 64. The right-front occupant was the most frequent restraint user at 86.6% in the 65 and over age category.

Table 4-10

RESTRAINT USAGE RATE By Occupant Age & Seat Position								
Seat Position	Age							
	0-4	5-9	10-14	15-20	21-24	25-29	30-64	65 & Over
Driver	-	-	48.0%	75.2%	75.6%	77.8%	82.7%	85.6%
Mid-front	75.5%	61.4%	49.1%	38.8%	40.0%	44.3%	52.2%	71.9%
Right-front	85.3%	81.7%	78.5%	69.1%	68.7%	71.0%	79.8%	86.6%
Left-back	92.1%	84.9%	73.3%	60.4%	59.9%	58.3%	67.4%	59.1%
Mid-back	86.6%	73.8%	61.5%	42.2%	28.6%	18.8%	50.3%	65.4%
Right-back	92.2%	85.8%	34.0%	62.9%	62.5%	70.0%	71.4%	29.8%
Other	54.5%	43.1%	33.7%	18.6%	15.2%	18.2%	14.6%	25.0%
Seat location unknown	58.6%	65.8%	60.4%	41.9%	26.9%	27.7%	43.0%	71.4%

A more detailed breakdown of types of restraints used by injury severity is presented for 1987 in Table 4-11. Of 538 occupants killed in vehicle collisions, 398 (74.0%) were not using restraints. Of the 5,465 persons sustaining disabling injuries by collisions, 53.4% were using no restraints. 57.9% of the occupants which were restrained with the combination lap/shoulder belts received no injuries as reported in investigated collisions, up from the 38.6% reported for 1986.

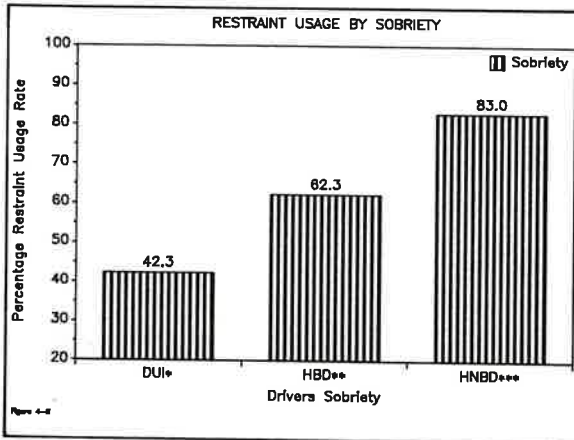
Table 4-11

TYPES OF RESTRAINTS USED By Severity of Injury												
Type	Number Used		Deaths		Disabling Inj		Evident Inj		Possible Inj		No Injury	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Lap Belt	38,212	19.1%	32	5.9%	574	10.5%	2,736	14.8%	7,318	27.1%	27,552	18.5%
Shoulder Belt	6,175	3.1%	4	0.7%	117	2.1%	403	2.2%	660	2.4%	4,991	3.4%
Lap & Shoulder Belt	109,082	54.5%	99	18.4%	1,845	33.8%	7,638	41.3%	13,475	49.9%	86,025	57.9%
Child Restraint	2,503	1.3%	5	0.9%	8	0.1%	116	0.6%	146	0.5%	2,228	1.5%
Air Bag (Activated)	27	0.0%	0	0.0%	0	0.0%	3	0.0%	3	0.0%	21	0.0%
No Restraints	44,071	22.0%	398	74.0%	2,921	53.4%	7,613	41.1%	5,411	20.0%	27,728	18.7%
TOTAL OCCUPANTS	200,070	100.0%	538	100.0%	5,465	100.0%	18,509	100.0%	27,013	100.0%	148,545	100.0%

*Less than 1/10 of 1 percent

Of all collision-involved drivers in 1987, those who had been drinking displayed a greater tendency not to use restraints than those drivers who had not been drinking. The latter category revealed a restraint-usage rate of 83.0% compared to a usage rate of 42.3% for drivers under the influence and 62.3% for drivers who had been drinking but were not under the influence (Figure 4-2).

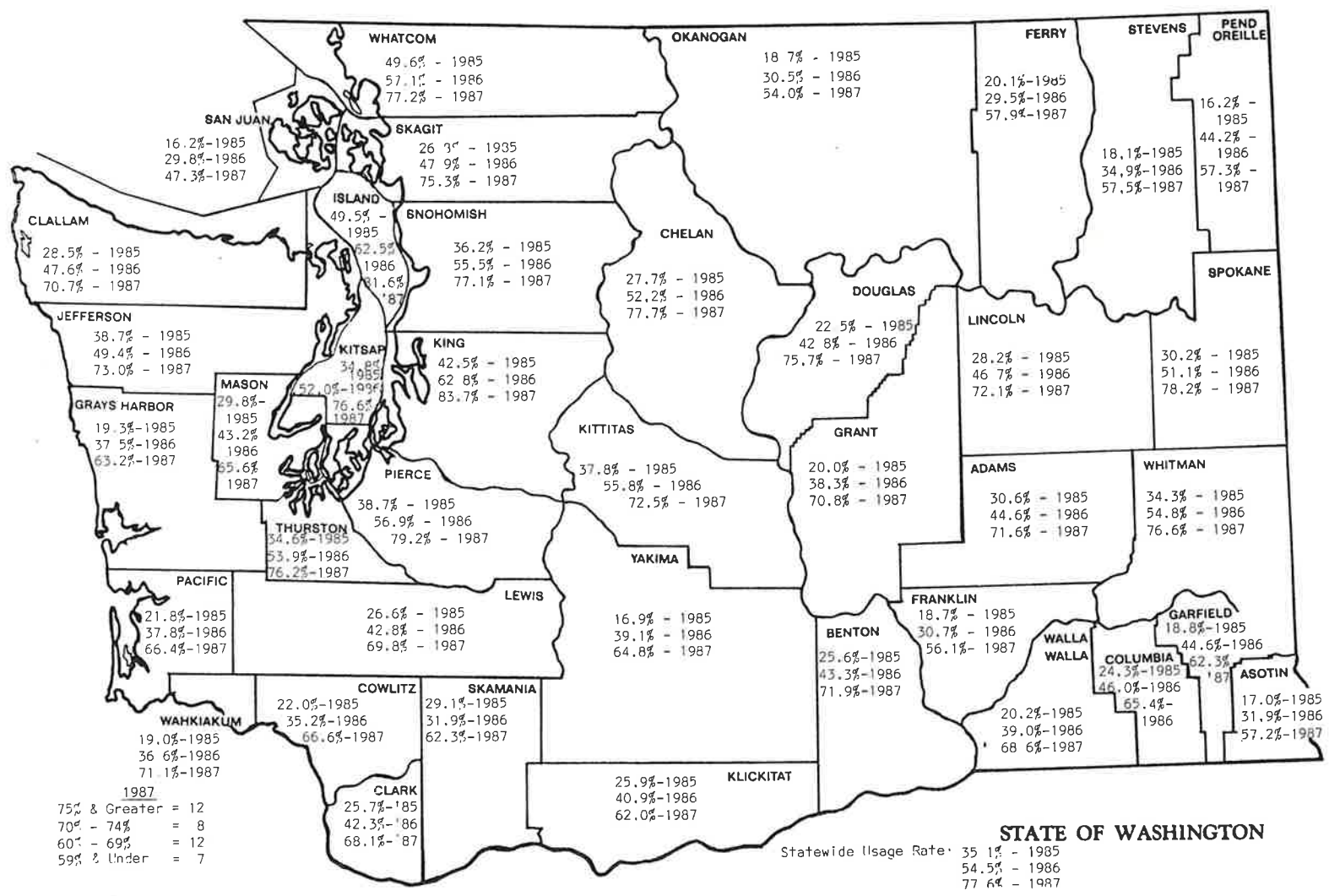
Figure 4-2



A graphic depiction of restraint use by county is presented in Figure 4-3. King County, at 83.7%, had the highest usage rate of all counties in the state in 1987. Island County had the next highest usage rate at 81.6%. The two counties with the lowest usage rate was San Juan County recording a usage rate of 47.3% and Okanogan County at 54.0%.

Figure 4-3

Occupant Restraint Usage Rate by County, 1985-87



Motorcycle Collisions

Overview

The 1987 motorcycle fatal collisions increased 14.3%, when compared to the previous 4-year baseline average. Total reported collisions, however, recorded a 3.4% decrease and injury collisions recorded a 5.7% decrease over the baseline average. Registration in 1987 totaled 124,215 motorcycles, a decrease of 1.2% over the baseline period. The motorcycle collision rate of 2.72 for 1987 was down 2.4% over the baseline rate of 2.72 motorcycle collisions per every 100 registered (Table 5-1).

Table 5-1

MOTORCYCLE COLLISIONS SUMMARY Five Year Comparison							
Collision Severity/Exposure & Rates	Years					Previous 4 Year Average	% of Change 87 - 4 Year Average
	1987	1986	1985	1984	1983		
Total Collisions	3,379	3,508	3,699	3,477	3,312	3,499	-3.43%
Fatal Collisions	88	80	82	69	77	77	14.29%
Injury Collisions	2,816	3,003	3,139	2,965	2,839	2,987	-5.71%
Motorcycle Registration	124,215	122,751	125,224	126,703	127,950	125,657	-1.15%
Fatal Collision Ratio*	26.0	22.8	22.2	19.8	23.2	22.0	18.29%
Fatal Registration Rate**	0.708	0.652	0.655	0.545	0.602	0.613	15.53%
Total Collision Registration Rate***	2.72	2.86	2.95	2.74	2.59	2.79	-2.36%

* Fatal Collisions per 1,000 motorcycle collisions

** Fatal Collisions per 1,000 motorcycles registered

*** Motorcycle involved per 100 registered

Motorcycle Collisions By Location

Table 5-2 displays a breakdown of motorcycle collision data by total for urban and rural areas as well as the state as a whole for 1987 and 1986. In 1987 rural areas again led urban areas in the total number of fatal collisions, 61 to 27, while urban areas led rural areas in total number of injury collisions, 1,486 to 1,330.

Table 5-2

MOTORCYCLE COLLISIONS BY LOCATION Two Year Comparison						
Severity of Collision	1987			1986		
	Urban	Rural	Statewide	Urban	Rural	Statewide
Total Collisions	1,845	1,534	3,379	2,026	1,482	3,508
Fatal Collisions	27	61	88	35	45	80
Injury Collisions	1,486	1,330	2,816	1,685	1,318	3,003
Property Damage Only, Collisions	332	143	475	306	119	425
Total Fatalities	27	63	90	35	46	81
All Persons Injured	1,821	1,676	3,497	2,049	1,624	3,673
Motorcyclists Killed	27	63	90	33	47	80
Motorcyclists Injured	1,702	1,586	3,288	1,904	1,523	3,427

A further breakdown of 1987 motorcycle collisions by road type indicates that 52.1% of the total collisions, 50.5% of the injury collisions and 28.4% of the fatal accidents occurred on city streets. 29.5% of the injury collisions, 28.3% of the total collisions and 46.6% of the fatal collisions happened on county roads. State routes recorded 10.3% of the injury and 10.1% of the total collisions as well as 12.5% of the fatal motorcycle collisions (Table 5-3).

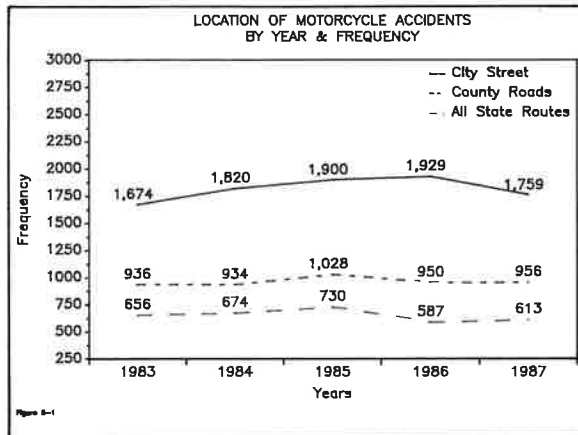
Table 5-3

MOTORCYCLE COLLISIONS by Location						
Location	Collisions				Persons	
	Total	Fatal	Injury	P.D. Only*	Killed	Injured
Interstate System	158	5	123	30	5	138
Other Full Control	51	1	44	6	1	47
U.S. Route No.**	64	5	57	2	5	72
State Route No.**	340	11	291	38	12	348
County Roads	956	41	831	84	42	994
City Streets***	1,759	25	1,421	313	25	1,630
Other Traffic Ways	51	0	49	2	0	59
Total	3,379	88	2,816	475	90	3,288

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

Total frequency of motorcycle collisions occurring on city streets decreased during 1987. This reverses a previous 3-year increase. Motorcycle collisions occurring on state routes recorded a slight increase after experiencing a six-year low of 587 collisions in 1986. County roads also recorded a slight increase after a one-year decrease in the number of collisions recorded in 1986. (Figure 5-1).

Figure 5-1



Motorcycle Collisions By Age Group

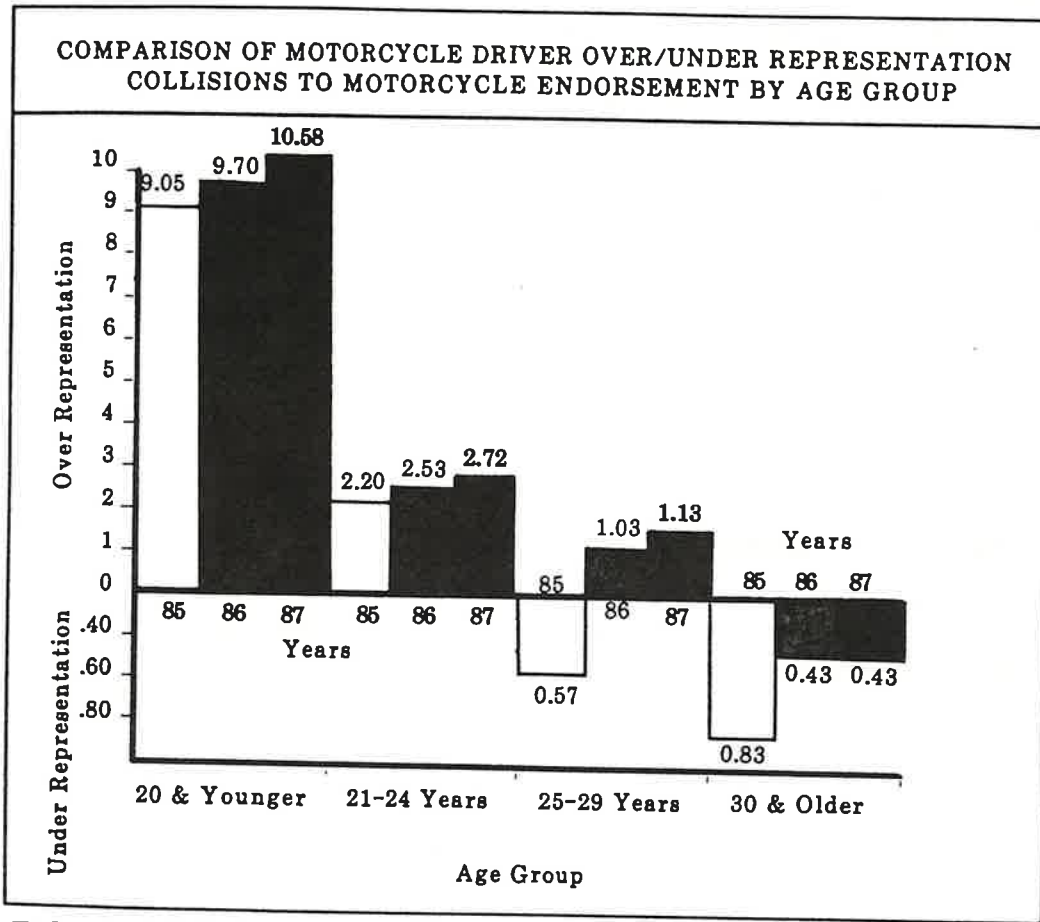
The 16-29 year old motorcycle rider continues to be over-represented in the accident population compared to the percentage of licensed motorcycle drivers comprising that age group. The 16-18 year old were involved in 13.3% of the total collisions, but comprise less than 1% of the motorcyclists licensed to drive. From age 30 on up, motorcycle riders are under-represented (Table 5-4).

Table 5-4

MOTORCYCLE RIDERS Comparison of Collisions to Licensed Drivers								
Age	Fatal Collisions		Injury Collisions		Total Collisions		% of Licensed Drivers	Over/Under Ratio
	Number	%	Number	%	Number	%		
Under 16	5	5.6%	68	2.4%	81	2.5%	0.00	0.00
16	2	2.2%	66	2.4%	75	2.3%	0.05%	46.60%
17-18	9	10.0%	309	11.1%	355	11.0%	0.69%	16.01%
19-20	8	8.9%	383	13.8%	430	13.4%	2.03%	6.59%
21-22	11	12.2%	303	10.9%	341	10.6%	3.10%	3.42%
23-24	6	6.7%	286	10.3%	328	10.2%	4.55%	2.24%
25-29	23	25.6%	487	17.5%	584	18.2%	16.17%	1.12%
30-34	12	13.3%	326	11.7%	374	11.6%	21.31%	0.54%
35-39	5	5.6%	223	8.0%	257	8.0%	17.96%	0.44%
40-44	6	6.7%	140	5.0%	171	5.3%	12.50%	0.42%
45-54	2	2.2%	128	4.6%	145	4.5%	12.44%	0.36%
55-64	1	1.1%	44	1.6%	51	1.6%	6.27%	0.25%
65 & over	0	0.0%	19	0.7%	21	0.7%	2.93%	0.22%

Figure 5-2 shows that motorcycle riders under 29 years of age, and particularly those 20 years old and younger, are over-represented in total motorcycle accident involvement when compared to the percentages of licensed motorcycle riders comprising these age groups. The 30 year old and over age group continue to be under-represented.

Figure 5-2



Principal Violations in Collisions By Age Groups

Speed too fast for conditions was the principal cause of motorcycle collisions for all age groups in 1987, contributing to 27.4% of the year's motorcycle violations. Motorcyclists' driving over the speed limit was the second leading violation contributing 13.8% to the violation total. Driving while intoxicated was the third most prominent violation, contributing 13.2% to the total of motorcycle driver violations. In the 21 to 44 age group, driving while under the influence of intoxicating liquor was the second leading violation (Table 5-5).

Table 5-5

Violation	Violations		Age of Violator							Number Not Stated
	Total	%	20 & Under	21-24	25-29	30-34	35-44	45-54	55 & Over	
Speed - Conditions	638	27.4%	206	130	113	70	62	21	5	31
Speed - Over Legal	320	13.8%	114	72	61	30	29	2	3	9
Failed to Yield	122	5.2%	53	17	17	12	7	4	4	8
D.W.I.	306	13.2%	52	80	70	47	40	9	2	6
Following Too Closely	146	6.3%	53	34	21	15	12	8	1	2
Improper Passing	121	5.2%	31	36	22	12	14	1	1	4
Operating Defective Equipment	97	4.2%	40	17	7	14	10	6	1	2
Disregard Signs/Signals	95	4.1%	33	24	16	10	6	1	2	3
Over Centerline	69	3.0%	20	14	19	5	7	1	1	2
Other Violations	412	17.7%	131	69	59	51	53	16	10	23
Total	2,326	100.0%	733	493	405	266	240	69	30	90

Motorcycle Collisions By First Harmful Event

In 1987 the most common first harmful event causing a single motorcycle collision was overturning. This cause predominated for all age groups. In multiple vehicle collisions involving motorcycles, the rear-end collision was most prevalent (16%). Angular collisions constituted the next most common event (14.7%) in multiple vehicle motorcycle collisions. Collisions occurring while entering or leaving a driveway contributed to 11.6% of all motorcycle collisions. (Table 5-6).

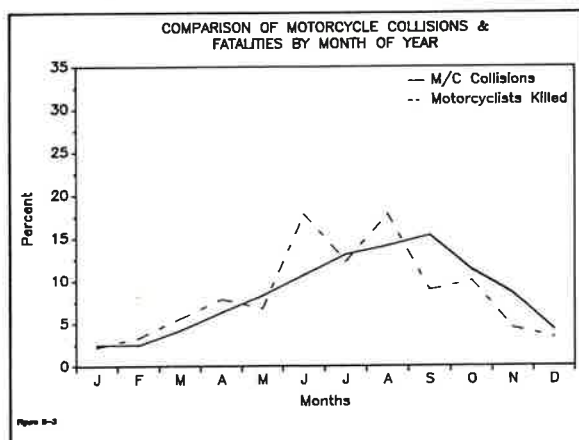
Table 5-6

MOTORCYCLE COLLISIONS By First Harmful Event									
Type of Collision	Collisions		Age of Motorcyclist						
	Total	%	20 & Under	21-24	25-29	30-34	35-44	45-54	55 & Over
Single Motorcycle Collision									
Struck Fixed Object	334	10.4%	109	61	60	56	28	13	7
Struck Other Object	10	0.3%	6	2	1	0	1	0	0
Overturned	763	23.7%	195	143	129	111	130	39	16
Motorcycle-Pedestrian	24	0.7%	7	7	3	4	2	1	0
Motorcycle-R.R. Train	1	0.0%	1	0	0	0	0	0	0
Motorcycle-Pedalcyclist	18	0.6%	5	4	4	2	1	1	1
Motorcycle-Animal	70	2.2%	19	8	13	8	12	8	2
Non-Collision	39	1.2%	13	12	7	1	4	1	1
Total Single Motorcycle Collisions	1,259	39.2%	355	237	217	182	178	63	27
Multiple Vehicle Collision									
Head-on	60	1.9%	28	10	11	7	2	0	2
Rear-end	513	16.0%	138	114	90	55	81	26	9
Sideswipe	154	4.8%	42	30	36	12	25	6	3
Angular Direction	473	14.7%	143	99	86	43	60	25	17
Enter/Leave Driveway	374	11.6%	127	86	63	40	41	12	5
One Left/One Straight-Opp. Dir.	235	7.3%	62	52	60	24	22	9	6
Other Multiple Vehicle Collision	145	4.5%	46	41	21	11	19	4	3
Total Multiple Vehicle Collisions	1,954	60.8%	586	432	367	192	250	82	45
TOTAL MOTORCYCLE COLLISIONS	3,213	100.0%	941	669	584	374	428	145	72

Time of Motorcycle Collision Occurrence

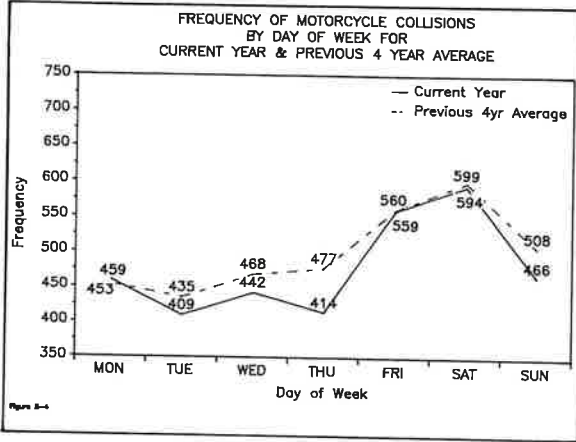
The milder weather months (May-September) of 1987 recorded the greatest percentage of motorcycle collisions. June through August recorded the most fatalities (Figure 5-3).

Figure 5-3



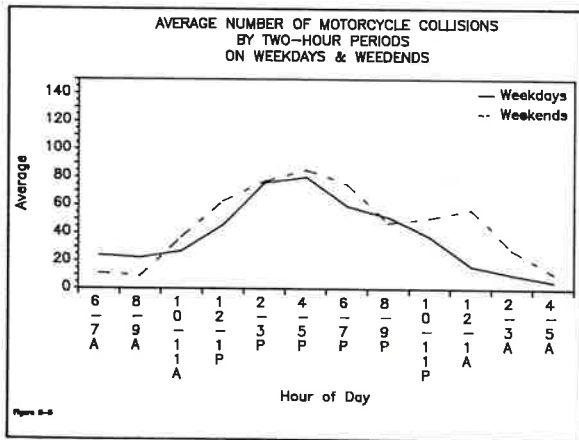
In comparing the frequencies of motorcycle collisions by day of week, Friday and Saturday are seen as the two days with the highest rate of occurrences. This trend has been consistent throughout the four-year baseline period and continued in 1987 as well (Figure 5-4).

Figure 5-4



A further breakdown by hour of day when motorcycle collisions were occurring in 1987 reveals that the weekday hours from 2 p.m. to 8 p.m. constituted the most dangerous period of the day. The noon to 6 p.m. time frame provided to be a dangerous time of day for weekend motorcycling (Figure 5-5).

Figure 5-5



Pedalcycles

Overview

In 1987 total pedalcycle accidents increased 20.3% over the previous four-year average. The number of pedalcyclists killed increased 46.9% from the baseline period. The number of persons injured was up 18.2%. (Table 6-1).

Table 6-1

PEDALCYCLE TRAFFIC COLLISIONS Five Year Comparison							
Severity	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
Total Collisions	1,575	1,507	1,325	1,174	1,230	1,309	20.32%
Persons Killed	18	12	12	11	14	12	46.94%
Persons Injured	1,584	1,538	1,354	1,204	1,266	1,341	18.16%

Rural - Urban Pedalcycle Collisions

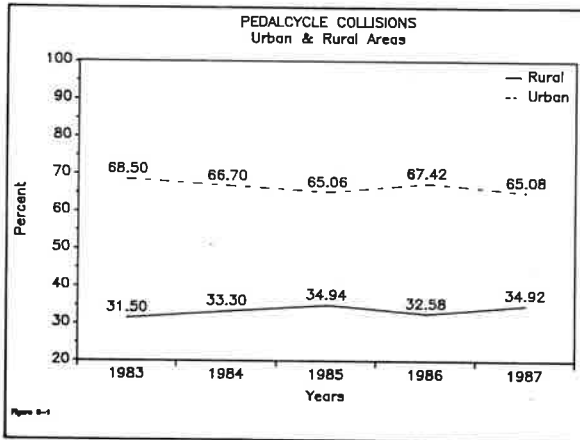
Total pedalcycle collisions in 1987 were up 27.0% in rural areas and up 17.0% in urban areas compared to a four-year baseline period. The number of persons killed in rural areas in 1987 was 15, up seven from the baseline, while three persons died in urban pedalcycle collisions, down one from the average of the previous four years. Rural injuries from pedalcycle collisions were up 25.1% in 1987 over baseline while urban injuries in this regard were up 14.7% (Table 6-2).

Table 6-2

RURAL & URBAN PEDALCYCLE ACCIDENTS Five Year Comparison							
Severity by Areas	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
Rural Areas							
Total Collisions	550	491	463	391	387	433	27.02%
Persons Killed	15	6	9	8	10	8	81.82%
Persons Injured	559	510	472	405	401	447	25.06%
Urban Areas							
Total Collisions	1,025	1,016	862	783	843	876	17.01%
Persons Killed	3	6	3	3	4	4	-25.00%
Persons Injured	1,025	1,028	882	799	865	894	14.72%

In 1987, 65.1% of the pedalcycle collisions occurred in urban areas, continuing a downward trend from 1982's high of 69.6%. Rural areas, however, experienced an increase in 1987, and continued an upward trend starting in 1982 after a one year drop in 1986 (Figure 6-1).

Figure 6-1



Pedalcyclists Killed And Injured - By Age

In 1987, 16.7% of the pedalcyclists killed were in the 5-9 age bracket. The 10-14 group experienced 28.6% of the injuries. The number of pedalcyclists killed in 1987 increased by six from the four-year average while injuries rose by 242 (Table 6-3 and 6-4)

Table 6-3

Age	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
0-4	0	2	0	0	1	1	-100.00%
5-9	4	2	3	1	1	2	128.57%
10-14	3	3	2	2	5	3	0.00%
15-19	2	1	2	1	4	2	0.00%
20-24	2	1	0	0	2	1	166.67%
25-34	3	3	1	0	0	1	200.00%
35-44	1	0	1	3	0	1	0.00%
45-54	2	0	2	0	0	1	300.00%
55-64	1	0	1	0	0	0	300.00%
65-74	0	0	0	1	1	1	-100.00%
75 & Older	0	0	0	0	0	0	0.00%
Not Stated	0	0	0	0	0	0	0.00%
TOTAL	18	12	12	8	14	12	56.52%

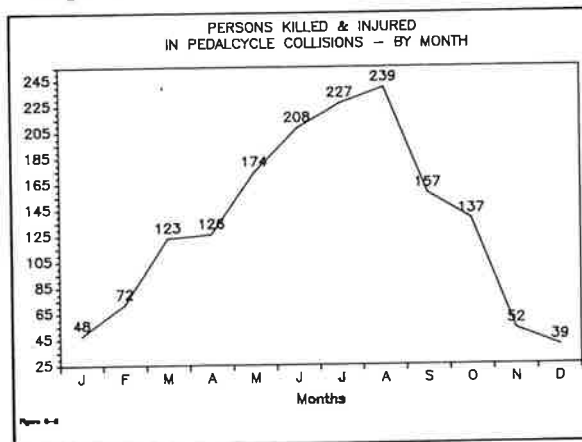
Table 6-4

PEDALCYCLISTS INJURED BY AGE Five Year Comparison							
Age	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
0-4	23	18	31	19	21	22	3.37%
5-9	284	266	251	171	180	217	30.88%
10-14	444	443	403	359	404	402	10.38%
15-19	302	296	241	240	240	254	18.78%
20-24	155	176	155	122	113	142	9.54%
25-34	166	170	143	147	139	150	10.85%
35-44	63	56	38	35	47	44	43.18%
45-54	20	18	15	17	11	15	31.15%
55-64	13	12	8	8	11	10	33.33%
65-74	17	7	2	11	4	6	183.33%
75 & Older	2	2	1	2	4	2	-11.11%
Not Stated	63	43	37	41	63	46	36.96%
TOTAL	1,552	1,507	1,325	1,172	1,237	1,310	18.45%

Pedalcycle Fatal And Injury Collisions - By Month

The months of May through September accounted for 62.7% of all injury and fatal pedalcycle accidents and total pedalcycle injuries and deaths for 1987 (Figure 6-2).

Figure 6-2



The City of Port Angeles experienced the highest pedalcycle collision rate in the state during 1987 with 98.49 collisions per 100,000 population. Puyallup recorded the second highest collision rate in the state at 95.81 collisions per 100,000 population, followed by Bellingham with 77.65 and Kent with a 76.44 pedalcycle collision rate. (Table 6-5).

Table 6-5

PEDALCYCLE COLLISION RATE BY POPULATION Cities 15,000 Population & Greater							
City	1987 Population	Pedalcycle Deaths		Pedalcycle Injuries		Total Ped Collision	
		Number	Rate*	Number	Rate*	Number	Rate*
250,000 and Over							
1. Seattle	491,300	0	0.00	262	53.33	265	53.94
100,000 to 250,000							
1. Spokane	172,100	0	0.00	80	46.48	82	47.65
2. Tacoma	158,900	0	0.00	80	50.35	81	50.98
50,000 to 100,000							
1. Bellevue	82,070	0	0.00	49	59.71	50	60.92
2. Everett	60,100	0	0.00	31	51.58	28	46.59
25,000 to 50,000							
1. Yakima	49,600	0	0.00	30	60.48	30	60.48
2. Bellingham	46,360	0	0.00	36	77.65	36	77.65
3. Vancouver	43,390	0	0.00	22	50.70	22	50.70
4. Kennewick	37,320	0	0.00	15	40.19	15	40.19
5. Renton	35,360	0	0.00	13	36.76	13	36.76
6. Bremerton	32,390	0	0.00	21	64.83	22	67.92
7. Richland	30,280	0	0.00	9	29.72	9	29.72
8. Auburn	30,260	0	0.00	8	26.44	8	26.44
9. Redmond	30,260	0	0.00	14	46.27	14	46.27
10. Kent	30,090	0	0.00	22	73.11	23	76.44
11. Olympia	29,600	0	0.00	17	57.43	17	57.43
12. Longview	29,520	0	0.00	18	60.98	19	64.36
13. Edmonds	28,300	0	0.00	10	35.34	10	35.34
14. Walla Walla	25,420	0	0.00	12	47.21	12	47.21
15,000 to 25,000							
1. Lynnwood	24,260	1	4.12	15	61.83	16	65.95
2. Pullman	22,240	0	0.00	11	49.46	13	58.45
3. Mercer Island	20,760	0	0.00	3	14.45	4	19.27
4. Puyallup	19,830	0	0.00	20	100.86	19	95.81
5. Kirkland	19,430	0	0.00	10	51.47	11	56.61
6. Pasco	18,520	0	0.00	4	21.60	4	21.60
7. Wenatchee	18,480	0	0.00	3	16.23	3	16.23
8. Port Angeles	17,260	0	0.00	15	86.91	17	98.49
9. Aberdeen	17,000	0	0.00	2	11.76	2	11.76
10. Mountlake Terrace	16,060	0	0.00	3	18.68	3	18.68
11. Lacey	15,840	0	0.00	12	75.76	11	69.44

*Frequency per 100,000 population

Pedestrians

Overview

The 93 pedestrians killed in 1987 was up 2.2% over the four-year average. The 1,830 pedestrians injured were 5.7% above the four-year baseline (Table 7-1).

Table 7-1

PEDESTRIANS KILLED AND INJURED STATEWIDE - URBAN & RURAL Five Year Comparison							
Severity	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
Pedestrians Killed	93	89	89	97	89	91	2.20%
Pedestrians Injured	1,830	1,752	1,763	1,710	1,701	1,732	5.69%

Locations And Age Groups Of Pedestrian Collisions

In 1987 pedestrian fatalities in rural areas was down 10 or 21.7% from the previous four-year average and injuries were down 3.9%. Urban area pedestrian fatalities in 1987 increased 23.4% from baseline and injuries increased 3.6% (Table 7-2).

Table 7-2

RURAL & URBAN PEDESTRIAN ACCIDENTS Five Year Comparison							
Severity by Area	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
Rural Areas							
Pedestrians Killed	37	49	45	51	44	47	-21.69%
Pedestrians Injure	441	432	483	449	471	459	-3.87%
Urban Areas*							
Pedestrians Killed	54	40	44	46	45	44	23.43%
Pedestrians Injure	1,319	1,320	1,280	1,261	1,230	1,273	3.63%

* 2,500 population and greater

Pedestrians Killed And Injured - By Age

In 1987, the overall number of pedestrians killed increased by 4 from the 89 killed in both 1985 and 1986 and up 2 from the 4 year baseline average. The number of younger pedestrians ages 14 years and younger increased from eight in 1986 to sixteen in 1987 and up one when compared to the previous four-year average. The number of older (65 & older) pedestrians injured was down thirteen from the previous four-year average. The largest percentage increases in pedestrians injured during 1987 was in the 35-44 year age bracket and the 9 year and younger age bracket recording a 31.8% increase and 15.9% increase respectively when compared to the baseline average (Tables 7-3 and 7-3a).

Table 7-3

PEDESTRIANS KILLED BY AGE Five Year Comparison							
Age	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
0-4	5	2	3	8	4	4	17.65%
5-9	5	4	11	6	6	7	-25.93%
10-14	6	2	3	8	4	4	41.18%
15-19	7	10	3	6	13	8	-12.50%
20-24	2	7	5	9	6	7	-70.37%
25-34	14	12	11	18	12	13	5.66%
35-44	11	13	9	8	10	10	10.00%
45-54	11	7	7	4	5	6	91.30%
55-64	11	10	9	11	8	10	15.79%
65-74	7	8	7	6	8	7	-3.45%
75 & Older	14	14	21	13	13	15	-8.20%
Not Stated	0	0	0	0	0	0	0.00%
TOTAL	93	89	89	97	89	91	2.20%

Table 7-3a

PEDESTRIANS INJURED BY AGE Five Year Comparison							
Age	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
0-4	92	77	83	75	84	80	15.36%
5-9	251	231	203	215	216	216	16.07%
10-14	196	198	195	194	216	201	-2.37%
15-19	206	206	208	215	209	210	-1.67%
20-24	166	151	181	167	163	166	0.30%
25-34	289	290	285	255	222	263	9.89%
35-44	196	176	169	126	124	149	31.76%
45-54	108	111	99	121	97	107	0.93%
55-64	84	76	90	89	89	86	-2.33%
65-74	83	72	92	89	90	86	-3.21%
75 & Older	76	98	82	80	89	87	-12.89%
Not Stated	83	66	76	84	102	82	1.22%
TOTAL	1,830	1,752	1,763	1,710	1,701	1,732	5.69%

Actions Of Pedestrians Killed and Injured

Thirty-six percent of the pedestrians killed or injured in the rural area of the state were struck while crossing the roadway, not at an intersection, during 1987. Another 15.4% were killed or injured while crossing at an intersection. The largest percentage of these pedestrians were in a ten-year age group of five to 14 years (Table 7-4).

Table 7-4

ACTIONS OF PEDESTRIANS KILLED & INJURED Rural Areas										
Action	Killed		Killed/Injured		Age					Number Not Stated
	Number	%	Number	%	0-4	5-14	15-24	25-64	65+	
Rural:										
Crossing, entering roadway at intersection	6	15.4%	97	19.0%	2	30	16	40	6	3
Not at intersection	14	35.9%	177	34.6%	12	60	35	58	10	2
Walking with traffic	1	2.6%	26	5.1%	1	6	5	12	1	1
Walking against traffic	0	0.0%	14	2.7%	0	1	8	4	1	0
Standing or working in roadway	5	12.8%	53	10.4%	1	3	12	30	2	5
Playing in roadway	0	0.0%	24	4.7%	2	18	3	0	0	1
Lying in roadway	4	10.3%	6	1.2%	0	0	3	3	0	0
Not in roadway	6	15.4%	82	16.0%	1	6	28	42	2	3
Other & Not Stated	3	7.7%	32	6.3%	0	9	9	11	3	0
TOTAL RURAL	39	100.0%	511	100.0%	19	133	119	200	25	15
% of Total Killed or Injured					3.7%	26.0%	23.3%	39.1%	4.9%	2.9%

Actions Of Pedestrians Killed and Injured

In urban areas in 1987, the most frequently involved pedestrian in fatal and injury accidents fell into the 25-64 year old age group, which accounted for 37.0% of all pedestrians killed or injured in traffic accidents. The most common contributing action of this age group was "crossing, entering roadway at intersection." Fifty two of the 79 (65.8%) of the pedestrians four years of age or younger were killed or injured while crossing the roadway between intersections. Nearly forty six (45.9%) of the pedestrians age 5-14 were also killed or injured while crossing between intersections (Table 7-5).

Table 7-5

ACTIONS OF PEDESTRIANS KILLED & INJURED Urban Areas										
Action	Killed		Killed/Injured		Age					Number Not Stated
	Number	%	Number	%	0-4	5-14	15-24	25-64	65+	
Urban:										
Crossing, entering roadway at intersection	20	37.0%	671	47.1%	15	123	130	265	103	35
Not at intersection	17	31.5%	460	32.3%	52	151	74	128	38	17
Walking with traffic	2	3.7%	19	1.3%	0	4	6	6	1	2
Walking against traffic	0	0.0%	6	0.4%	0	3	1	2	0	0
Standing or working in roadway	1	1.9%	70	4.9%	1	6	20	35	2	6
Playing in roadway	3	5.6%	34	2.4%	5	18	5	5	0	1
Lying in roadway	3	5.6%	4	0.3%	0	0	0	4	0	0
Not in roadway	7	13.0%	79	5.5%	5	11	15	39	6	3
Other & Not Stated	1	1.9%	82	5.8%	1	13	14	43	5	6
TOTAL URBAN	54	100.0%	1,425	100.0%	79	329	265	527	155	70
% OF TOTAL KILLED OR INJURED					5.5%	23.1%	18.6%	37.0%	10.9%	4.9%

Pedestrian Collisions By Day Of Week and Hour Of Day

In 1987, Wednesday, Friday and Saturday were the three high days for pedestrian fatalities recording 15.3%, 27.0%, and 15.7% deaths respectively. Friday also recorded the highest number of reported pedestrian collisions (Figure 7-1). The 6 p.m. to 9 p.m. time period evidenced the greatest percentage of fatal pedestrian collisions at 25.8%. The 3 p.m. to 6 p.m. recorded the greatest number of reported pedestrian collisions with 31.2% (Figure 7-2).

Figure 7-1

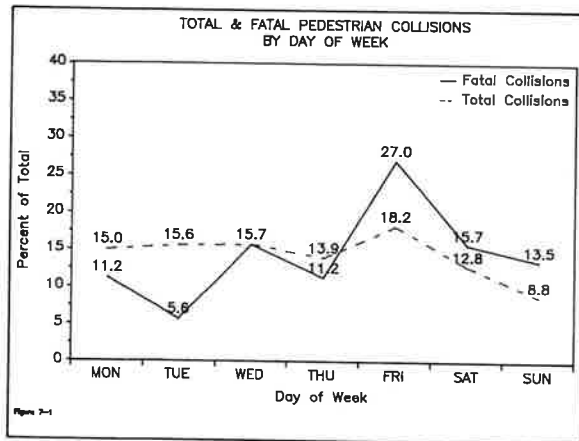


Figure 7-2

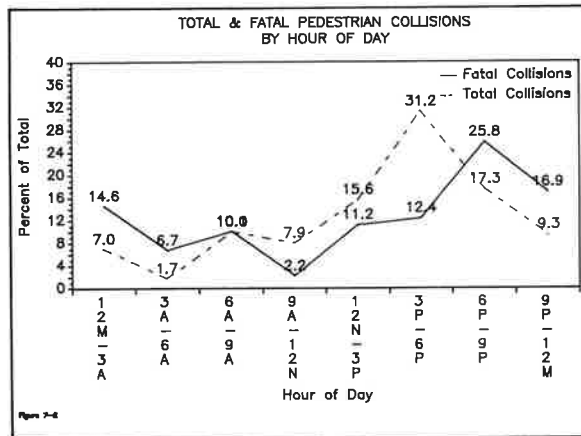


Table 7-6 (next page) presents the 1987 number and rates for pedestrian traffic deaths, injuries, and total collisions for cities of 15,000 or more in Washington. Seattle had the greatest number of fatalities, but Aberdeen had the greatest rate of pedestrian fatalities at 11.76 per 100,000 population based on two pedestrian deaths. Seattle had the greatest number of pedestrian collisions and pedestrian injuries and also had the highest rate for total pedestrian collisions (101.16 per 100,000 population) and second highest rate for pedestrian injuries (105.84 per 100,000). Wentachee had the highest pedestrian injury rate with 119.05 (Table 7-6).

Table 7-6

PEDESTRIAN COLLISION RATE BY POPULATION Cities 15,000 Population & Greater							
City	1987 Population	Pedestrian Deaths		Pedestrian Injuries		Total Ped Collision	
		Number	Rate*	Number	Rate*	Number	Rate*
250,000 and Over							
1. Seattle	491,300	15	3.05	520	105.84	497	101.16
100,000 to 250,000							
1. Spokane	172,100	5	2.91	143	83.09	136	79.02
2. Tacoma	158,900	4	2.52	134	84.33	128	80.55
50,000 to 100,000							
1. Bellevue	82,070	1	1.22	29	35.34	29	35.34
2. Everett	60,100	6	9.98	38	63.23	40	66.56
25,000 to 50,000							
1. Yakima	49,600	1	2.02	31	62.50	32	64.52
2. Bellingham	46,360	0	0.00	26	56.08	23	49.61
3. Vancouver	43,390	0	0.00	22	50.70	22	50.70
4. Kennewick	37,320	2	5.36	10	26.80	11	29.47
5. Renton	35,360	0	0.00	18	50.90	16	45.25
6. Bremerton	32,390	2	6.17	25	77.18	27	83.36
7. Richland	30,280	0	0.00	6	19.82	4	13.21
8. Auburn	30,260	0	0.00	15	49.57	12	39.66
9. Redmond	30,260	0	0.00	8	26.44	7	23.13
10. Kent	30,090	3	9.97	29	96.38	30	99.70
11. Olympia	29,600	0	0.00	16	54.05	16	54.05
12. Longview	29,520	0	0.00	21	71.14	18	60.98
13. Edmonds	28,300	1	3.53	12	42.40	12	42.40
14. Walla Walla	25,420	0	0.00	13	51.14	13	51.14
15,000 to 25,000							
1. Lynnwood	24,260	0	0.00	18	74.20	18	74.20
2. Pullman	22,240	0	0.00	4	17.99	4	17.99
3. Mercer Island	20,760	0	0.00	4	19.27	4	19.27
4. Puyallup	19,830	0	0.00	11	55.47	10	50.43
5. Kirkland	19,430	1	5.15	14	72.05	12	61.76
6. Pasco	18,520	1	5.40	9	48.60	9	48.60
7. Wenatchee	18,480	1	5.41	22	119.05	15	81.17
8. Port Angeles	17,260	0	0.00	13	75.32	13	75.32
9. Aberdeen	17,000	2	11.76	12	70.59	13	76.47
10. Mountlake Terrace	16,060	0	0.00	4	24.91	3	18.68
11. Lacey	15,840	1	6.31	4	25.25	5	31.57

*Frequency per 100,000 population

Heavy Trucks

Overview

In 1987 6,243 heavy trucks were involved in collisions, for a 18.4% decrease over the four-year baseline. Registrations in 1987 totaled 168,600, a 9.6% increase over the four-year average. Based on this registration figure, the 1987 collision rate was 370.3 collisions per 10,000 registered trucks, a decrease of 25.4% over the previous four-year average.

There were 71 heavy trucks involved in fatal collisions during 1987. This was a 6.3% decrease compared to the baseline average. While the fatal collision rate was up slightly from the previous year, it was down 14.7% from the previous 4-year average rate of 4.9 deaths per 10,000 registered trucks (Table 8-1).

Table 8-1

SUMMARY OF HEAVY TRUCKS Heavy Trucks Involved in Traffic Collisions							
Collision Severity/Exposure & Rates	Years					Previous 4 Year Average	% of Change 86 - 4 Year Average
	1987	1986	1985	1984	1983		
Total Trucks Involved in Collisions	6,243	7,983	8,605	7,472	6,525	7,646	-18.4%
Trucks Involved in Fatal Collisions	71	66	85	87	65	76	-6.3%
Registration of Heavy Trucks*	168,600	164,000	155,000	150,661	145,595	153,814	9.6%
Total Collision Rate**	370.3	486.8	555.2	495.9	448.2	496.5	-25.4%
Fatal Collision Rate**	4.2	4.0	5.5	5.8	4.5	4.9	-14.7%

* Estimated

**Collisions per 10,000 registered trucks

Location of Heavy Truck Collisions By Severity

In 1987, 55.6% of the heavy trucks involved in total collisions were in urban areas (Figure 8-1). In 1987 there were 13 heavy trucks involved in fatal accidents in urban areas, compared to 58 in the rural areas. These figures comprise an 18.3 - 81.7% urban/rural proportion of involvement in fatal accidents, (Figure 8-2). The 1987 heavy truck involvement in injury accidents was split, 823 urban to 955 rural. These figures are 46.3 - 53.7% urban/rural split (Figure 8-3).

Figure 8-1

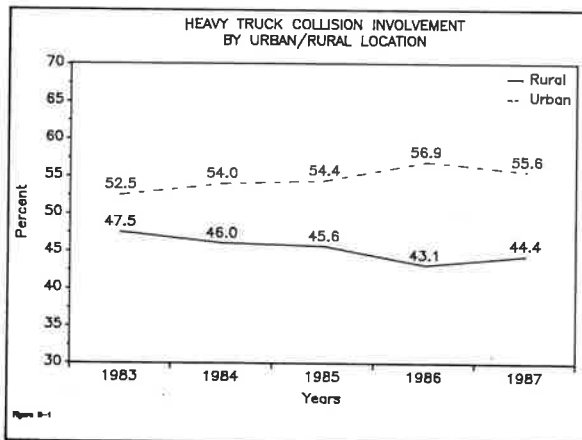


Figure 8-2

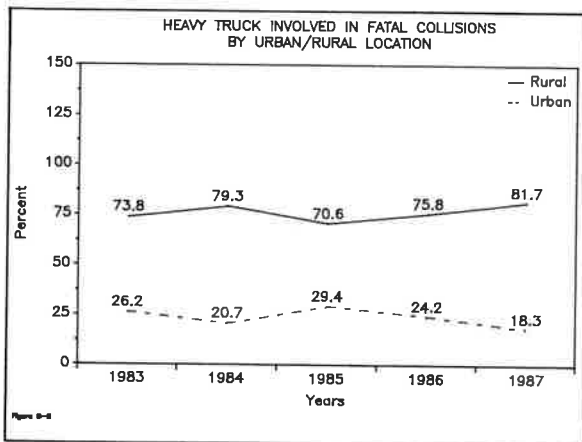
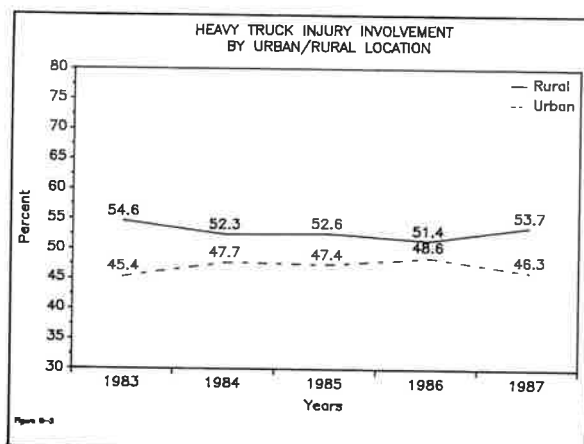


Figure 8-3



Age of Drivers Involved in Heavy Truck Collisions

The 39 year old and younger drivers were over-represented in heavy truck collisions in 1987 compared to the percentage of licensed drivers each group comprised. The 19 and under group comprised 0.3% of all licensed heavy truck operators. Yet this group was involved in 1.8% of all heavy truck collisions, 2.9% of the heavy truck fatal crashes and 1.9% of the heavy truck injury collisions. The ratio for percent of collision involvement compared to percent of licensed drivers comprised by the 19 and under age group resulted in an over-representation ratio of 6.43 for this group. The 20-29 year old age group was involved in 28.4% of the total collisions, 27.1% of the fatal collision and 31.7% of the injury collisions. This group comprised 14.5% of all drivers having a classified endorsement on their licenses. Based on the percent of licensed drivers and collision involvement, this group was over-represented in collisions by a ratio of 1.95. The 30-39 year old age group was involved in 30.9% of the total reported collisions and made up 30% of the drivers having a classified endorsement on their license. The representation for this group was equal. The rest of the driver age groups were under-represented in total collisions (Table 8-2).

Table 8-2

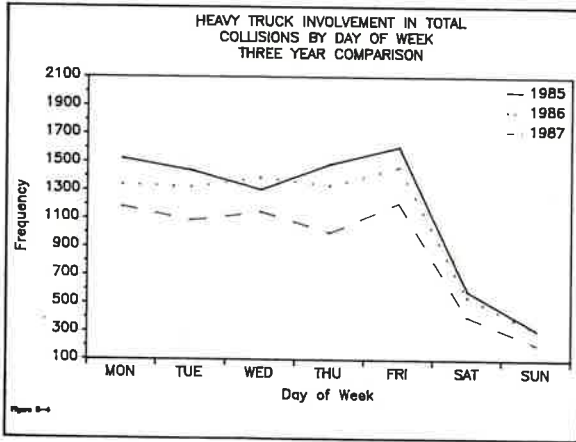
DRIVERS INVOLVED IN HEAVY TRUCK COLLISIONS By Age								
Age	All Accidents		Fatal Accidents		Injury Accidents		% of Classified Drivers*	Over/Under Ratio**
	Number	%	Number	%	Number	%		
19 & Under	102	1.8%	2	2.9%	31	1.9%	0.28	6.43
20-29	1,575	28.4%	19	27.1%	527	31.7%	14.54	1.95
30-39	1,715	30.9%	21	30.0%	488	29.3%	30.05	1.00
40-49	1,194	21.5%	17	24.3%	342	20.6%	25.52	0.84
50-59	707	12.8%	9	12.9%	198	11.9%	16.58	0.77
60 & Over	250	4.5%	2	2.9%	78	4.7%	13.04	0.35

* Classified Endorsement is only required for operators of the larger trucks and truck combinations
 ** Percent of collision involvement to percent of licensed drivers

Heavy Truck Collision Occurrences By Time

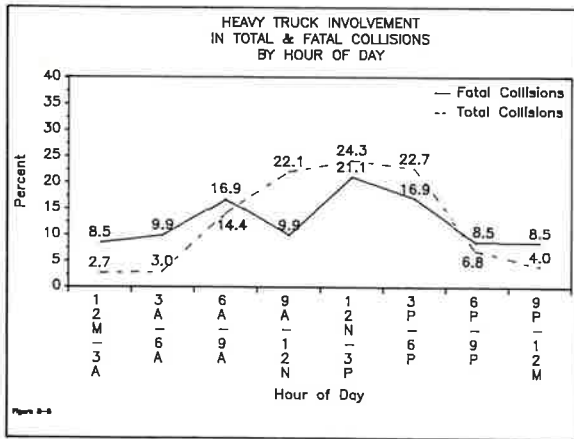
The weekdays had the highest frequencies of heavy truck collision involvement with Friday recording the single day high followed by Monday and Wednesday. During the weekends, as expected, there was a substantial decline in the frequency of heavy truck involvement in collisions (Figure 8-4).

Figure 8-4



In 1987, the time period from noon to 3 p.m. recorded the highest incidence of heavy truck involvement in collisions. A substantial increase in collisions commenced during the 6 a.m. to 9 a.m. time period, peaking at the noon to 3 p.m. period, remaining high during the 3 p.m. to 6 p.m. period and then taking a sharp decline (Figure 8-5).

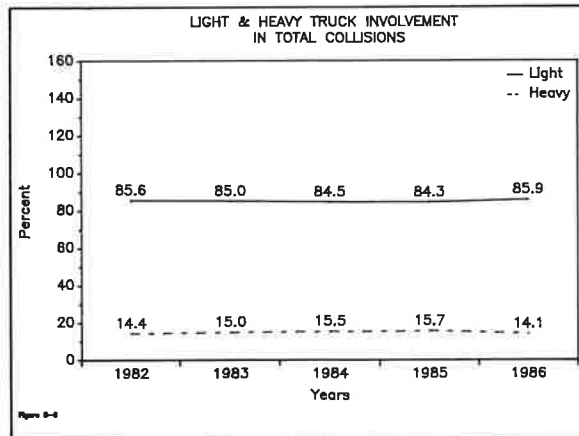
Figure 8-5



Total Collisions - Light Trucks vs. Heavy Trucks

In 1987 there were 53,714 light trucks and 6,447 heavy trucks involved in collisions. This 89.3% - 10.7% ratio between light and heavy trucks represents a slight change from the ratios of the previous three years (Figure 8-6).

Figure 8-6



Collisions By First Harmful Event

During 1987 heavy trucks were involved in 4,595 collisions involving other moving motor vehicles. This figure represents 73.6% of all heavy truck collisions. Heavy trucks also were involved in 440 collisions in which the other vehicle was parked and in 636 collisions with fixed or other objects. Overturning, other non-collisions and all other collisions accounted for the remaining heavy truck-involved collisions (Table 8-3).

Table 8-3

Type of Collision	1987		1986		1985		1984	
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
Collision with other moving motor vehicles	4,595	73.6%	5,686	73.7%	6,042	73.2%	5,170	72.4%
Collision with parked vehicle	440	7.0%	600	7.8%	643	7.8%	507	7.1%
Collision with fixed/other object	636	10.2%	792	10.3%	884	10.7%	801	11.2%
Overturning	379	6.1%	386	5.0%	414	5.0%	409	5.7%
Other non-collision	107	1.7%	116	1.5%	153	1.9%	139	1.9%
All other collisions*	86	1.4%	130	1.7%	116	1.4%	117	1.6%

* Pedestrians, pedalcyclists, RR train & animal.

Heavy Truck Defects

In 1987 defective brakes accounted for 39.6% of the defects detected in heavy trucks involved in collisions. Other defects and the percentages were worn or smooth tires, 12.3%; defective steering, 4.7%; defective rear lights, 4.2%; and all other defects, 35.6% (Table 8-4).

Table 8-4

DEFECTS OF HEAVY TRUCKS INVOLVED IN COLLISIONS Four Year Comparison								
Condition of Vehicle	1987		1986		1985		1984	
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
Defective Brakes	254	39.6%	329	42.1%	325	41.1%	359	44.0%
Defective Headlights	6	0.9%	4	0.5%	7	0.9%	6	0.7%
Defective Rear Lights	27	4.2%	48	6.1%	49	6.2%	61	7.5%
Defective Steering Mechanism	30	4.7%	33	4.2%	37	4.7%	28	3.4%
Puncture or Blowout	23	3.6%	21	2.7%	29	3.7%	37	4.5%
Worn or Smooth Tires	79	12.3%	87	11.1%	101	12.8%	93	11.4%
Other Defects	222	34.6%	259	33.2%	243	30.7%	231	28.3%

Pupil Transportation

Overview

In the 1985-87 school year there were 310 reported school bus collisions in which 169 persons were injured and 5 persons were killed. This represented a 3.7% increase over the previous three-year average in total school bus collisions an 18.2% increase in the number of persons injured and an increase of 4 in the number killed. Injuries to pupils riding in the school buses totaled 59 for the 1986/87 school year; up 63.9% from the average of 36 pupils injured in the three-year baseline period. There were 6,185 registered school buses in the 1986-87 school year. This marked a 0.2% decrease in registrations from the baseline period. School bus travel increased 11.1 during the 1986-87 school year compared to the previous three-year baseline period (Table 9-1).

Table 9-1

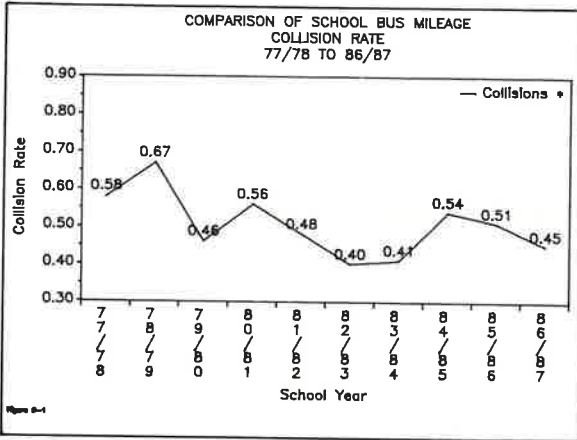
COLLISIONS INVOLVING SCHOOL BUSES Four Year Comparison						
Severity, Exposure & Rates	Years				Previous 3 Year Average	% of Change 86 - 3 Year Average
	86-87	85-86	84-85	83-84		
Total Collisions	310	338	310	248	299	3.79%
Fatal Collisions	5	0	2	0	1	650.00%
Injury Collisions	92	95	91	75	87	5.75%
Property Damage Collisions	213	243	217	173	211	0.95%
Number Killed	5	0	2	0	1	650.00%
Persons Injured						
Pupils	59	29	28	50	36	65.42%
School Bus Drivers	9	19	23	11	18	-49.06%
Other Occupants of School Bus	1	2	0	4	2	-50.00%
Pedestrian/Bicyclist	7	5	4	6	5	40.00%
Occupants/Other Vehicles Involved	93	92	85	71	83	12.50%
Total Injured	169	147	140	142	143	18.18%
School Bus Registration	6,185	6,121	6,107	6,005	6,078	1.77%
Registration Collision Rate*	50.1	55.2	50.8	41.3	49.1	2.09%
Miles Traveled (in thousands)	68,658.8	66,586.6	57,849.3	61,042.7	61,826.2	11.05%
Mileage Collision Rate**	0.45	0.51	0.54	0.41	0.483	-6.57%

* Collisions per 1,000 registered vehicles

** Collisions per 100,000

In 1986-87 school year, the school bus mileage collision rate was .45 collisions per 100,000 miles of travel (Figure 9.1). This rate was down from the 1985-86 rate of 0.51 and from the 0.48 rate of the previous three-year baseline (Figure 9-1).

Figure 9-1



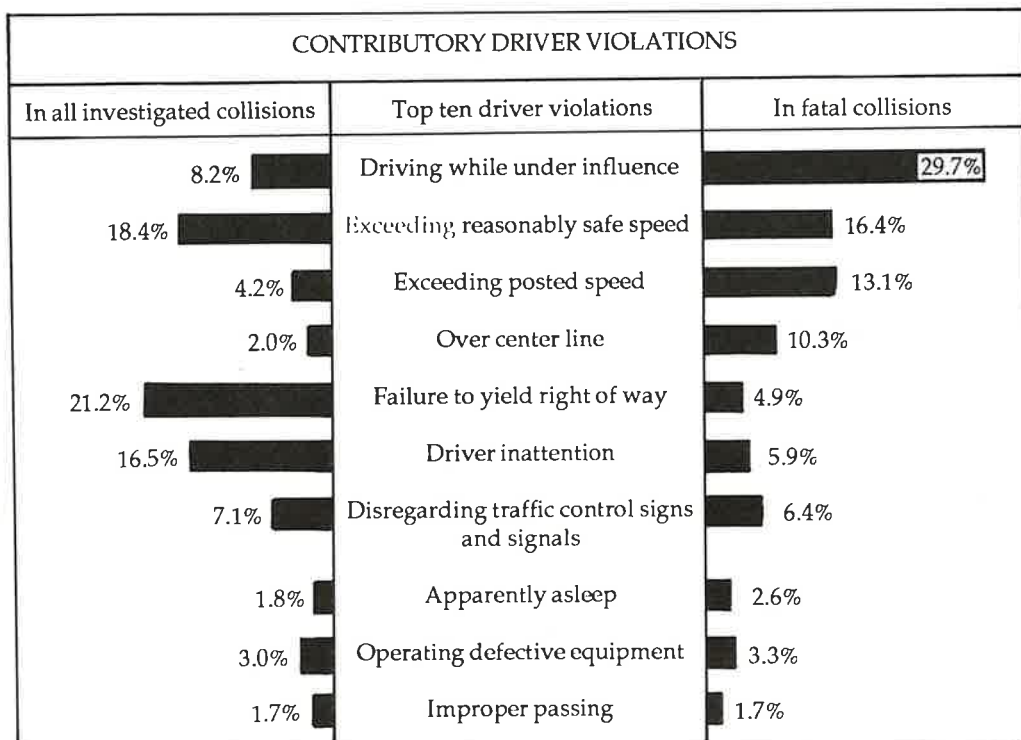
* Collisions Per 100,000 Miles Of Travel

Contributory Driver Violations

Overview

Driving while under the influence of intoxicating liquor contributed to 29.7% of the driver violations in fatal collisions and 8.2% of all investigated collisions. Failure to yield right of way contributed to 21.2% of all investigated collisions and 4.9% of the violations in fatal collisions (Figure 10-1).

Figure 10-1



Vehicle Defects

Overview

In investigated collisions during 1987, only 4.86% of the collision-involved vehicles were found to have contributory vehicle defects. The most common defect was worn or smooth tires, a defect found in 2,806 vehicles. This represented an 8.2% decrease in this category compared to the previous four-year average. Defective brakes, the second most contributory defect, was found on 1,961 collision-involved vehicles in 1987. This was an increase of 6.3% compared to the baseline (Table 10-1).

Table 10-1

VEHICLE CONDITION*							
Five Year Comparison							
Description	Years					Previous 4 Year Average (83-86)	% of Change 87 - 4 Year Average
	1987	1986	1985	1984	1983		
Defective Tires:							
Worn or Smooth Tires	2,806	3,129	3,043	2,996	2,964	3,056	-8.2%
Puncture or Blowout	469	343	345	367	462	352	33.4%
Defective Brakes	1,961	2,026	1,723	1,785	1,514	1,845	6.3%
Defective Lights:							
Headlights	144	167	156	143	149	155	-7.3%
Rear Lights	331	373	370	394	361	379	-12.7%
Other Lights/Reflectors	116	112	97	122	95	110	5.1%
Defective Steering	339	287	307	381	308	325	4.3%
All Other Defects	2,082	2,026	1,963	1,439	1,387	1,809	15.1%
No Defects	161,595	156,360	147,591	139,320	131,273	147,757	9.4%
TOTAL VEHICLES INVOLVED	169,843	164,823	155,595	146,947	138,513	155,788	9.0%

* Investigated Collisions

Senior Driver Involvement

Overview

Drivers 55 years old and older were involved in 24,473 reported collisions 149 fatal collisions and 8,896 injury collisions during 1987. This was a 0.6% increase in reported collisions, a 1.4% increase in fatal crashes but a decrease of 2.0% in injury crashes compared to the previous four-year baseline period. There were 741,653 licensed drivers 55 years old and older in 1987, up 6.8% from the baseline period. The fatal collision rate (total collisions per 1,000 licensed drivers) of 0.20 for 1987 was down 4.8% from the baseline period (Table 11-1).

Table 11-1

SENIOR DRIVER COLLISIONS - 55 YEARS & OLDER Five Year Comparison							
Collisions & Rates	Years					Previous 4 Year Average	% of Change 85 - 4 Year Average
	1987	1986	1985	1984	1983		
Total Collisions	24,473	25,842	24,978	23,630	22,897	24,337	0.6%
Fatal Collisions	149	140	144	149	153	147	1.7%
Injury Collisions	8,896	9,560	9,264	8,855	8,643	9,081	-2.0%
Licensed Drivers	741,653	719,784	706,719	686,985	664,355	694,461	6.8%
Fatal Collision Ratio*	6.09	5.42	5.77	6.31	6.68	6.04	0.8%
Fatal Rate**	0.20	0.19	0.20	0.22	0.23	0.21	-4.9%
Total Collision Rate***	3.30	3.59	3.53	3.44	3.45	3.50	-5.8%

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

Senior Driver Involvement In Collisions By First Harmful Event

In 1987, 87.3% of those drivers 55 years and older who were involved in all reported collisions collided with other moving vehicles. This type of collision also resulted in the greatest percentage of fatal collisions (61.1%) and injury collisions (84.7%). Single vehicle collisions with a fixed object led to the second largest percentage of senior drivers involvement in total, fatal and injury collisions at 5.6%, 16.8% and 6.5% respectively. While collisions with pedestrians and bicycles comprised only 1.9% of the total senior driver collisions, this collision type contributed to 14.1% of the fatal crashes and 5.0% of the senior's injury collisions (Table 11-2).

Table 11-2

SENIOR DRIVER INVOLVEMENT IN COLLISIONS By First Harmful Event						
Type of Collision	Total Collisions		Fatal Collisions		Injury Collisions	
	Number	% of Total	Number	% of Total	Number	% of Total
Collision with other moving motor vehicles	21,358	87.3%	91	61.1%	7,535	84.7%
Collision with parked vehicle	657	2.7%	1	0.7%	126	1.4%
Collision with fixed/other object	1,380	5.6%	25	16.8%	574	6.5%
Overturning & other non collision	354	1.4%	8	5.4%	187	2.1%
Collisions with pedestrian & bicycles	476	1.9%	21	14.1%	448	5.0%
Other collisions including RR train, animal	248	1.0%	3	2.0%	26	0.3%
TOTAL	24,473	100.0%	149	100.0%	8,896	100.0%

Senior Driver Collision Involvement By Age Group

Failure to yield right-of-way contributed to 51.5% of the total drivers violations for drivers 75 years and older. This violation was also the leading violation for all drivers 55 years and older. This was followed by disregarding traffic control signs and signals for drivers 65 and over while speed, too fast for conditions was the second leading contributing cause for the drivers 55-59 group and the 60-64 year group (Table 11-3).

Table 11-3

SENIOR DRIVER COLLISIONS - 55 YEARS AND OLDER Percent of Total Circumstances by Age Group										
Contributing Circumstances*	55-59		60-64		65-69		70-74		75 & Older	
	Number	%	Number	%	Number	%	Number	%	Number	%
Failure to Yield Right of Way	915	31.8%	912	35.2%	881	38.3%	868	42.3%	1,544	51.5%
Speed--Too Fast For Conditions	372	12.9%	274	10.6%	211	9.2%	191	9.3%	181	6.0%
Disregarding Traffic Signal/Signs	249	8.7%	232	9.0%	246	10.7%	221	10.8%	357	11.9%
Following Too Closely	245	8.5%	229	8.8%	198	8.6%	135	6.6%	158	5.3%
Driving While Under the Influence	216	7.5%	121	4.7%	89	3.9%	51	2.5%	27	0.9%
Operating Defective Equipment	66	2.3%	61	2.4%	26	1.1%	30	1.5%	25	0.8%
Crossing Over the Centerline	38	1.3%	40	1.5%	27	1.2%	29	1.4%	25	0.8%
Exceeding Legal Speed	44	1.5%	14	0.5%	14	0.6%	9	0.4%	6	0.2%
All Other Circumstances Including Driver Inattention	732	25.4%	705	27.2%	608	26.4%	517	25.2%	677	22.6%
TOTAL	2,877	100.0%	2,588	100.0%	2,300	100.0%	2,051	100.0%	3,000	100.0%

*Investigated collisions only

In 1987 the 55-59 year old group was involved in 6,917 reported collisions for 3.56% of all collisions. This group made up 5.56% of the total number of drivers licensed to drive in this state. The under-representation ratio of 0.64 was the same as reported for the previous year but down slightly from the previous four-year baseline average (Figure 11-1). The 60-64 age group post an under-representation ratio of 0.57, down slightly from the previous four-year baseline average (Figure 11-2). The 65-69 year old group recorded a 0.52 under-representation ratio, down from the .54 four-year average (Figure 11-3).

The 70-74 age group recorded a 0.55 under-representation ratio; the same as the .55 baseline average (Figure 11-4). The last group is the 75 years old and older group. This group had a .61 under-representation, down from the baseline ratio of .64 (Figure 11-5).

Figure 11-1

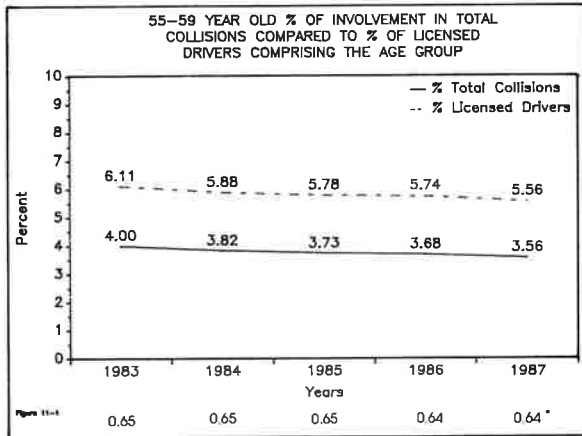


Figure 11-2

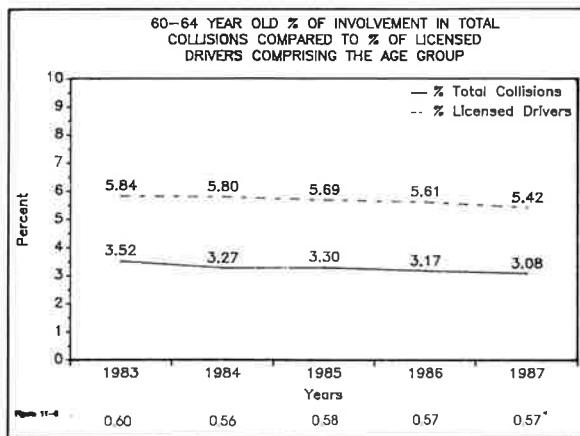


Figure 11-3

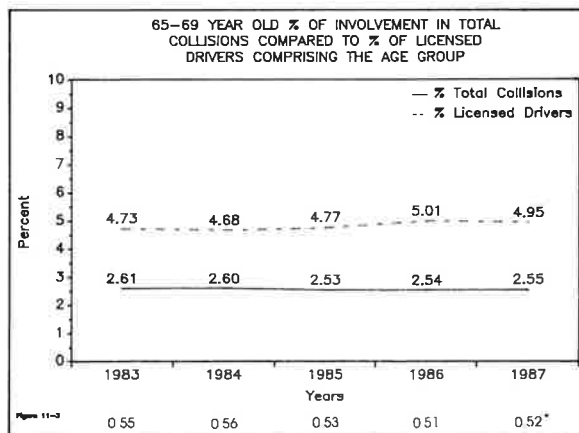


Figure 11-4

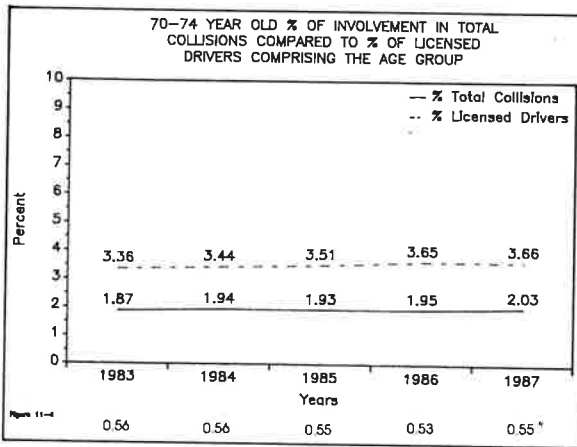
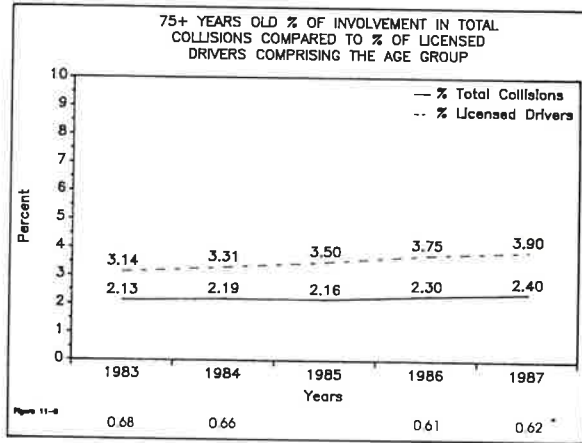


Figure 11-5



The urban/rural collision ratio involving senior drivers (55 years old and older) remained relatively constant during the past four years with a 65.4/34.6 urban/rural mix for 1987. The senior driver injury collision urban/rural mix has also remained fairly constant during the past four years. Senior driver fatal collisions continued to be more common in rural areas. In 1987, 71.1% or nearly three fourths of the fatal collisions involving senior drivers occurred in rural areas (Figure 11-8).

Figure 11-6

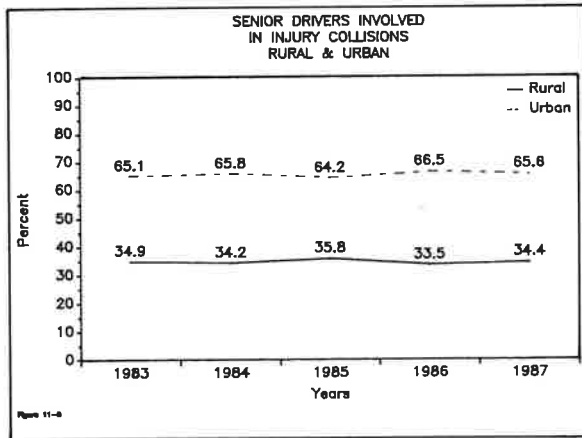


Figure 11-7

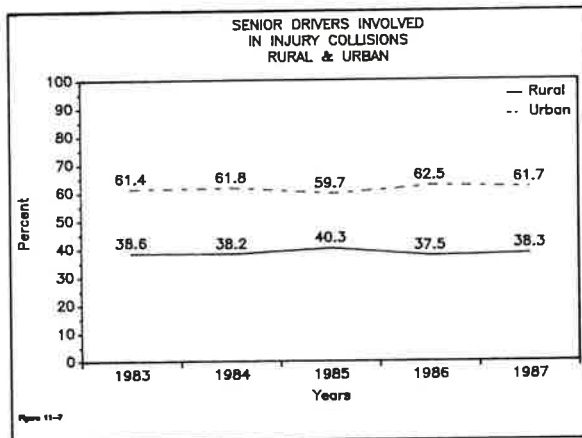
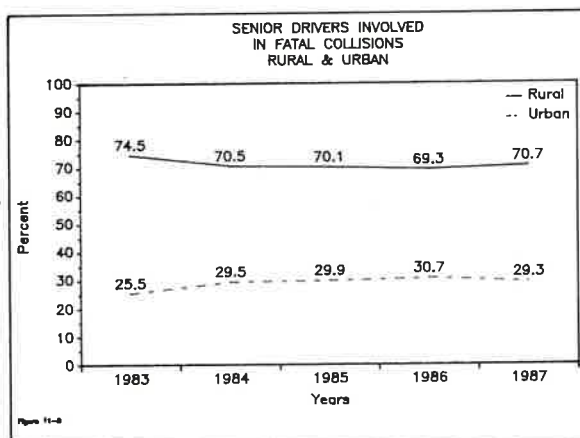


Figure 11-8



Senior Driver Involvement By Time

In 1987, 18.0% of all rural fatal collisions involving senior drivers occurred on Friday, 17% occurred on Saturday and 16% occurred on Wednesday. Friday was also the high day of the week for total reported rural collision, recording 17.3% of the senior driver collisions followed by Thursday with 15.3% Wednesday recorded 14.6% and Monday 14.4% of the collisions (Figure 11-9). Thursday was the highest fatal collision day recording 25.6% of the senior drivers urban area collisions. Friday recorded the greatest percentage of urban total reported collisions (18.3%) for the group (Figure 11-10).

Figure 11-9

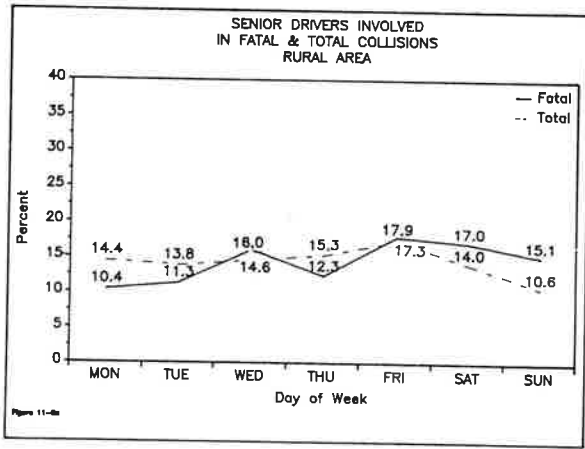
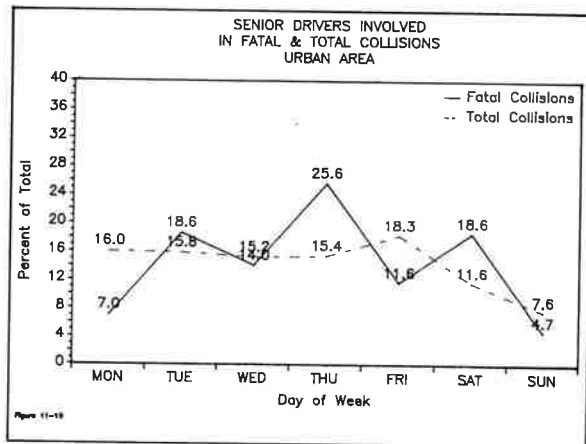


Figure 11-10



In rural areas, the greatest percentage (25.5%) of senior driver involvement in fatal crashes in 1987 occurred from 3 p.m. to 6 p.m.. The greatest percentage of total collision involvement (29.1%) for these drivers also occurred from 3 p.m. to 6 p.m. (Figure 11-11). In the urban areas, the greatest senior involvement by time period in fatal collisions was 32.6% in the 3 p.m. to 6 p.m. period. This same time frame recorded 29.4% of the total urban reported collisions of the senior drivers (Figure 11-12).

Figure 11-11

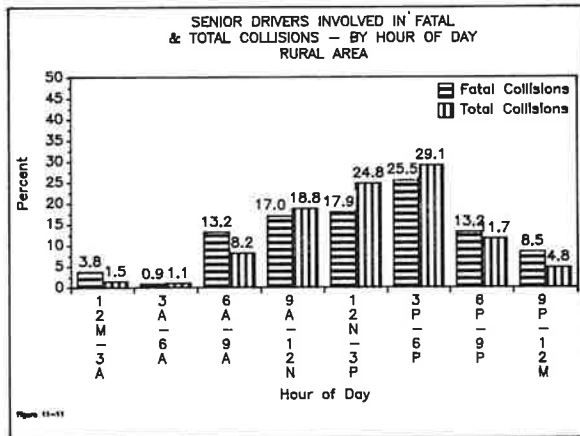


Figure 11-12

