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*A STUDY OF SPEED ZONING AND
TRAFFIC CRASHES IN NEW SOUTH WALES*

by

Rodney G. Vaughan, B.E., M.Eng. Sc.

Jill Hennessy, B. Sc.

1975.

DEPARTMENT OF MOTOR TRANSPORT NEW SOUTH WALES



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✓ RSKR

A Study of Speed Zoning and Traffic Crashes in New South Wales

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Introduction

Speed zoning provides a means whereby speed limits may be tailored to suit the particular design and condition of and traffic stream characteristics on a given section of road. In 1965, several rural sections of highways in New South Wales were speed-zoned to replace the previously applying 50 mph prima facie speed limit (a prima facie speed limit permits a driver to exceed the stated limit, but if apprehended and prosecuted he must furnish proof that conditions at the time were such that it was in fact safe for him to do so). Since that time, speed zoning has been extended to other sections of road throughout the State. In all cases, speed zoning replaced the previously applying 50 mph prima facie speed limit.

One of the well documented effects of imposing an absolute speed limit on a road is that the variance of the speed distribution of vehicles travelling along the road is reduced¹. It is also well documented that increasing the spread of speeds in a traffic stream increases the crash potential of that traffic stream¹. Thus, it is reasonable to expect that the introduction of rational speed zoning might have a beneficial effect on the traffic crash activity on the roads concerned. The purpose of this paper is to examine the traffic crash histories of speed zoned highways in New South Wales with a view to measuring the effectiveness of speed zoning in this State as a traffic crash countermeasure.

Speed Zoned Roads in New South Wales

Table 1 lists the sections of the principle State Highways in New South Wales which were speed zoned prior to the metric conversion of speed limits on July 1, 1974². The approximate commencement and completion dates for the sign-posting of these sections are also given. There were several minor adjustments made from time to time to the actual speed limits on sections of these routes until the speed zoning of all roads was reviewed with metric conversion in July 1974.

The metric conversion of speed limits also saw speed zoning extended to the sections of Highways listed in Table 2².

Data Gathering and Methods of Analysis

The basic approach taken by the authors in considering this question has been to use the "interrupted time series" technique. This involves examining trends in the variable concerned (for example, numbers of reported traffic crashes) over a number of years before a change is introduced into the system (in this instance, the introduction of speed zoning). One then determines whether the value of the variable after the introduction of the change reflects a significant deviation from the previously established trends. If a significant deviation can be established, the next step is to consider whether or not the deviation can be attributed to that particular change in the system.

Two sources of data were used. Traffic crash data were available for State Highways from the December quarter, 1961, onwards. One of the roads considered in this study was a heavily utilised Main Road (MR. 503) and data on this road were available only from the March Quarter, 1966 onwards. In all cases, data were available by quarters, and were grouped into years ending by the quarter nearest to the time of the change from the *prima facie* speed limit to speed zoning.

Where the introduction of speed zoning was a fairly recent occurrence, there were sufficient "before" data to establish trends and to determine if the data for the year after the start of speed zoning deviated significantly from the trend. However, where speed zoning was introduced some years ago, there were insufficient data to establish meaningful trends before the change. In these cases, the "after" data were used to establish trends which were then projected backwards to determine whether the data point for the year before speed zoning was significantly different from the trends after speed zoning. In all cases, linear regressions were used to calculate the equations of trend lines.

The trends examined in all cases were in the numbers of reported crashes and the numbers of reported casualties. For all roads speed zoned prior to metric conversion of speed limits, trends in reported crashes per million vehicle kilometres and in reported casualties per million vehicle

kilometres were also examined, using AADT (Annual Average Daily Traffic) data provided by the Department of Main Roads, New South Wales ^{3,4}. However, the trend equations based upon AADT data provided very poor fits and examination of these trends was not undertaken for those roads speed zoned subsequent to metric conversion of speed limits.

Appendix 1 lists the detailed analyses of the crash histories of roads speed zoned prior to metric conversion. These analyses include examination of any changes in crash rates with speed zoning. Appendix 2 lists predictions for future crash trends on and the detailed crash histories of roads speed zoned with the conversion to metric speed limits. No further analyses were made of this data. The crash history of MR. 184 (Bells Line of Road) has not been included, as the relevant data were not readily available. Appendix 3 lists the crash histories, by quarters, of all roads considered in the study.

Results

A summary of the main results of the analyses in Appendix 1 is given in Table 3. This table lists the changes in various parameters immediately after the introduction of speed zoning - that is, for the year after in those cases where a "before" trend was well established; and for the cases where only an "after" trend was established, the change relative to the year before the commencement of speed zoning.

In six of the eight roads concerned, no significant change in the number of reported crashes was detected after the introduction of speed zoning. In the remaining two cases, the number of reported crashes declined from that which could have been expected. No significant changes could be detected in the number of reported casualties or the number of crashes per million vehicle kilometres for any of the roads. In seven cases, the casualties per million vehicle kilometres were unchanged and in one case the value of this parameter rose above that which could have been expected. In the three cases where changes were detected, no attempt has been made to determine the existence of a causal link.

These results do not provide any strong data to support the hypothesis that speed zoning is an effective traffic crash countermeasure.

This is not to say that speed zoning is not effective in this way - it only means that evidence of this effectiveness is not forthcoming from this study. Even in the two cases where the number of crashes fell from the expected number with the introduction of speed zoning, no causal link was established, and, in the light of the other results, the establishment of such a link would be a difficult task. However, the question of causal links is to be further examined.

Conclusion

The crash histories of speed zoned roads in New South Wales have been examined and long term trends considered in an attempt to detect any changes coinciding with introduction of speed zoning. In almost all of the parameters measured, no changes could be detected. In the few cases where changes were found, no attempt was made to establish causal links.

The study does not provide effective support for the hypothesis that speed zoning is an effective crash countermeasure. However, the study also does not show that the speed zoning is ineffective as a countermeasure - it merely leaves the question unresolved.

Period of Introduction	Section of Road Concerned	Highway Number	Section Numbers
A. Aug - Sept 1965	Hume Highway between Liverpool and Goulburn.	2	19-35
B. Aug - Sept 1965	Princes Highway between Sutherland and Nowra, including the Mount Ousley Road and the Wollongong By pass.	1	16-43
C. Aug - Sept 1965	Pacific Highway between Hornsby and Newcastle.	10	17-36
D. Sept - Nov 1965	Great Western and Mitchell Highways, Parramatta to Orange.	5 7	19-36 1-3
E. July - Aug 1968	New England Highway, Raymond Terrace to Muswellbrook.	9	01-11
F. Aug - Sept 1969	Pacific Highway, Raymond Terrace to Coopernook.	10	46-56
G. July 1973	Federal Highway	3	all sections (1-4)
H. Jan - Feb 1970	Putty Road between Windsor and Singleton.	MR.503	-

Table 1: The sections of the principle State Highways which were speed zoned prior to metric conversion of speed limits on July 1, 1974.

Section of Road Concerned	Highway Number	Section Number
I. Pacific Highway, Coopernook to the Queensland Border	10	57-90
J. New England Highway, Muswellbrook to the Queensland Border	9	12-41
K. Princes Highway, Nowra to the Victorian Border	1	44-68
L. Hume Highway, Goulburn to the Victorian Border	2	36-60
M. Mitchell Highway, Orange to Dubbo	7	4-13
N. Snowy Mountains Highway	4	all sections (1-5, 9-23)
O. Monaro Highway	19	all sections (1-14)
Bells Line of Road	MR.184	-
P. Olympic Way from Wagga to Albury	78	14-21
Q. Sturt Highway from Wagga to the Hume Highway	14	1-3

Table 2: The sections of the principle State Highways which were speed zoned at the time of metric conversion of speed limits in July, 1974.

Road Section (from Tables 1)	Change in parameter values immediately after introduction of speed zoning.			
	No. of reported crashes	No. of reported Casualties	No. of reported crashes per million vehicle kilometres	No. of reported casualties per millio vehicle kilometres
A	↓	N.C.	N.C.	↑
B	N.C.	N.C.	N.C.	N.C.
C	N.C.	N.C.	N.C.	N.C.
D	↓	N.C.	N.C.	N.C.
E.	N.C.	N.C.	N.C.	N.C.
F.	N.C.	N.C.	N.C.	N.C.
G	N.C.	N.C.	N.C.	N.C.
H	N.C.	N.C.	N.C.	N.C.

↓ drop in parameter value

N.C. no significant change in parameter value

↑ rise in parameter value.

Table 3: Changes in parameter values with introduction of speed zoning on various roads in New South Wales.

References

1. R.W. Cumming and P.G. Croft (1971), "Speed Control and Safety in the Road Transport System", prepared for the National Review of the Road Accident Situation in Australia, conducted by the Expert Group on Road Safety.
2. Internal memorandum from Chief Traffic Planner to Executive Director of Traffic Safety dated 20th January, 1975. Department of Motor Transport, New South Wales.
3. Department of Main Roads, "Traffic Volumes and Supplementary Data", Department of Main Roads (various years).
4. Department of Main Roads (1975), private communication.

Appendix 1: Trend data and associated calculations for speed zoned roads in New South Wales.

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A. Hume Highway between Liverpool and Goulburn.

(Highway 0002, Sections 19-35)

The Hume Highway between Liverpool and Goulburn was speed zoned in August and September, 1965. The numbers of reported traffic crashes and the numbers of persons killed and injured on this section of the Hume Highway for the years ended September 30 for 1962 to 1974 are listed in Table A1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1966-74 inclusive to establish the "after speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 61.20x - 3301$$

where y = number of crashes

and x = year (66,67 etc)

The correlation coefficient is $r = 0.96$

If the circumstances and conditions applying in 1966-74 had not changed since 1962-65, one would expect the number of crashes (with 95% confidence limits) listed in Table A2. Since for 1962 and 1965 the actual number of crashes lies above its respective confidence interval, there were significant changes in the number of reported crashes in 1962 and 1965.

Casualties

The equation for the regression line for the number of casualties is

$$y = 15.85x - 618.4$$

where y = number of casualties

and x = year

The correlation coefficient is $r = 0.89$

The predicted numbers of casualties and 95% confidence limits for 1962-65 are listed in table A3. Since in each case the actual number of casualties lies within its respective confidence interval, there were no significant changes in the number of reported casualties in 1962-65.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1962-73 inclusive from permanent counting station 07.002. A linear regression analysis was undertaken on these data to provide an AADT value for the calendar year 1974. The correlation coefficient of these data is 0.99, indicating a very good fit.

The length of this section of the Hume Highway is 173.49 km. The figures in Table A1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table A4 lists the AADT figures, the number of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres. AADT figures for the year ending December 31 were used with crash and casualty data for the same year ending September 30.

Linear regression analyses were undertaken on the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres for the 1966-74 period. The results are given in the following sub-sections.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = -0.0003x + 2.14$$

where y = number of crashes per million vehicle
kilometres
x = year.

The correlation coefficient is $r = -0.008$. The predicted numbers of crashes per million vehicle kilometres are 2.12 for each of the years 1962, 1963, 1964 and 1965. The actual results are 3.31, 2.19, 1.38 and 1.72 respectively. These results do not appear extremely different from the predicted numbers. (In view of the value of r , which indicates a very poor fit, we have not calculated confidence limits).

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = -0.0315x + 3.28$$

where y = number of casualties per million
vehicle kilometres

x = year

The correlation coefficient is $r = -0.88$. If the circumstances and conditions applying in 1966-74 had not changed since 1962-65 one would expect the number of casualties per million vehicle kilometres (with 95% confidence limits) listed in Table A5. Since for 1962 the actual number of casualties per million vehicle kilometres lies above its respective confidence interval, and for 1964 and 1965 the actual numbers of casualties per million vehicle kilometres lie below their respective confidence intervals, there were significant changes in the number of reported casualties per million vehicle kilometres in 1962, 1964 and 1965.

Summary.

Analyses of the trends in reported casualties and crashes per million vehicle kilometres on the Hume Highway between Liverpool and Goulburn did not show any significant deviations from later trends after the introduction of speed zoning.

However, analyses of the trends in reported crashes and casualties per million vehicle kilometres after the introduction of speed zoning did show that there were significant deviations in the numbers of reported crashes in 1962 and 1965, and in the numbers of casualties per million vehicle kilometres in 1962, 1964 and 1965.

Year ending September 30	Crashes	Killed	Injured	Casualties
62	731	22	355	377
63	722	18	352	370
64	759	21	394	415
65	843	34	412	446
66	799	23	406	429
67	850	22	428	450
68	813	28	438	466
69	835	30	426	456
70	958	30	446	476
71	1018	35	512	547
72	1111	30	480	510
73	1221	12	494	506
74	1244	27	553	580

Table A 1: Crash data, by years, for the Hume Highway (Highway 0002, Sections 19-35).

Year ending September 30	Prediction from Trend			Actual No. of Crashes	Outside Confidence Limits?
	Predicted No. of Crashes	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
62	494	304	683	731	Yes
63	555	377	733	722	No
64	616	448	784	559	No
65	677	519	836	843	Yes

Table A 2: Predicted Number of Crashes with Lower and Upper Confidence Limits, and Actual Number of Crashes on the Hume Highway (Highway 0002, Sections 19-35).

Year ending September 30	Predicted No. of Casualties	Prediction from Trend.		Actual No. of Casualties	Outside Confidence Limits ?
		Lower 95% Confidence Limits	Upper 95% Confidence Limits		
62	364	279	449	377	No
63	380	300	460	370	No
64	396	321	472	415	No
65	412	341	483	446	No

Table A 3: Predicted Number of Casualties with Lower and Upper Confidence Limits, and Actual Number of Casualties on the Hume Highway (Highway 0002, Sections 19-35)

Year ending September 30	Annual Average Daily Traffic (AADT)	Crashes per million Casualties per million.	
		vehicle kilometres	vehicle kilometres
62	3490	3.31	1.71
63	4603	2.19	1.17
64	5100	1.38	0.74
65	5500	1.72	0.85
66	5680	2.22	1.19
67	5970	2.25	1.19
68	6270	2.05	1.17
69	6780	1.94	1.06
70	7400	2.04	1.02
71	7960	2.02	1.09
72	8390	2.09	0.96
73	8500	2.27	0.94
74	9080*	2.16	1.01

Table A 4: AADT, Crashes and Casualties per million vehicle kilometres on the Hume Highway (Highway 0002, Sections 19-35)

Note that AADT figures for the year ending December 31, were used with crash and casualty data for the same year ending September 30,

* Calculated from linear regression analysis of AADT data for 1962 to 1973.

<u>Prediction from Trend</u>					
Year ending September 30	Predicted No. of Casualties per Million Vehicle Kilometres	Lower 95% Confidence Limit	Upper 95% Confidence Limit	Actual No. of Casualties per Million Vehicle Kilometres	Outside Confidence Limits?
62	1.32	1.15	1.49	1.71	Yes
63	1.29	1.13	1.45	1.17	No
64	1.26	1.11	1.41	0.74	Yes
65	1.23	1.08	1.37	0.85	Yes

Table A5: Predicted Number of Casualties per million vehicle
Kilometres with Lower and Upper Confidence Limits,
and Actual Number of Casualties per million vehicle
kilometres on the Hume Highway (Highway 0002, Sections
19-35)

B.

Princes Highway between Sutherland and Nowra

(Highway 0001, Section 16-43)

The Princes Highway between Sutherland and Nowra was speed zoned in August and September, 1965. The numbers of reported traffic crashes and the numbers of persons killed and injured on this section of the Princes Highway for the years ended September 30, for 1962 to 1974 are listed in Table B1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1966-1974 inclusive to establish the "after speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 118.1 x - 6817$$

where y = number of crashes

and x = year (66,67 etc)

The correlation coefficient is $r = 0.97$

If the circumstances and conditions applying in 1966-74 had not changed since 1962-65, one would expect the number of crashes (with 95% confidence limits) listed in Table B2. Since for 1962 and 1963 the actual number of crashes lies above its respective confidence interval, there were significant changes in the number of reported crashes in 1962 and 1963.

Casualties

The equation for the regression line for the number of casualties is

$$y = 21.25x - 912.5$$

where y = number of casualties

and x = year

The correlation coefficient is $r = 0.79$

The predicted numbers of casualties and 95% confidence limits for 1962-65 are listed in table B3. Since in each case the actual number of casualties lies within its respective confidence interval, there were no significant changes in the number of reported casualties in 1962-65.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1962-73 inclusive from permanent counting station 37.001. A linear regression analysis was undertaken on these data to provide an AADT value for the calendar year 1974. The correlation coefficient of these data is 0.99, indicating a very good fit.

The length of this section of the Princes Highway is 121.18 km. The figures in Table B1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table B4 lists the AADT figures, the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres. AADT figures for the year ending December 31 were used with crash and casualty data for the same year ending September 30.

Linear regression analyses were undertaken on the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres for the 1966-74 period. The results are given in the following sub-sections.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = 0.0022x + 1.236$$

where y = number of crashes per million vehicle kilometres

x = year.

The correlation coefficient is $r = .06$. The predicted numbers of crashes per million vehicle kilometres are 1.37 for the years 1962 and 1963 and 1.38 for the years 1964 and 1965 respectively. The actual results are 1.79, 1.59, 0.93 and 1.17 respectively. These results do not appear extremely different from the predicted numbers. (In view of the value of r , which indicates a very poor fit, we have not calculated confidence limits)

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = -0.0259x + 2.375$$

where y = number of casualties per million
vehicle kilometres

x = year

The correlation coefficient is $r = -0.76$. If the circumstances and conditions applying in 1966-77 had not changed since 1962-65, one would expect the number of casualties per million vehicle kilometres (with 95% confidence limits) listed in Table B5. Since in each case the actual number of casualties per million vehicle kilometres lies within its respective confidence interval, there were no significant changes in the number of reported casualties per million vehicle kilometres in 1962-65.

Summary

Analyses of the trends in reported casualties, crashes per million vehicle kilometres and casualties per million vehicle kilometres on the Princes Highway between Sutherland and Nowra did not show any significant deviations from previous trends with the introduction of speed zoning.

However, analysis of the trend in reported crashes after the introduction of speed zoning did show that there were significant deviations in the numbers of reported crashes in 1962 and 1963.

Year ending September 30	Crashes	Killed	Injured	Casualties
62	921	28	401	429
63	1003	17	511	528
64	883	17	497	514
65	1120	24	519	543
66	1134	21	551	572
67	1099	21	458	479
68	1151	23	512	535
69	1266	16	502	518
70	1375	19	518	537
71	1509	16	563	579
72	1640	17	568	585
73	1880	18	623	641
74	2015	25	704	729

Table B1: Crash data, by years, for the Princes Highway
(Highway 1, Sections 16-43)

Year ending September 30	<u>Prediction from Trend.</u>			Actual No. of Crashes	Outside Confidence Limits ?
	Predicted No. of Crashes	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
62	507	189	825	921	Yes
63	625	326	925	1003	Yes
64	743	461	1026	883	No
65	861	595	1128	1120	No

Table B2: Predicted Number of Crashes with Lower and Upper Confidence
Limits, and Actual Number of Crashes on the Princes Highway
(Highway 1, Sections 16-43)

Prediction from Trend					
Year ending September 30	Predicted No. of Casualties	Lower 95% Confidence Limits	Upper 95% Confidence Limits	Actual No. of Casualties	Outside Confidence Limits ?
62	405	235	575	429	NO
63	426	266	586	528	No
64	448	297	598	514	No
65	469	326	611	543	No

Table B3: Predicted Number of Casualties with lower and Upper Confidence Limits, and Actual Number of Casualties on the Princes Highway (Highway 1, Sections 16-43)

Year ending September 30	Annual Average Daily Traffic (AADT)	Crashes per million vehicle kilometres	Casualties per million vehicle kilometres
62	11610	1.79	0.84
63	12774	1.59	0.93
64	13930	0.93	0.83
65	15880	1.17	0.77
66	16560	1.55	0.78
67	18210	1.36	0.59
68	19570	1.33	0.62
69	21640	1.32	0.54
70	23620	1.32	0.51
71	26900	1.27	0.49
72	26670	1.39	0.50
73	29370	1.45	0.49
74	30330 *	1.50	0.54

Table B4: AADT, Crashes and Casualties per million vehicle kilometres on the Princes Highway (Highway 1, Sections 16-43).

Note that AADT figures for the year ending December 31, were used with crash and casualty data for the same year ending September 30.

* Calculated from linear regression analysis of AADT data for 1962 to 1973.

Prediction from Trend.					
Year ending September 30	Predicted No. of Casualties per Million vehicle Kilometres	Lower 95% Confidence Limit	Upper 95% Confidence Limit	Actual No of Casualties per Million Vehicle Kilometres	Outside Confidence Limits?
62	0.77	0.54	1.00	0.84	No
63	0.74	0.53	0.96	0.93	NO
64	0.72	0.52	0.92	0.83	No
65	0.69	0.50	0.88	0.77	No

Table B5: Predicted Number of Casualties per million vehicle
kilometres with Lower and Upper Confidence Limits,
and Actual Number of Casualties per million vehicle
kilometres on the Princes Highway (Highway 1, Sections 16-43)

C. Pacific Highway between Hornsby and Newcastle
(Highway 0010 Sections 17-36)

The Pacific Highway between Hornsby and Newcastle was speed zoned in August and September, 1965. The numbers of reported traffic crashes and the numbers of persons killed and injured on this section of the Pacific Highway for the years ended September for 1962 to 1974 are listed in Table C1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1966-74 inclusive to establish the "after speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 71.32 x - 3784$$

where y = number of crashes

and x = year (66,67 etc.)

The correlation coefficient is $r = 0.89$

If the circumstances and conditions applying in 1966-74 had not changed since 1962-65 one would expect the number of crashes (with 95% confidence limits) listed in Table C2. Since in each case the actual number of crashes lies within its respective confidence interval, there were no significant changes in the number of reported crashes in 1962-65.

Casualties

The equation for the regression line for the number of casualties is

$$y = 14.92 x - 504.1$$

where y = number of casualties

and x = year

The correlation coefficient is $r = 0.67$

The predicted numbers of casualties and 95% confidence limits for 1962-65 are listed in table C3. Since in each case the actual number of casualties lies within its respective confidence interval, there were no significant changes in the number of reported casualties in 1962-65.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1962-74 inclusive from permanent counting station P05.002. A linear regression analysis was undertaken on these data to provide an AADT value for the calendar year 1974. The correlation coefficient of these data is 0.99 indicating a very good fit.

The length of this section of the Pacific Highway is 131.97 km. The figures in Table C1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table C4 lists the AADT figures, the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres. AADT figures for the year ending December 31 were used with crash and casualty data for the same year ending September 30.

Linear regression analyses were undertaken on the numbers of crashes per million kilometres and the numbers of casualties per million vehicle kilometres for the 1966-74 period. The results are given in the following sub-sections.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = 0.0027x + 2.54$$

where y = number of crashes per million vehicle kilometres

x = Year

The correlation coefficient is $r = 0.0333$. The predicted numbers of crashes per million vehicle kilometres are 2.71 for the years 1962 and 1963 and 2.72 for the years 1964 and 1965 respectively. The actual results are 3.29, 3.35, 3.00, 2.99. These results do not appear extremely different from the predicted numbers. (In view of the value of r , which indicates a very poor fit, we have not calculated confidence limits).

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = -0.0388x + 3.95$$

where y = number of casualties per million
vehicle kilometres

= year

The correlation coefficient is $r = -0.69$. If the circumstances and conditions applying in 1966-74 had not changed since 1962-65, one would expect the number of casualties per million vehicle kilometres (with 95% confidence limits) listed in Table C5. Since in each case the actual number of casualties per million vehicle kilometres lies within its respective confidence interval, there were no significant changes in the number of reported casualties per million vehicle kilometres in 1962-65.

Summary

Analyses of the trends in reported crashes, casualties, crashes per million vehicle kilometres and casualties per million vehicle kilometres on the Pacific Highway between Hornsby and Newcastle did not show any significant deviations from later trends after the introduction of speed zoning.

Year ending September 30	Crashes	Killed	Injured	Casualties
62	906	25	372	397
63	941	17	425	442
64	922	19	404	423
65	999	14	517	531
66	1081	20	516	536
67	981	23	507	530
68	1063	27	463	490
69	1014	18	449	467
70	1164	20	484	504
71	1180	19	510	529
72	1276	17	515	532
73	1514	19	590	609
74	1603	30	634	664

Table C1: Crash data, by years, for the Pacific Highway
(Highway 10, Sections 17-36)

Year ending September 30	<u>Prediction from Trend</u>			Actual No. of Crashes	Outside Confidence Limits?
	Predicted No. of Crashes	Lower 95% Confidence limit	Upper 95% Confidence Limit		
62	638	269	1007	906	No
63	709	362	1056	941	No
64	781	454	1107	922	No
65	852	543	1161	999	NO

Table C2: Predicted Number of Crashes with Lower and Upper Confidence
Limits, and Actual Number of Crashes on the Pacific Highway
(Highway 10, Sections 17-36)

Year ending September 30	Prediction from Trend				Outside Confidence Limits?
	Predicted No. of Casualties	Lower 95% Confidence Limits	Upper 95% Confidence Limits	Actual No. of Casualties	
62	421	253	589	397	No
63	436	278	594	442	No
64	451	302	599	423	No
65	466	325	606	531	No

Table C3: Predicted Number of Casualties with Lower and Upper Confidence Limits, and Actual Number of Casualties on the Pacific Highway (Highway 10, Sections 17-36)

Year ending September 30	Annual Average Daily Traffic (AADT)	Crashes per million vehicle kilometres	Casualties per million vehicle kilometres.
62	5722	3.29	1.44
63	5836	3.35	1.57
64	6390	3.00	1.37
65	6940	2.99	1.59
66	7300	3.07	1.52
67	7590	2.68	1.45
68	7960	2.77	1.28
69	8690	2.42	1.12
70	9130	2.65	1.15
71	9900	2.47	1.11
72	10040	2.69	1.10
73	10830	2.90	1.17
74	11075*	3.00	1.24

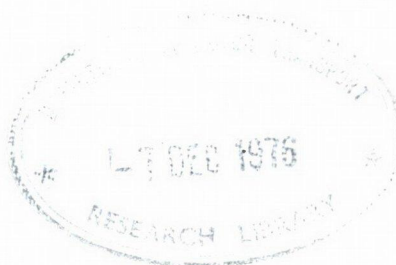
Table C4: AADT, Crashes and Casualties per million vehicle kilometres on the Pacific Highway (Highway 10, Sections 17-36).

Note that AADT figures for the year ending December 31, were used with crash and casualty data for the same year ending September 30.

* Calculated from linear regression analysis of AADT data for 1962 to 1973.

Year ending September 30	Prediction from Trend.			Actual No. of Casualties per Million Vehicle Kilometres	Outside Confidence Limits?
	Predicted No. of Casualties per Million Vehicle Kilometres	Lower 95% Confidence Limit	Upper 99% Confidence Limit		
62	1.55	1.13	1.97	1.44	NO
63	1.51	1.11	1.91	1.57	No
64	1.47	1.10	1.84	1.37	No
65	1.43	1.08	1.78	1.59	No

Table C5: Predicted Number of Casualties per million vehicle
kilometres with Lower and Upper Confidence Limits,
and Actual Number of Casualties per million
vehicle kilometres on the Pacific Highway
(Highway 10, Sections 17-36)



D. The Great Western and Mitchell Highways between Parramatta and Orange (Highway 5, Sections 19-36 and Highway 7, Sections 1-3.)

The Great Western and Mitchell Highways between Parramatta and Orange were speed zoned in September to November, 1965. The numbers of reported traffic crashes and the numbers of persons killed and injured on these sections of the Great Western and New England Highways for the years ended September 30 for 1962 to 1974 are listed in Table D1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1966-74 inclusive to establish the "after speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 115.5 x - 6823$$

where y = number of crashes

and x = year (66, 67 etc.)

The correlation coefficient is $r = 0.97$.

If the circumstances and conditions applying in 1966 - 74 had not changed since 1962-65, one would expect the number of crashes (with 95% confidence limits) listed in Table D2. Since in each case the actual number of reported crashes lies above its respective confidence interval, there were significant changes in the number of reported crashes in 1962-65.

Casualties

The equation for the regression line for the number of casualties is

$$y = 38.05x - 2056$$

where y = number of casualties

and x = year.

The correlation coefficient is $r = 0.89$.

The predicted numbers of casualties and 95% confidence limits for 1962-65 are listed in Table D3. Since in each case the actual number of casualties lies within its respective confidence interval, there were no significant changes in the number of reported casualties in 1962-65.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1962-73 inclusive from permanent counting station 99.001. A linear regression analysis was undertaken on these data to provide an AADT value for the calendar year 1974. The correlation coefficient of these data is 0.96, indicating a very good fit.

The length of these sections of the Great Western and Mitchell Highways is 223.38 km. The figures in Table D1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table D4 lists the AADT figures, the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres. AADT figures for the year ending December 31 were used with crash and casualty data for the same year ending September 30.

Linear regression analyses were undertaken on the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres for the 1966-74 period. The results are given in the following sub-sections.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = 0.143x - 5.30$$

where y = number of crashes per million vehicle kilometres

x = year.

The correlation coefficient is $r = 0.76$. If the circumstances and conditions applying in 1966 -74 had not changed since 1962 -65, one would expect the number of crashes per million vehicle kilometres (with 95% confidence limits) listed in table D5. Since in each case the actual number of crashes per million vehicle kilometres lies within its respective confidence interval, there were no significant changes in the number of reported crashes per million vehicle kilometres in 1962 -65.

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = -0.0002x + 2.3$$

where y = number of casualties per million
vehicle kilometres

year x = year.

The correlation coefficient is $r = -0.003$.

The predicted numbers of casualties per million vehicle kilometres are 2.26 for each of the years 1962, 1963, 1964, and 1965. The actual results are 2.10, 2.67, 2.39 and 2.61 respectively. These results do not appear extremely different from the predicted numbers (In view of the value of r, which indicates a very poor fit, we have not calculated confidence limits).

Summary

Analyses of the trends in reported casualties, crashes per million vehicle kilometres and casualties per million vehicle kilometres on the Great Western and Mitchell Highways between Parramatta and Orange did not show any significant deviations from later trends after the introduction of speed zoning

However, analysis of the trend in reported crashes after the introduction of speed zoning did show that there were significant deviations in the numbers of reported crashes in the years prior to the introduction of speed zoning.

Year ending September 30	Crashes	Killed	Injured	Casualties
62	734	16	348	364
63	842	18	483	501
64	842	12	481	493
65	964	23	528	551
66	883	31	463	494
67	893	26	443	469
68	1058	22	539	561
69	1065	30	515	545
70	1295	29	605	634
71	1279	32	570	602
72	1520	27	591	618
73	1539	31	650	681
74	1847	29	834	863

Table D1: Crash data, by years, for the Great Western and Mitchell Highways (Highway 0005, Sections 19-36, and Highway 0007, Sections 01 - 03).

Year ending September 30	<u>Prediction from Trend</u>				
	Predicted No.	Lower 95% Confidence	Upper 95% Confidence	Actual No.	Outside Confidence
	of Crashes	Limit	Limit	of Crashes	Limits?
62	338	56	624	734	Yes
63	454	189	723	842	Yes
64	569	320	822	842	Yes
65	685	450	924	964	Yes

Table D2: Predicted Number of Crashes with Lower and Upper Confidence Limits, and Actual Number of Crashes on the Great Western and Mitchell Highways (Highway 0005, Sections 19-36, and Highway 0007, Sections 01 -03)

Prediction from Trend					
Year ending September 30	Predicted No. of Casualties	Lower 95% Confidence Limits	Upper 95% Confidence Limits	Actual No of Casualties	Outside Confidence Limits?
62	303	104	502	364	No
63	341	154	528	501	No
64	379	203	556	493	No
65	417	250	584	551	No

Table D 3: Predicted Number of Casualties with Lower and Upper Confidence Limits, and Actual Number of Casualties on the Great Western and Mitchell Highways (Highway 0005, Sections 19-36, and Highway 0007, Sections 01-03).

Year ending September 30	Annual Average Daily Traffic (AADT)	Crashes per million vehicle kilometres	Casualties per million vehicle kilometres
62	2129	4.23	2.10
63	2303	4.48	2.67
64	2470	4.18	2.39
65	2590	4.57	2.61
66	2530	4.28	2.39
67	2670	4.10	2.15
68	2770	4.68	2.48
69	3020	4.33	2.21
70	3260	4.87	2.39
71	3370	4.65	2.19
72	3590	5.19	2.11
73	4160	4.54	2.01
74	3930*	5.76	2.69

Table D4: AADT, Crashes and Casualties per million vehicle kilometres on the Great Western and Mitchell Highways, (Highway 0005, Section 19-36, and Highway 0007, Sections 01-03).

Note that AADT figures for the year ending December 31 were used with crash and casualty data for the same year ending September 30.

* Calculated from linear regression analysis of AADT data for 1962 to 1973.

Year ending September 30	Prediction from Trend				Outside Confidence Limits?
	Predicted No. of Crashes per Million vehicle Kilometres	Lower 95% Confidence Limit	Upper 95% Confidence Limit	Actual No. of Crashes per Million vehicle Kilometres	
62	3.57	2.33	4.80	4.23	No
63	3.71	2.55	4.87	4.48	No
64	3.85	2.76	4.95	4.18	No
65	4.00	2.96	5.03	4.57	No

Table D5: Predicted Number of Crashes per million vehicle kilometres with Lower and Upper Confidence Limits, and Actual Number of Crashes per million vehicle kilometres on the Great Western and Mitchell Highways (Highway 0005, SEctions 19-36, and Highway 0007, Sections 01-03).

E. New England Highway between Raymond Terrace and Muswellbrook

(Highway 0009, Section 01-11)

The New England Highway between Raymond Terrace and Muswellbrook was speed zoned in July and August, 1968. The numbers of reported traffic crashes and the numbers of persons killed and injured on this section of the New England Highway for the years ended June 30 for 1963 to 1974 are listed in Table E1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1963-68 inclusive to establish the "before speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 18.31 x - 828.1$$

where y = number of crashes"

and x = year (63, 64 etc)

The correlation coefficient is $r = 0.88$

If the circumstances and conditions applying in 1963-68 were maintained in 1969-74, one would expect the number of crashes (with 95% confidence limits) listed in Table E2. Since in each case the actual number of crashes lies within its respective confidence interval, there were no significant changes in the number of reported crashes in 1969-74.

Casualties

The equation for the regression line for the number of casualties is

$$y = 8.371 x - 350.5$$

where y = number of casualties

and x = year

The correlation coefficient is $r = 0.46$

The predicted numbers of casualties and 95% confidence limits for 1969-74 are listed in table E3. Since in each case the actual number of casualties lies within its respective confidence interval, there were no significant changes in the number of reported casualties in 1969-74.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1962-73 inclusive from permanent counting station P05-003.

The length of this section of the New England Highway is 111.2km. The figures in Table E1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table E4 lists the AADT figures, the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres.

Linear regression analyses were undertaken on the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres for the 1963-68 period. The results are given in the following sub-sections.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = -0.0782x + 8.69$$

where y = number of crashes per million
vehicle kilometres

$$x = \text{year}$$

The correlation coefficient is $r = -0.66$. If the circumstances and conditions applying in 1963-68 were maintained in 1969-74, one would expect the number of crashes per million vehicle kilometres (with 95% confidence Limits) listed in Table E5. Since in each case

the actual number of crashes per million vehicle kilometres lies within its respective confidence interval, there were no significant changes in the number of reported crashes per million vehicle kilometres in 1969-74.

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = -0.0545x + 5.47$$

where y = number of casualties per million
vehicle kilometres

x = year

The correlation coefficient is $r = 0.39$. If the circumstances and conditions applying in 1963-68 were maintained in 1969-74, one would expect the number of casualties per million vehicle kilometres (with 95% confidence limits) listed in Table E6. Since in each case the actual number of casualties per million vehicle kilometres lies within its respective confidence interval, there were no significant changes in the number of reported casualties per million vehicle kilometres in 1969-74.

Summary

Analyses of the trends in reported crashes, casualties, crashes per million vehicle kilometres and casualties per million vehicle kilometres on the New England Highway between Raymond Terrace and Muswellbrook did not show any significant deviations from previous trends with the introduction of speed zoning.

Year ending June 30	Crashes	Killed	Injured	Casualties
63	336	14	172	186
64	330	6	167	173
65	356	3	184	187
66	376	5	181	186
67	432	10	256	266
68	399	5	184	189
69	443	15	202	217
70	513	12	216	228
71	516	16	212	228
72	523	22	228	250
73	508	7	226	233
74	546	15	248	263

Table E1: Crash data, by years, for the New England Highway, between Raymond Terrace and Muswellbrook (Highway 0009, Sections 01-11).

Year ending June 30	Prediction from Trend			Actual No. of Crashes	Outside Confidence Limits?
	Predicted No. of Crashes	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
69	436	335	516	443	No
70	454	364	543	513	No
71	472	372	572	516	No
72	491	379	602	523	No
73	509	386	632	508	No
74	527	392	662	546	No

Table E2: Predicted Number of Crashes with Lower and Upper Confidence Limits, and Actual Number of Crashes on the New England Highway (Highway 0009, Sections 01-11).

Year ending June 30	Prediction from Trend			Actual No. of Casualties	Outside Confidence Limits?
	Predicted No. of Casualties	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
69	227	100	355	217	No
70	236	93	378	228	No
71	244	85	403	228	No
72	252	76	429	250	No
73	261	65	456	233	No
74	269	54	484	263	No

Table E3: Predicted Number of Casualties with Lower and Upper Confidence Limits, and Actual Number of Casualties on the New England Highway (Highway 0009, Sections 01-11).

Year ending June 30	Annual Average Daily Traffic (AADT)	Crashes per million vehicle kilometres	Casualties per million vehicle kilometres
63	2165	3.82	2.12
64	2335	3.48	1.83
65	2390	3.67	1.93
66	2560	3.62	1.79
67	2910	3.66	2.25
68	3090	3.18	1.51
69	3430	3.18	1.56
70	3840	3.29	1.46
71	4110	3.09	1.37
72	4340	2.97	1.42
73	4310	2.90	1.33
74	4830	2.79	1.34

Table E4: AADT, Crashes and Casualties per million vehicle kilometres on the New England Highway (Highway 0009, Sections 01-11).

Note that AADT figures for the year ending December 31 were used with accident and casualty data for the year ending the following June 30.

Year ending June 30	Prediction from Trend			Actual No. of Crashes per Million Vehicle Kilometres	Outside Confidence Limits?
	Predicted No. of Crashes per Million Vehicle Kilometres	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
69	3.30	2.60	4.00	3.18	No
70	3.22	2.44	4.00	3.29	No
71	3.14	2.27	4.01	3.09	No
72	3.06	2.09	4.03	2.97	No
73	2.98	1.91	4.06	2.90	No
74	2.91	1.73	4.09	2.79	No

Table E5: Predicted Number of Crashes per million vehicle kilometres with Lower and Upper Confidence Limits, and Actual Number of Crashes per million vehicle kilometres on the New England Highway (Highway 0009, Sections 01-11).

Year ending June 30	Prediction from Trend			Actual No.of Casualties per Million Vehicle Kilometres	Outside Confidence Limits?
	Predicted No. of Casualties per million Vehicle Kilometres	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
69	1.71	0.69	2.74	1.56	No
70	1.66	0.52	2.80	1.46	No
71	1.60	0.33	2.88	1.37	No
72	1.55	0.13	2.97	1.42	No
73	1.49	0	3.06	1.33	No
74	1.44	0	3.17	1.34	No

Table E6: Predicted Number of Casualties per million vehicle kilometres with Lower and Upper Confidence Limits, and Actual Number of Casualties per million vehicle kilometres on the New England Highway (Highway 0009, Sections 01-11).

F. Pacific Highway between Raymond Terrace and Coopernook (Highway 0010, Sections 46-56)

The Pacific Highway between Raymond Terrace and Coopernook was speed zoned in August and September, 1969. The numbers of reported traffic crashes and the numbers of persons killed and injured on this section of the Pacific Highway for the years ended September 30 for 1962 to 1974 are listed in Table F1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1962-69 inclusive to establish the "before speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 2.095x + 242.0$$

where y = number of crashes

and x = year (62,63, etc.)

The correlation coefficient is $r = 0.13$.

If the circumstances and conditions applying in 1962-69 were maintained in 1970-74, one would expect the number of crashes (with 95% confidence limits) listed in Table F2. Since in each case the actual number of crashes lies within its respective confidence interval, there were no significant changes in the number of reported crashes in 1970-74.

Casualties

The equation for the regression line for the numbers of casualties is

$$y = 8.679x - 377.6$$

where y = number of casualties

and x = year

The correlation coefficient is $r = 0.72$.

The predicted numbers of casualties and 95% confidence limits for 1970-74 are listed in table F3. Since in each case the actual number of casualties lies within its respective confidence interval, there were no significant changes in the number of reported casualties in 1970-74.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1962-73 inclusive from permanent counting station P05-006. A linear regression analysis was undertaken on these data to estimate in AADT value for the calendar year 1974. The correlation coefficient of these data is $r = .97$ indicating a very good fit.

The length of this section of the Pacific Highway is 179.1 km. The figures in Table F1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table F4 lists the AADT figures, the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres.

According to the data available to us, there was a large increase in AADT figures between 1963 and 1964. This increase in traffic volume was accompanied by a decrease in crashes and casualties in 1964. In the early 1960's, sections of the Pacific Highway were diverted from what is now Trunk Road 90 and Main Road 110 to the Highway's present location. This probably explains the increase in traffic volumes and decrease in reported crashes between 1963 and 1964.

Linear regression analyses were undertaken on the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres for the 1962-69 period. The results are given in the following sub-sections.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = -0.9726x + 67.16$$

where y = number of crashes per million vehicle kilometres

x = year.

The correlation coefficient is $r = -0.75$. If the circumstances and conditions applying in 1962-69 were maintained in 1970-74, one would expect the number of crashes per million vehicle kilometres (with 95% confidence limits) listed in Table F5. Since in each case the actual number of crashes per million vehicle kilometres lies within its respective confidence interval, there were no significant changes in the number of reported crashes per million vehicle kilometres in 1970-74.

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = -0.3209x + 22.56$$

where y = number of casualties per million vehicle kilometres

x = year.

The correlation coefficient is $r = -0.82$. If the circumstances and conditions applying in 1962-69 were maintained in 1970-74, one would expect the number of casualties per million vehicle kilometres (with 95% confidence limits) listed in Table F6. Since in each case the actual number of casualties per million vehicle kilometres lies within its respective confidence interval, there were no significant changes in the number of reported casualties per million vehicle kilometres in 1970-74.

Summary

Analyses of the trends in reported crashes, casualties, crashes per million vehicle kilometres and casualties per million vehicle kilometres on the Pacific Highway between Raymond Terrace and Coopernook did not show any significant deviations from previous trends with the introduction of speed zoning.

Year ending September 30	Accidents	Killed	Injured	Casualties
62	444	9	132	141
63	350	9	162	171
64	303	10	156	166
65	372	17	216	233
66	385	13	186	199
67	385	7	192	199
68	395	11	199	210
69	400	12	196	208
70	405	13	204	217
71	423	25	263	286
72	420	15	236	249
73	542	11	285	296
74	578	21	249	280

Table F1: Crash data, by years, for the Pacific Highway (Highway 0010, Sections 46-56).

Year ending September 30	Prediction from trend			Actual Number of Crashes	Outside Confidence Limits?
	Predicted Number of Crashes	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
70	389	253	524	405	No
71	391	245	536	423	No
72	393	237	549	420	No
73	395	227	563	542	No
74	397	217	578	578	No

Table F2: Predicted Number of Crashes with Lower and Upper Confidence Limits, and Actual Number of Crashes on the Pacific Highway (Highway 0010, Sections 46-56).

Year ending September 30	Predicted from trend			Actual Number of Casualties	Outside Confidence Limits?
	Predicted Number of Casualties	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
70	230	162	298	217	No
71	239	165	312	286	No
72	247	169	326	249	No
73	256	171	340	296	No
74	265	174	355	280	No

Table F3: Predicted Number of Casualties, with Lower and Upper Confidence Limits, and Actual Number of Casualties on the Pacific Highway (Highway 0010, Sections 46-56).

Year ending September 30	Annual Average Daily Traffic (AADT)	Crashes per million vehicle kilometres	Casualties per million vehicle kilometres
62	645	10.53	3.34
63	937	5.71	2.79
64	2390	1.94	1.06
65	2870	1.98	1.24
66	2770	2.12	1.10
67	3090	1.91	.99
68	3370	1.79	.95
69	3700	1.65	.86
70	3890	1.59	.85
71	4520	1.43	.97
72	4580	1.40	.83
73	5350	1.55	.85
74	5620*	1.57	.76

Table F4: AADT, Crashes and Casualties per million vehicle kilometres on the Pacific Highway (Highway 0010, Sections 46-56).

Note that AADT figures for the year ending December 31 were used with crash and casualty data for the same year ending September 30.

* Calculated from linear regression analysis of AADT data for 1962 to 1973.

Year ending September 30	Prediction from Trend			Actual No. of Crashes per million vehicle kilometres	Outside Confidence Limits?
	Predicted No. of Crashes per million vehicle kilometres	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
70	0	0	6.02	1.59	No
71	0	0	5.55	1.43	No
72	0	0	5.13	1.40	No
73	0	0	4.76	1.55	No
74	0	0	4.43	1.57	No

Table F5: Predicted Number of Crashes per Million Vehicle Kilometres with Lower and Upper 95% Confidence Limits, and Actual Number of Crashes per Million Vehicle Kilometres on the Pacific Highway (Highway 0010, Sections 46-56).

Year ending September 30	Predicted from Trend			Actual No. of Casualties per million vehicle kilometres	Outside Confidence Limits?
	Predicted No. of Casualties per million vehicle kilometres	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
70	.10	0	1.94	.85	No
71	0	0	1.75	.97	No
72	0	0	1.58	.83	No
73	0	0	1.42	.85	No
74	0	0	1.27	.76	No

Table F6: Predicted Number of Casualties per Million Vehicle Kilometres with Lower and Upper 95% Confidence Limits, and Actual Number of Casualties per Million Vehicle Kilometres on the Pacific Highway (Highway 0010, Sections 46-56).

G. The Federal Highway (Highway 3) - NSW section only

The Federal Highway was speed zoned in July, 1973. The numbers of reported traffic crashes and the number of persons killed and injured on the Federal Highway for the years ended June 30 for 1963 to 1974 are listed in Table G1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1963-73 inclusive to establish the "before speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 9.264x - 499.5$$

where y = number of crashes
and x = year (63,64, etc.)

The correlation coefficient is $r = 0.84$.

If the circumstances and conditions applying in 1963-73 were maintained in 1974, one could expect from the regression line equation that there would be 186 reported crashes in 1974. 95% confidence limits for this predicted value were found to be 129 and 243. Since the actual result of 215 reported crashes lies within this confidence interval, there was no significant change in the number of reported crashes in 1974.

Casualties

The equation for the regression line for the numbers of casualties is

$$y = 5.055x - 248.5$$

where y = number of casualties
and x = year

The correlation coefficient is $r = 0.72$

The predicted value for 1974 is 126, with 95% confidence limits of 80 and 171. Since the actual result of 137 casualties lies inside this confidence interval, there was no significant change in the number of casualties in 1974.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1966-73 inclusive from permanent counting station P94-046. A linear regression analysis was undertaken on these data to provide AADT's for the calendar years 1962-65. The correlation coefficient of these data is 0.98, indicating a very good fit.

The length of the Federal Highway in N.S.W. is 68.7 km. The figures in Table G1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table G2 lists the AADT figures, the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres. AADT figures for the year ending December 31 were used with crash and casualty data for the year ending the following June 30.

Linear regression analyses were undertaken on the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres for the 1963-73 period. The results are given in the following sub-sections.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = -0.0041x + 2.491$$

where y = number of crashes per million vehicle kilometres

x = year.

The correlation coefficient is $r = -0.04$. The predicted value for 1974 is 2.19. The actual result of 2.47 does not appear extremely different from the predicted number (In view of the value of r , which does not indicate a good fit, we have not calculated confidence limits).

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = -0.0290x + 3.60$$

where y = number of casualties per million vehicle kilometres

x = year

The correlation coefficient is $r = -0.33$. The predicted value for 1974 is 4.37. The actual result of 1.46 does not appear extremely different from the predicted number (again, in view of the value of r , we have not calculated confidence limits).

Summary

Analyses of the trends in reported crashes, casualties, crashes per million vehicle kilometres and casualties per million vehicle kilometres on the Federal Highway did not show any significant deviations from previous trends with the introduction of speed zoning.

Year ending June 30	Crashes	Killed	Injured	Casualties
63	84	1	62	63
64	102	5	81	86
65	133	8	75	83
66	100	2	71	73
67	105	7	98	105
68	119	10	93	103
69	99	7	56	63
70	157	4	106	110
71	185	5	128	133
72	172	9	98	107
73	179	11	110	121
74	215	9	128	137

Table G1. Crash data, by years, for the Federal Highway
(highway 0003).

Year ending June 30	Annual Average Daily Traffic (AADT)	Crashes per million vehicle kilometres	Casualties per million vehicle kilometres
63	1520*	2.20	1.65
64	1690*	2.41	2.03
65	1860*	2.85	1.78
66	2030*	1.96	1.43
67	2260	1.85	1.85
68	2350	2.02	1.75
69	2460	1.60	1.02
70	2780	2.25	1.58
71	2740	2.69	1.94
72	3110	2.21	1.37
73	3110	2.30	1.55
74	3470	2.47	1.57

Table G2. AADT, Crashes and Casualties per million vehicle kilometres on the Federal Highway (highway 0003). Note that AADT figures for the year ending December 31 were used with crash and casualty data for the year ending the following June 30.

* Calculated from linear regression analysis of AADT data for 1967 to 1974.

H. Putty Road between Windsor and Singleton (Main Road 503)

The Putty Road was speed zoned in January and February, 1970. The number^s of reported traffic crashes and the number^s of persons killed and injured on the Putty Road for the years ended December 31 for 1966 to 1973 are listed in Table H1. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1966-70 inclusive to establish the "before speed zoning" trends. The results are given in the following sub sections.

Crashes

The equation for the regression line for the numbers of reported crashes is

$$y = 0.300x + 161.6$$

where y = number of crashes
and x = year (66,67, etc.)

The correlation coefficient is $r = 0.026$.

If the circumstances and conditions applying in 1966-70 were maintained in 1971-73, one would expect the number of crashes (with 95% confidence limits) listed in table H2. Since in each case the actual number of crashes lies within its respective confidence interval, there were no significant changes in the number of reported crashes in 1971-73.

Casualties

The equation for the regression line for the numbers of casualties is

$$y = 1.000x + 29.0$$

where y = number of casualties
and x = year

The correlation coefficient is $r = 0.086$

The predicted numbers of casualties and 95% confidence limits for 1971-73 are listed in table H3. Since in each case the actual number of casualties lies within its respective confidence interval, there were no significant changes in the number of reported casualties in 1971-73.

Traffic Volume Data

Traffic Volume (AADT) data were obtained from the Department of Main Roads for the calendar years 1966-73 inclusive from permanent counting station P05-167.

The length of the Putty Road is 156.3km. The figures in Table H1 together with the AADT figures and the length of the road were used to calculate the numbers of crashes per million vehicle kilometres and casualties per million vehicle kilometres. Table H4 lists the AADT figures, the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres.

Linear regression analyses were undertaken on the numbers of crashes per million vehicle kilometres and the numbers of casualties per million vehicle kilometres for the 1966-70 period. The results are given in the following sub-section.

Crashes per million vehicle kilometres

The equation for the regression line for the numbers of crashes per million vehicle kilometres is

$$y = -.01x + 3.87$$

where y = number of crashes per million vehicle kilometres

x = year.

The correlation coefficient is $r = -0.062$. The predicted values are 3.16 and 3.14 for 1971, 1972 and 1973 respectively. The actual results were 2.92, 2.73 and 3.34 respectively. These

results do not appear extremely different from the predicted numbers. (In view of the value of r , which indicates a very poor fit, we have not calculated confidence limits).

Casualties per million vehicle kilometres

The equation for the regression line for the numbers of casualties per million vehicle kilometres is

$$y = 0.001x + 1.604$$

where y = number of casualties per million vehicle kilometres

x = year

The correlation coefficient is $r = .006$. The predicted values are 1.675, 1.676 and 1.677 for 1971, 1972 and 1973 respectively. The actual results of 1.80, 1.37 and 1.57 do not appear extremely different from the predicted numbers (again, in view of the value of r , we have not calculated confidence limits).

Summary

Analysis of the trends in reported crashes, casualties, crashes per million vehicle kilometres and casualties per million vehicle kilometres on the Putty Road did not show any significant deviations from previous trends with the introduction of speed zoning.

Year ending December 31	Crashes	Killed	Injured	Casualties
66	187	5	86	91
67	157	6	76	82
68	204	9	120	129
69	190	11	81	92
70	172	9	82	91
71	183	8	105	113
72	179	8	82	90
73	238	10	102	112

Table H1: Crash data, by years, for the Putty Road
(Main Road 503).

Year ending December 31	Prediction from trend			Actual Number of Crashes	Outside Confidence Limits?
	Predicted Number of Crashes	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
71	183	87	279	183	No
72	183	73	294	179	No
73	184	56	311	238	No

Table H2: Predicted Number of Crashes with Lower
and Upper Confidence Limits, and Actual
Number of Crashes on the Putty Road
(M.R.503).

Year ending December 31	Prediction from trend			Actual Number of Casualties	Outside Confidence Limits?
	Predicted Number of Casualties	Lower 95% Confidence Limit	Upper 95% Confidence Limit		
71	100	3	197	113	No
72	101	0	213	90	No
73	102	0	231	112	No

Table H3: Predicted Number of Casualties with Lower and Upper Confidence Limits, and Actual Number of Casualties on the Putty Road (M.R. 503).

Year ending December 31	Annual Average Daily Traffic (AADT)	Crashes per million vehicle kilometres	Casualties per million vehicle kilometres
66	960	3.42	1.66
67	990	2.78	1.45
68	1070	3.34	2.11
69	1010	3.30	1.60
70	970	3.11	1.64
71	1100	2.92	1.80
72	1150	2.73	1.37
73	1250	3.34	1.57

Table H4: AADT, Crashes and Casualties per million vehicle kilometres on the Putty Road (M.R.503).

Appendix 2

Sections of Roads which were speed zoned in July 1974.

The sections of the principal state Highways which were speed zoned at the time of metric conversion of speed limits in July, 1974 are listed in Table 2. The numbers of reported traffic crashes and the numbers of persons killed and injured on these sections of road for the years ended June 30 are listed in Tables I, J, K, L, M, N, O, P and Q respectively. Linear regression analyses were undertaken on the numbers of reported crashes and the numbers of casualties for 1963-74 for roads I, J, K, L, M, N, O and Q, and for 1970-74 for road P. Predicted values for the numbers of reported crashes and the numbers of casualties in the year ending June 30, 1975 were obtained for each section of road using the fitted linear equations. 95% confidence limits were also obtained. Correlation coefficients and predicted numbers of reported crashes with lower and upper confidence limits for each section of road are listed in Table 4. Predicted numbers of reported casualties with lower and upper confidence limits for each section of road are listed in Table 5.

Section of Road Concerned	Correlation coefficient	Predicted No. of crashes for year ending June 30 '75	Lower 95% confidence limit	Upper 95% confidence limit
I	0.98	1710	1490	1930
J	0.98	805	704	905
K	0.92	74 ⁵	567	923
L	0.97	893	798	988
M	0.73	315	236	394
N	0.37	205	110	300
O	-0.76	132	87	178
P	0.27	147	66	227
Q	-0.10	68	6	130

Table 4 : Predicted number of crashes for the year ending June 30, 1975, with lower and upper confidence limits for the sections of the principal State Highways which were speed zoned at the time of metric conversion of speed limits in July, 1974, (see Table 2 for the full description of each Section of Road Concerned)

Section of Road Concerned	Correlation Coefficient	Predicted No. of Casualties for year ending June 30, 75.	Lower 95% confidence limit	Upper 95% confidence limit
I	0.89	803	666	940
J	0.94	476	412	539
K	0.85	377	261	493
L	0.77	496	380	612
M	0.18	130	70	189
N	0.31	97	36	159
O	-0.72	67	28	107
P	0.27	67	48	87
Q	-0.16	39	0	87

Table 5: Predicted number of casualties for the year ending June 30, 1975, with lower and upper confidence limits for the sections of the principal state Highways which were speed zoned at the time of metric conversion of speed limits in July, 1974 (see Table 2 for the full description of each Section of Road Concerned).

Year ending June 30	Crashes	Killed	Injured	Casualties
63	811	16	479	495
64	755	30	457	487
65	910	30	547	577
66	903	36	494	530
67	1050	20	594	614
68	1050	27	546	573
69	1061	25	560	585
70	1241	28	631	659
71	1322	48	649	697
72	1415	27	604	631
73	1632	45	704	749
74	1740	48	830	878

Table I : Crash data, by years, for the Pacific Highway (Highway 10, Sections 57-90).

Year ending June 30	Crashes	Killed	Injured	Casualties
63	452	18	249	267
64	470	21	251	272
65	568	16	304	320
66	511	13	247	260
67	600	22	326	348
68	695	36	341	377
69	790	25	347	372
70	804	20	367	387
71	781	22	400	422
72	867	22	392	414
73	940	23	389	412
74	987	22	449	471

Table J : Crash data, by years, for the New England Highway (Highway 9, Sections 12-41).

Year ending June 30	Crashes	Killed	Injured	Casualties
63	433	20	282	302
64	475	33	328	361
65	528	29	331	360
66	553	37	350	387
67	533	24	287	311
68	584	30	351	381
69	613	38	404	442
70	724	36	482	518
71	698	30	411	441
72	788	27	429	456
73	878	26	451	477
74	840	40	385	425

Table L : Crash data, by years, for the Hume Highway.
(Highway 2, Section 36-60).

Year ending June 30	Crashes	Killed	Injured	Casualties
63	207	6	104	110
64	222	9	102	111
65	276	10	127	137
66	228	10	126	136
67	241	6	114	120
68	254	1	112	113
69	273	12	137	149
70	269	7	97	104
71	222	1	88	89
72	284	3	108	111
73	286	6	116	122
74	362	12	157	169

Table M : Crash data, by years, for the Mitchell Highway
(Highway 7, Sections 4-13).

Year ending June 30	Crashes	Killed	Injured	Casualties
63	108	3	35	38
64	143	4	57	61
65	147	4	77	81
66	179	2	84	86
67	239	2	94	96
68	214	2	107	109
69	228	7	96	103
70	197	5	116	121
71	177	1	72	73
72	184	4	89	93
73	187	3	88	91
74	159	1	57	58

Table N : Crash data, by years, for the Snowy Mountains Highway (Highway 4, Sections 1-5, 9-23).

Year ending June 30	Crashes	Killed	Injured	Casualties
63	199	3	114	117
64	193	8	114	122
65	202	5	119	124
66	185	8	106	114
67	170	3	84	87
68	176	3	95	98
69	153	4	58	62
70	136	3	68	71
71	121	9	75	84
72	146	3	64	77
73	161	6	76	82
74	162	7	86	93

Table O : Crash data, by years, for the Monaro Highway
(Highway 19, Sections 1-14).

Year ending June 30	Crashes	Killed	Injured	Casualties
70	147	3	68	71
71	111	5	38	43
72	146	7	49	56
73	148	6	63	69
74	142	11	57	68

Table P : Crash data, by years, for the Olympic Way
(Highway 78, Sections 14-21).

Year ending June 30	Crashes	Killed	Injured	Casualties
63	45	4	19	23
64	58	2	30	32
65	104	3	67	70
66	75	4	57	61
67	101	6	46	52
68	109	6	70	76
69	62	2	35	37
70	56	5	38	43
71	47	5	15	20
72	61	1	31	32
73	87	4	46	50
74	61	3	33	36

Table Q : Crash data, by years, for the Sturt Highway
(Highway 14, Sections 1-3).

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Accident History, by quarters, of the Hume Highway between
Liverpool and Goulburn (Highway 2, Sections 19-35)

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Dec. 61	186	6	107
Mar. 62	173	3	65
June 62	192	6	89
Sept. 62	180	7	94
Dec. 62	174	4	90
Mar. 63	149	2	81
June 63	211	6	94
Sept. 63	188	5	87
Dec. 63	176	4	79
Mar. 64	191	7	93
June 64	188	2	112
Sept. 64	204	8	110
Dec. 64	211	9	116
Mar. 65	185	12	89
June 65	249	9	130
Sept. 65	198	4	77
Dec. 65	194	9	101
Mar. 66	187	5	104
June 66	215	3	98
Sept. 66	203	6	103
Dec. 66	245	6	114
Mar. 67	189	7	103
June 67	211	3	103
Sept. 67	205	6	108
Dec. 67	199	12	103
Mar. 68	214	7	130
June 68	214	2	114
Sept 68	186	7	91
Dec. 68	204	13	118

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Mar. 69	174	9	95
June 69	243	5	116
Sept. 69	214	3	97
Dec. 69	225	9	85
Mar. 70	249	10	117
June 70	254	4	131
Sept. 70	230	7	113
Dec. 70	244	10	120
Mar. 71	237	6	151
June 71	239	15	117
Sept. 71	298	4	124
Dec. 71	262	18	118
Mar. 72	280	5	139
June 72	284	2	116
Sept. 72	285	5	107
Dec. 72	302	3	113
Mar. 73	310	1	116
June 73	316	5	142
Sept. 73	293	3	123
Dec. 73	317	11	160
Mar. 74	296	4	131
June 74	371	8	168
Sept. 74	260	4	94

Accident History, by quarters, of the Princes Highway,
Between Sutherland and Nowra (Highway 1, Sections 16-43)

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Dec. 61	269	1	100
Mar. 62	214	12	90
June 62	182	6	74
Sept. 62	256	9	137
Dec. 62	258	6	133
Mar. 63	240	3	124
June 63	272	4	144
Sept. 63	233	4	110
Dec. 63	247	4	114
Mar. 64	127	3	130
June 64	267	6	134
Sept. 64	242	4	119
Dec. 64	275	10	143
Mar. 65	253	9	117
June 65	298	5	133
Sept. 65	294	0	126
Dec. 65	288	9	163
Mar. 66	272	4	120
June 66	304	3	137
Sept. 66	270	5	131
Dec. 66	312	7	161
Mar. 67	251	3	102
June 67	269	6	92
Sept. 67	267	5	103
Dec. 67	289	5	117
Mar. 68	275	4	119
June 68	312	9	162
Sept. 68	275	5	114
Dec. 68	341	4	119

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Mar. 69	287	2	130
June 69	313	5	125
Sept. 69	325	5	128
Dec. 69	355	3	132
Mar. 70	363	4	161
June 70	303	7	97
Sept. 70	354	5	128
Dec. 70	346	4	126
Mar. 71	369	5	155
June 71	354	1	113
Sept. 71	440	6	169
Dec. 71	421	10	160
Mar. 72	352	3	122
June 72	444	3	124
Sept. 72	423	1	162
Dec. 72	476	4	122
Mar. 73	504	1	189
June 73	432	9	147
Sept. 73	468	4	165
Dec. 73	468	3	159
Mar. 74	491	9	152
June 74	540	6	219
Sept. 74	516	7	174

Accident History, by quarters, of the Pacific Highway between
Hornsby and Newcastle (Highway 10, Sections 17-36)

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Dec. 61	244	6	115
Mar. 62	204	3	67
June 62	215	6	65
Sept. 62	243	10	125
Dec. 62	265	5	129
Mar. 63	200	4	96
June 63	238	4	104
Sept. 63	238	4	96
Dec. 63	238	7	111
Mar. 64	231	4	105
June 64	228	3	90
Sept. 64	225	5	98
Dec. 64	271	3	138
Mar. 65	207	3	105
June 65	278	5	138
Sept. 65	243	3	136
Dec. 65	301	6	155
Mar. 66	275	4	133
June 66	277	6	113
Sept. 66	228	4	115
Dec. 66	271	3	141
Mar. 67	247	3	123
June 67	220	9	128
Sept. 67	243	8	115
Dec. 67	254	10	97
Mar. 68	259	7	96
June 68	308	7	164
Sept. 68	242	3	106
Dec. 68	287	6	114

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Mar. 69	225	4	112
June 69	248	4	107
Sept. 69	254	4	116
Dec. 69	297	7	141
Mar. 70	259	10	91
June 70	320	2	127
Sept. 70	288	1	125
Dec. 70	273	3	110
Mar. 71	284	5	130
June 71	288	4	136
Sept. 71	335	7	134
Dec. 71	318	6	123
Mar. 72	357	2	166
June 72	271	4	82
Sept. 72	330	5	144
Dec. 72	404	3	158
Mar. 73	364	2	147
June 73	375	6	141
Sept. 73	371	8	144
Dec. 73	362	1	172
Mar. 74	426	10	152
June 74	408	9	155
Sept. 74	407	10	155

Accident History, by quarters, of the Great Western and Mitchell Highways, between Parramatta and Orange (Highway 5, Sections 19-36, and Highway 7, Sections 1-3)

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Dec. 61	167	7	90
Mar. 62	211	5	67
June 62	186	1	84
Sept. 62	170	3	107
Dec. 62	179	4	113
Mar. 63	195	6	113
June 63	242	4	138
Sept. 63	226	4	119
Dec. 63	188	1	123
Mar. 64	213	4	126
June 64	228	2	122
Sept. 64	213	5	110
Dec. 64	245	4	151
Mar. 65	207	3	116
June 65	302	7	168
Sept. 65	210	9	93
Dec. 75	210	8	125
Mar. 66	203	6	125
June 66	247	11	110
Sept. 66	223	6	103
Dec. 66	228	6	123
Mar. 67	189	6	84
June 67	232	4	121
Sept. 67	244	10	115
Dec. 67	215	7	125
Mar. 68	246	5	126
June 68	325	1	144
Sep. 68	272	9	144
Dec. 68	247	8	161

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Mar. 69	206	4	87
June 69	318	12	146
Sept. 69	294	6	121
Dec. 69	284	6	136
Mar. 70	306	8	160
June 70	368	10	167
Sept. 70	337	5	142
Dec. 70	327	6	140
Mar. 71	277	7	136
June 71	396	11	137
Sept. 71	379	8	157
Dec. 71	352	7	115
Mar. 72	383	5	174
June 72	408	5	184
Sept. 72	377	10	118
Dec. 72	396	10	146
Mar. 73	327	6	166
June 73	380	8	162
Sept. 73	436	7	176
Dec. 73	496	10	250
Mar. 74	380	3	181
June 74	493	10	212
Sept. 74	478	6	191

Accident History, by quarters, of the New England Highway,
between Raymond Terrace and Muswellbrook (Highway 9,
Sections 1 - 11)

<u>Quarter ending</u>	<u>No. of Accidents</u>	<u>No. of Killed</u>	<u>No. of Injured</u>
Dec. 1961	99	2	55
Mar. 1962	62	3	17
June 1962	70	0	43
Sept 1962	81	3	36
Dec. 1962	86	5	39
Mar. 1963	72	4	45
June 1963	97	2	52
Sept 1963	93	0	56
Dec. 1963	73	0	25
Mar. 1964	76	4	41
June 1964	88	2	45
Sept 1964	85	0	41
Dec. 1964	82	3	43
Mar. 1965	77	0	39
June 1965	112	0	61
Sept 1965	88	0	31
Dec. 1965	103	1	70
Mar. 1966	85	2	35
June 1966	100	2	45
Sept 1966	114	2	68
Dec. 1966	108	2	57
Mar. 1967	98	4	79
June 1967	112	2	52
Sept 1967	98	2	44
Dec. 1967	105	1	46
Mar. 1968	100	1	50
June 1968	96	1	44
Sept 1968	109	2	43
Dec. 1968	90	4	41
Mar. 1969	102	2	55

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 1969	142	7	63
Sept 1969	126	2	52
Dec. 1969	128	1	51
Mar. 1970	114	1	42
June 1970	145	8	71
Sept 1970	136	2	53
Dec. 1970	134	6	56
Mar. 1971	132	4	51
June 1971	114	4	52
Sept 1971	147	11	72
Dec. 1971	126	4	45
Mar. 1972	114	2	55
June 1972	136	5	56
Sept 1972	101	1	31
Dec. 1972	155	0	65
Mar. 1973	127	3	61
June 1973	125	3	69
Sept 1973	148	8	72
Dec. 1973	139	2	56
Mar. 1974	112	2	67
June 1974	147	3	53

Accident History, by quarters, of the Pacific Highway,
between Raymond Terrace and Coopernook (Highway 10,
Sections 46 - 56)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec. 1961	140	2	44
Mar. 1962	122	1	46
June 1962	100	5	17
Sept 1962	82	1	25
Dec. 1962	102	1	46
Mar. 1963	83	4	31
June 1963	91	2	43
Sept 1963	74	2	42
Dec. 1963	94	5	47
Mar. 1964	89	2	52
June 1964	40	1	18
Sept 1964	80	2	39
Dec. 1964	86	4	43
Mar. 1965	89	6	45
June 1965	101	3	61
Sept 1965	96	4	67
Dec. 1965	80	1	33
Mar. 1966	102	3	52
June 1966	95	4	49
Sept 1966	108	5	52
Dec. 1966	98	3	58
Mar. 1967	109	3	42
June 1967	94	0	49
Sept 1967	84	1	43
Dec. 1967	106	1	58
Mar. 1968	123	3	67
June 1968	93	3	37
Sept 1968	73	4	37
Dec. 1968	87	3	50
Mar. 1969	98	1	34

Quarter ending	No. of Accident	No. of Killed	No. of Injured
June 1969	120	8	70
Sept 1969	95	0	42
Dec. 1969	102	2	52
Mar. 1970	126	2	57
June 1970	86	2	45
Sept 1970	91	7	50
Dec. 1970	91	4	37
Mar. 1971	131	3	95
June 1971	92	6	57
Sept 1971	109	10	74
Dec. 1971	95	4	65
Mar. 1972	133	3	71
June 1972	117	6	57
Sept 1972	75	2	41
Dec. 1972	136	5	88
Mar. 1973	173	2	107
June 1973	109	3	47
Sept 1973	124	1	43
Dec. 1973	164	12	84
Mar. 1974	150	1	63
June 1974	133	2	56
Sept 1974	131	6	46

Accident History, by quarters, of the Federal Highway
(Highway 3), New South Wales

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec. 1961	19	1	16
Mar. 1962	13	0	10
June 1962	24	0	9
Sept 1962	28	0	23
Dec. 1962	9	0	0
Mar. 1963	22	1	19
June 1963	25	0	20
Sept 1963	34	1	23
Dec. 1963	24	1	23
Mar. 1964	20	0	18
Jun. 1964	24	3	17
Sept 1964	26	2	19
Dec. 1964	51	2	27
Mar. 1965	25	2	9
Jun. 1965	31	2	20
Sept 1965	23	0	30
Dec. 1965	23	1	13
Mar. 1966	22	0	6
Jun. 1966	32	1	22
Sept 1966	27	0	24
Dec. 1966	29	3	25
Mar. 1967	23	0	23
Jun. 1967	26	4	26
Sept 1967	37	0	27
Dec. 1967	30	4	21
Mar. 1968	29	3	20
Jun. 1968	23	3	25
Sept 1968	17	1	12
Dec. 1968	30	4	19
Mar. 1969	14	0	10

June. 1969	38	2	15
Sept 1969	38	0	35
Dec. 1969	37	0	27
Mar. 1970	37	3	23
Jun. 1970	45	1	21
Sept 1970	41	3	36
Dec. 1970	44	1	26
Mar. 1971	51	1	38
Jun. 1971	49	0	28
Sept 1971	52	5	25
Dec. 1971	42	2	30
Mar. 1972	43	0	27
Jun. 1972	35	2	16
Sept 1972	44	2	29
Dec. 1972	41	3	27
Mar. 1973	49	6	38
Jun. 1973	45	0	16
Sept 1973	57	1	24
Dec. 1973	35	1	24
Mar. 1974	46	3	41
Jun. 1974	77	4	39
Sept 1974	58	2	26

Accident History, by quarters, of the Putty Road (Main Road
503) between Windsor and Singleton

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Sept 65	50	1	24
Dec 65	40	0	29
Mar 66	38	0	18
June 66	49	2	20
Sept 66	53	2	29
Dec 66	47	1	19
Mar 67	44	0	21
June 67	39	0	18
Sept 67	33	1	14
Dec 67	41	5	23
Mar 68	57	4	38
June 68	54	1	34
Sept 68	52	3	21
Dec 68	41	1	27
Mar 69	40	5	27
June 69	51	4	17
Sept 69	52	1	13
Dec 69	47	1	24
Mar 70	53	4	25
June 70	42	1	25
Sept 70	37	2	15
Dec 70	40	2	17
Mar 71	39	4	14
June 71	51	3	21
Sept 71	51	1	35
Dec 71	42	0	35
Mar 72	41	2	25

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 72	53	1	28
Sept 72	48	3	19
Dec 72	37	2	10
Mar 73	60	3	22
June 73	58	0	17
Sept 73	50	4	31
Dec 73	70	3	32
Mar 74	51	3	34
June 74	53	2	26
Sept 74	33	1	14

Accident History, by quarters, of the Pacific Highway between
Cooperook and the Queensland Border (Highway 10, Section 57-90)

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
Dec. 61	247	9	147
Mar. 62	211	4	83
June 62	176	4	72
Sept. 62	180	7	127
Dec. 62	243	3	137
Mar. 63	209	5	122
June 63	179	1	93
Sept. 63	101	13	98
Dec. 63	212	3	103
Mar. 64	245	6	135
June 64	197	8	121
Sept. 64	198	9	81
Dec. 64	237	2	129
Mar. 65	179	6	172
June 65	296	13	165
Sept. 65	199	4	119
Dec. 65	239	12	132
Mar. 66	229	8	132
June 66	236	12	111
Sept. 66	243	4	152
Dec. 66	262	7	153
Mar. 67	339	6	177
June 67	206	3	112
Sept. 67	208	7	95
Dec. 67	249	6	149
Mar. 68	378	8	177
June 68	215	6	125
Sept. 68	237	6	123
Dec. 68	291	8	153
Mar. 69	253	6	119

Quarter Ending	No. of Accidents	No. of Killed	No. of Injured
June 69	280	5	165
Sept. 69	282	8	166
Dec. 69	322	4	156
Mar. 70	376	10	176
June 70	261	6	133
Sept. 70	302	14	171
Dec. 70	319	8	106
Mar. 71	426	9	236
June 71	275	17	136
Sept. 71	326	1	135
Dec. 71	265	11	133
Mar. 72	455	3	188
June 72	369	12	148
Sept. 72	266	12	101
Dec. 72	397	7	186
Mar. 73	562	17	252
June 73	407	9	165
Sept. 73	403	6	154
Dec. 73	418	16	274
Mar. 74	479	17	211
June 74	440	9	191
Sept. 74	379	14	159

Accident History, by quarters, of the New England Highway,
between Muswellbrook and the Queensland Border (Highway 9,
Sections 12-41)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec 61	123	2	55
Mar 62	104	2	59
June 62	113	7	49
Sept 62	93	2	46
Dec 62	130	4	67
Mar 63	103	4	63
June 63	126	8	73
Sept 63	88	5	32
Dec 63	109	6	63
Mar 64	137	5	97
June 64	136	5	59
Sept 64	121	2	61
Dec 64	159	7	91
Mar 65	135	3	64
June 65	153	4	88
Sept 65	135	1	58
Dec 65	130	7	87
Mar 66	110	2	35
June 66	136	3	67
Sept 66	119	3	43
Dec 66	172	10	117
Mar 67	148	6	84
June 67	161	3	82
Sept 67	159	8	73
Dec 67	162	7	94
Mar 68	170	7	84
June 68	204	14	90
Sept 68	155	4	72
Dec 68	258	5	74
Mar 69	152	3	74

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	225	13	127
Sept 69	195	5	97
Dec 69	199	8	102
Mar 70	200	4	84
June 70	210	3	84
Sept 70	196	8	97
Dec 70	201	2	102
Mar 71	183	9	109
June 71	201	3	92
Sept 71	213	5	108
Dec 71	207	7	95
Mar 72	205	5	90
June 72	242	5	99
Sept 72	166	4	62
Dec 72	249	4	104
Mar 73	242	7	94
June 73	283	8	129
Sept 73	264	3	108
Dec 73	233	5	97
Mar 74	237	3	114
June 74	253	11	130
Sept 74	224	6	89

Accident History, by quarters, of the Princes Highway between
Nowra and the Victorian Border (Highway 1, Sections 44-68)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec 61	68	1	44
Mar 62	58	3	34
June 62	62	0	19
Sept 62	50	3	20
Dec 62	89	1	40
Mar 63	86	3	52
June 63	59	2	33
Sept 63	66	1	40
Dec 63	93	0	57
Mar 64	103	0	74
June 64	69	1	40
Sept 64	56	4	33
Dec 64	98	1	57
Mar 65	99	7	42
June 65	107	5	50
Sept 65	71	1	28
Dec 65	110	6	61
Mar 66	120	2	77
June 66	84	4	34
Sept 66	73	1	41
Dec 66	107	6	53
Mar 67	129	9	75
June 67	83	0	36
Sept 67	79	4	36
Dec 67	98	2	53
Mar 68	145	4	68
June 68	141	12	36
Sept 68	80	7	41
Dec 68	119	2	58
Mar 69	56	0	46

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	126	1	68
Sept 69	89	3	58
Dec 69	127	2	57
Mar 70	170	3	80
June 70	101	6	64
Sept 70	107	5	74
Dec 70	111	2	57
Mar 71	172	7	92
June 71	112	2	47
Sept 71	138	2	55
Dec 71	139	3	58
Mar 72	173	6	83
June 72	137	2	55
Sept 72	100	3	52
Dec 72	155	0	42
March 73	288	6	130
June 73	168	4	88
Sept 73	140	5	67
Dec 73	207	5	91
Mar 74	282	4	109
June 74	203	2	181
Sept 74	204	3	105



Accident History, by quarters, of the Hume Highway, between
Goulburn and the Victorian border (Highway 2, Sections 36-60)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec 61	110	3	81
Mar 62	82	2	37
June 62	101	2	38
Sept 62	100	5	77
Dec 62	107	6	72
Mar 63	107	3	53
June 63	119	6	80
Sept 63	108	5	63
Dec 63	96	7	68
Mar 64	135	12	134
June 64	136	9	63
Sept 64	112	9	52
Dec 64	140	6	87
Mar 65	112	7	83
June 65	164	7	109
Sept 65	131	8	76
Dec 65	147	5	94
Mar 66	120	12	85
June 66	155	12	95
Sept 66	116	6	50
Dec 66	140	6	74
Mar 67	155	5	95
June 67	122	7	68
Sept 67	134	11	83
Dec 67	133	6	61
Mar 68	145	9	98
June 68	172	4	109
Sept 68	123	4	61
Dec 68	160	6	84
Mar 69	129	10	108

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	201	18	151
Sept 69	158	9	98
Dec 69	172	6	86
Mar 70	186	8	136
June 70	208	13	162
Sept 70	163	3	117
Dec 70	146	5	67
Mar 71	203	10	134
June 71	186	12	93
Sept 71	201	7	103
Dec 71	171	6	106
Mar 72	211	6	128
June 72	205	8	92
Sept 72	172	4	89
Dec 72	213	5	88
Mar 73	245	4	135
June 73	248	13	139
Sept 73	175	10	68
Dec 73	199	13	118
Mar 74	236	4	106
June 74	230	13	93
Sept 74	209	14	97

Accident History, by quarters, of the Mitchell Highway between
Orange and Dubbo (Highway 7, Sections 4-13)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec 61	39	1	16
Mar 62	33	3	20
June 62	51	2	30
Sept 62	63	1	29
Dec 62	47	1	22
Mar 63	43	1	16
June 63	54	3	37
Sept 63	57	1	19
Dec 63	60	2	39
Mar 64	46	6	25
June 64	59	0	19
Sept 64	74	1	43
Dec 64	74	8	31
Mar 65	46	0	24
June 65	82	1	29
Sept 65	70	3	46
Dec 65	50	2	24
Mar 66	45	2	28
June 66	63	3	28
Sept 66	57	0	18
Dec 66	78	3	47
Mar 67	46	1	15
June 67	60	2	34
Sept 67	52	0	27
Dec 67	66	0	33
Mar 68	51	1	24
June 68	85	0	28
Sept 68	57	2	26
Dec 68	73	6	37
Mar 69	58	2	39

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	85	2	35
Sept 69	72	2	20
Dec 69	64	1	19
Mar 70	41	2	26
June 70	92	2	32
Sept 70	54	0	30
Dec 70	56	1	27
Mar 71	56	0	17
June 71	56	0	14
Sept 71	90	1	44
Dec 71	80	0	30
Mar 72	51	2	12
June 72	63	0	22
Sept 72	64	2	37
Dec 72	80	1	24
Mar 73	73	1	28
June 73	69	2	27
Sept 73	95	3	35
Dec 73	88	1	29
Mar 74	80	4	40
June 74	99	4	53
Sept 74	79	2	24

Accident History, by quarters, of the Snowy Mountains Highway
(Highway 4, Sections 1-5, 9-23)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec 61	39	1	22
Mar 62	36	2	12
June 62	23	0	9
Sept 62	19	1	6
Dec 62	23	1	10
Mar 63	31	1	9
June 63	35	0	10
Sept 63	27	0	13
Dec 63	27	1	16
Mar 64	47	2	15
June 64	42	1	13
Sept 64	30	0	13
Dec 64	34	1	23
Mar 65	36	1	14
June 65	47	2	27
Sept 65	46	0	19
Dec 65	46	0	22
Mar 66	38	2	20
June 66	49	0	23
Sept 66	59	0	17
Dec 66	64	0	24
Mar 67	54	1	27
June 67	62	1	26
Sept 67	65	0	29
Dec 67	41	1	25
Mar 68	57	1	37
June 68	51	0	16
Sept 68	44	0	16
Dec 68	56	2	31
Mar 69	65	1	17

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	63	4	32
Sept 69	54	2	39
Dec 69	43	0	23
Mar 70	39	3	21
June 70	61	0	33
Sept 70	51	0	18
Dec 70	37	1	12
Mar 71	41	0	25
June 71	48	0	17
Sept 71	54	3	28
Dec 71	55	1	28
Mar 72	36	0	17
June 72	39	0	16
Sept 72	46	0	24
Dec 72	45	2	24
Mar 73	54	1	21
June 73	42	0	19
Sept 73	40	0	10
Dec 73	29	0	11
Mar 74	54	1	26
June 74	36	0	10
Sept 74	59	0	21

Accident History, by quarters, of the Monaro Highway (Highway
19, Sections 1-14)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec 61	47	1	23
Mar 62	24	2	13
June 62	45	1	16
Sept 62	50	1	20
Dec 62	43	0	19
Mar 63	43	1	33
June 63	63	1	42
Sept 62	52	3	42
Dec 63	34	2	20
Mar 64	59	1	20
June 64	48	2	32
Sept 64	41	3	23
Dec 64	58	0	27
Mar 65	30	0	15
June 65	73	2	54
Sept 65	55	0	35
Dec 65	36	4	20
Mar 66	49	2	22
June 66	45	2	29
Sept 66	39	0	22
Dec 66	44	0	18
Mar 67	44	2	22
June 67	43	1	22
Sept 67	51	0	25
Dec 67	34	1	15
Mar 68	42	0	25
June 68	49	2	30
Sept 68	40	0	22
Dec 68	27	1	5
Mar 69	44	1	23

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	42	2	8
Sept 69	40	0	23
Dec 69	35	1	12
Mar 70	34	1	13
June 70	27	1	20
Sept 70	36	1	25
Dec 70	23	4	16
Mar 71	28	0	18
June 71	34	4	16
Sept 71	45	0	19
Dec 71	33	2	18
Mar 72	27	0	15
June 72	41	1	12
Sept 72	36	3	14
Dec 72	47	3	35
Mar 73	36	0	11
June 73	42	0	16
Sept 73	47	1	17
Dec 73	46	0	31
Mar 74	27	2	8
June 74	42	4	30
Sept 74	26	0	16

Accident History, by quarters, of the Olympic Way between
Wagga and Albury (Highway 78, Sections 14-21)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	37	1	21
Sept 69	35	1	14
Dec 69	41	0	21
Mar 70	25	1	7
June 70	46	1	26
Sept 70	36	3	8
Dec 70	37	2	12
Mar 71	9	0	3
June 71	29	0	15
Sept 71	50	6	16
Dec 71	43	0	11
Mar 72	27	0	10
June 72	26	1	12
Sept 72	31	1	11
Dec 72	43	1	19
Mar 73	38	3	19
June 73	36	1	14
Sept 73	37	1	19
Dec 73	26	3	7
Mar 74	31	1	15
June 74	48	6	16
Sept 74	53	1	27

Accident History, by quarters, of the Sturt Highway, between
Wagga and the Hume Highway (Highway 14, Sections 1-3)

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
Dec 61	16	1	9
Mar 62	11	0	4
June 62	7	1	5
Sept 62	12	0	2
Dec 62	11	1	6
Mar 63	13	0	8
June 63	9	3	3
Sept 63	13	0	9
Dec 63	18	1	9
Mar 64	10	1	3
June 64	17	0	9
Sept 64	25	3	16
Dec 64	27	0	22
Mar 65	28	0	14
June 65	24	0	15
Sept 65	14	0	7
Dec 65	24	0	15
Mar 66	19	1	15
June 66	18	3	20
Sept 66	26	3	9
Dec 66	29	1	7
Mar 67	21	0	18
June 67	25	2	12
Sept 67	27	0	21
Dec 67	27	0	20
Mar 68	17	1	11
June 68	38	5	18
Sept 68	16	2	6
Dec 68	11	0	6
Mar 69	11	0	11

Quarter ending	No. of Accidents	No. of Killed	No. of Injured
June 69	24	0	12
Sept 69	13	2	8
Dec 69	16	0	11
Mar 70	12	1	8
June 70	15	2	11
Sept 70	14	0	5
Dec 70	10	3	0
Mar 71	13	2	9
June 71	10	0	1
Sept 71	20	1	13
Dec 71	9	0	5
Mar 72	21	0	7
June 72	11	0	6
Sept 72	27	2	18
Dec 72	18	0	4
Mar 73	22	2	15
June 73	20	0	9
Sept 73	21	1	18
Dec 73	9	0	5
Mar 74	15	0	7
June 74	16	2	3
Sept 74	18	0	2