

***Taupo District
Road Safety Report
2005 to 2009***



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Introduction and general information

The NZ Transport Agency provides information on road safety to its stakeholders and the public. It also has responsibility for promoting safety and sustainability in land transport, among a variety of other functions. This road safety report is an example of information supplied by the NZ Transport Agency.

This report helps identify road safety issues in Taupo District area ('the district') by presenting tables or graphs of:

- numbers and trends in reported crashes and casualties
- characteristics and types of crashes and casualties
- factors contributing to crashes
- locations with bad crash records
- characteristics of crashes on council authority roads

The information is intended to assist road controlling authorities, the New Zealand Police and others in evaluating the safety performance of the road network in Taupo District. Comparison with other cities, districts or regions elsewhere in the country is included.

Researchers, students, and organisations with an interest in road safety will also find the information useful.

Source of crash information

This report uses data from the NZ Transport Agency's crash database. This database includes all crashes involving injury and non-injury for which Police reports have been completed and forwarded to the NZ Transport Agency. Mostly five-year data (2005 to 2009) has been used, but 10-year data (2000 to 2009) has been used to analyse trends.

Council authority peer groups

Traffic crash patterns and features for an area can depend on the traffic and roading characteristics of that area. The most useful comparisons are made with other areas or authorities with similar characteristics, rather than with the whole country. The data for the city is compared with a peer group of similar council authorities (Group D) along with data for all New Zealand.

The peer group used for comparison with Taupo District is Group D which consists of provincial towns and hinterland. (Population 20000 - 75000 and/or rural crashes greater than 55 percent). Council authorities included in this group are listed in Figure 1.4.

Definitions of urban and rural

Data has been separated for urban and rural (open) roads through this report because each has a distinctly different pattern of crashes. In this report urban roads are defined as all those with a speed limit of 70 km/h or less, however it should be noted that some locations which have been speed limit zoned might be more appropriately defined as rural but are included in urban zones.

Definition of statistically significant

A number of graphs include a comparison between the road controlling authority, all New Zealand and a similar peer group. These graphs can include an indication as to whether the difference is statistically significant. For the purposes of this report statistically significant means that a difference of this size is unlikely to be due to chance. Significance is noted at the 5% level ($P < 0.05$), this means that the observed result would occur by chance in only 1 in 20 similar situations.

Road user compliance data

The Ministry of Transport collects information on road user compliance with traffic law. This information includes speed surveys, occupant restraint use surveys and cycle helmet use surveys. Information about these surveys is available on Ministry of Transport web site.

The appropriate web addresses are as follows:

Speed Surveys <http://www.transport.govt.nz/research/SpeedSurveys/>

Safety belts <http://www.transport.govt.nz/research/safetybeltstatistics/>

Cycle helmets <http://www.transport.govt.nz/research/cyclehelmets2009/>

The information is also distributed quarterly in the Ministry of Transport publication Road safety progress.

The Ministry of Transport also conducts public attitude surveys. These have been undertaken annually since 1994. They evaluate attitudes to road safety issues, primarily alcohol-impaired driving and speed. Surveys are carried out in May and June of each year by trained interviewers who conduct interviews with respondents in their homes. The sample is chosen to be representative of the New Zealand adult population, and includes men and women aged 15 and over from towns, cities and rural areas throughout New Zealand.

The results of these surveys are available from:

<http://www.transport.govt.nz/research/PublicAttitudestoRoadSafety-Survey/>

General explanatory notes

1. Crash and casualty information in this report generally includes data for both council roads and state highways. Some tables and charts can separate this information, however figures 8.1–8.26 provide information for council roads only.
2. Crash and casualty rates are based on 2009 populations estimates updated from the 2006 census, traffic flows from the year 2009, and the average of five year crash data (2005–2009).
3. Traffic flows are based on Road Asset Maintenance and Management (RAMM) data from December 2009. As different road controlling authorities update flow data in RAMM at different times some data will be more up to date than other data, hence caution should be exercised when comparing traffic flow based crash rates in one authority with those of other authorities particularly as the traffic flow data (VKT) used in the calculations can not be considered definitive. Comparisons should be considered as indicative only.
4. With four to five categories of road for each council authority, some categories will only have short lengths of road. This may cause significant variation in the calculated crash and casualty rates.
5. The crash numbers include all those within the road controlling authority. The crash numbers used in the crash rate section can, however, vary slightly from the remainder of the document as only 'on road' crashes can be used. These are crashes on roads that have traffic volume information recorded. Crashes that occurred in car parks, reserves, beaches etc. are excluded.

6. The severity of a crash is determined as the most severely injured casualty in the crash. Injury severity is classified as fatal, serious, or minor as follows:
 - Fatal:** Injuries that result in death within 30 days of a crash.
 - Serious:** Fractures, concussion, internal injuries, crushing, severe cuts and lacerations, severe general shock necessitating medical treatment, and any injury involving removal to and detention in hospital.
 - Minor:** Injuries which are not serious but which require first aid, or cause discomfort or pain to the person injured, eg sprains and bruises.

7. Ethnicity of road users involved in crashes can now be recorded on traffic crash reports, although some reports may not include this data. Figures 3.25 and 3.26 shows the ethnicity of casualties, where known. Ethnicity is divided into five different groups. Only data for 2005 to 2009 is available. The graph includes all casualties irrespective of culpability.

NOTE: Ethnicity data should be treated with caution as the data can be considered subjective and incomplete.

8. For the licence status grouping in Figures 3.27 and 3.28 the 'no/wrong licence' group includes drivers who have never held a licence or have an expired or wrong class licence. This graph includes all drivers irrespective of injury or culpability.

9. See appendix for detailed descriptions of:
 - crash movement types and crash movement groupings (for Figures 4.1–4.4)
 - grouping of factors contributing to crashes (for Figures 5.1–5.14)

10. Blackspot sites listed in Figures 9.1 and 9.3 are listed by the total cost of crashes at the site and are listed regardless of any remedial treatments. Site were initially selected on the basis of 3 reported crashes and then the sites listed were limited to those with a higher number of injury crashes and over a defined social cost, which is indicated on each figure.

11. Alarm crash sites in section 9 as Figures 9.4 to 9.6 are crash sites that have shown a statistically significant increase (at the 95 percent level of confidence) in reported crashes in 2009 compared with the previous five years (2004 to 2008). The sites are initially selected on the basis of 3 or more reported crashes at the sites. Sites are listed regardless of any recent remedial treatments and they may already be under investigation for treatment.

Crash Rates and Costs

Crash reporting rates

The ratio of 'reported serious injuries' can be assessed by comparing seriously injured casualty numbers from Police crash reports to hospital admissions, given that a serious injury is generally one requiring hospital attention.

Figure 1.1 below indicates the serious injury reporting rate for each region.

Figure 1.1 Reporting rate serious injuries to hospital admissions

Region	2005	2006	2007	2008	2009
Northland	30%	28%	34%	38%	27%
Auckland	17%	20%	16%	18%	18%
Waikato	40%	38%	50%	47%	40%
Bay of Plenty	32%	37%	38%	29%	27%
Gisborne	32%	26%	31%	28%	27%
Hawkes Bay	80%	75%	59%	68%	42%
Taranaki	55%	65%	79%	41%	36%
Manawatu-Wanganui	38%	34%	35%	36%	31%
Wellington	68%	61%	74%	55%	48%
Nelson-Marlborough	44%	52%	54%	50%	39%
West Coast	53%	55%	59%	53%	54%
Canterbury	47%	42%	49%	45%	43%
Otago	99%	85%	77%	69%	39%
Southland	78%	103%	73%	53%	39%
New Zealand	36%	35%	37%	35%	33%

This is the ratio of the number of persons with serious injuries in reported crashes divided by the number of persons admitted to hospital with serious injuries.

These variations in reporting rates need to be considered when viewing the trends in crashes and casualties shown in this report.

Note: These values should be considered indicative only.

Figure 1.2 Crashes per 100 million vehicle kilometres travelled

	Council roads		State Highways	
	Urban	Rural	Urban	Rural
Taupo District	43	26	21	18
Group D	35	27	24	17
All NZ	37	29	27	18

Figure 1.3 Casualties per 100 million vehicle kilometres travelled

	Council roads		State Highways	
	Urban	Rural	Urban	Rural
Taupo District	53	38	27	30
Group D	45	40	34	27
All NZ	46	42	36	26

Figure 1.4 Peer group crash and casualty rates
Group D

City or District name	Crashes per					Casualties per					2009 Population	% of rural crashes
	10,000 Population (5 year average)	100 million vehicle kilometres travelled				10,000 Population (5 year average)	100 million vehicle kilometres travelled					
		Council roads		State Highways			Council roads		State Highways			
		Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural		
Ashburton	21	36	16	17	7	29	47	23	24	10	29100	56
Far North	35	29	34	26	26	54	44	52	35	42	58000	84
Franklin	31	33	35	0	7	44	43	51	0	11	64200	77
Horowhenua	30	26	14	35	20	43	30	22	47	31	30600	63
Manawatu	31	30	24	34	15	45	38	36	46	23	29500	79
Marlborough	27	58	25	32	19	37	71	41	41	27	45000	57
Masterton	30	52	26	44	25	39	66	35	58	31	23300	37
Matamata Piako	44	53	32	24	14	64	68	44	31	22	23300	79
Queenstown Lakes	22	46	37	18	24	33	67	60	23	36	51500	65
Rodney	28	27	28	24	14	39	36	38	36	21	98100	69
Selwyn	25	18	19	7	12	35	21	27	9	19	38600	90
South Taranaki	26	45	25	16	19	39	55	39	26	28	26800	73
South Waikato	31	24	28	19	19	49	31	42	34	32	22800	80
Southland	57	43	32	41	25	90	62	48	60	42	29300	90
Tasman	25	28	21	21	23	35	34	30	26	34	46800	76
Taupo	42	43	26	21	18	62	53	38	27	30	33600	69
Thames Coromandel	30	32	27	27	25	44	47	35	45	34	26800	63
Waikato	42	39	28	16	17	61	46	37	24	26	47600	83
Waimakariri	17	32	30	9	10	24	44	43	11	14	46900	71
Waipa	28	40	27	27	15	39	52	37	35	23	45100	67
Waitaki	45	54	31	51	17	64	67	42	62	29	20700	60
Western Bay of Plenty	26	27	25	21	16	39	32	34	33	25	44800	84
Whakatane	26	30	26	24	18	40	40	44	33	29	34300	69
Group D	30	35	27	24	17	44	45	40	33	27	916700	73
All New Zealand	26	38	29	28	18	36	48	42	38	26	4331000	41

Group D : Provincial towns and hinterland. (Population 20000-75000 and/or rural crashes greater than 55 percent).

Crashes and casualties per 100 million VKT are based on five years of reported injury on-road crash data (2005-2009) and December 2009 VKT estimates.

Crashes and casualties per 10,000 population are based on five year average crash data (2005-2009) and Statistics NZ 2009 population estimates.

Figure 1.5 Crashes per 100 million vehicle-kilometres travelled - urban council roads

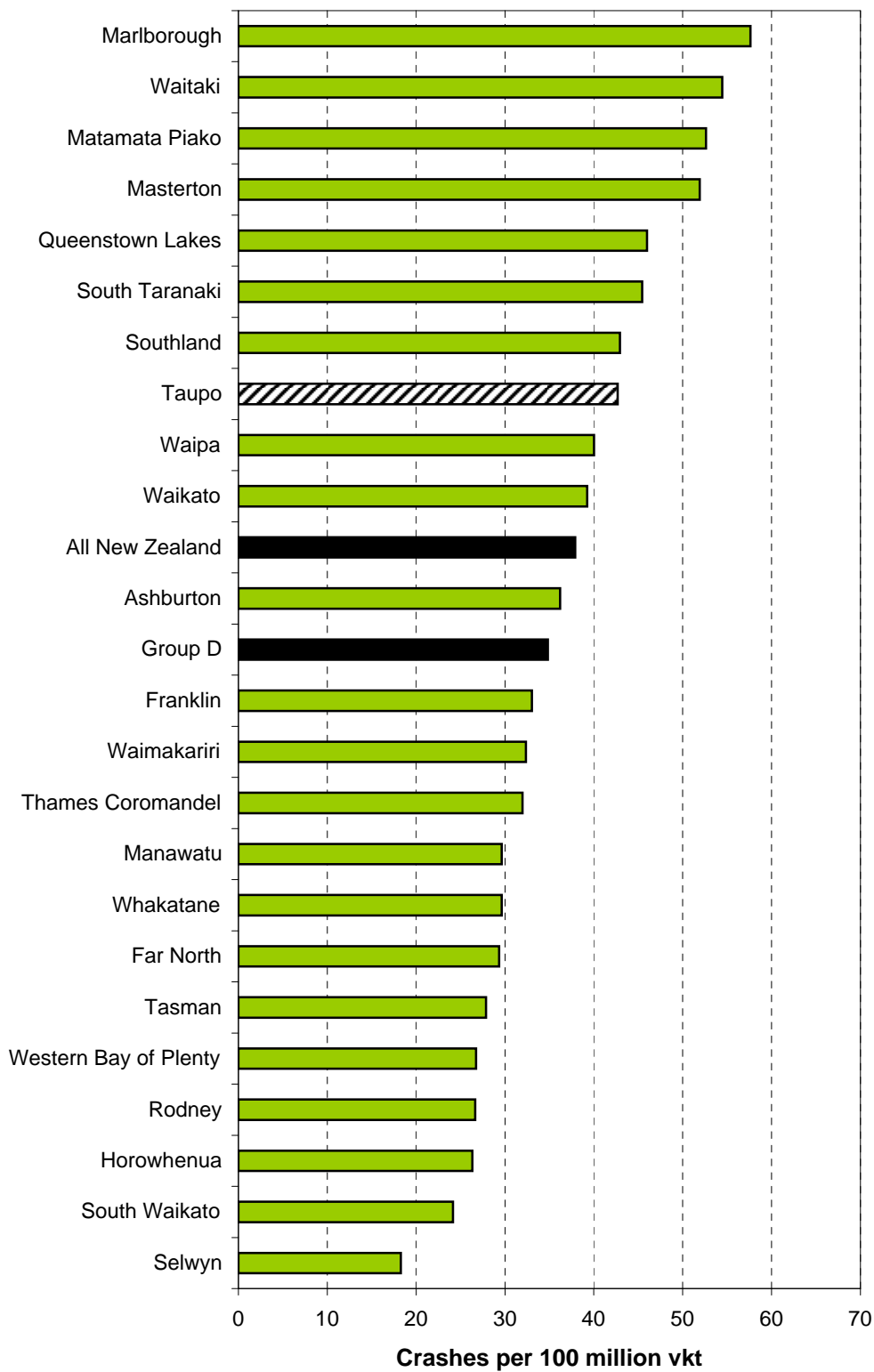


Figure 1.6 Crashes per 100 million vehicle-kilometres travelled - rural council roads

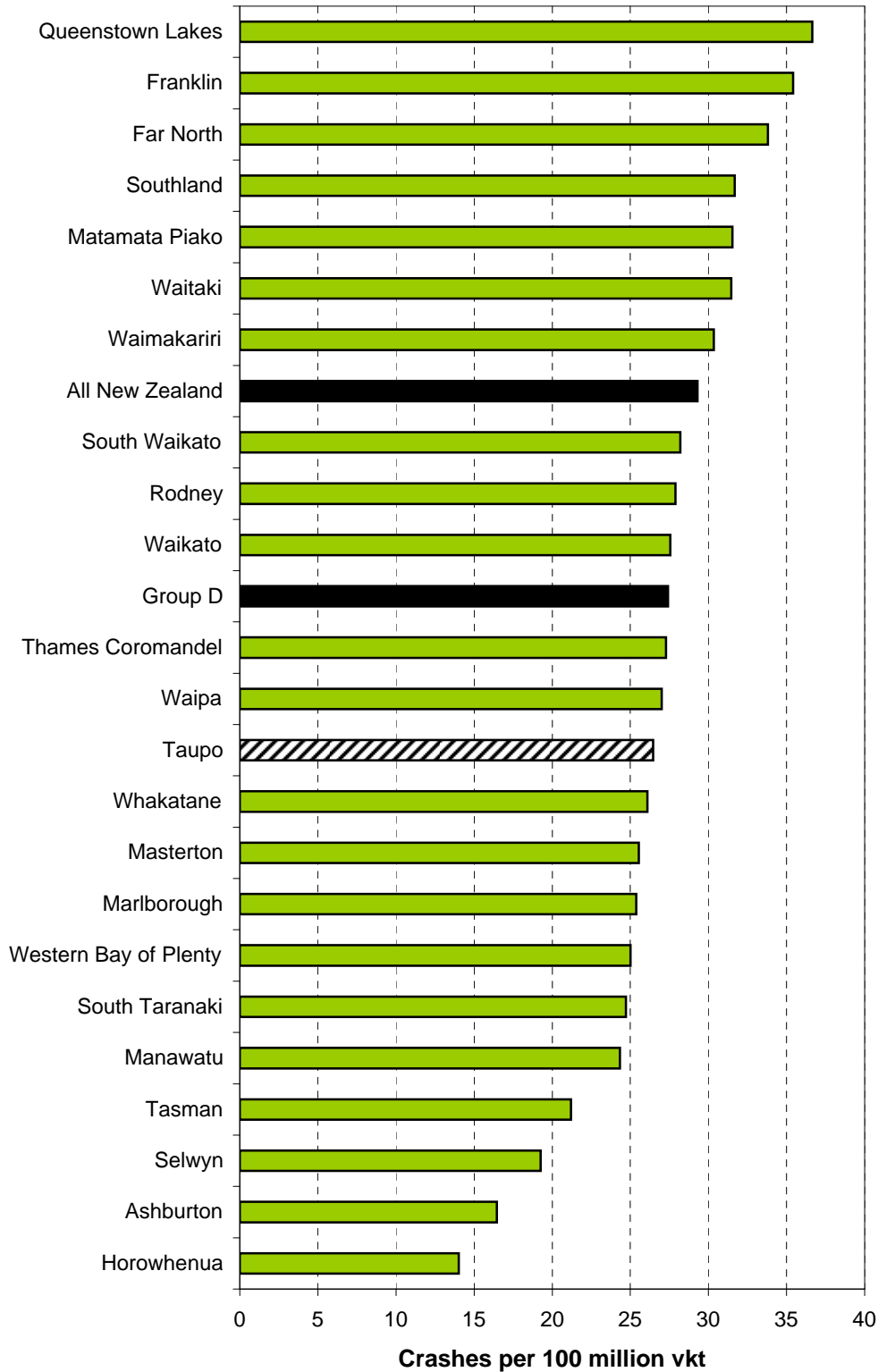


Figure 1.7 Crashes per 100 million vehicle kilometres travelled - urban state highways

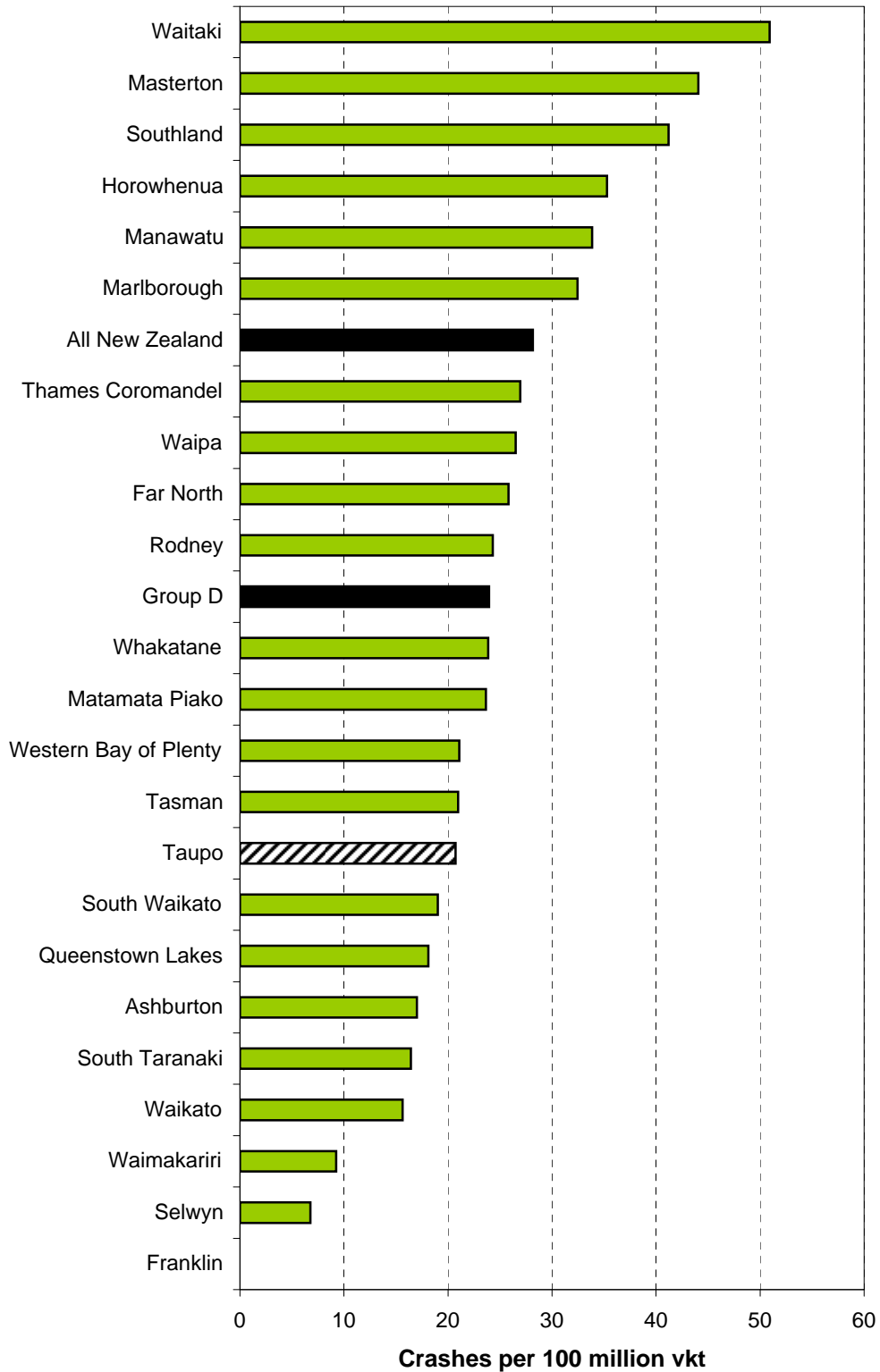
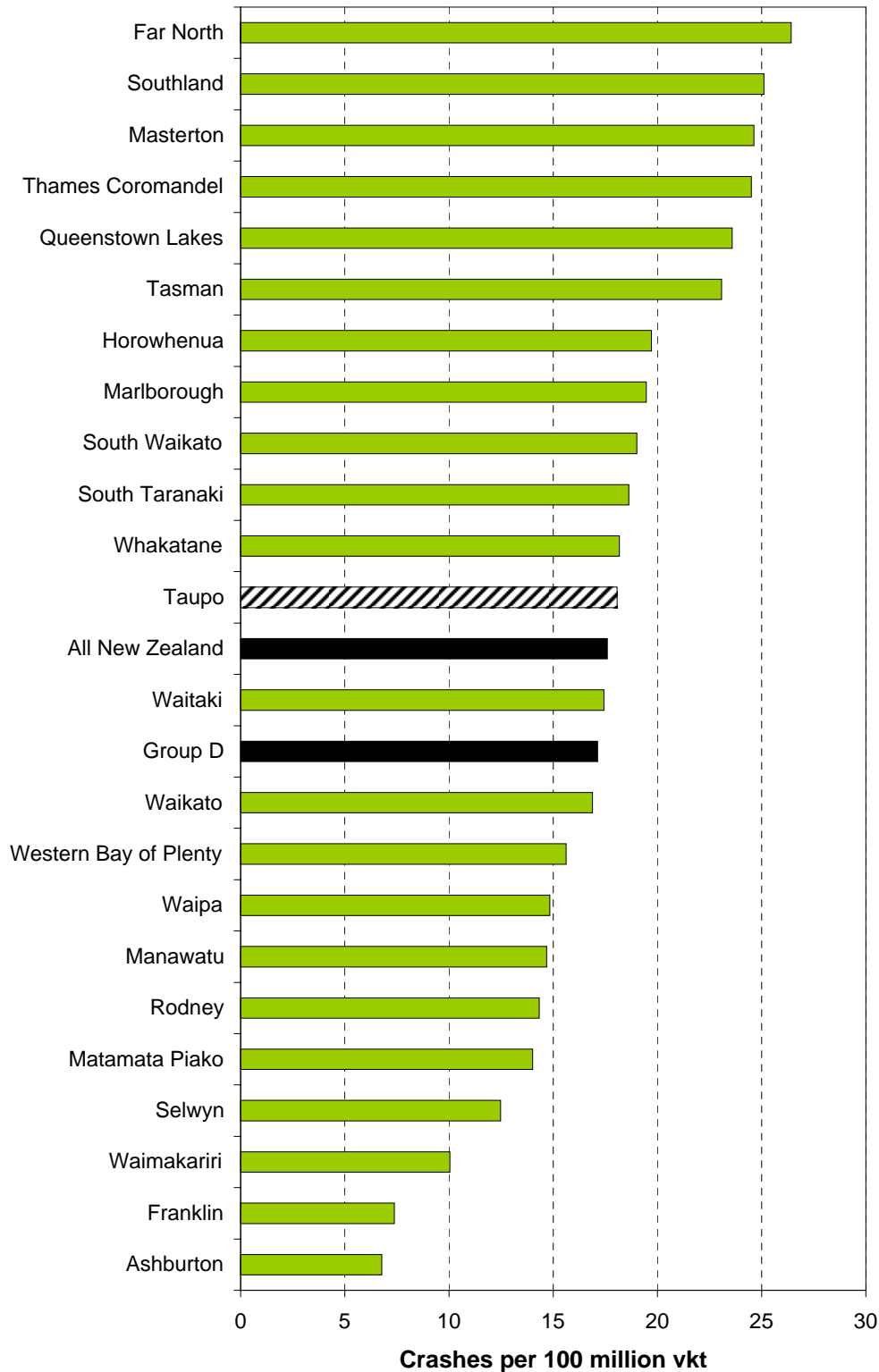


Figure 1.8 Crashes per 100 million vehicle-kilometres travelled - rural state highways



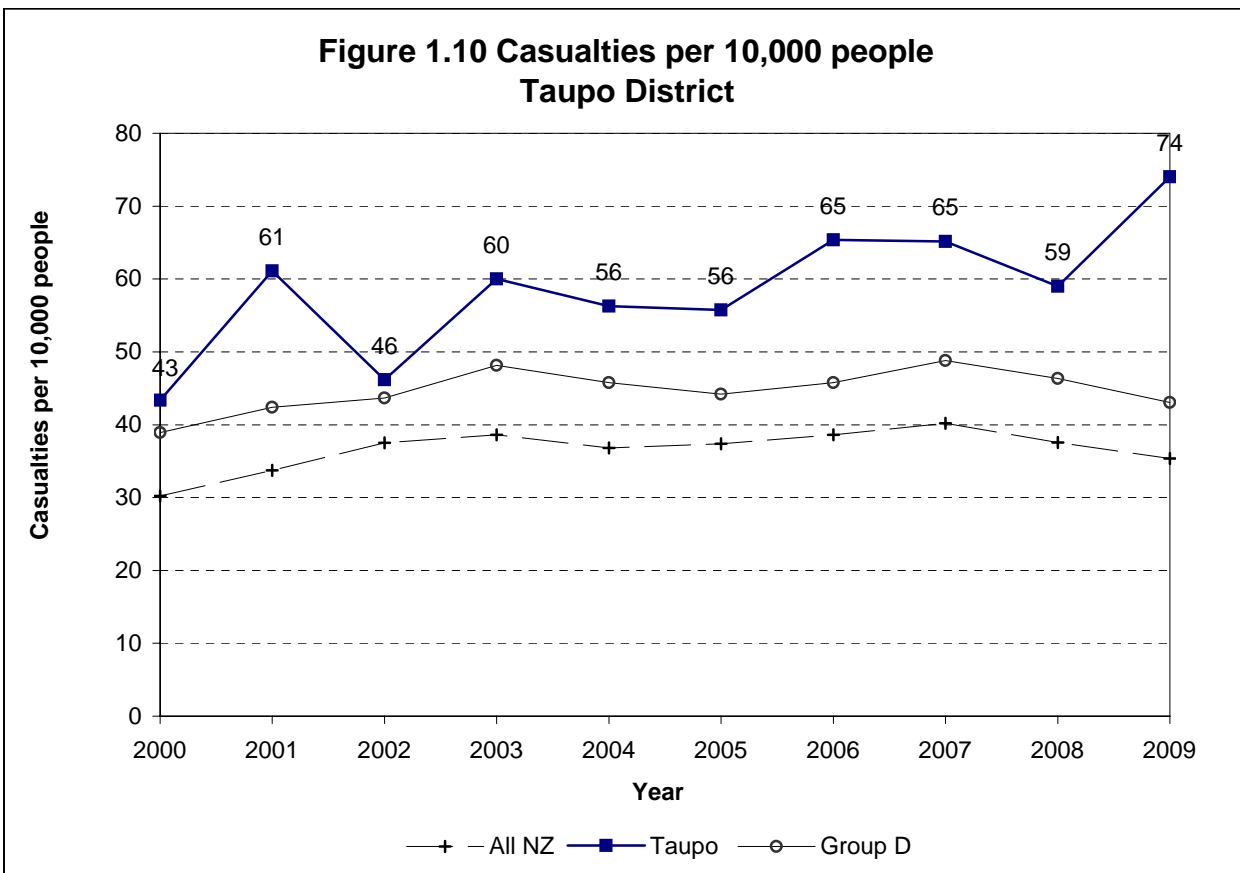
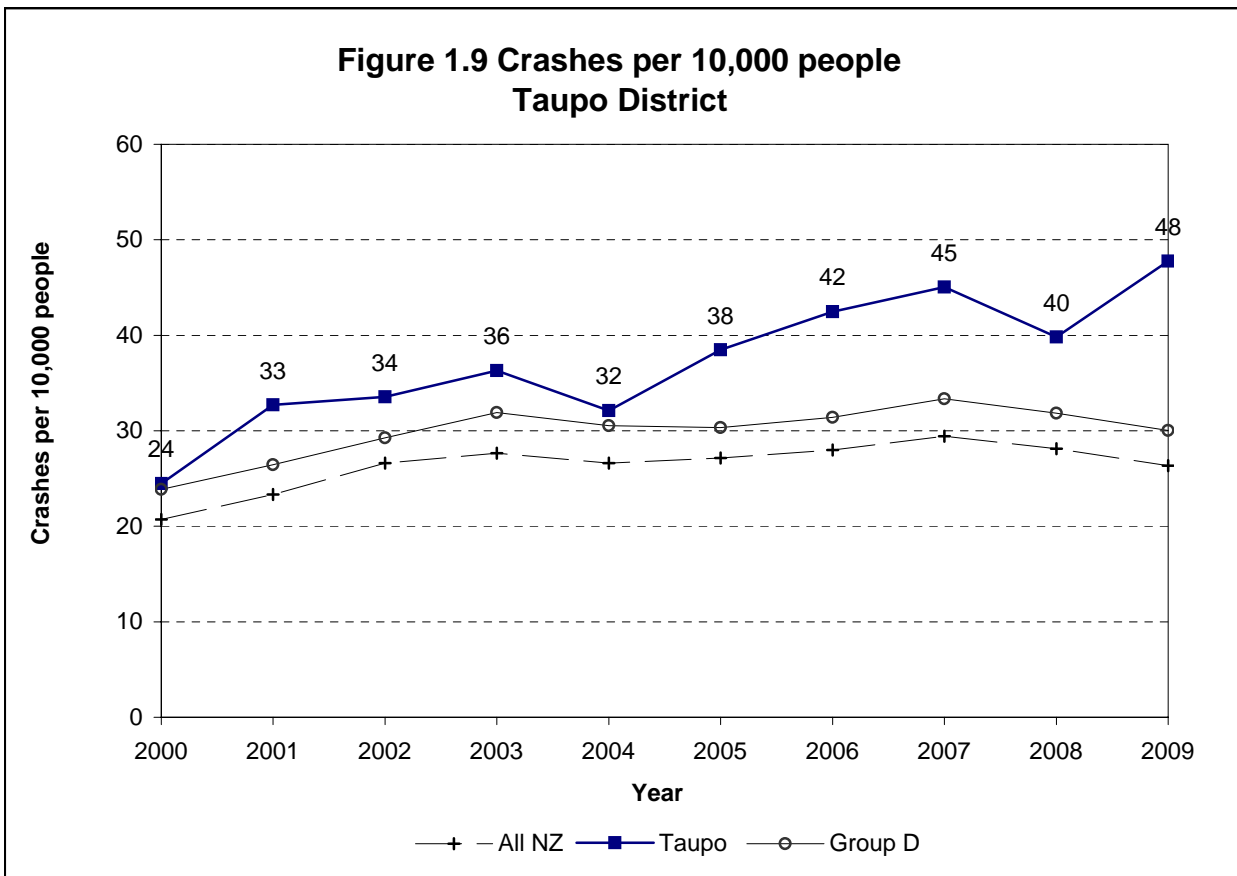


Figure 1.11 Social cost of crashes in Taupo District in 2009

		Taupo District	New Zealand
Council roads	urban	\$8.97	\$1,607.40
	rural	\$23.48	\$909.43
State Highways	urban	\$3.63	\$299.76
	rural	\$62.47	\$1,487.35
Total		\$98.56	\$4,303.94

Note: Crash costs are in \$ millions

The social costs of a road crash and the associated injuries include a number of different elements:

- Loss of life and life quality
- Loss of output due to temporary incapacitation
- Medical costs
- Legal costs
- Property damage costs

The average value of a loss of life due to a road crash is estimated by the amount of money the New Zealand population would be willing to pay for a safety improvement that would result in the expected avoidance of one premature death. This is the willingness to pay based value of statistical life or VOSL. The VOSL was established at \$2 million in 1991. This has been indexed to the average hourly earnings (ordinary time) to express the value in current dollars. The updated VOSL is \$3.5 million (in June 2009 dollars). Based on several international and New Zealand studies on VOSL, the average loss of life quality for permanent impairments due to a serious and a minor injury were estimated to be 10% and 0.4% of the VOSL respectively.

Crash rates can vary due to reporting rates. These are adjusted on a regional basis in this report by comparing with hospitalisation rates.

The other social cost components are estimated based on a number of studies conducted during the early to mid-1990s and are updated for price changes by indexing to an appropriate price index.

For a detail discussion on this, please refer to 'The social cost of road crashes and injuries: June 2009 update', available at the Ministry of Transport's website:

<http://www.transport.govt.nz/assets/NewPDFs/NewFolder/Social-Cost-June-2009-update-final.pdf>

The average social cost per reported crash (in June 2009 dollars) are estimated at:

Rural fatal crash	\$4,260,000
Rural serious crash	\$820,000
Rural minor crash	\$91,000
Urban fatal crash	\$3,775,000
Urban serious crash	\$699,000
Urban minor crash	\$82,000

These values include an allowance for non-reported injury crashes, and the totals in Fig. 1.11 also include an allowance for non-injury crashes.

Crash Counts

Figure 2.1: Crash numbers and severity 2005 to 2009 - whole District

	2005	2006	2007	2008	2009	Total	%	Group D
Fatal crashes	8	4	19	14	11	56	8%	5%
Serious crashes	27	21	27	31	42	148	21%	22%
Minor crashes	92	116	104	88	107	507	71%	72%
Total injury crashes	127	141	150	133	160	711	100%	100%
Non-injury crashes	247	273	273	235	265	1293		

Figure 2.2: Crash numbers and severity 2005 to 2009 - urban roads

	2005	2006	2007	2008	2009	Total	%	Group D
Fatal crashes	3	0	4	2	0	9	4%	3%
Serious crashes	6	5	5	10	9	35	15%	17%
Minor crashes	34	44	35	32	40	185	81%	80%
Total injury crashes	43	49	44	44	49	229	100%	100%
Non-injury crashes	118	126	126	122	130	622		

Figure 2.3: Crash numbers and severity 2005 to 2009 - rural roads

	2005	2006	2007	2008	2009	Total	%	Group D
Fatal crashes	5	4	15	12	11	47	10%	6%
Serious crashes	21	16	22	21	33	113	23%	24%
Minor crashes	58	72	69	56	67	322	67%	70%
Total injury crashes	84	92	106	89	111	482	100%	100%
Non-injury crashes	129	147	147	113	135	671		

Figure 2.4: Casualty numbers and severity 2005 to 2009 - whole District

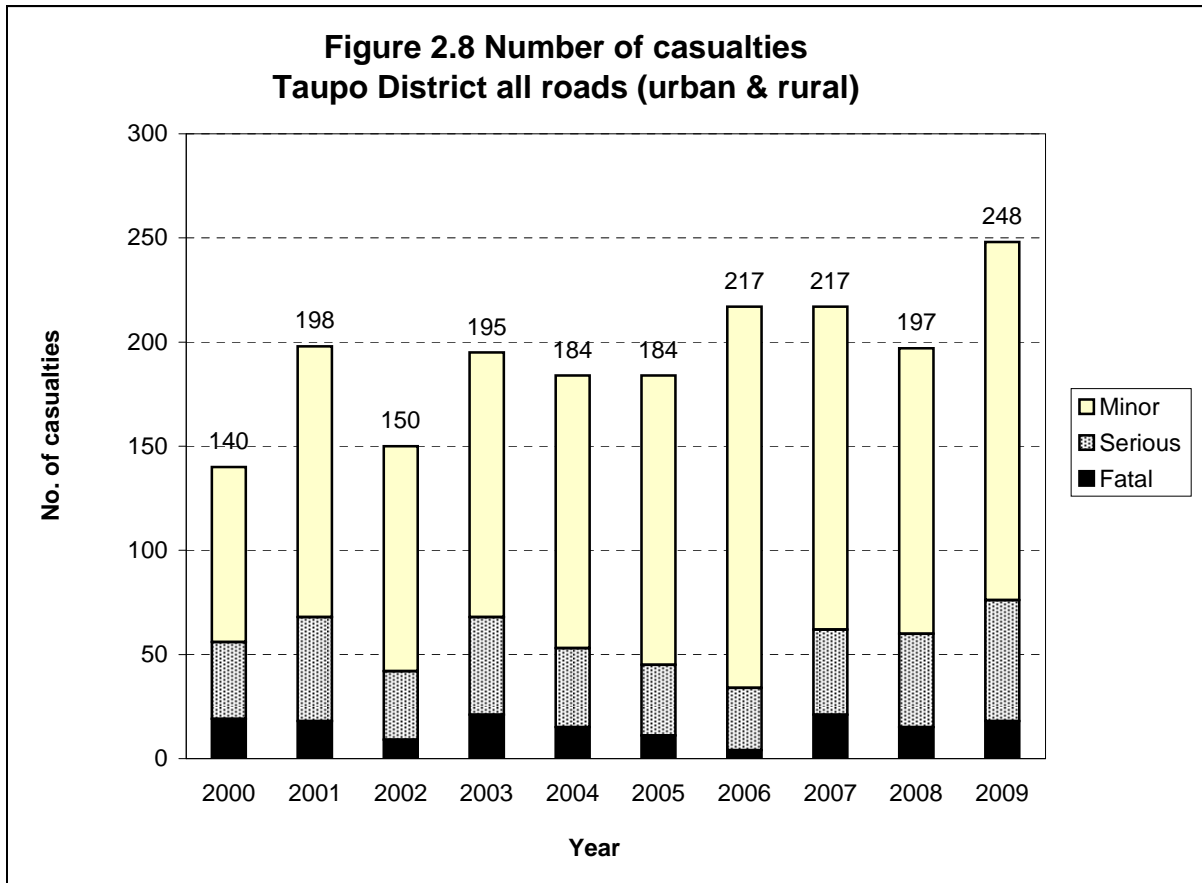
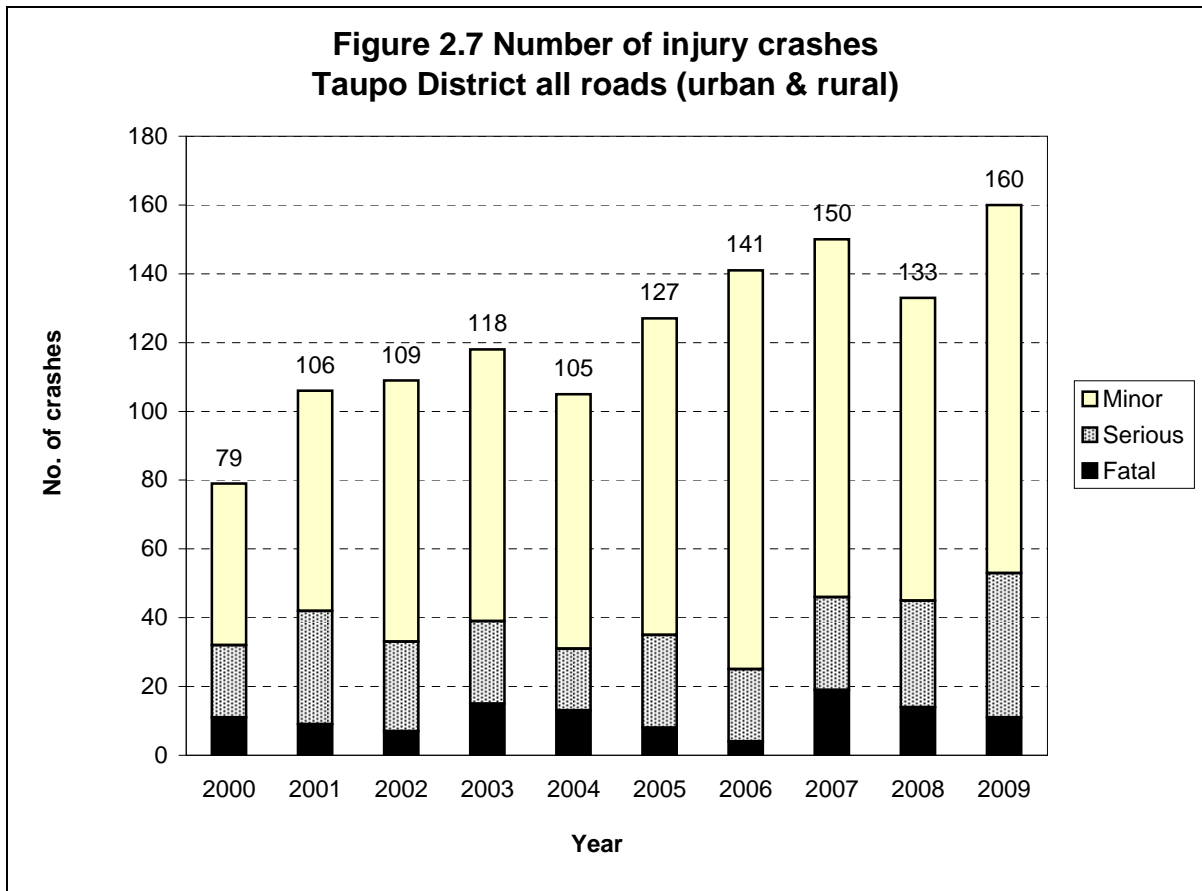
	2005	2006	2007	2008	2009	Total	%	Group D
Fatal casualties	11	4	21	15	18	69	6%	4%
Serious casualties	34	30	41	45	58	208	20%	20%
Minor casualties	139	183	155	137	172	786	74%	76%
Total casualties	184	217	217	197	248	1063	100%	100%

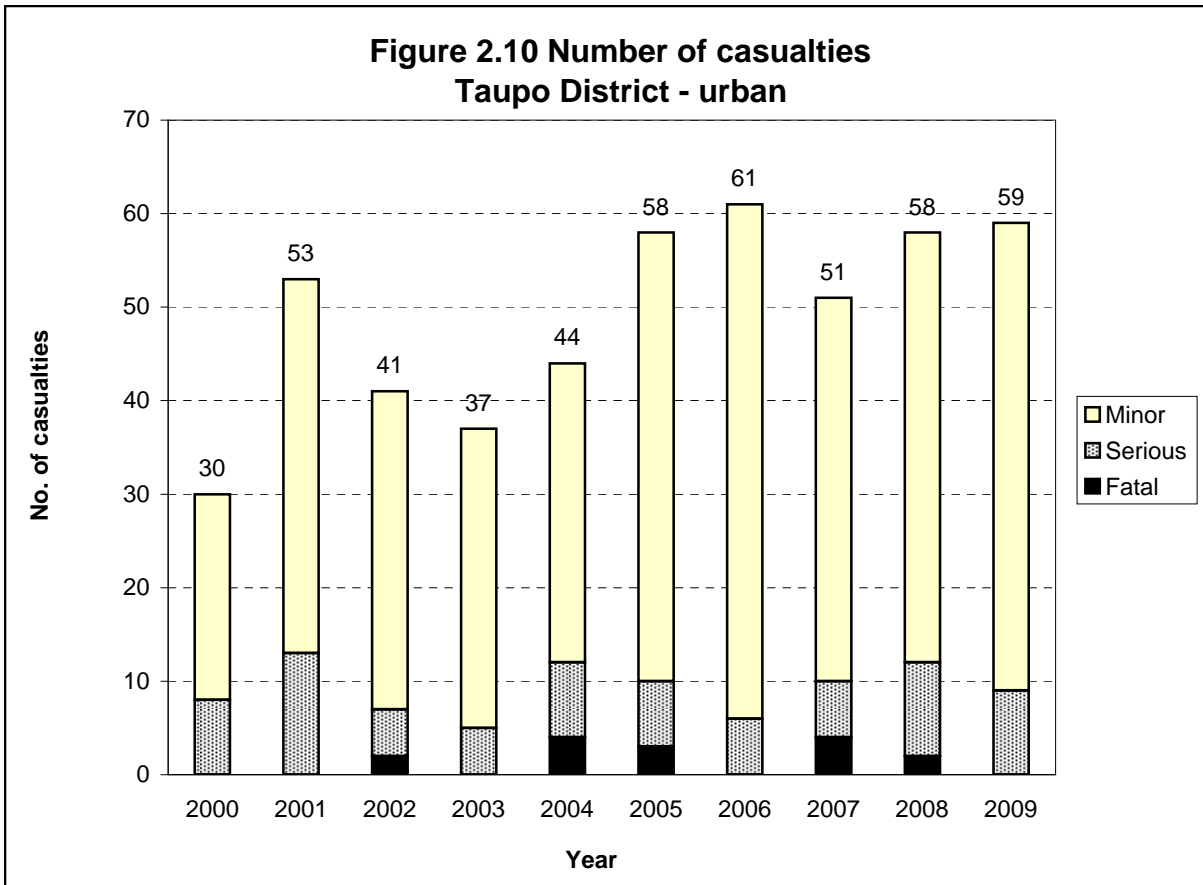
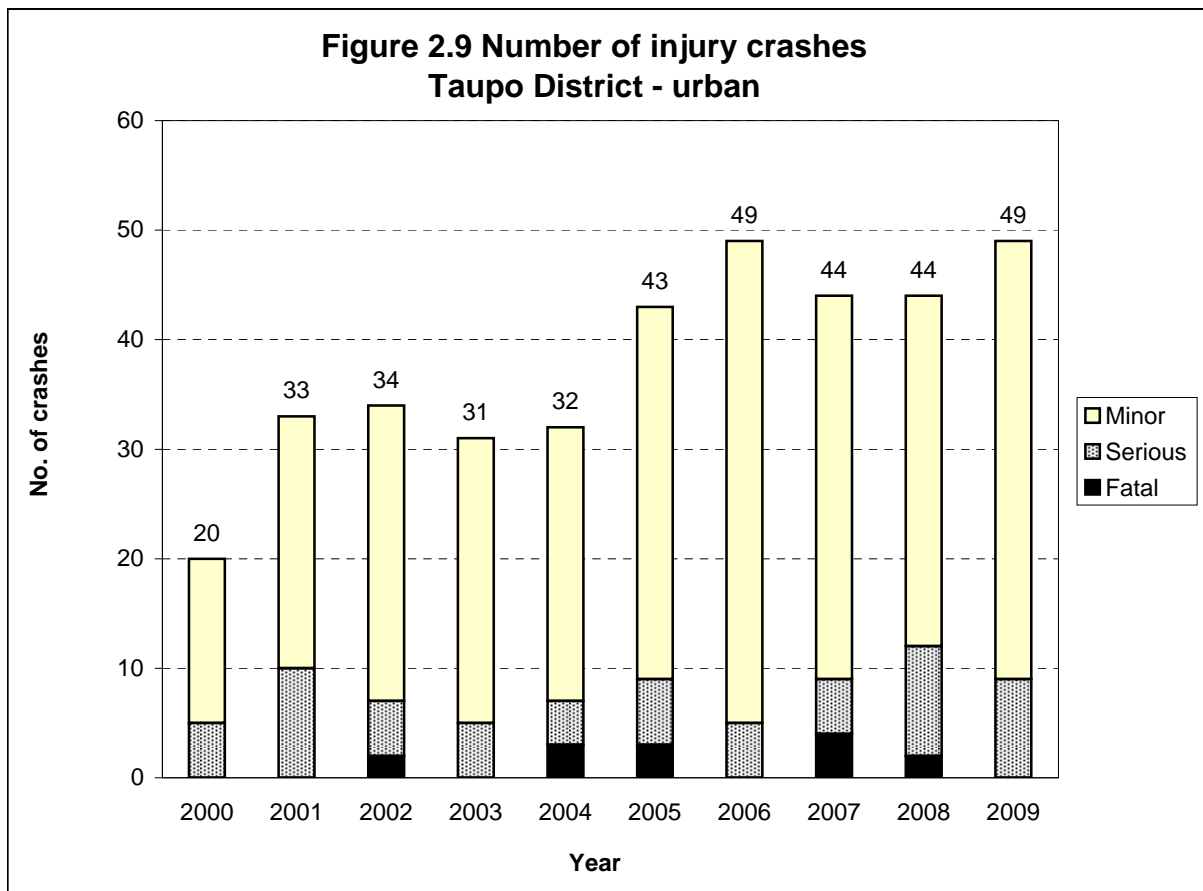
Figure 2.5: Casualty numbers and severity 2005 to 2009 - urban roads

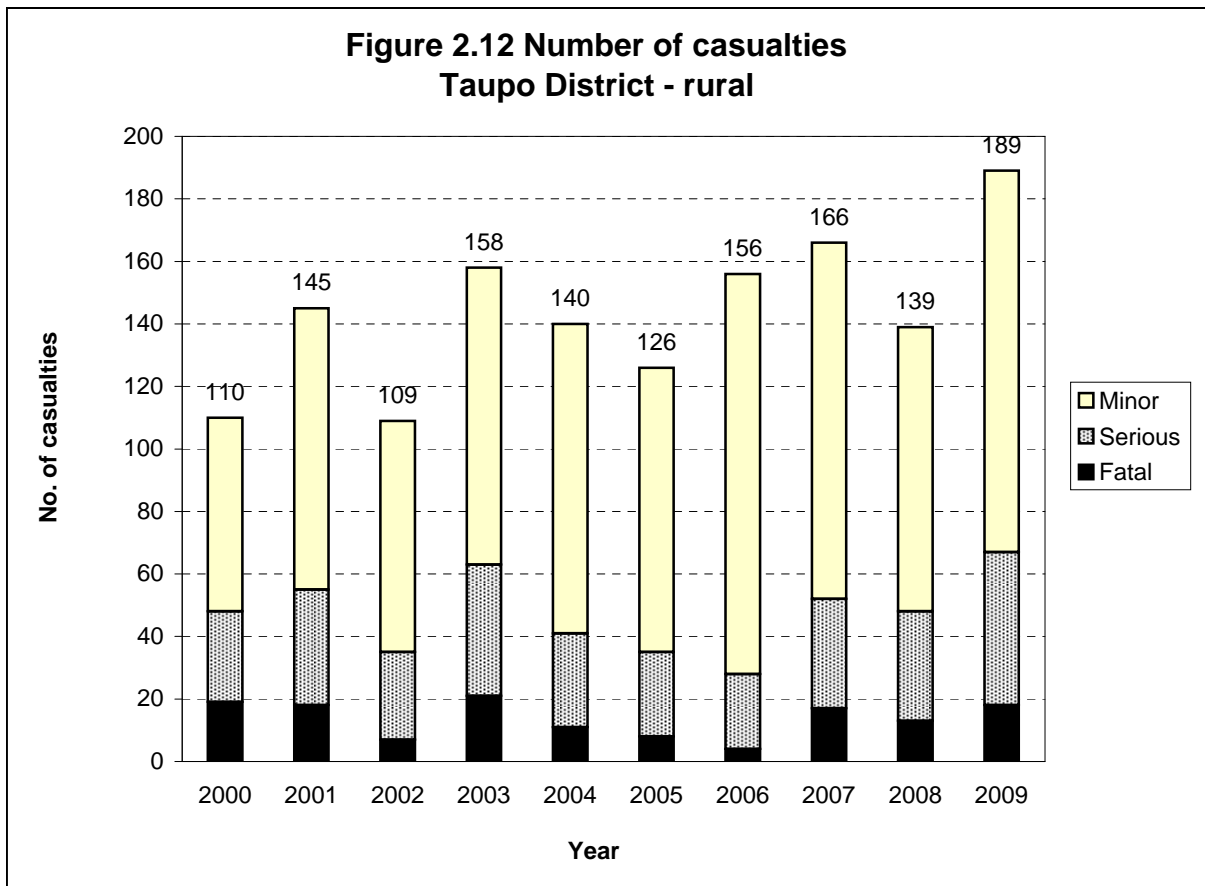
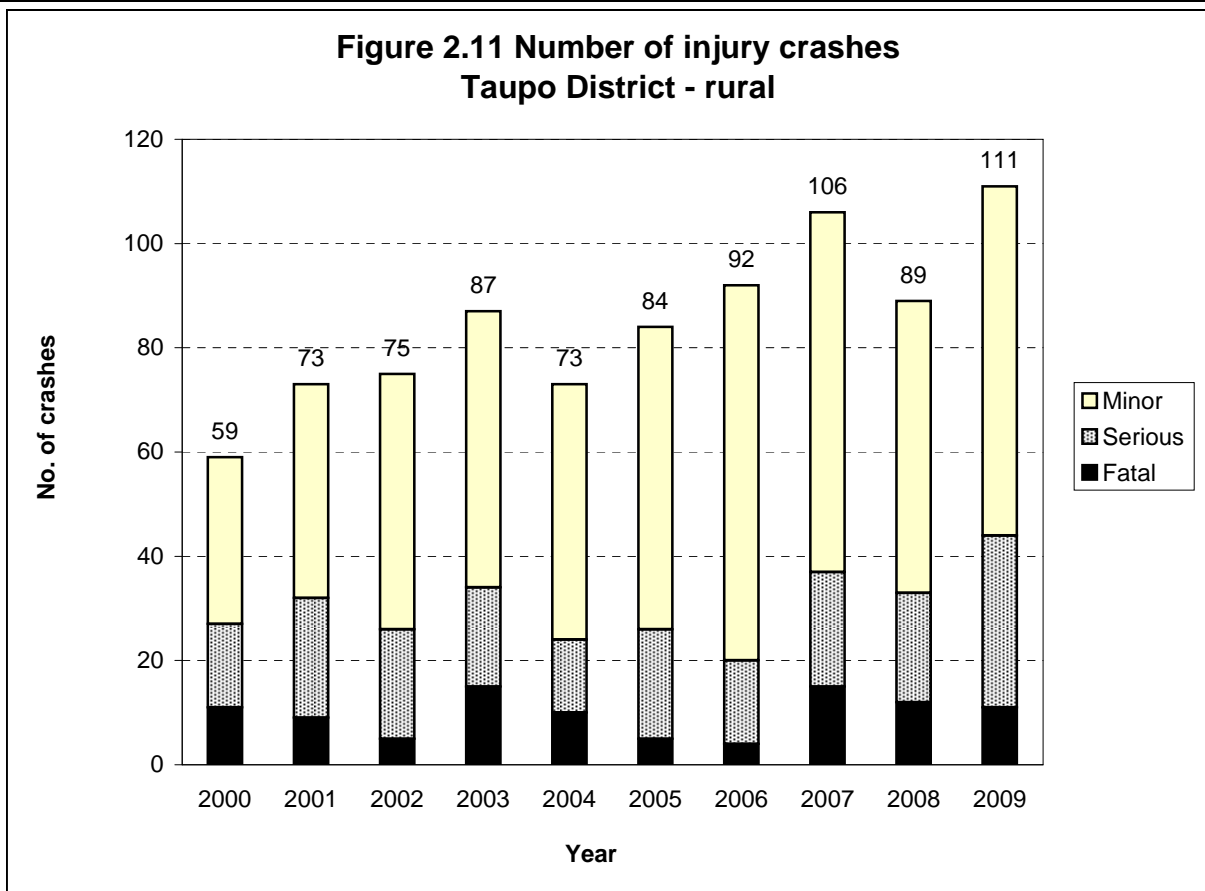
	2005	2006	2007	2008	2009	Total	%	Group D
Fatal casualties	3	0	4	2	0	9	3%	2%
Serious casualties	7	6	6	10	9	38	13%	16%
Minor casualties	48	55	41	46	50	240	84%	82%
Total casualties	58	61	51	58	59	287	100%	100%

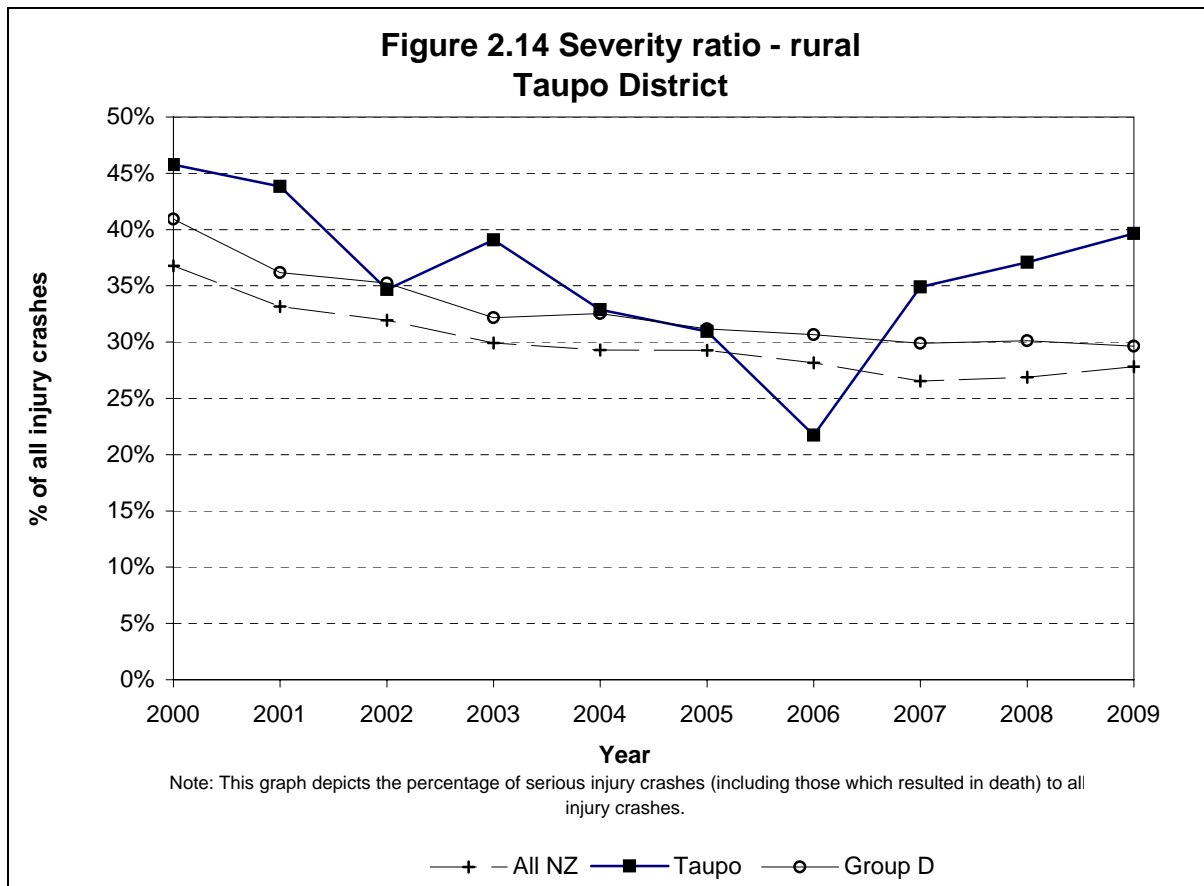
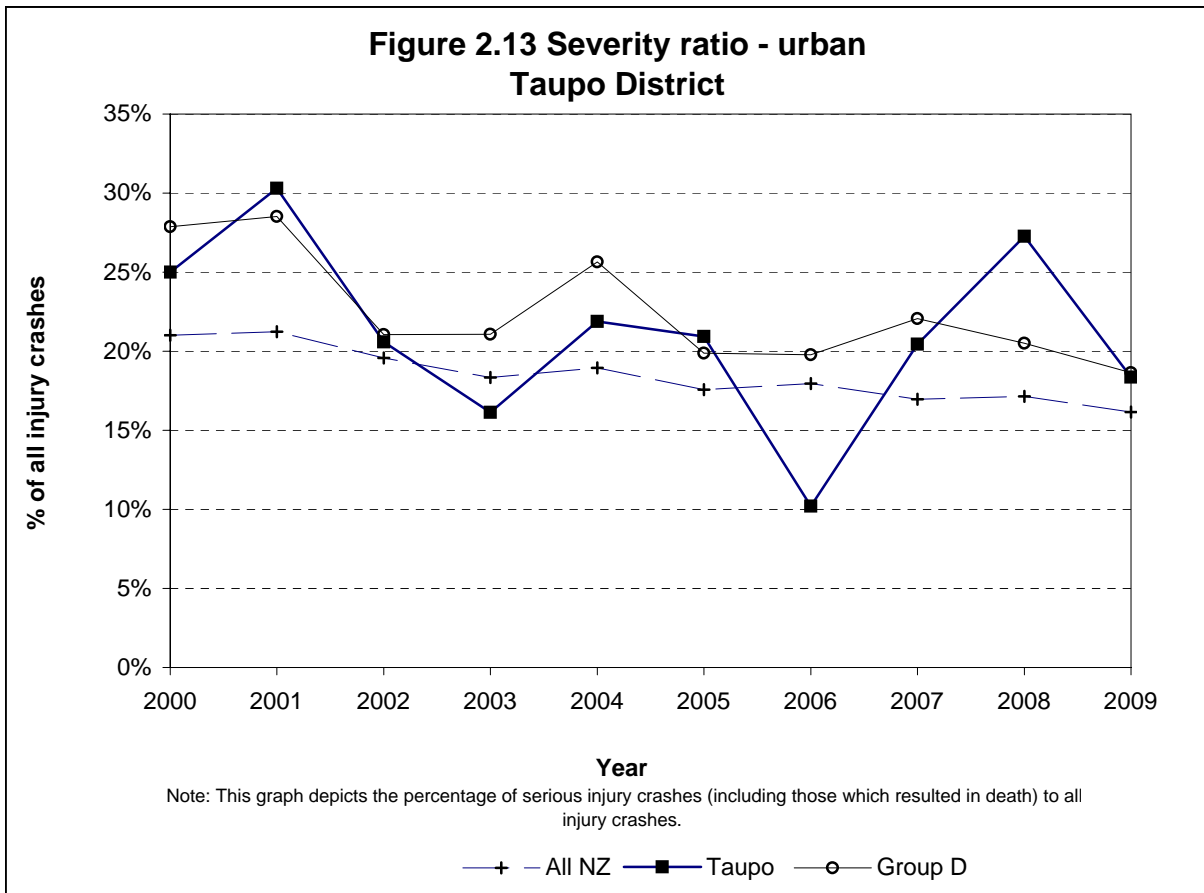
Figure 2.6: Casualty numbers and severity 2005 to 2009 - rural roads

	2005	2006	2007	2008	2009	Total	%	Group D
Fatal casualties	8	4	17	13	18	60	8%	5%
Serious casualties	27	24	35	35	49	170	22%	21%
Minor casualties	91	128	114	91	122	546	70%	74%
Total casualties	126	156	166	139	189	776	100%	100%



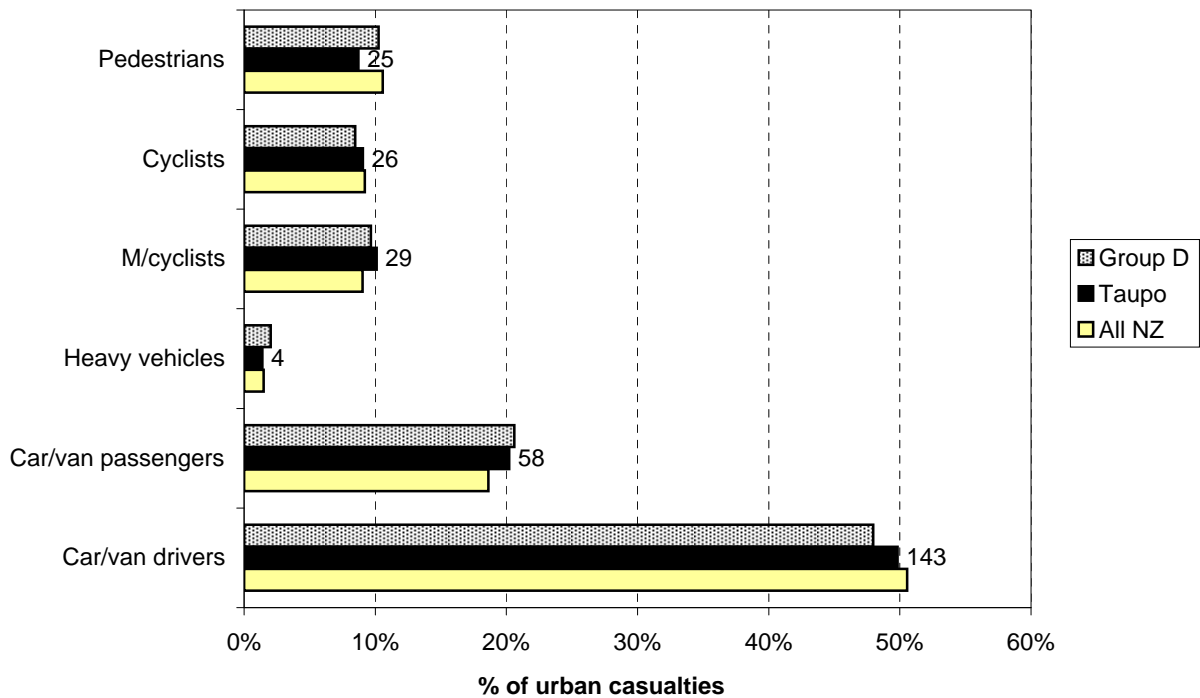






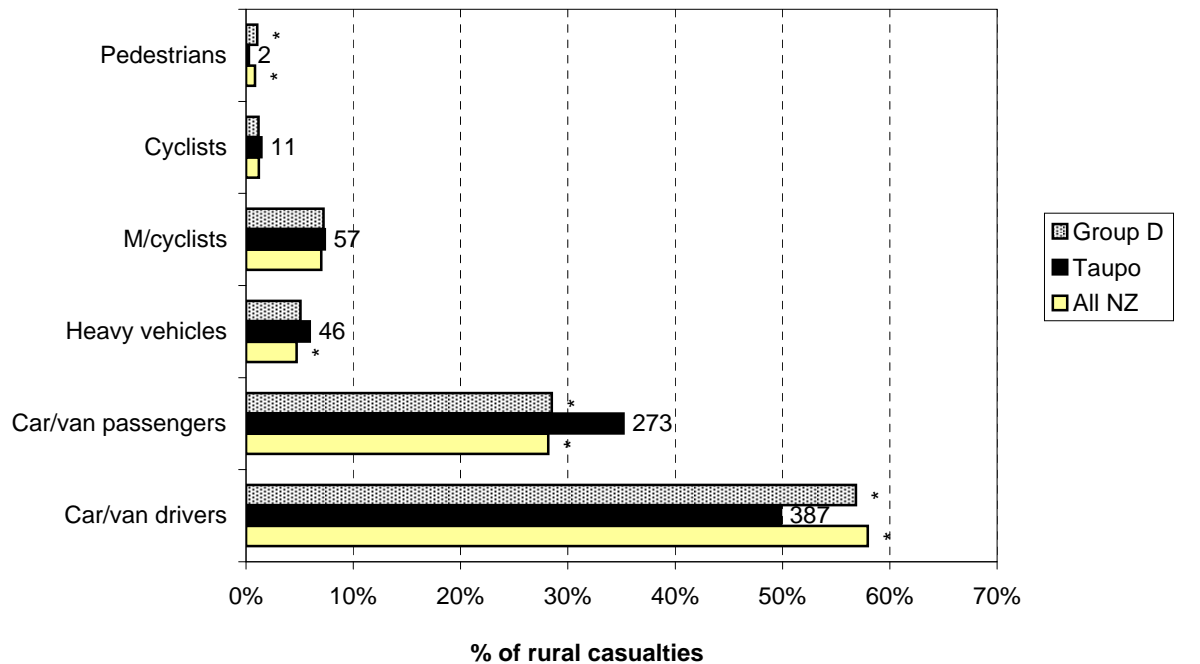
Road User Statistics

**Figure 3.1 Road user casualties - urban
Taupo District (2005-2009)**



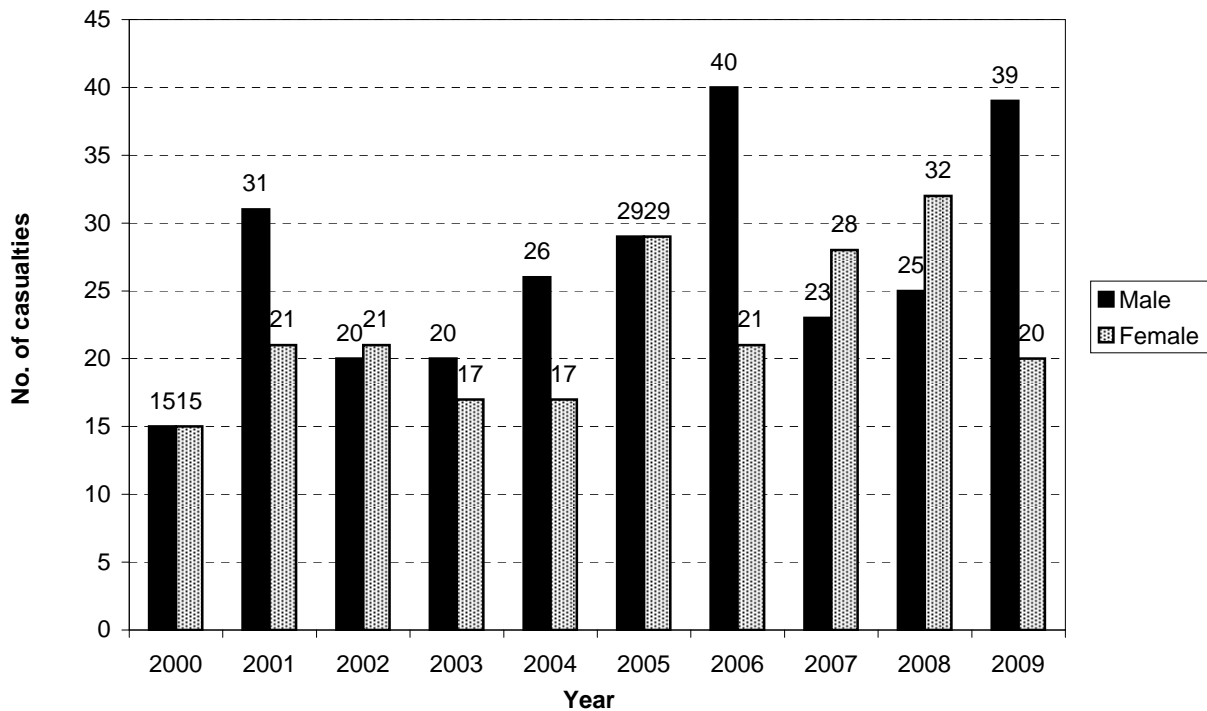
Note: While the graph plots percentages, the number of casualties is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 3.2 Road user casualties - rural
Taupo District (2005-2009)**



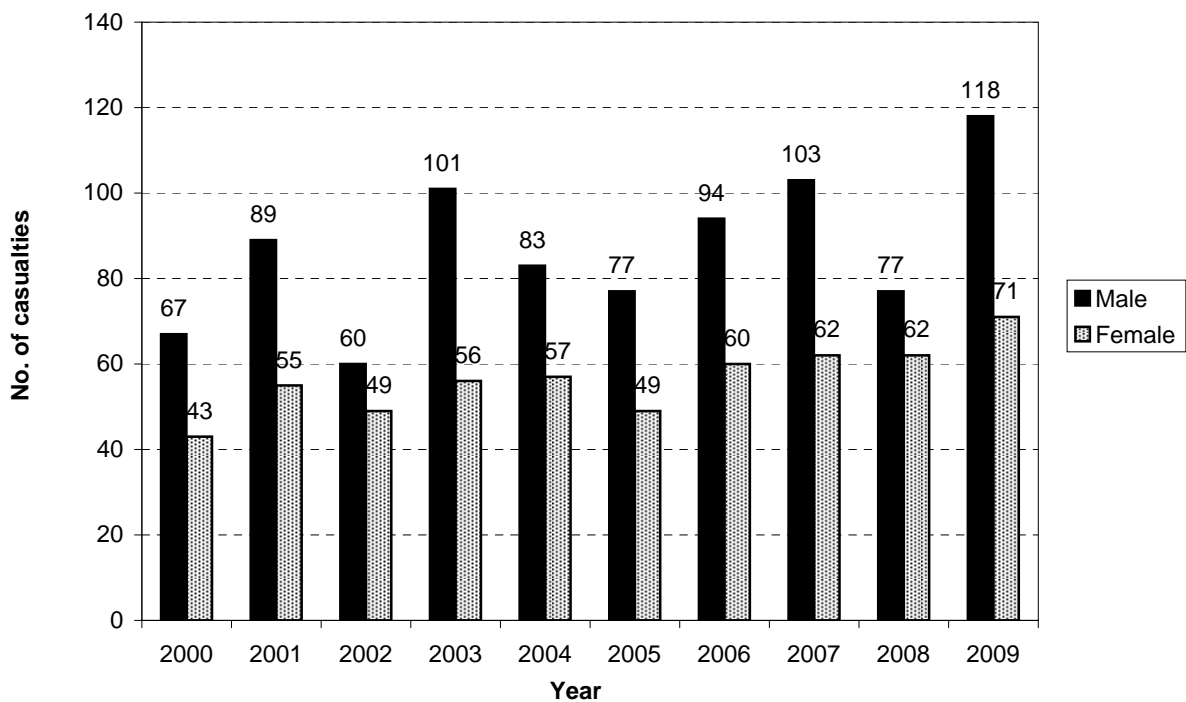
Note: While the graph plots percentages, the number of casualties is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 3.3 Male/female casualties - urban
Taupo District**



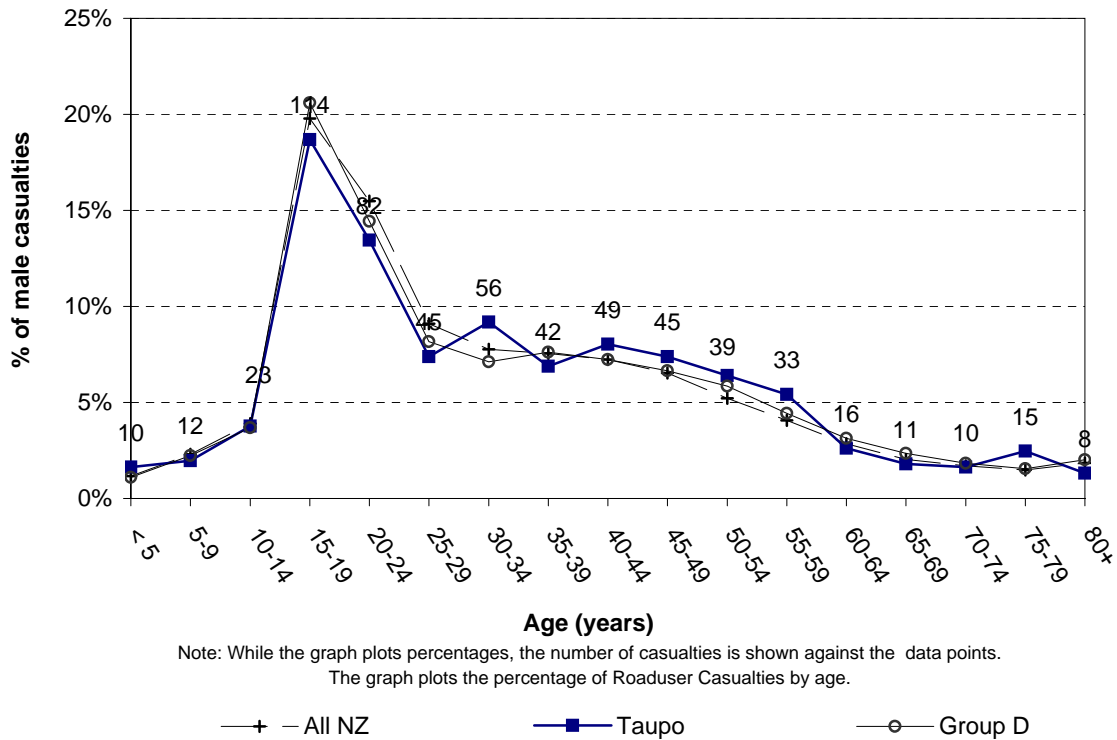
Note: This graph shows the number of male and female roadusers injured

**Figure 3.4 Male/female casualties - rural
Taupo District**

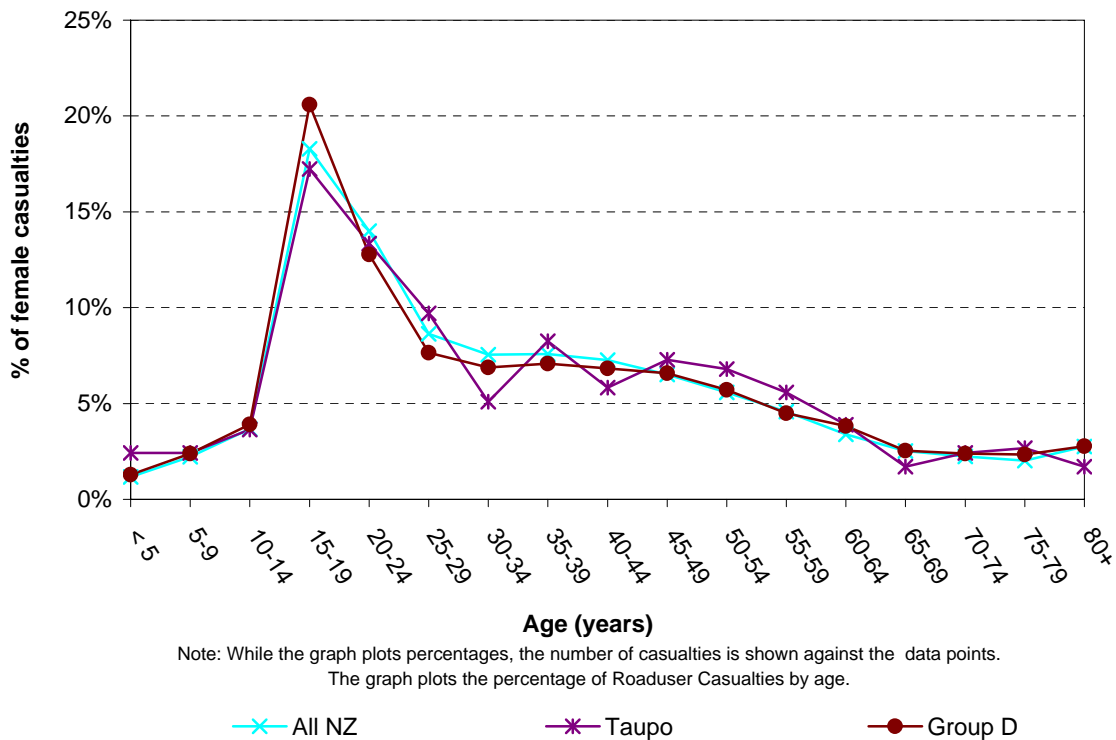


Note: This graph shows the number of male and female roadusers injured

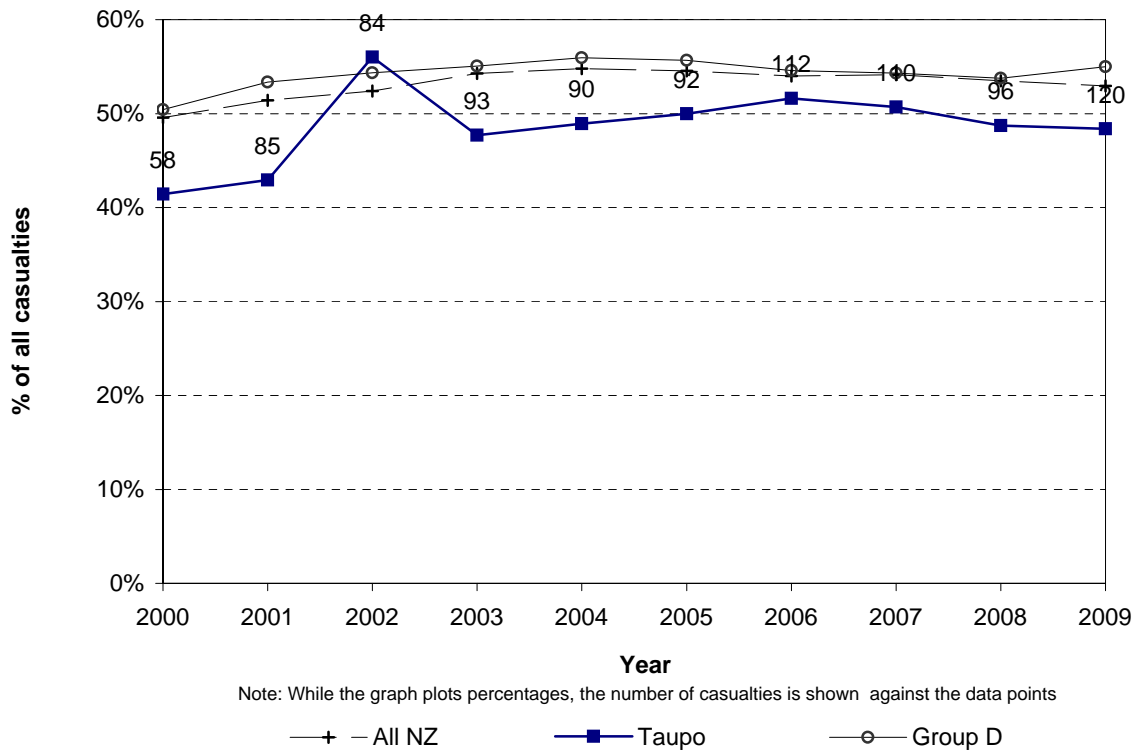
**Figure 3.5 Male casualties by age
Taupo District (2005-2009)**



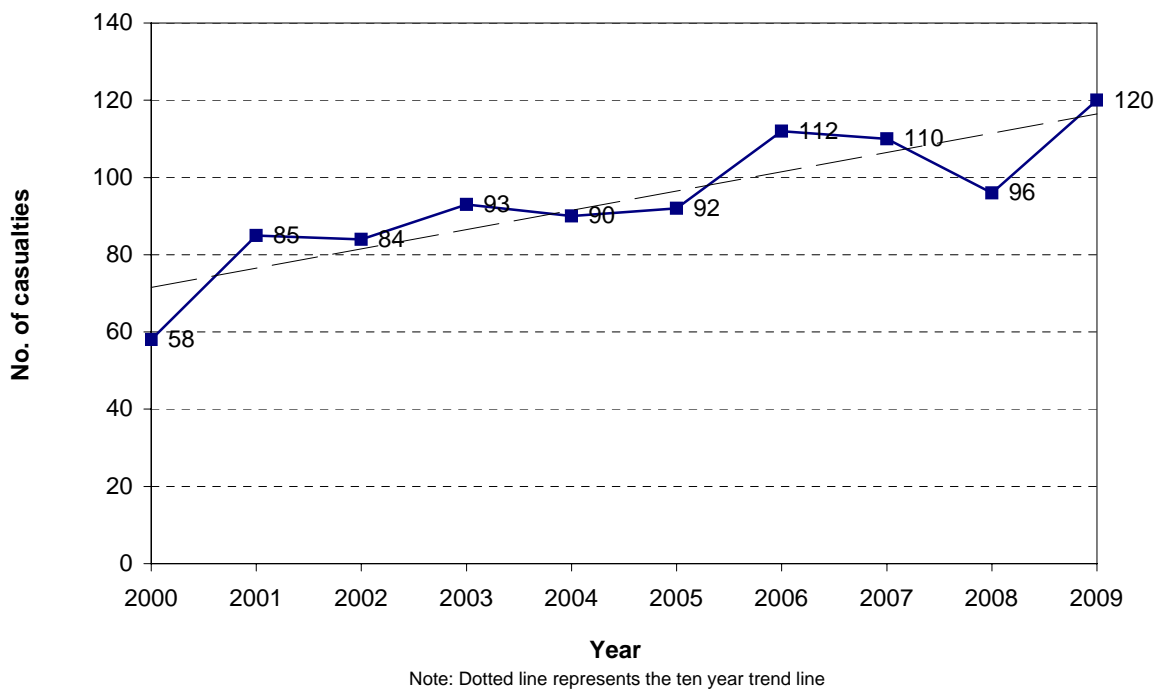
**Figure 3.6 Female casualties by age
Taupo District (2005-2009)**



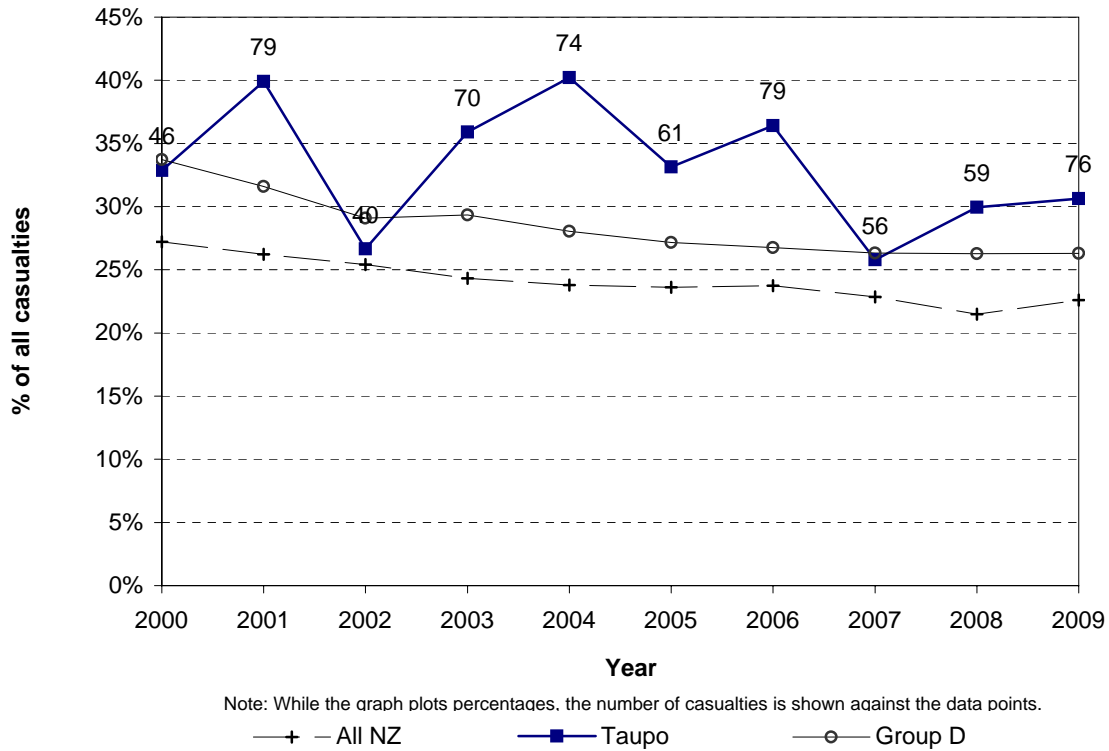
**Figure 3.7 Car/van driver casualties
Taupo District**



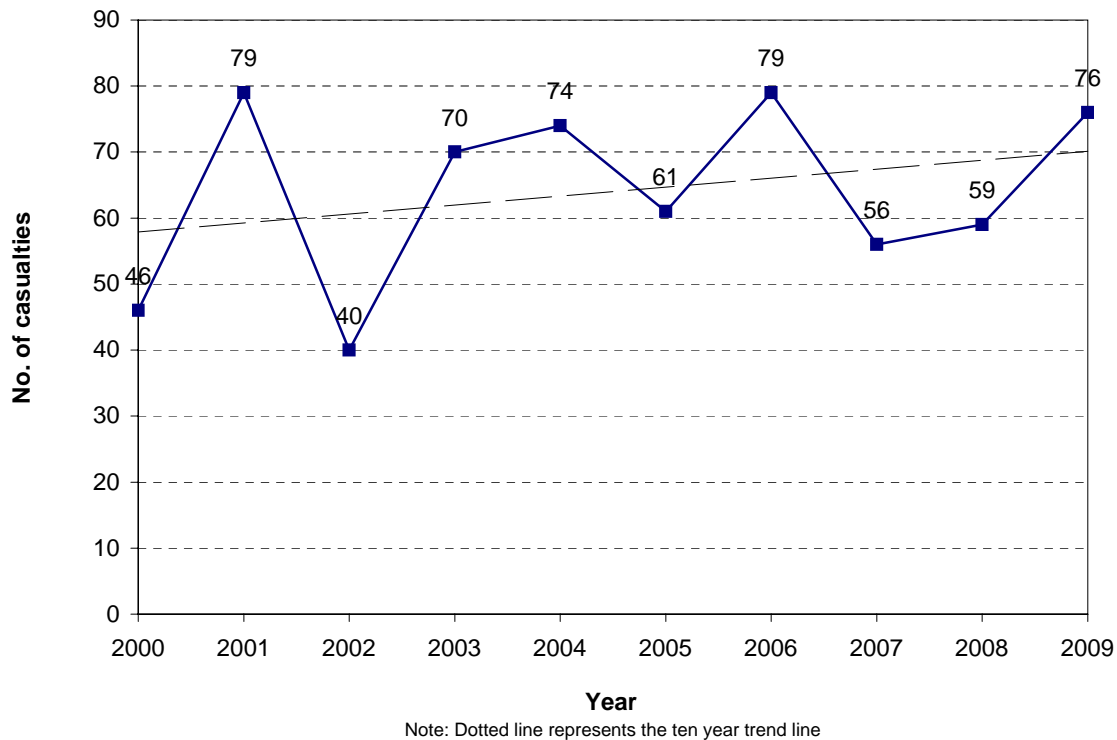
**Figure 3.8 Car/van driver casualties
Taupo District**



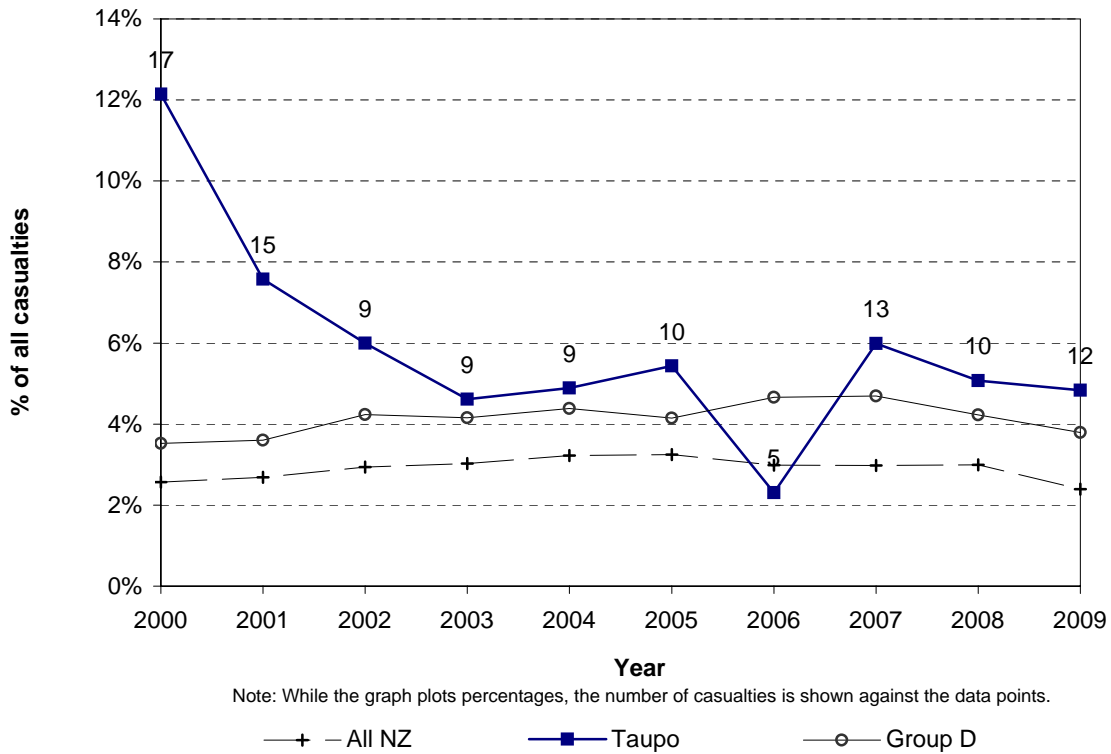
**Figure 3.9 Car/van passenger casualties
Taupo District**



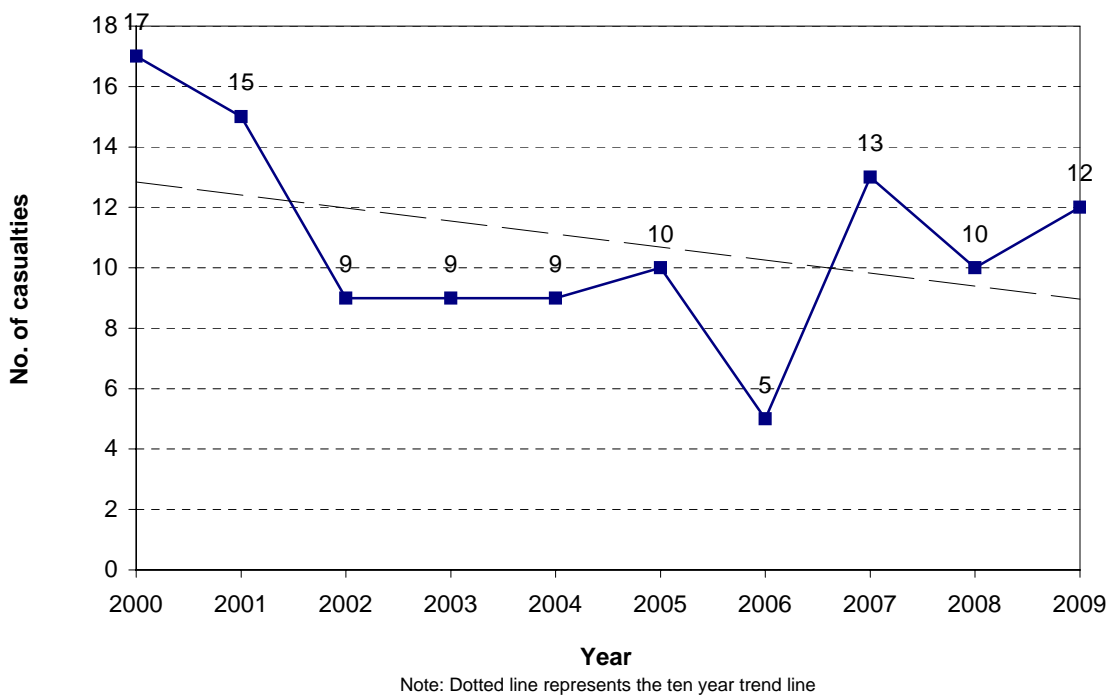
**Figure 3.10 Car/van passenger casualties
Taupo District**



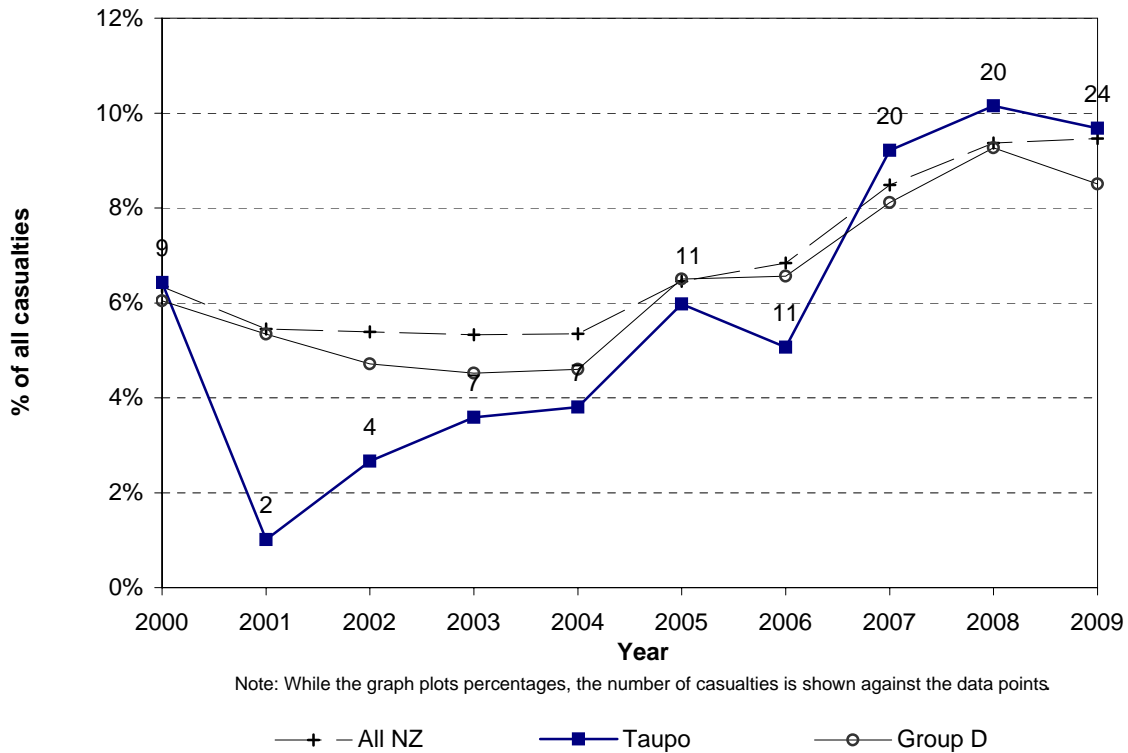
**Figure 3.11 Heavy vehicle casualties
Taupo District**



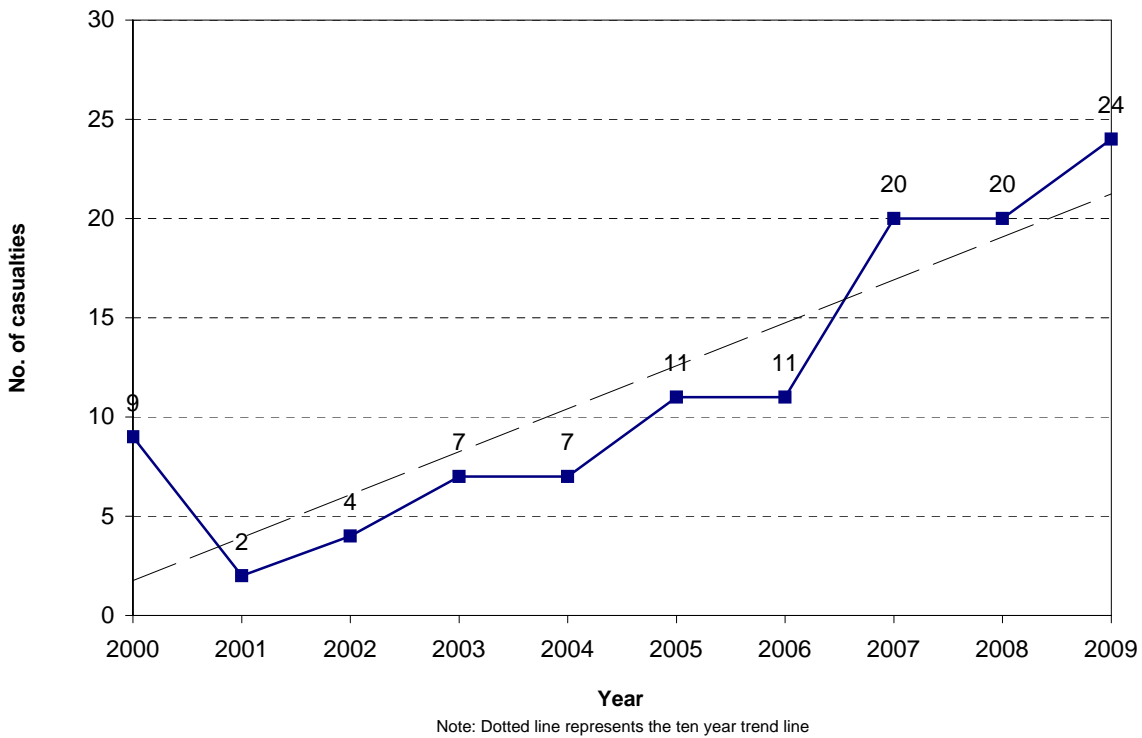
**Figure 3.12 Heavy vehicle casualties
Taupo District**



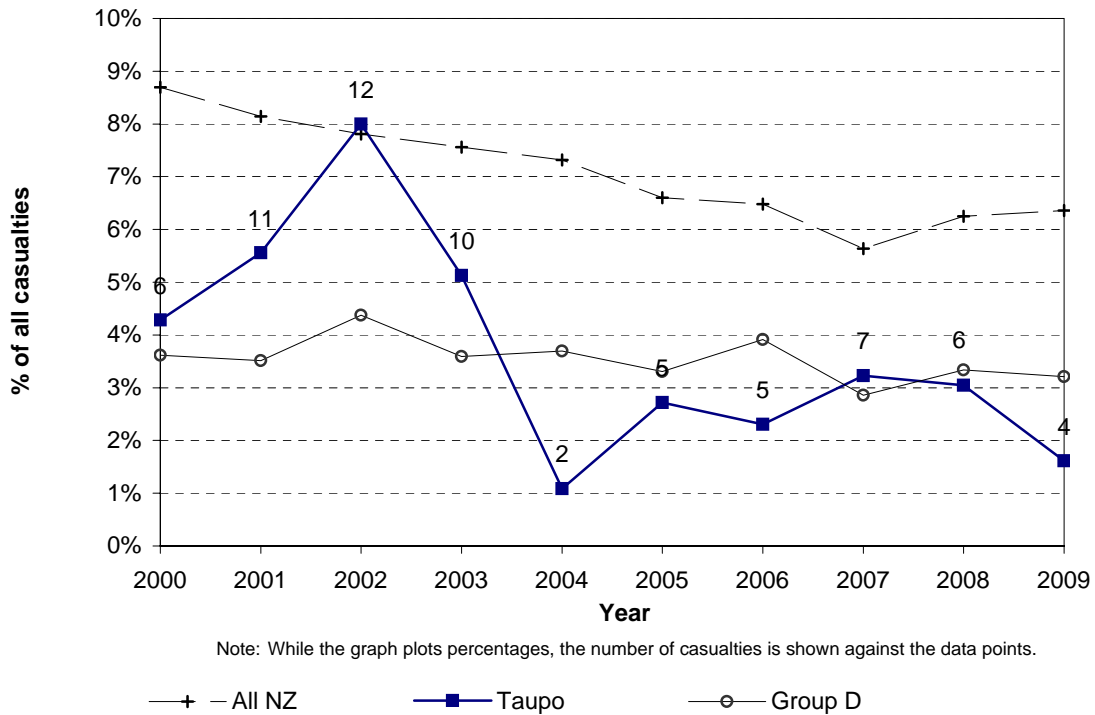
**Figure 3.13 Motorcyclist casualties
Taupo District**



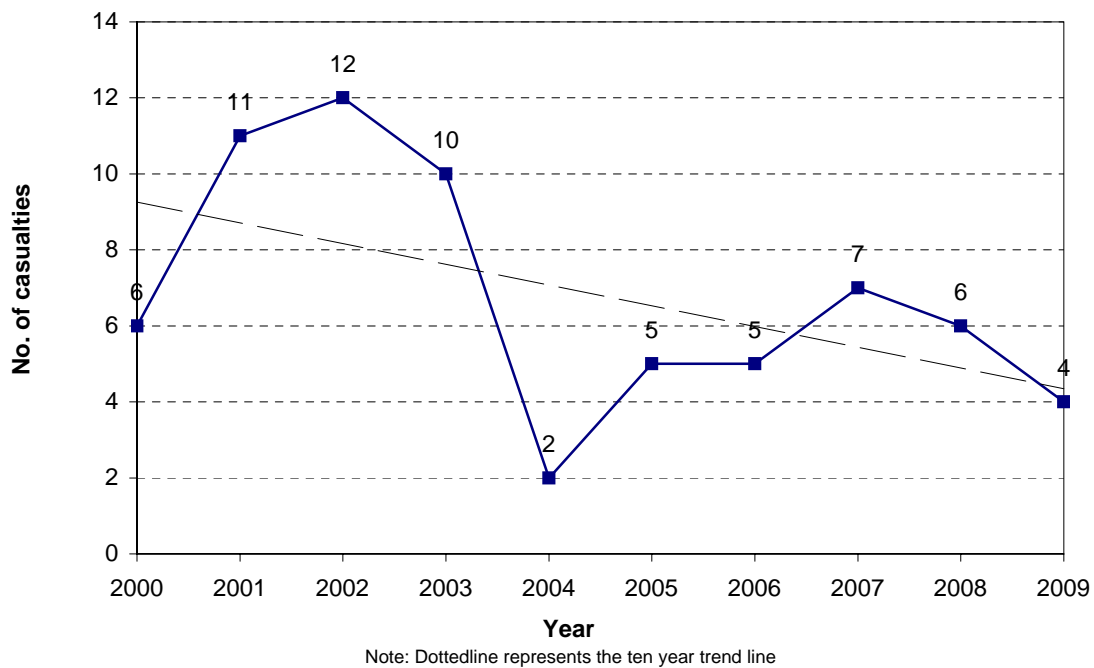
**Figure 3.14 Motorcyclist casualties
Taupo District**



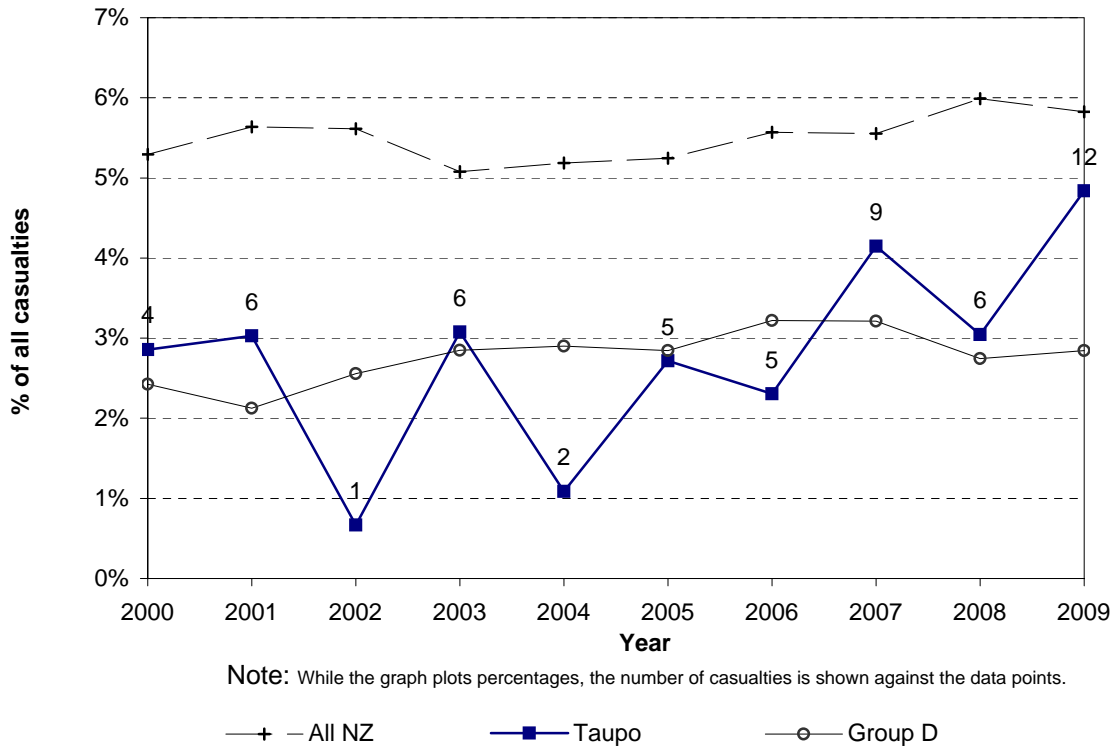
**Figure 3.15 Pedestrian casualties
Taupo District**



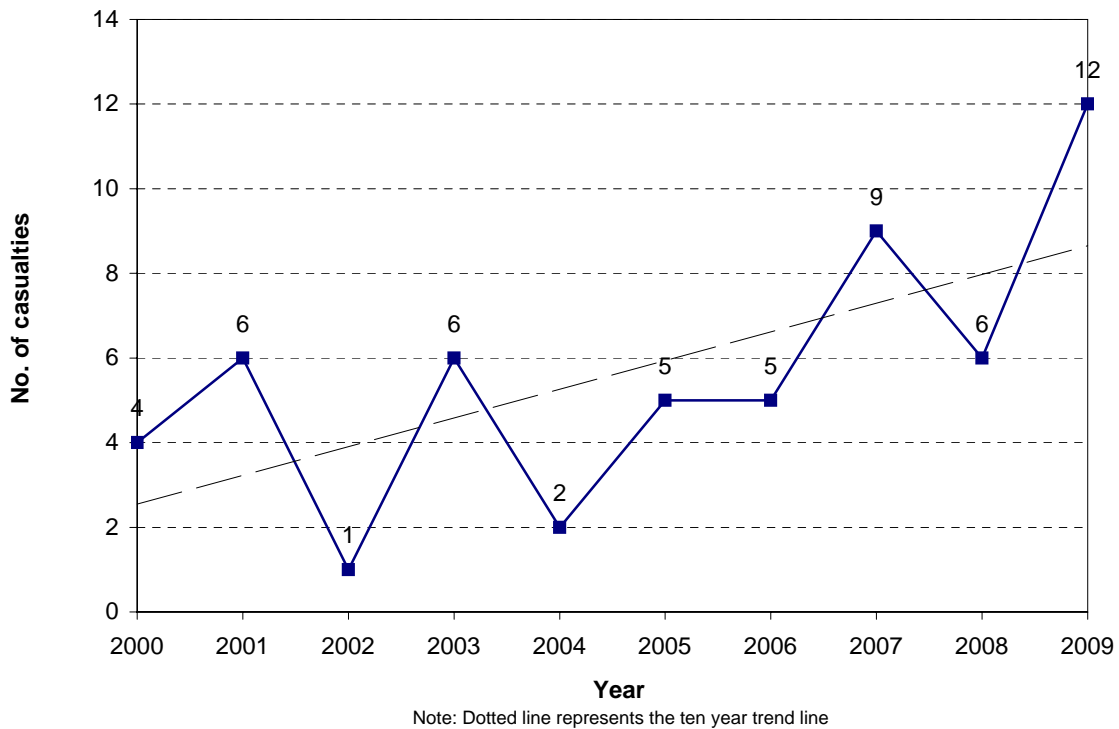
**Figure 3.16 Pedestrian casualties
Taupo District**



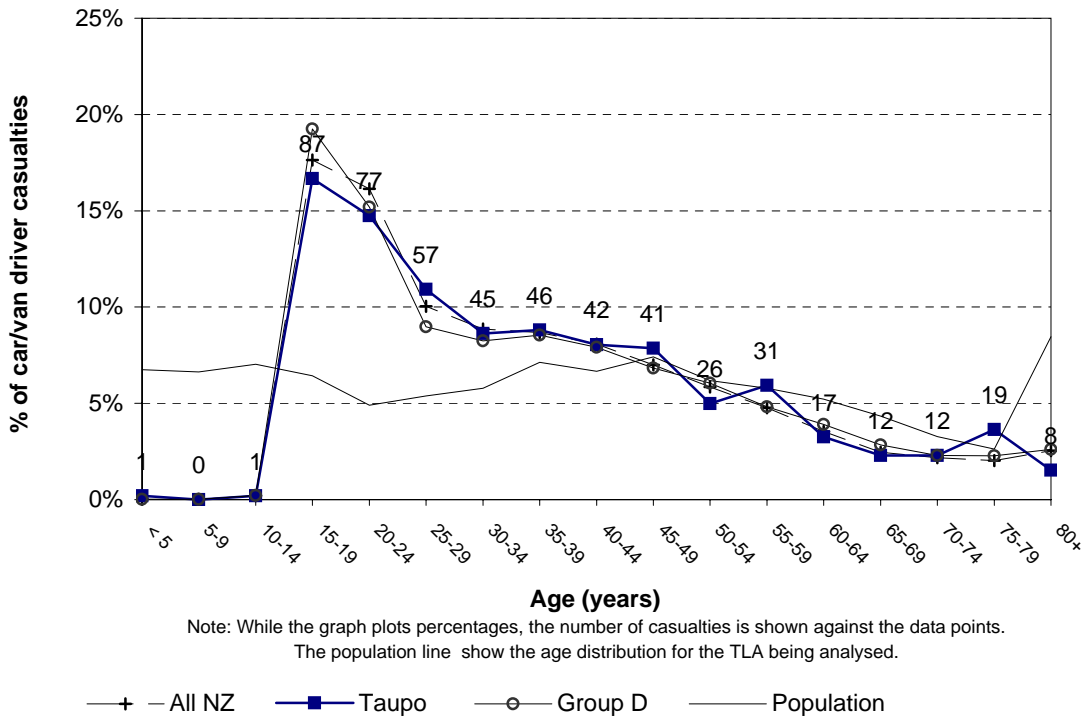
**Figure 3.17 Cyclist casualties
Taupo District**



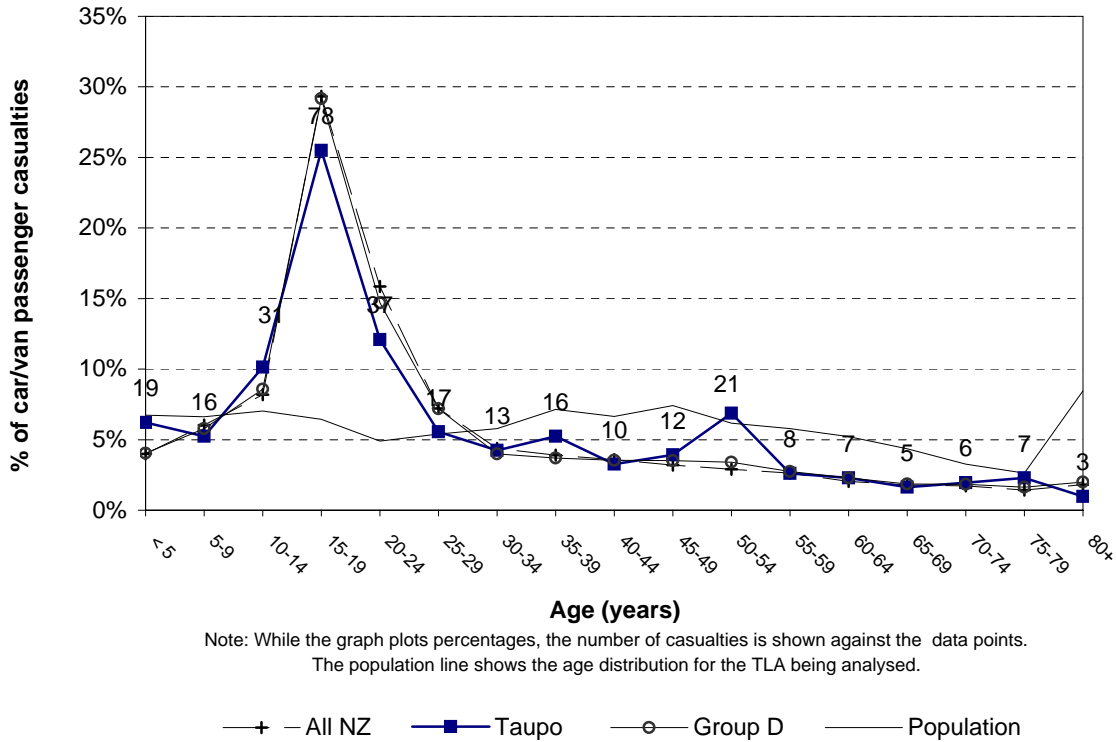
**Figure 3.18 Cyclist casualties
Taupo District**



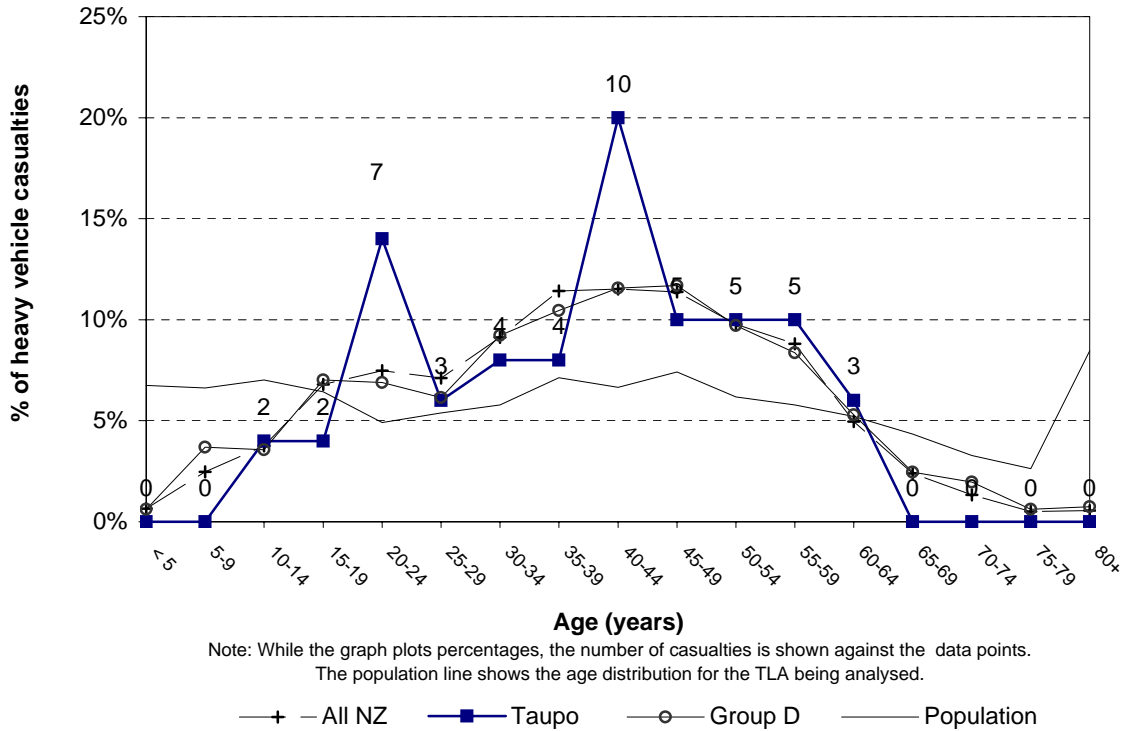
**Figure 3.19 Car/van driver casualty age
Taupo District (2005-2009)**



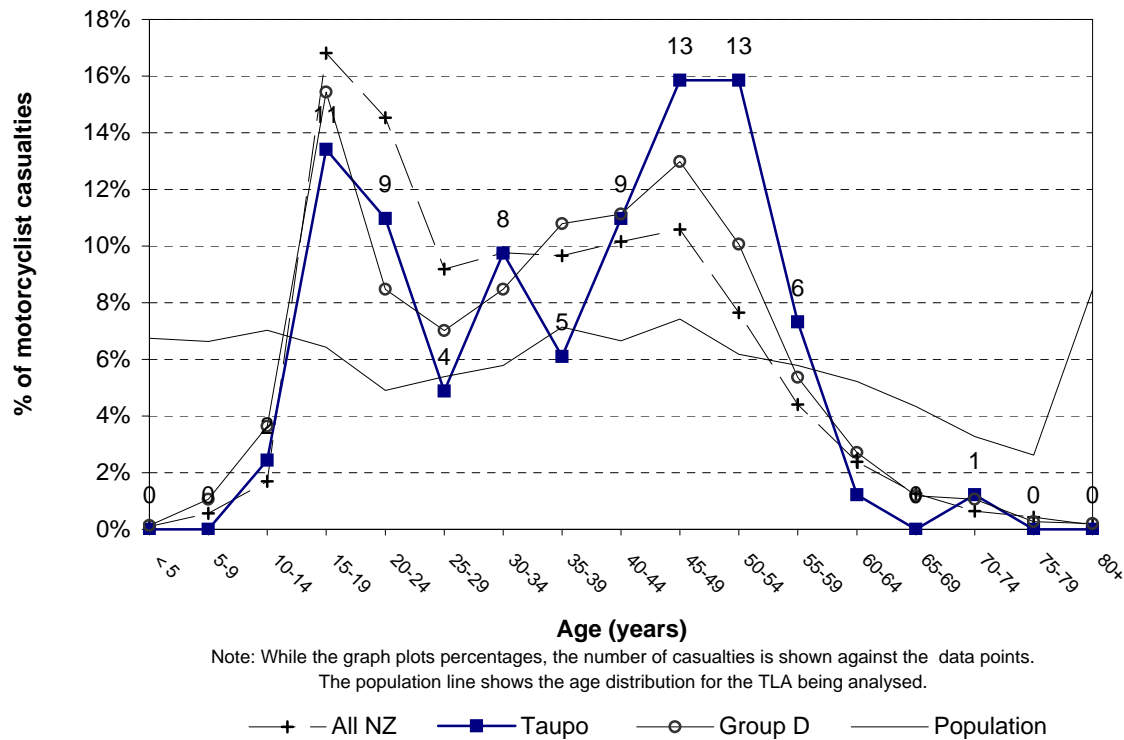
**Figure 3.20 Car/van passenger casualty age
Taupo District (2005-2009)**



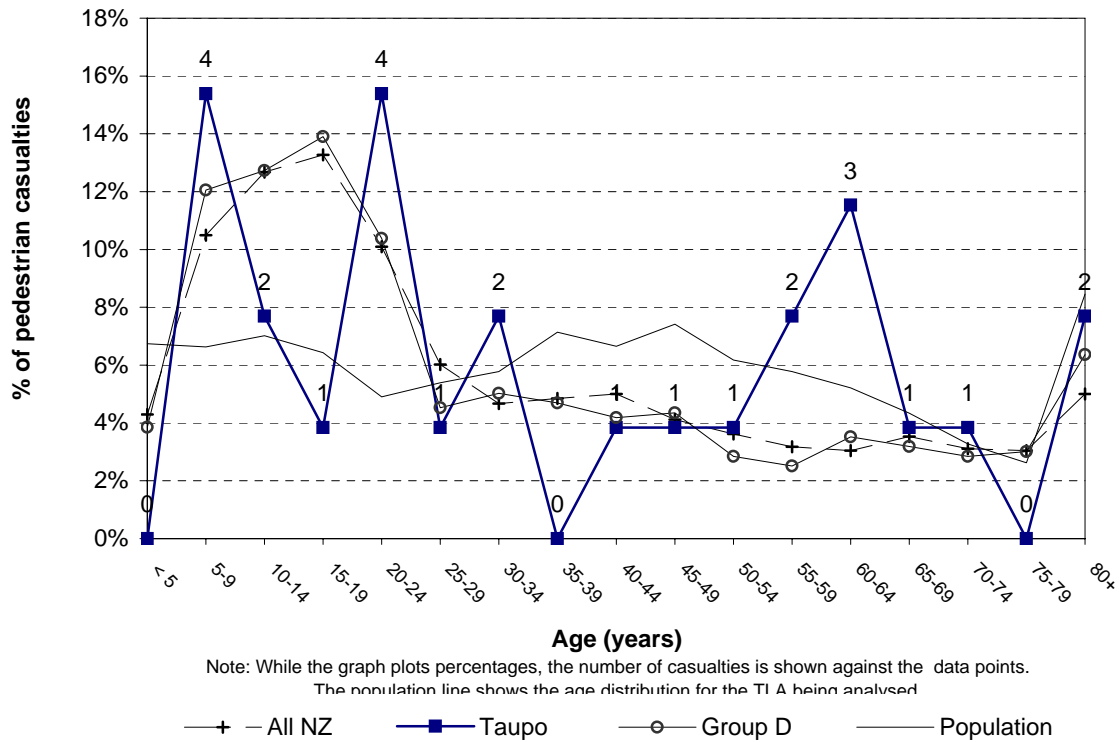
**Figure 3.21 Heavy vehicle casualty age
Taupo District (2005-2009)**



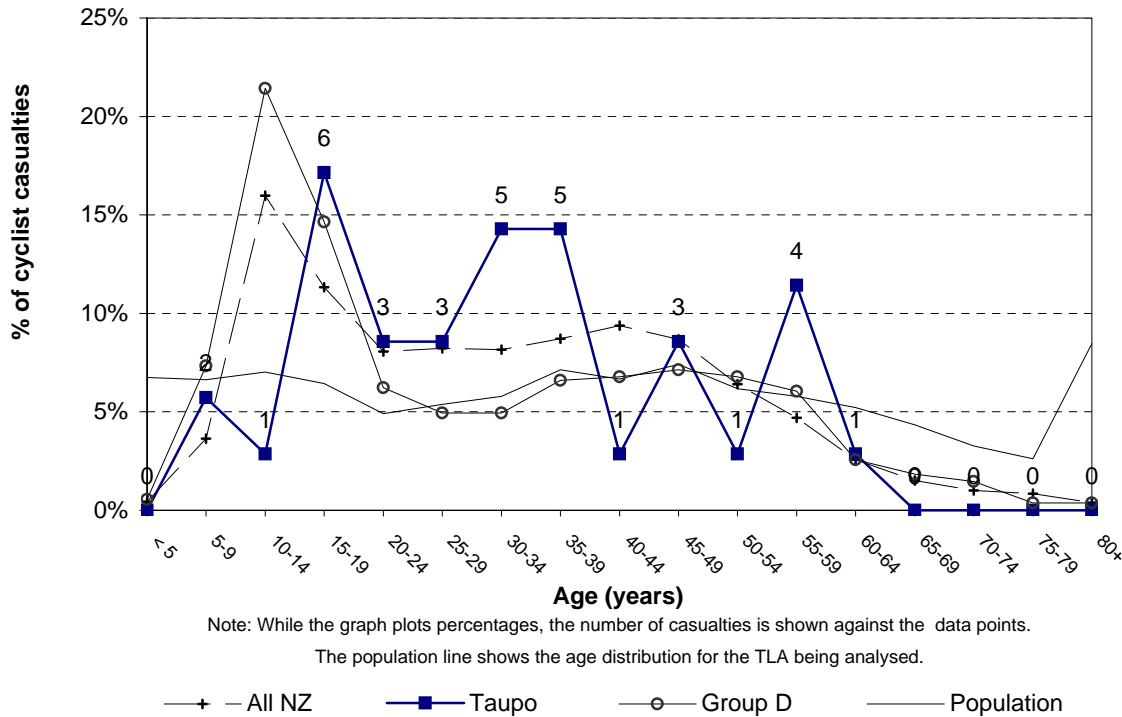
**Figure 3.22 Motorcyclist casualty age
Taupo District (2005-2009)**



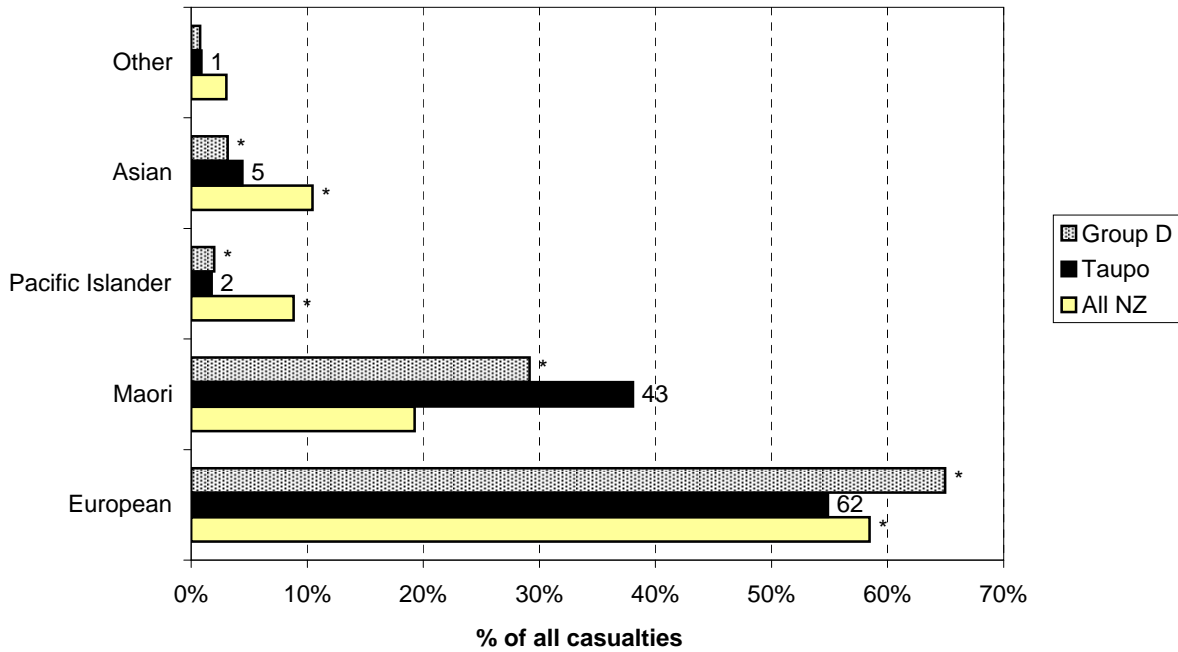
**Figure 3.23 Pedestrian casualty age
Taupo District (2005-2009)**



**Figure 3.24 Cyclist casualty age
Taupo District (2005-2009)**

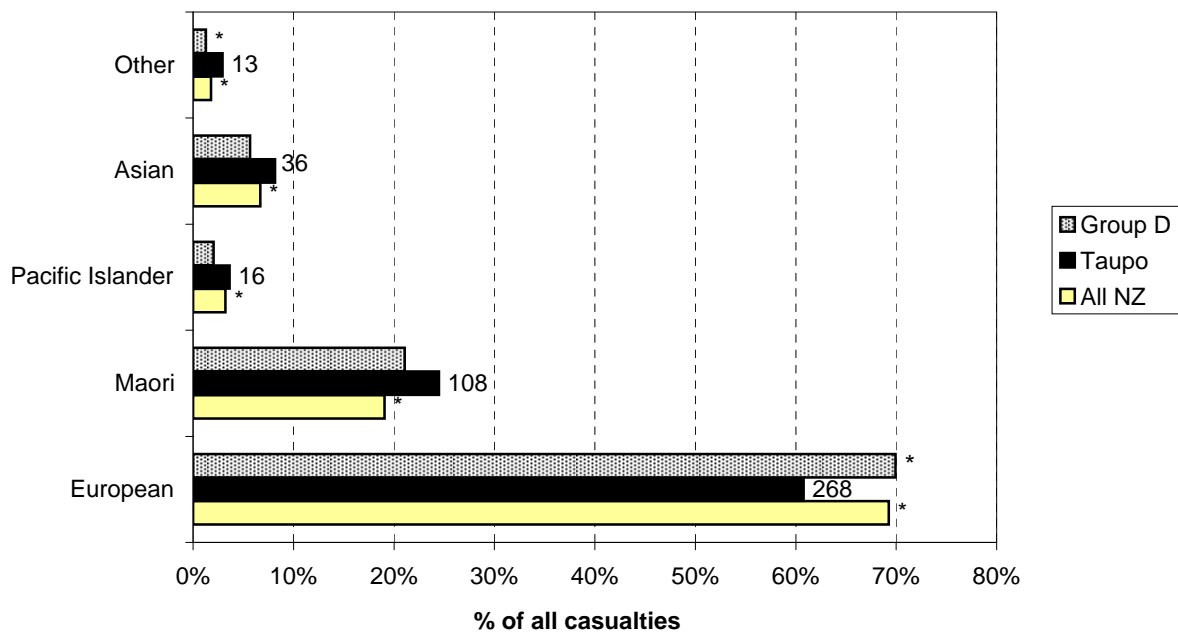


**Figure 3.25 Casualty ethnicity - urban
Taupo District (2005-2009)**



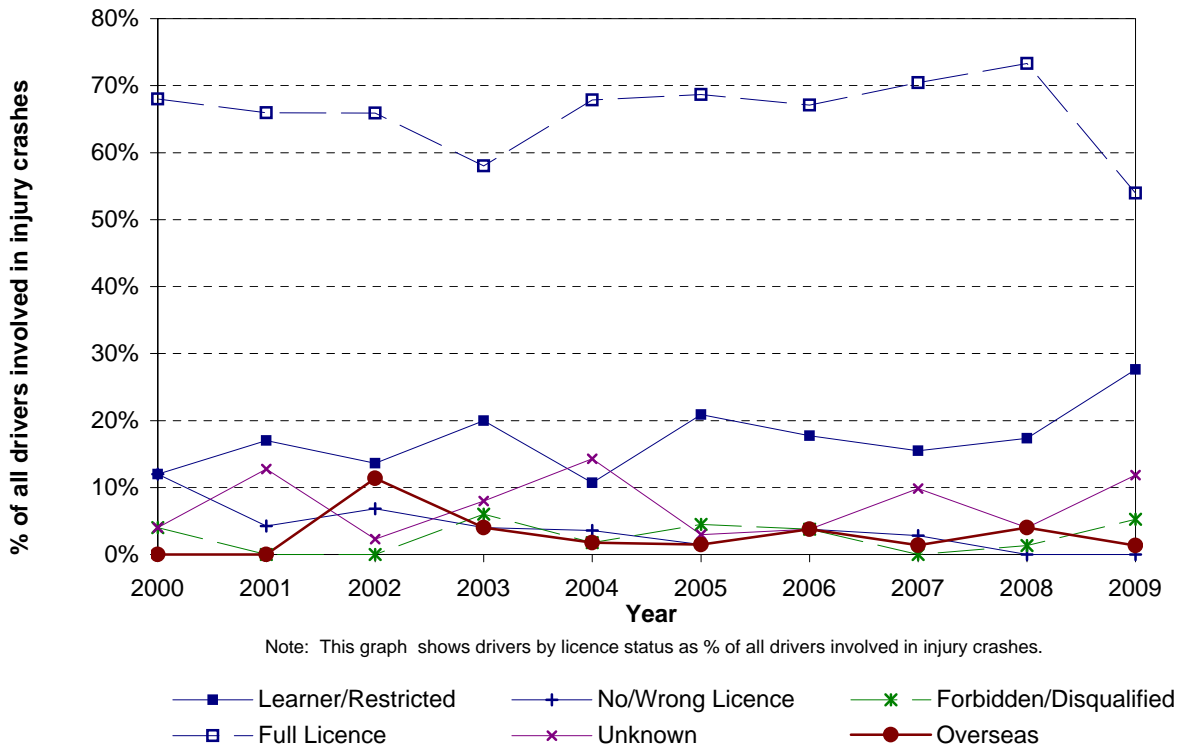
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 3.26 Casualty ethnicity - rural
Taupo District (2005-2009)**

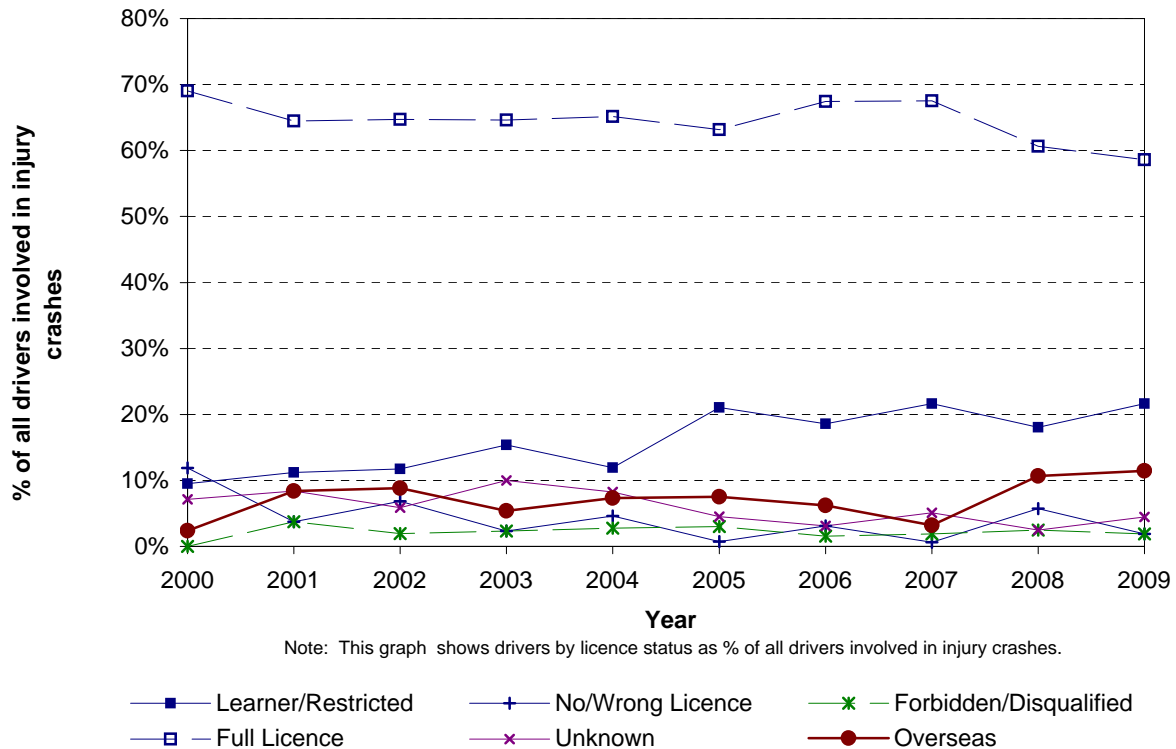


Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 3.27 Licence status - urban
Taupo District**

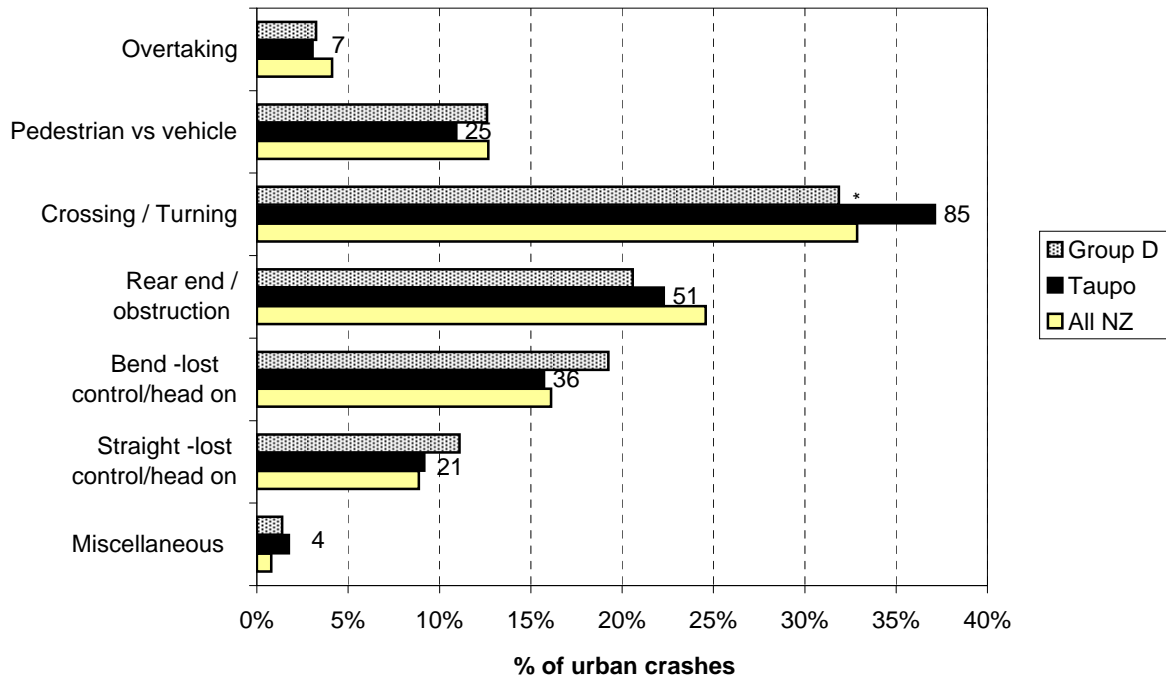


**Figure 3.28 Licence status - rural
Taupo District**



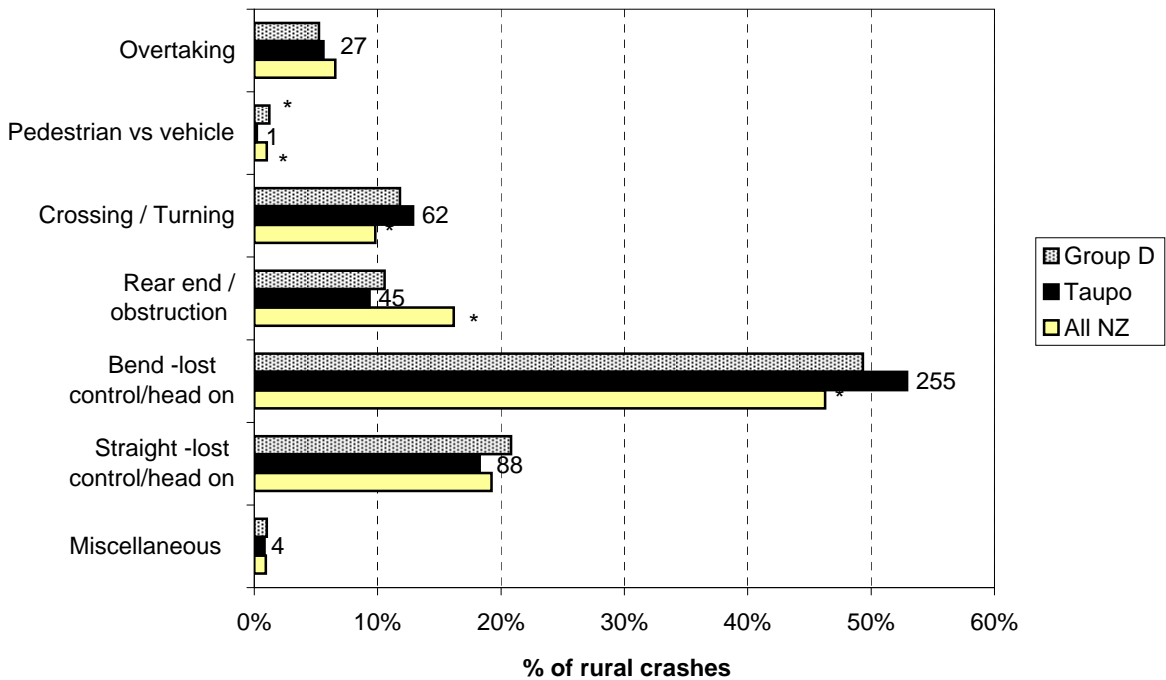
Crash Type Statistics

**Figure 4.1 Crash movement type - urban
Taupo District (2005-2009)**



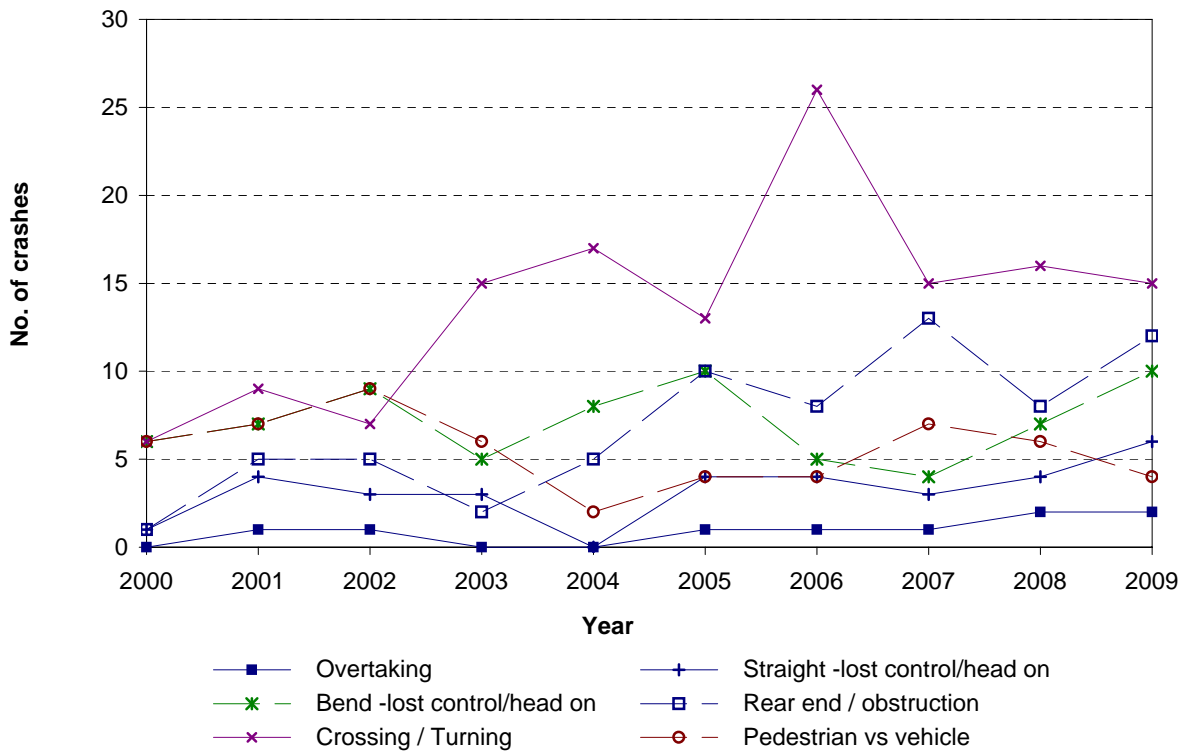
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 4.2 Crash movement type - rural
Taupo District roads (2005-2009)**

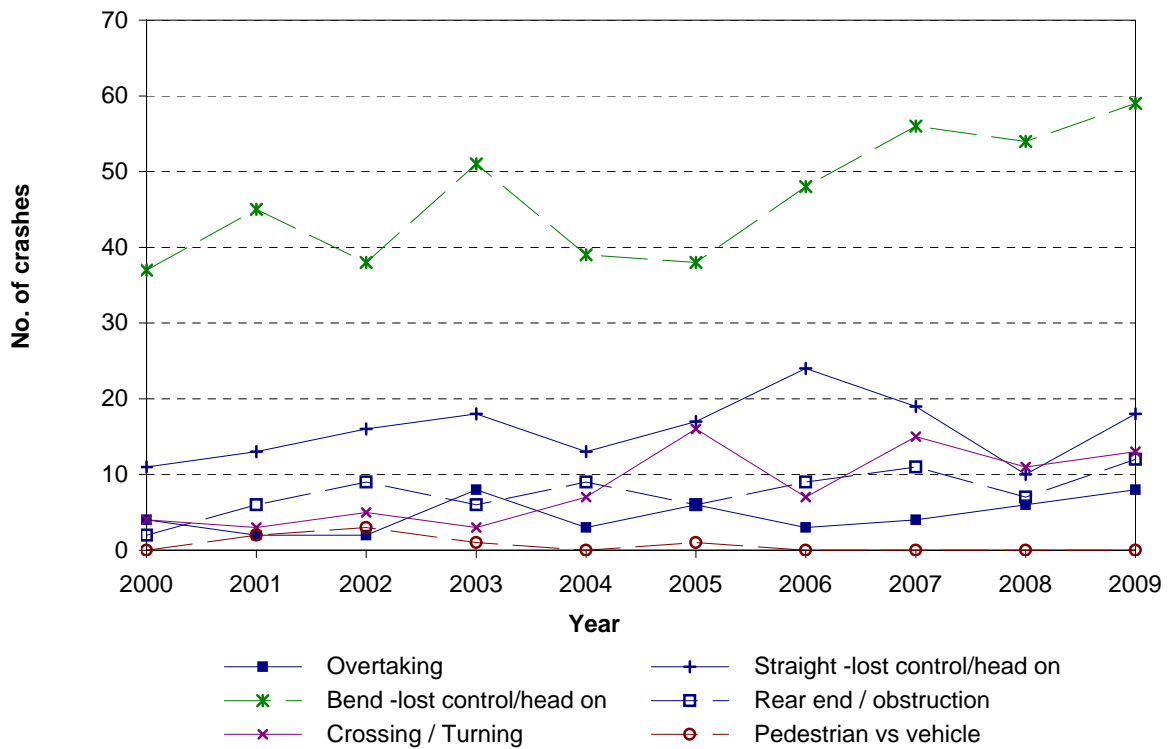


Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

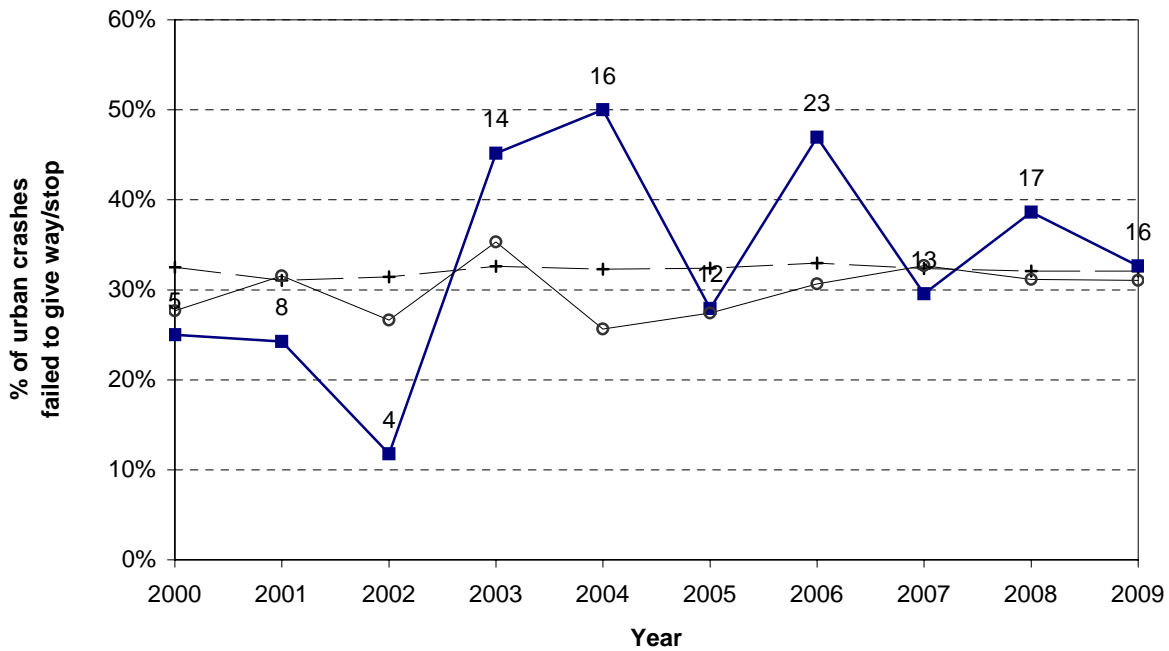
**Figure 4.3 Crash movement type - trends
Taupo District - urban roads**



**Figure 4.4 Crash movement type - trends
Taupo District - rural roads**



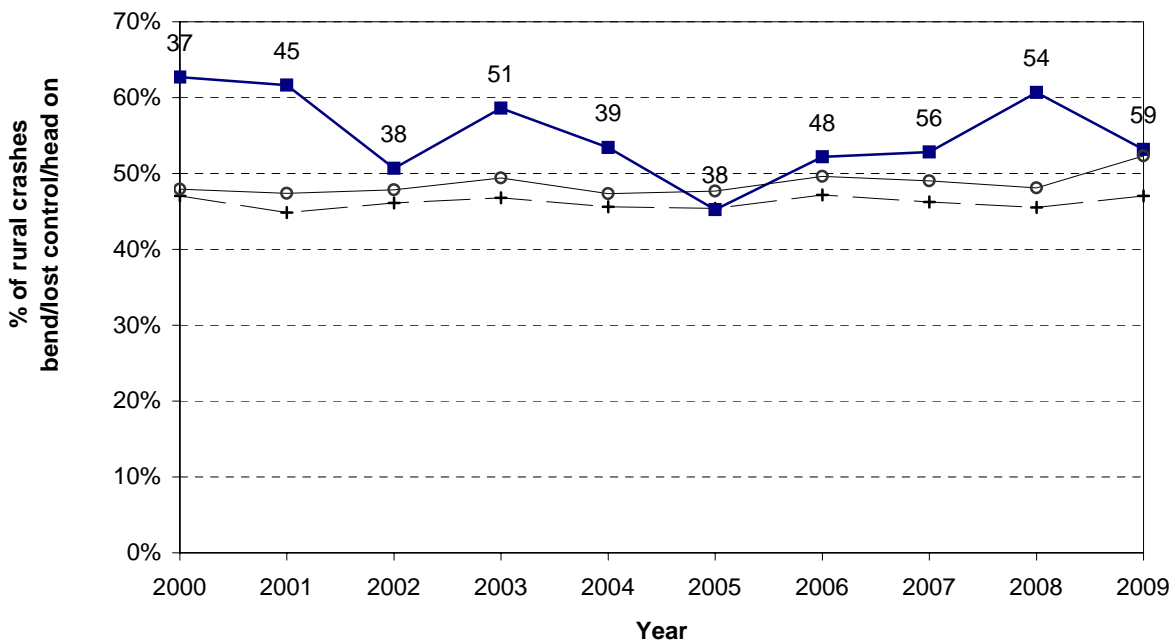
**Figure 4.5 Failed to give way / stop
Taupo District - urban roads**



Note: While the graph plots percentages, the number of crashes is shown against the data points.

—+— All NZ —■— Taupo —○— Group D

**Figure 4.6 Bend - lost control / head - on
Taupo District - rural roads**

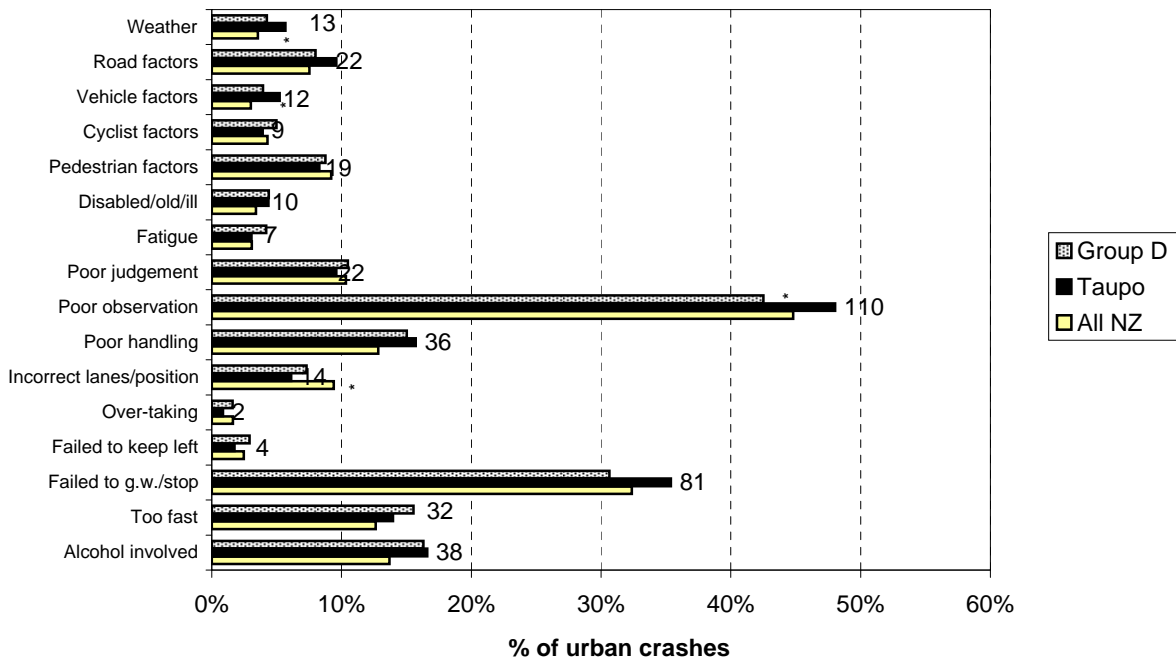


Note: While the graph plots percentages, the number of crashes is shown against the data points.

—+— All NZ —■— Taupo —○— Group D

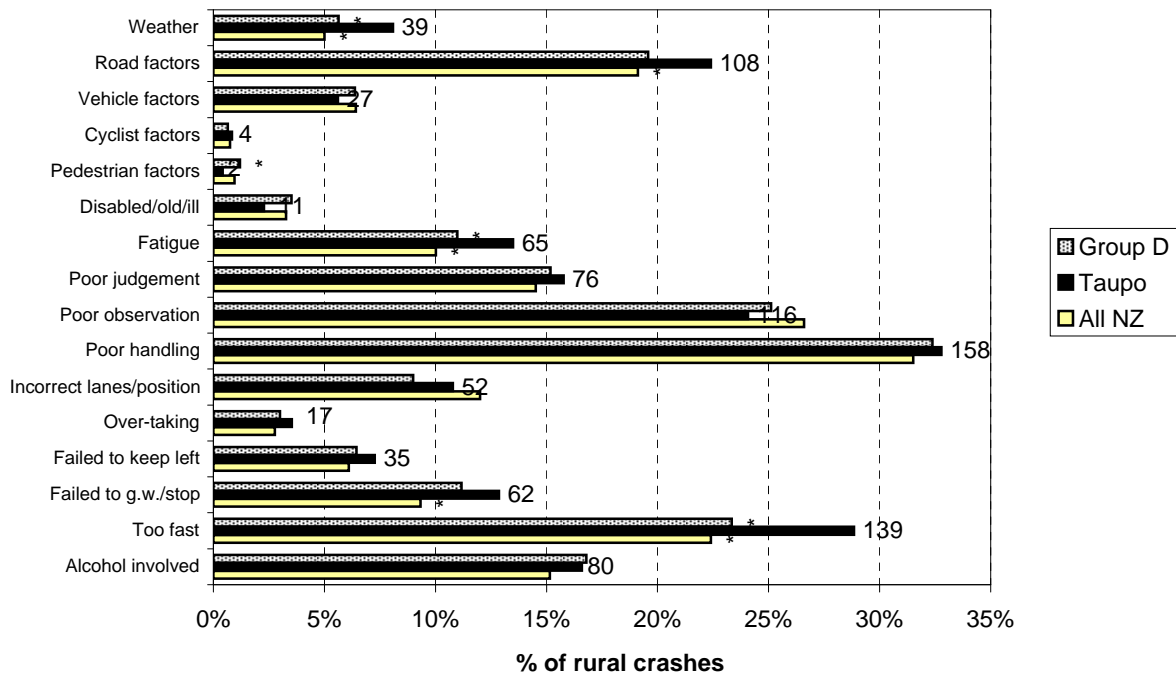
Crash Factor Statistics

**Figure 5.1 Contributing factors - urban
Taupo District (2005-2009)**



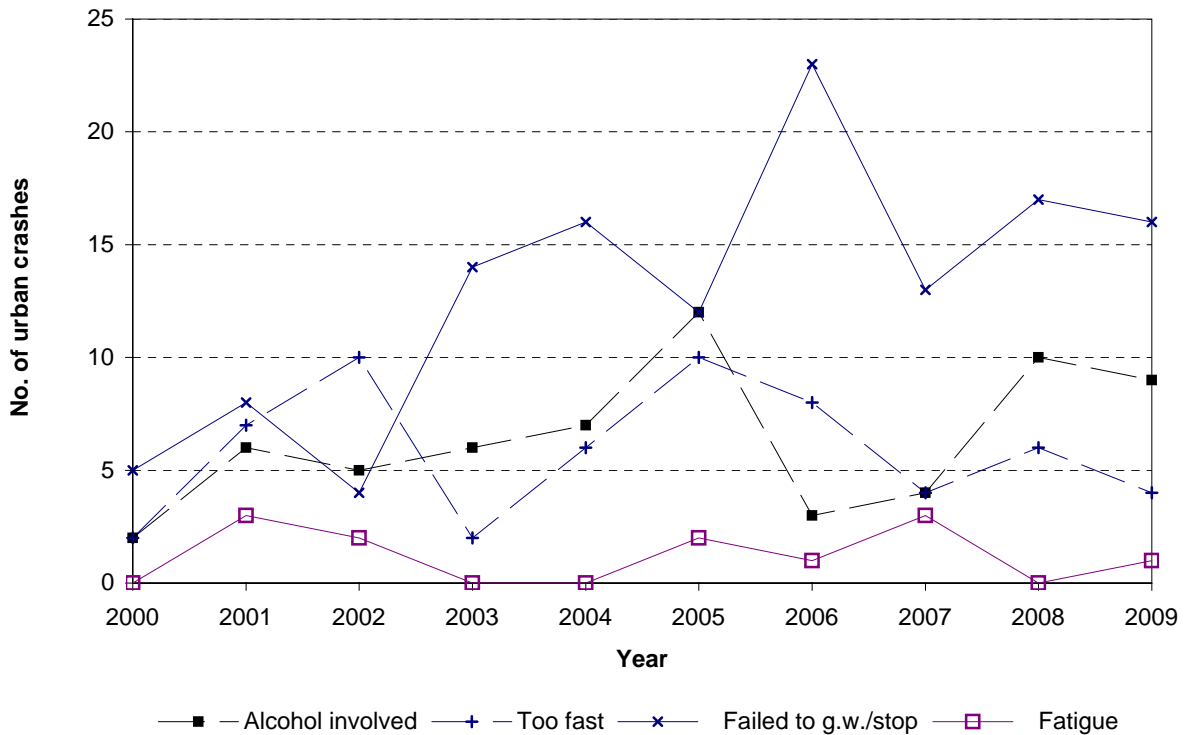
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 5.2 Contributing factors - rural
Taupo District (2005-2009)**

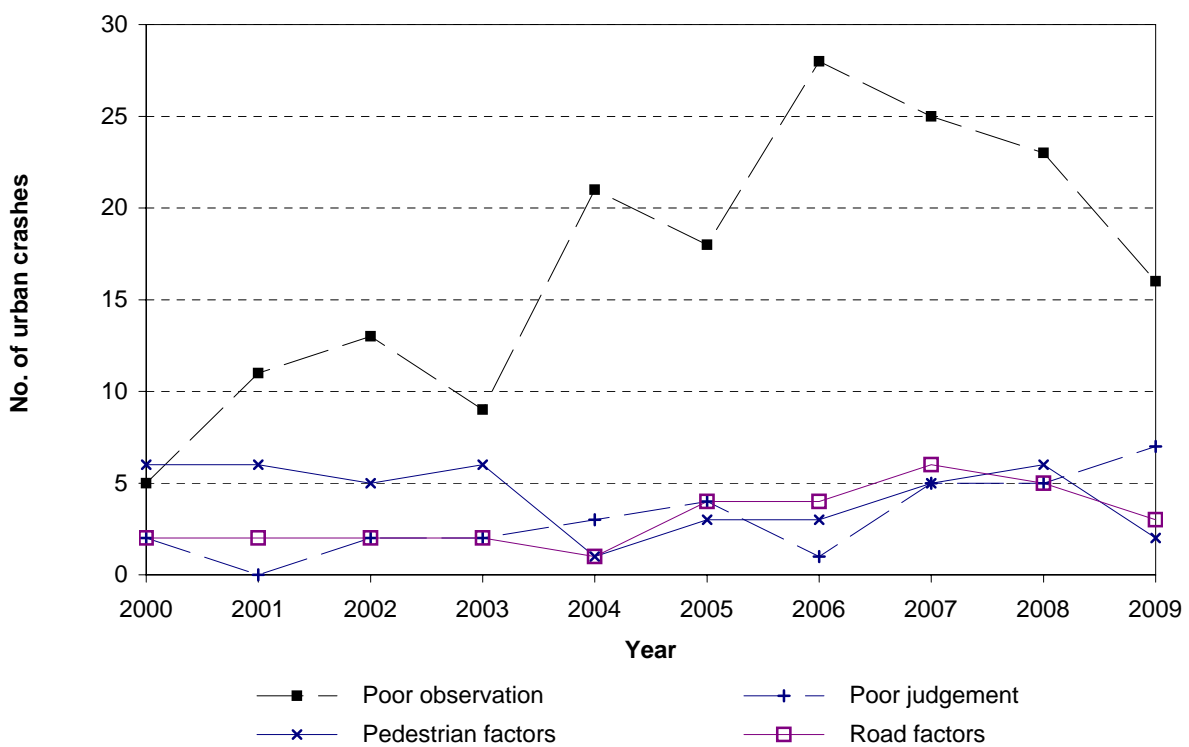


Note: While the graph plots percentages, the number of casualties is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

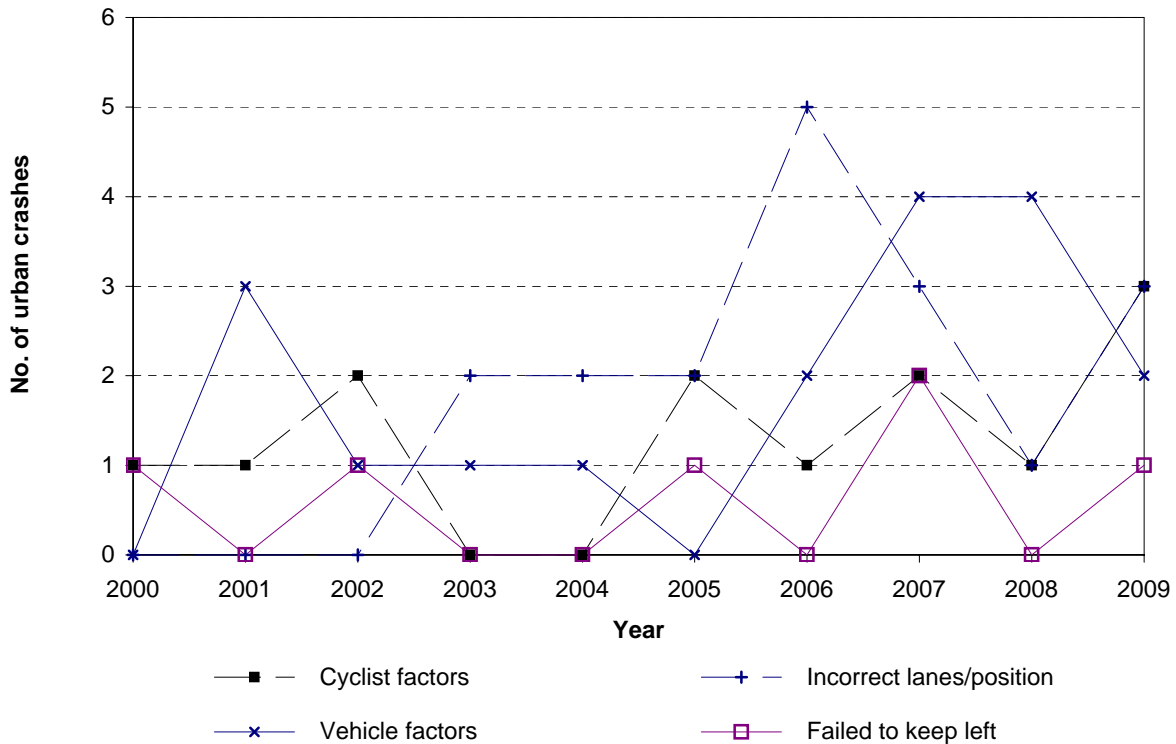
**Figure 5.3 Contributing factor trends
Taupo District - urban roads**



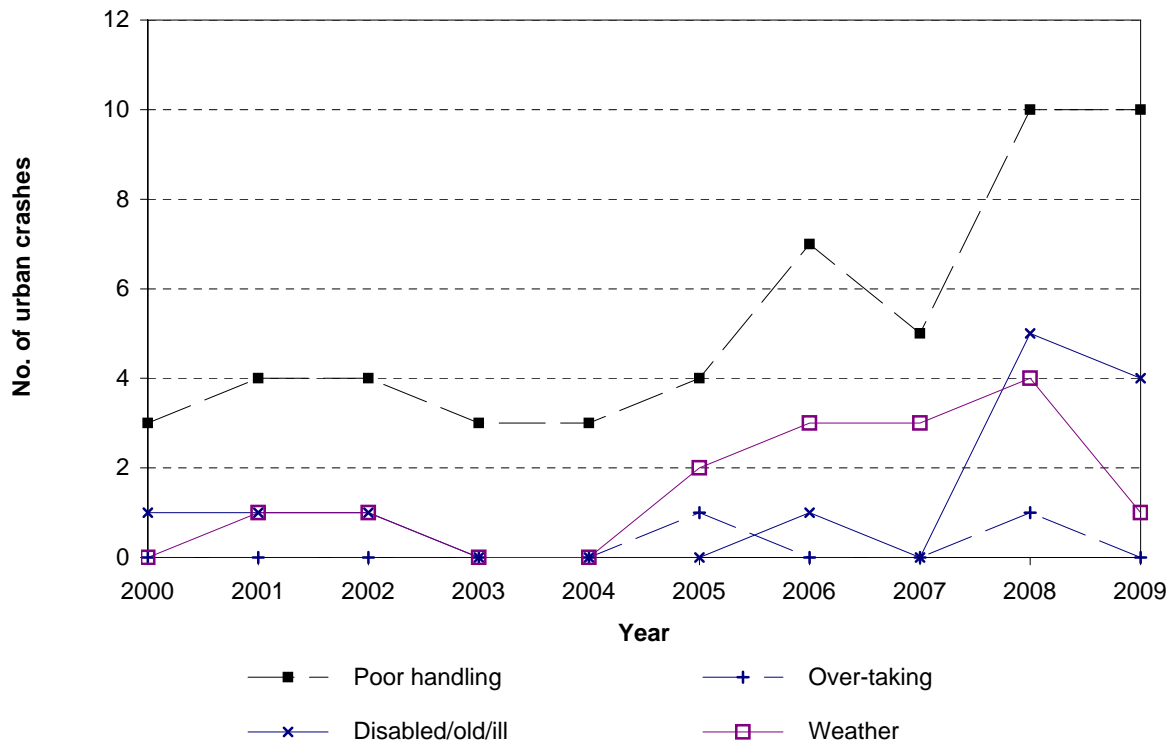
**Figure 5.4 Contributing factor trends
Taupo District - urban roads**



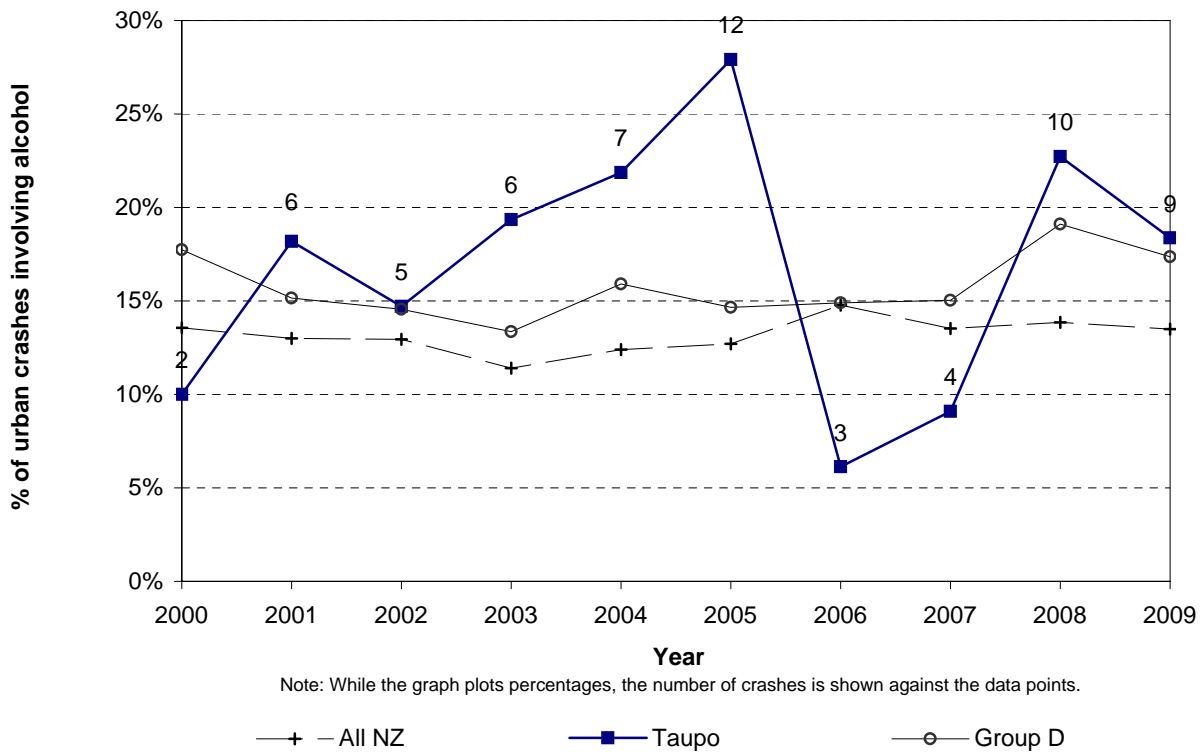
**Figure 5.5 Contributing factor trends
Taupo District - urban roads**



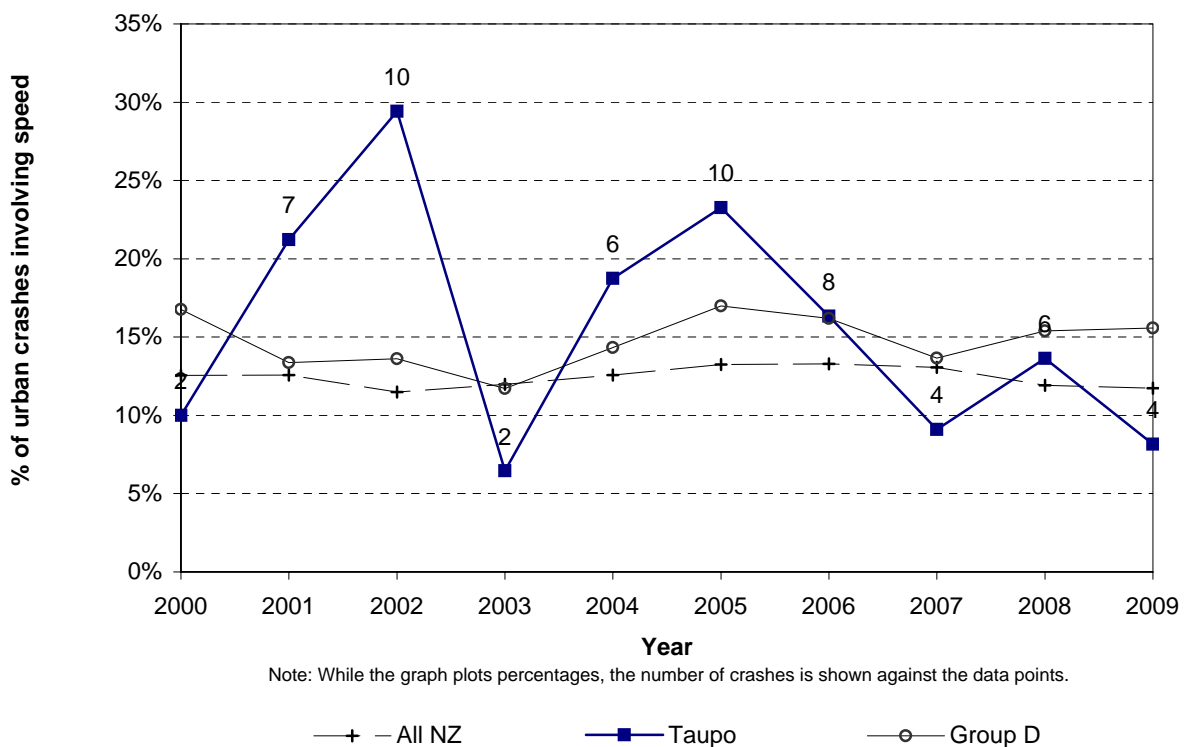
**Figure 5.6 Contributing factor trends
Taupo District - urban roads**



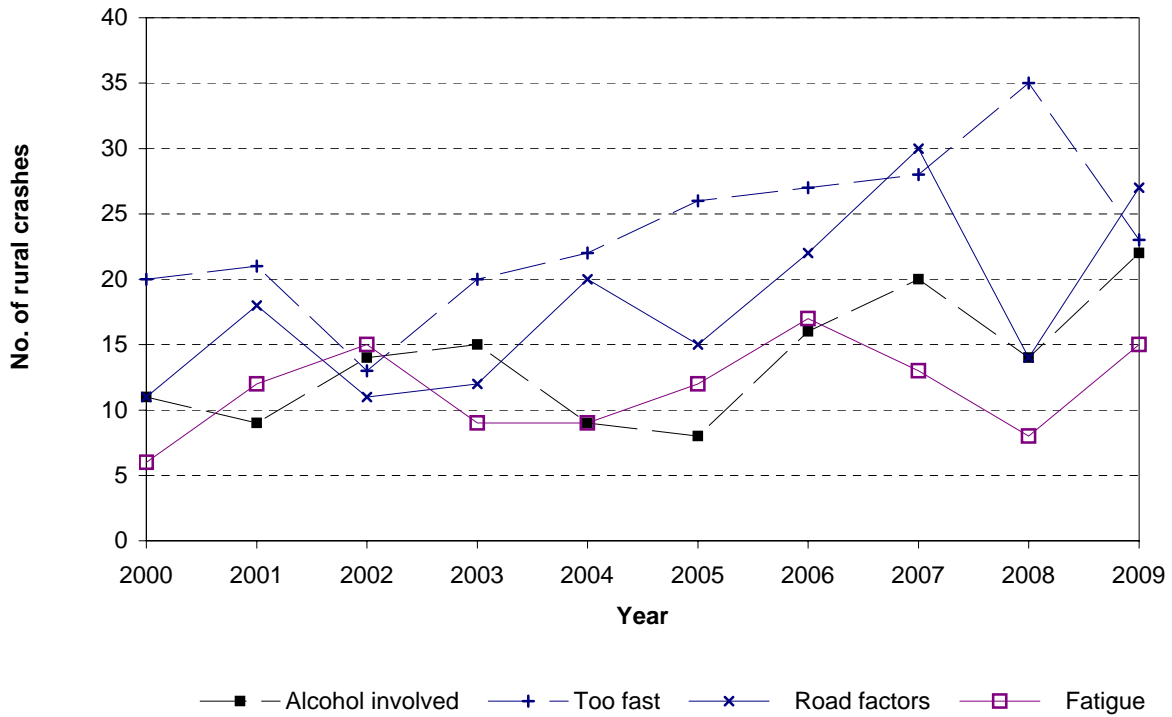
**Figure 5.7 Alcohol involved trend
Taupo District - urban roads**



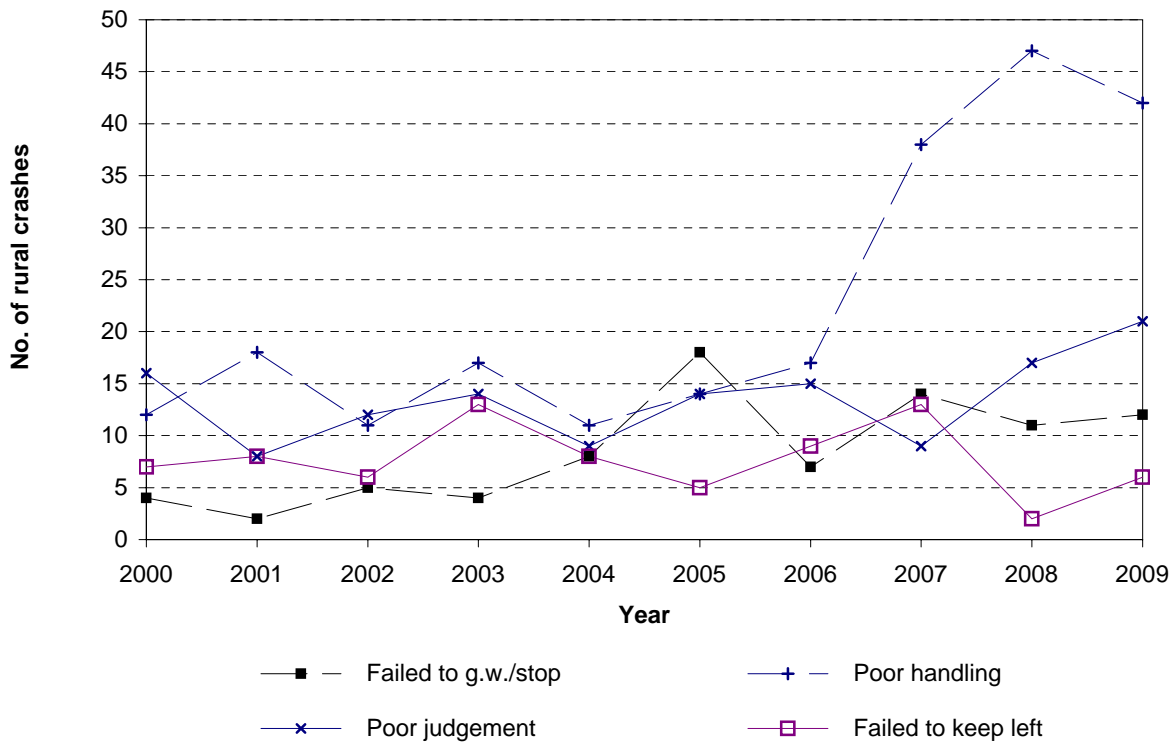
**Figure 5.8 Speed involved trend
Taupo District - urban roads**



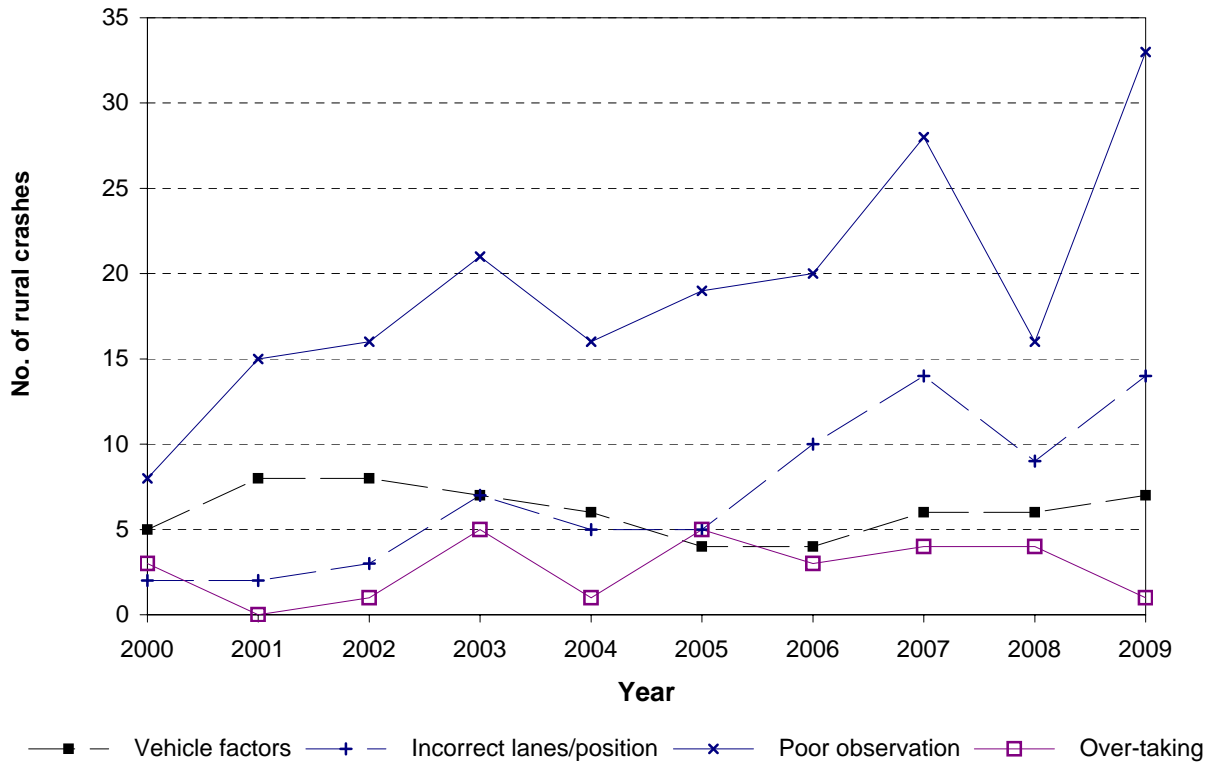
**Figure 5.9 Contributing factor trends
Taupo District - rural roads**



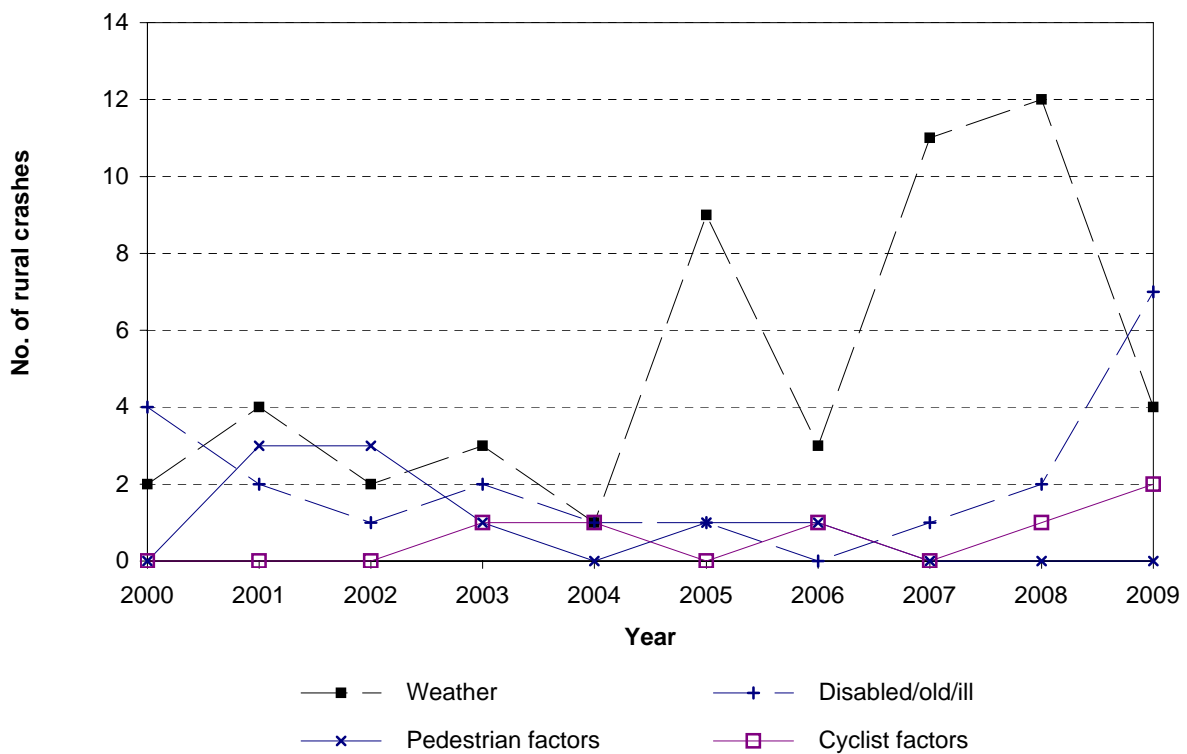
**Figure 5.10 Contributing factor trends
Taupo District - rural roads**



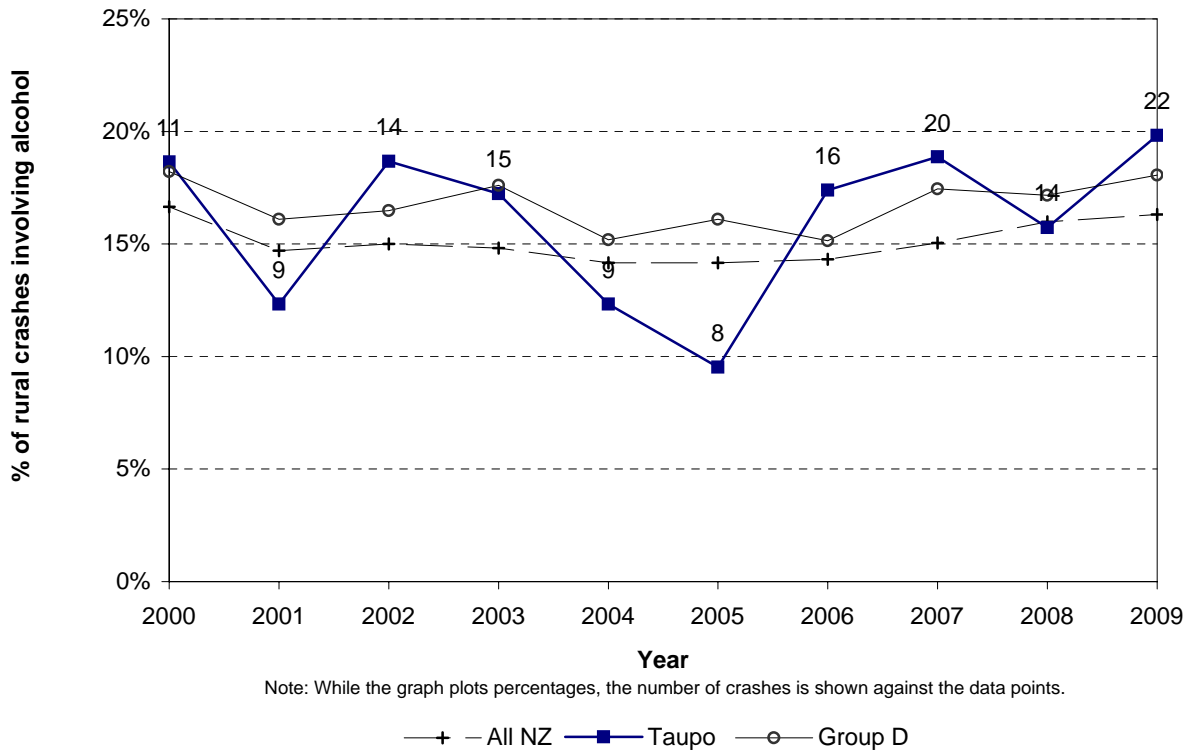
**Figure 5.11 Contributing factor trends
Taupo District - rural roads**



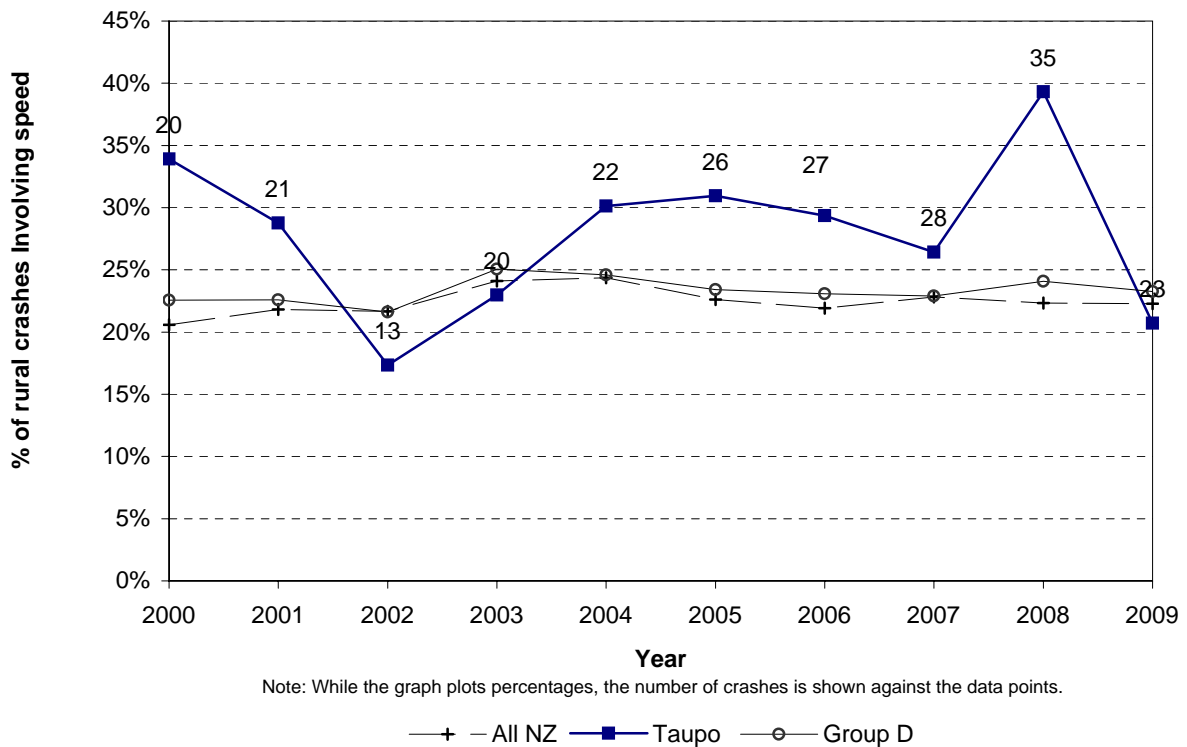
**Figure 5.12 Contributing factor trends
Taupo District - rural roads**



**Figure 5.13 Alcohol involved trend
Taupo District - rural roads**

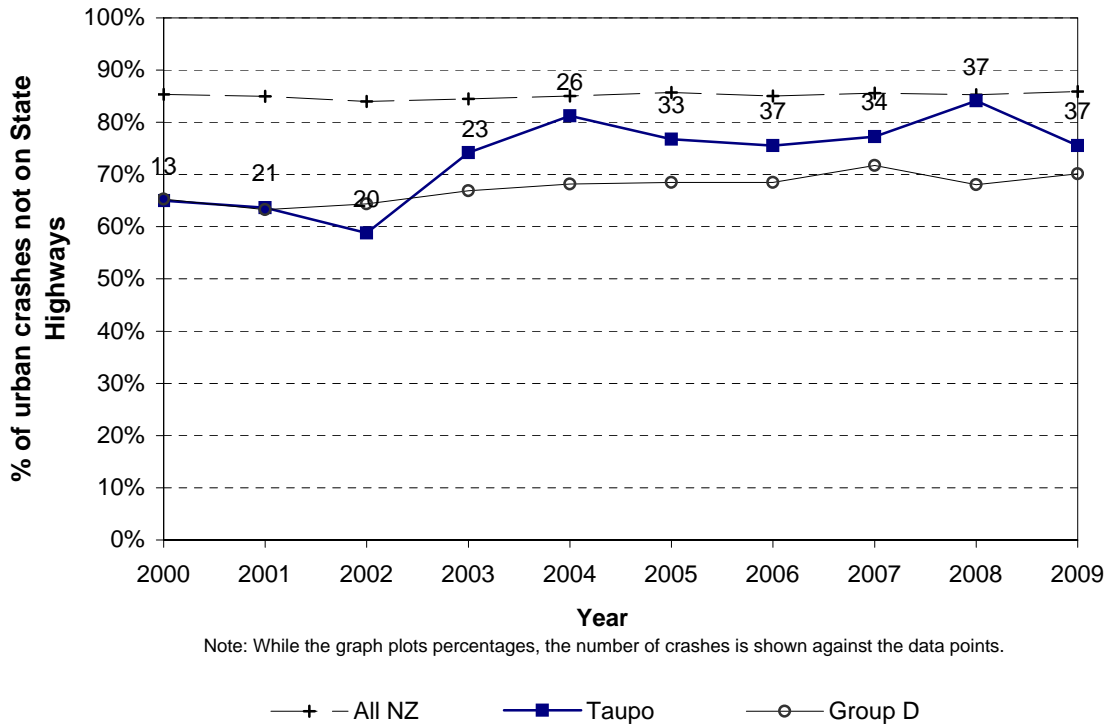


**Figure 5.14 Speed involved trend
Taupo District - rural roads**

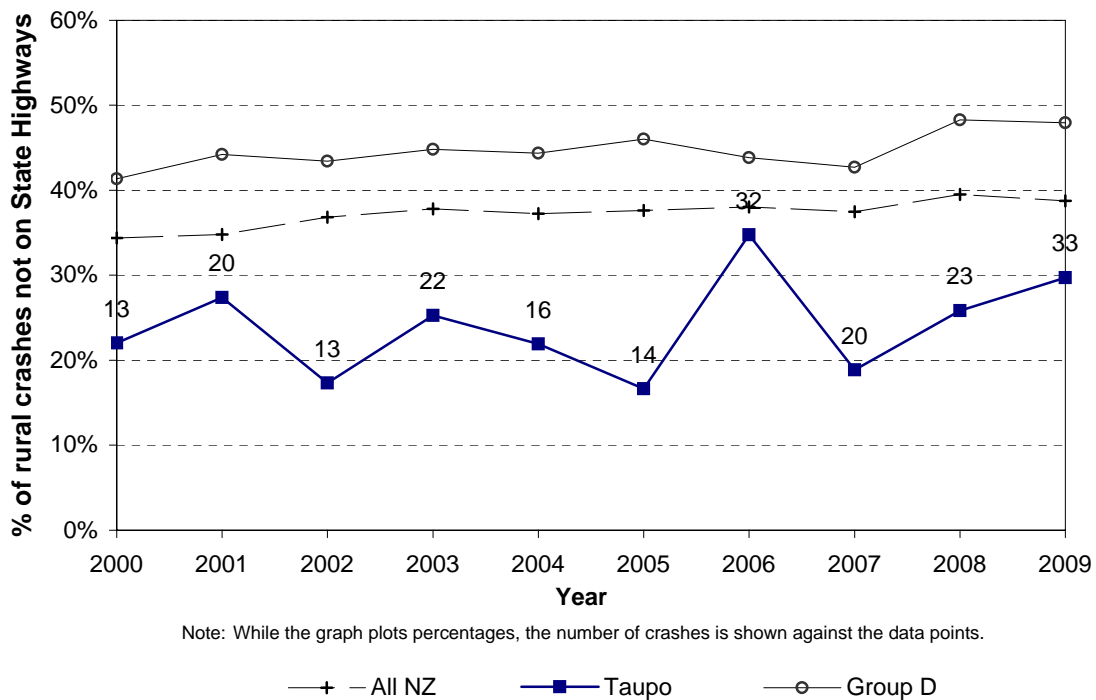


Environmental Statistics

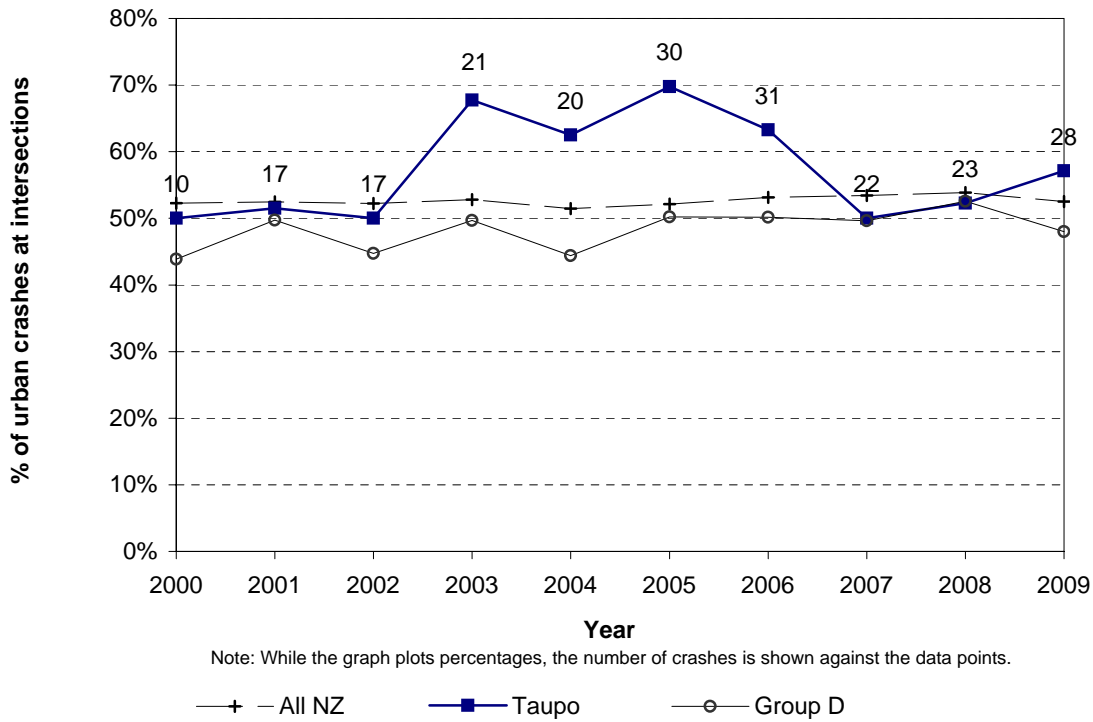
**Figure 6.1 Crashes not on state highways
Taupo District - urban roads**



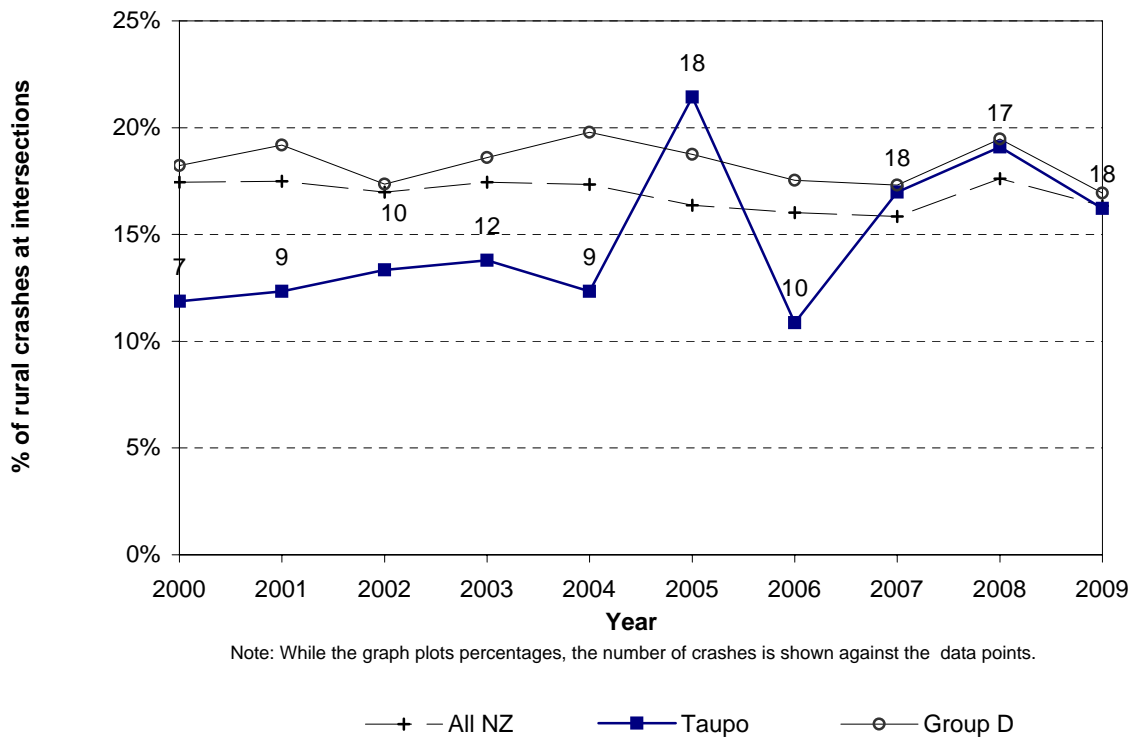
**Figure 6.2 Crashes not on state highways
Taupo District - rural roads**



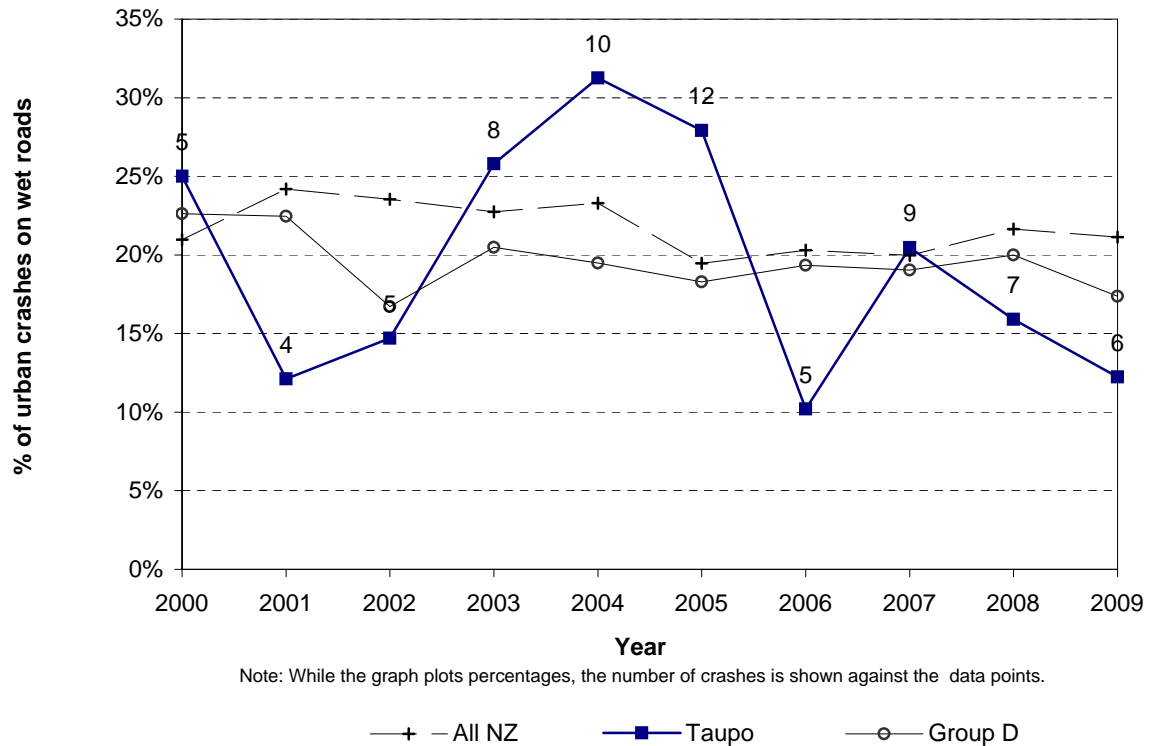
**Figure 6.3 Intersection crashes
Taupo District - urban roads**



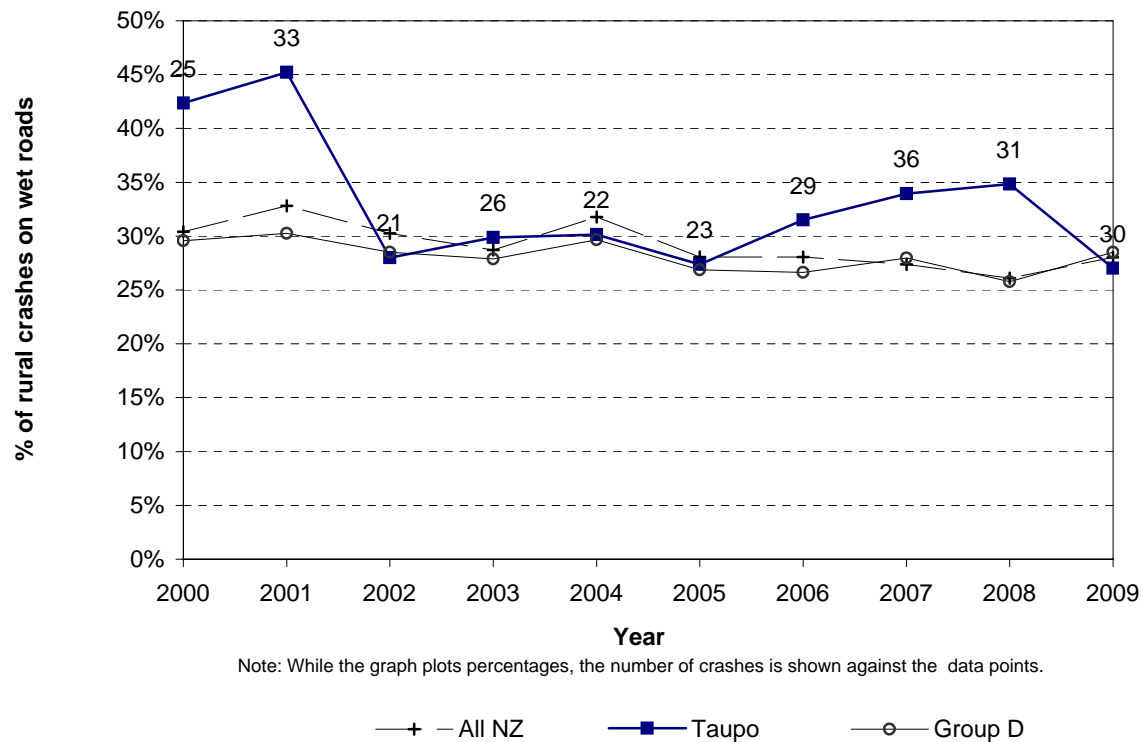
**Figure 6.4 Intersection crashes
Taupo District - rural roads**



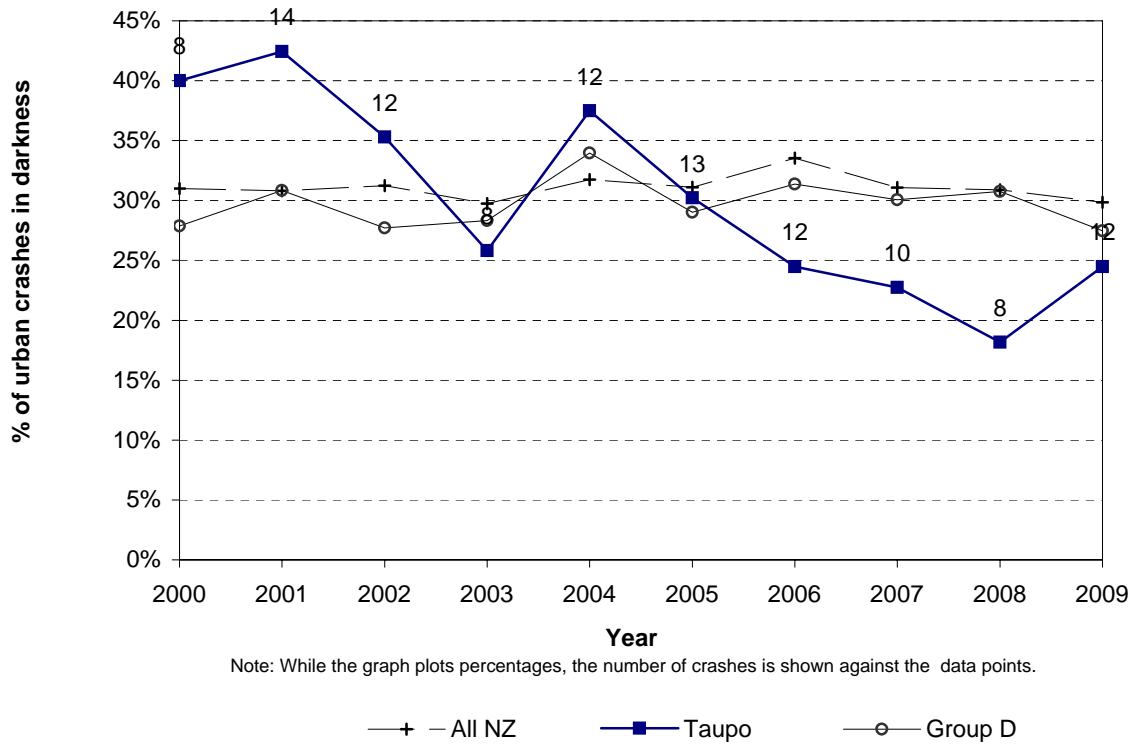
**Figure 6.5 Wet road crashes
Taupo District - urban roads**



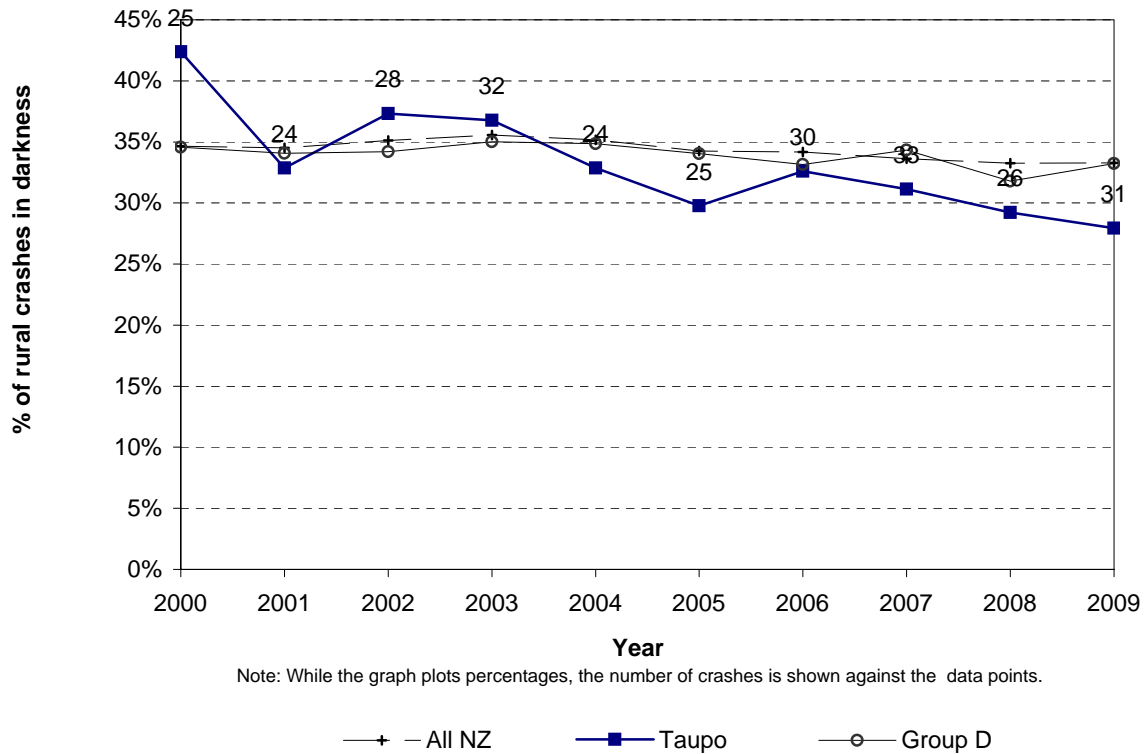
**Figure 6.6 Wet road crashes
Taupo District - rural roads**



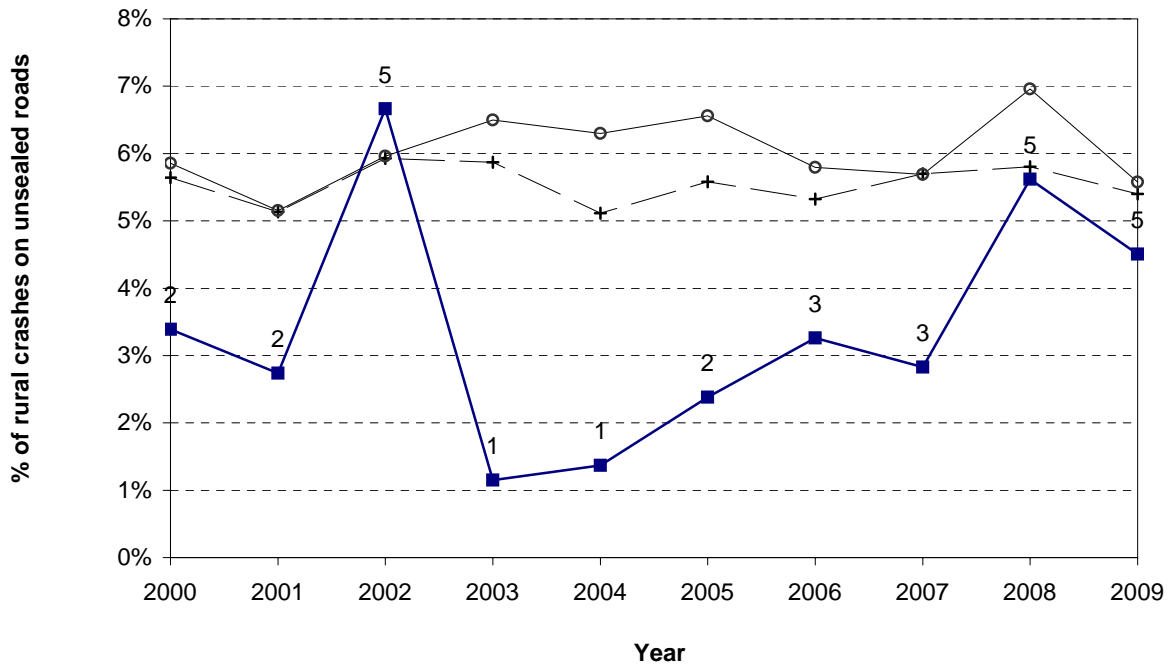
**Figure 6.7 Crashes in darkness
Taupo District - urban roads**



**Figure 6.8 Crashes in darkness
Taupo District - rural roads**



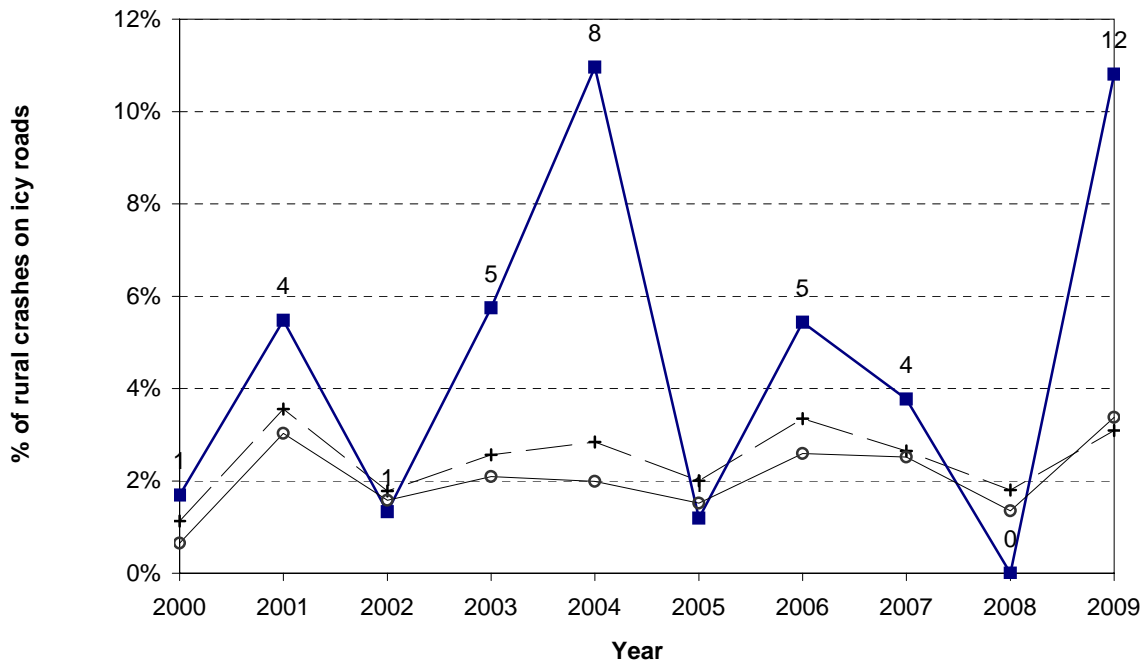
**Figure 6.9 Unsealed road crashes
Taupo District - rural roads**



Note: While the graph plots percentages, the number of crashes is shown against the data points.

+ All NZ ■ Taupo ○ Group D

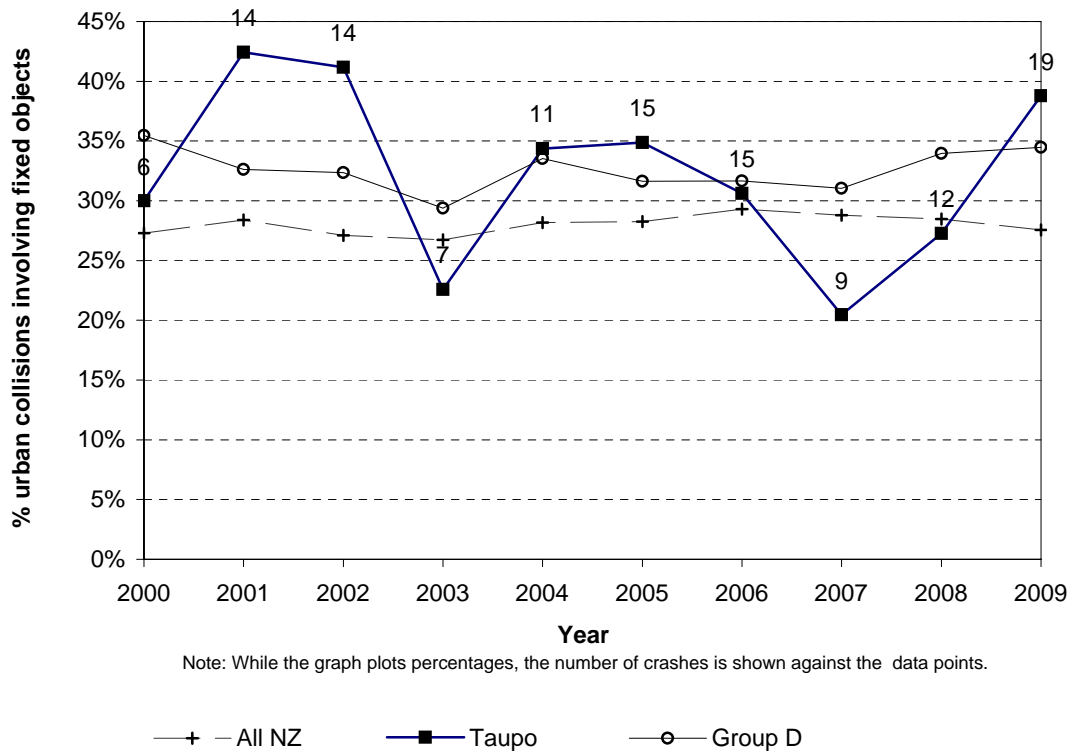
**Figure 6.10 Icy road crashes
Taupo District - rural roads**



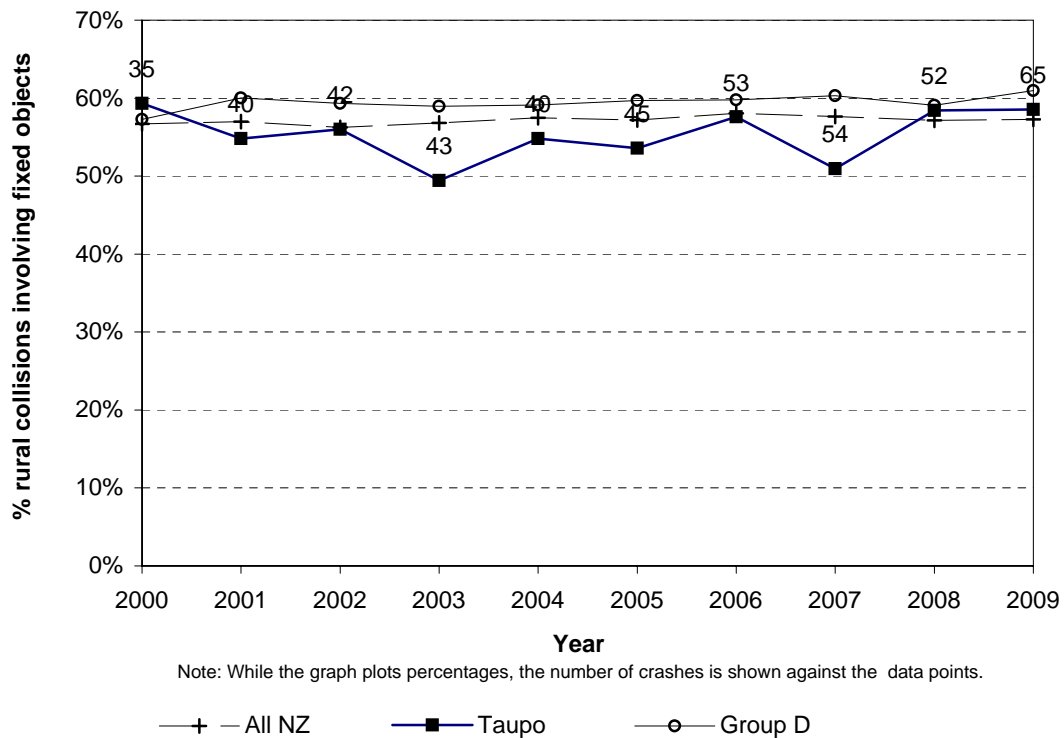
Note: While the graph plots percentages, the number of crashes is shown against the data points.

+ All NZ ■ Taupo ○ Group D

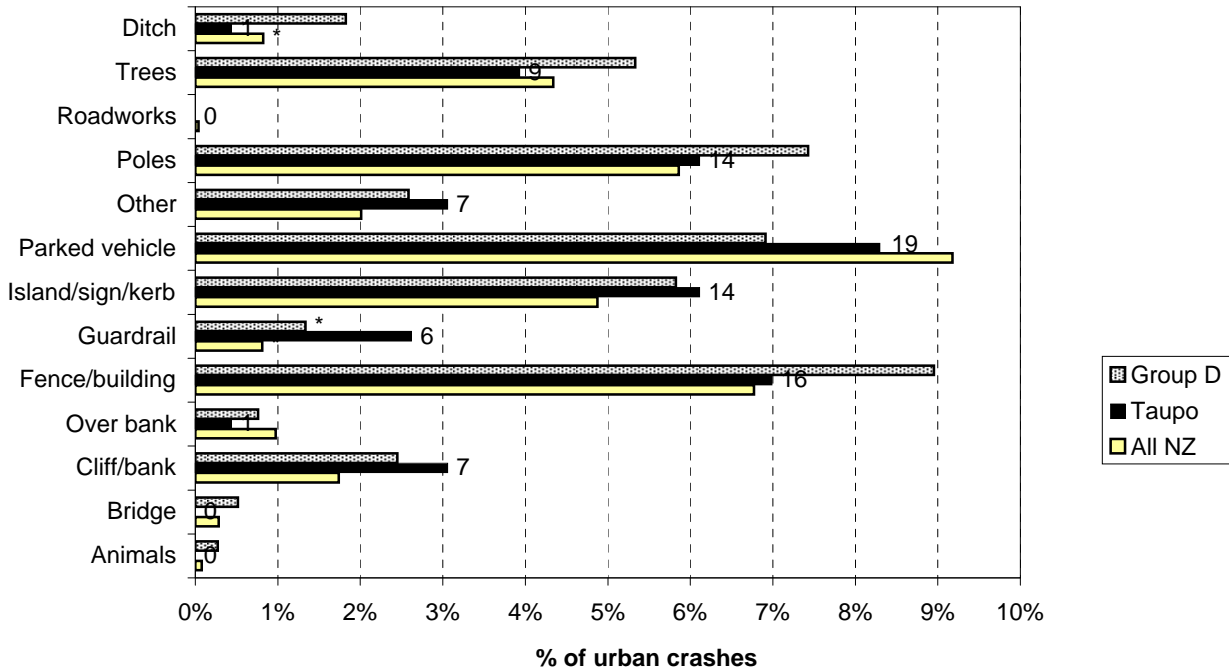
**Figure 6.11 Collisions with objects
Taupo District - urban roads**



**Figure 6.12 Collisions with objects
Taupo District - rural roads**

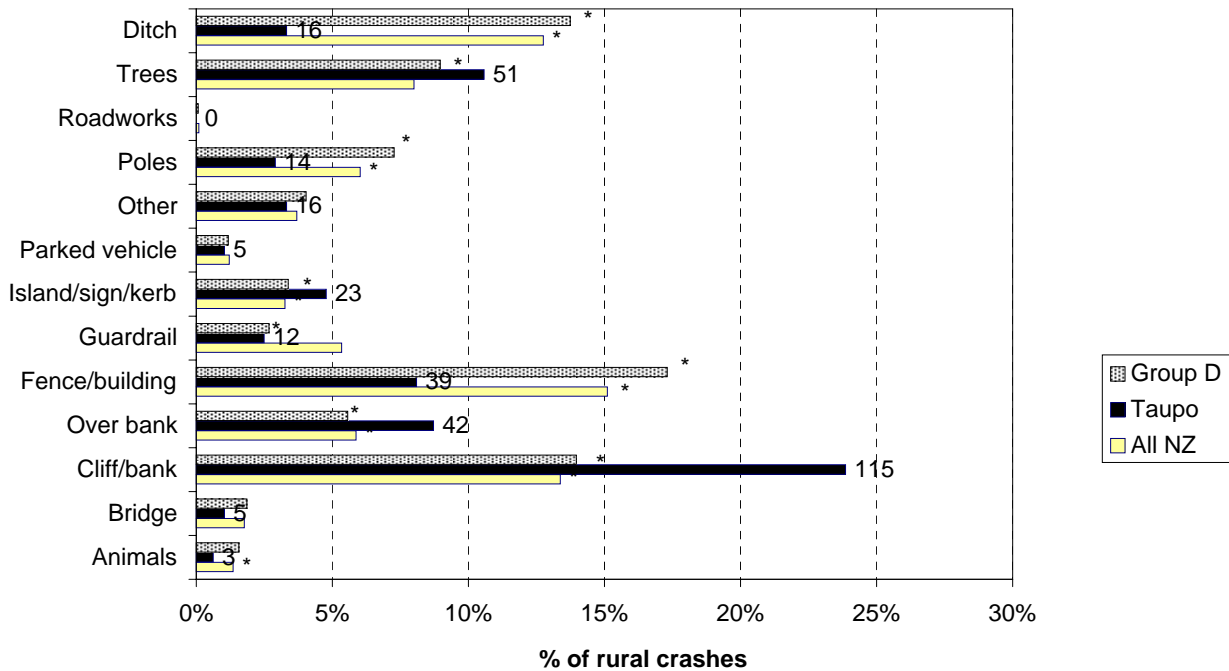


**Figure 6.13 Objects struck - urban
Taupo District (2005-2009)**



Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

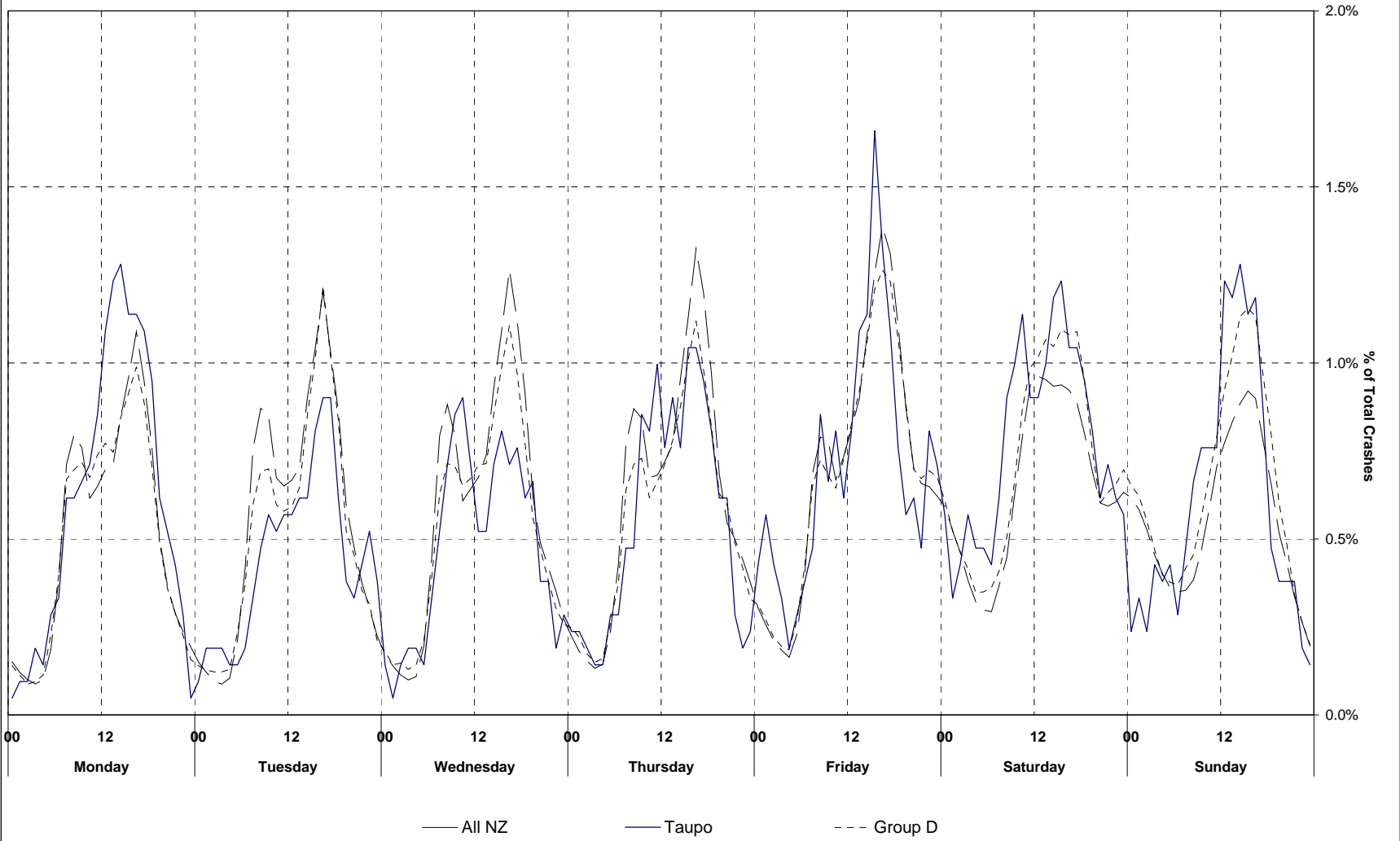
**Figure 6.14 Objects struck - rural
Taupo District (2005-2009)**



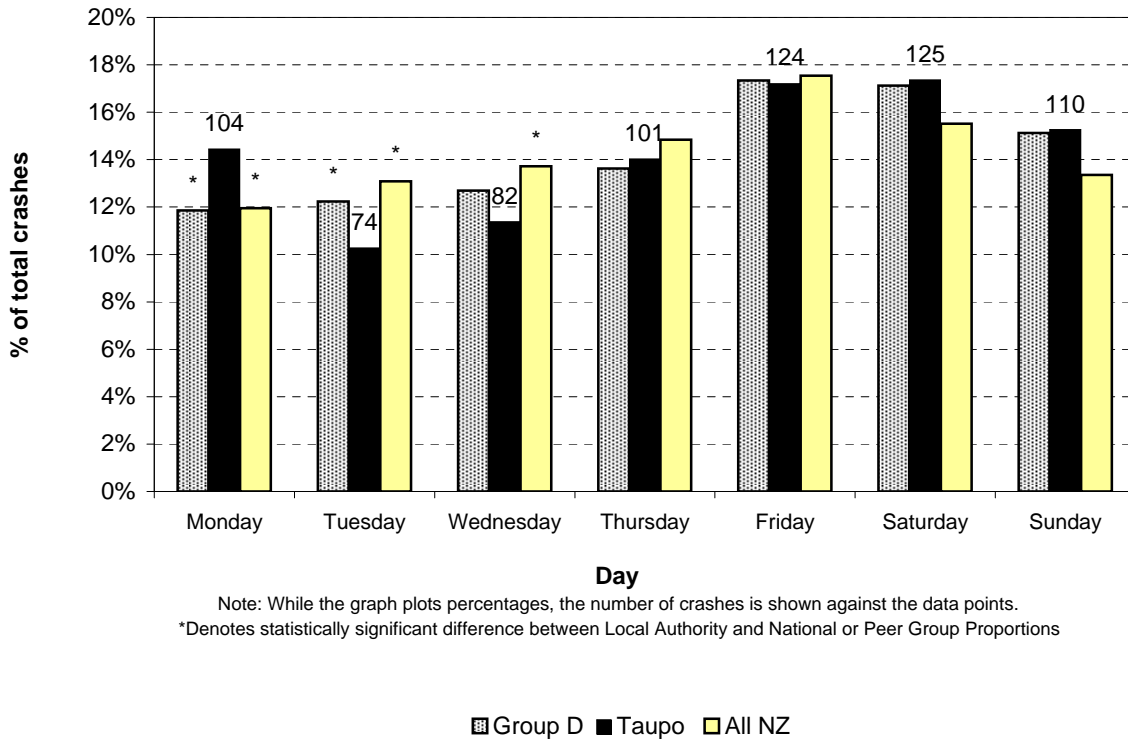
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

Date and Time Statistics

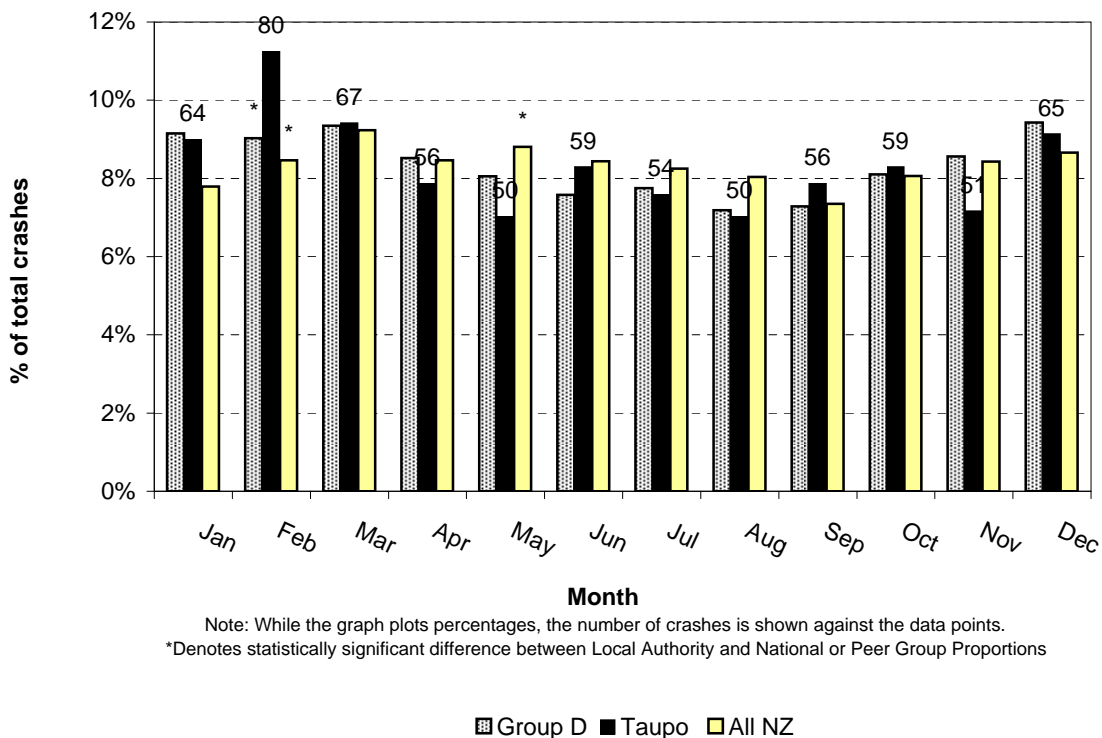
Figure 7.1 Time pattern over average week
Taupo District (2005-2009)



**Figure 7.2 Day of week (6 a.m. to 6 a.m.)
Taupo District (2005-2009)**



**Figure 7.3 Month of year
Taupo District (2005-2009)**



Local Road Statistics

Figure 8.1 Number of injury crashes
Taupo District - council roads (urban & rural)

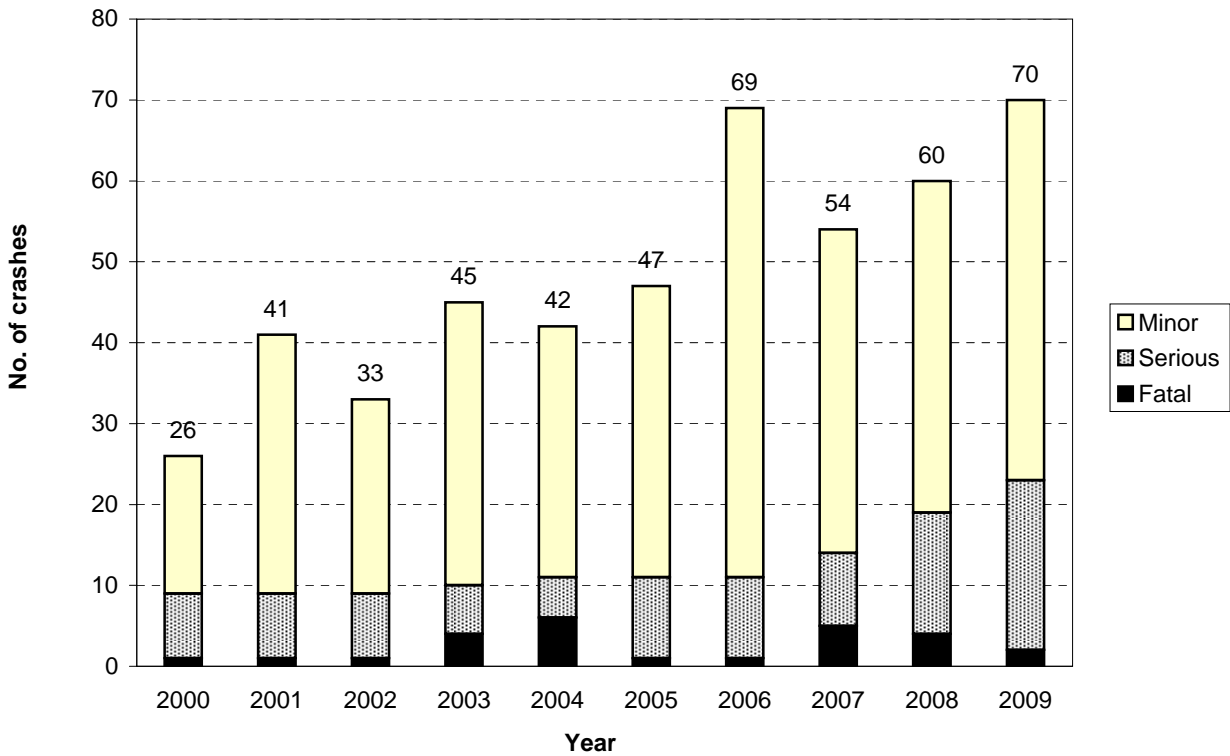
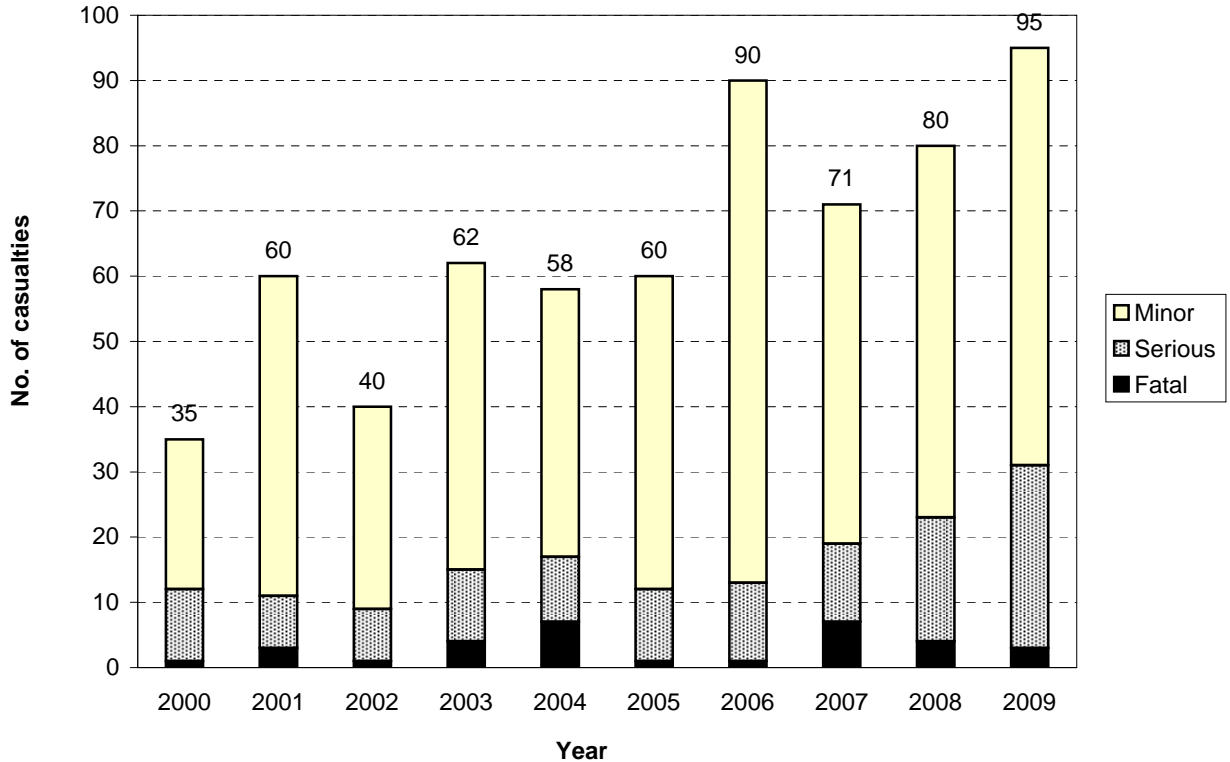
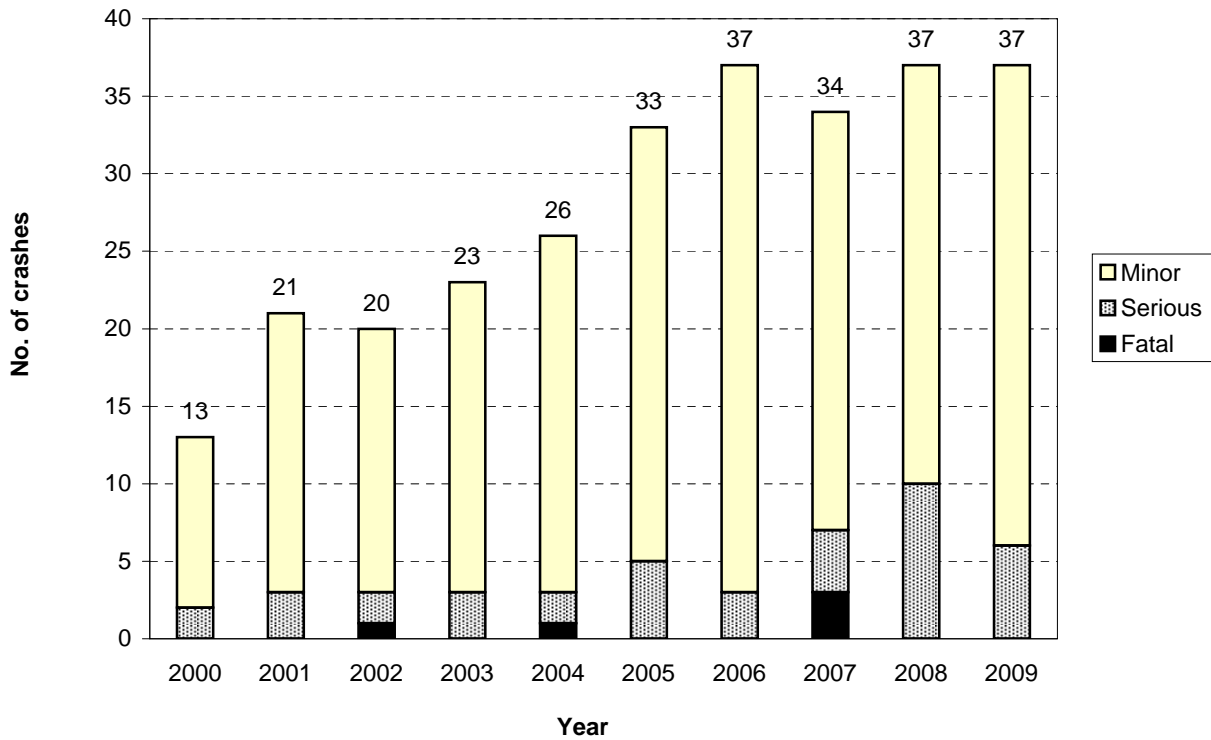


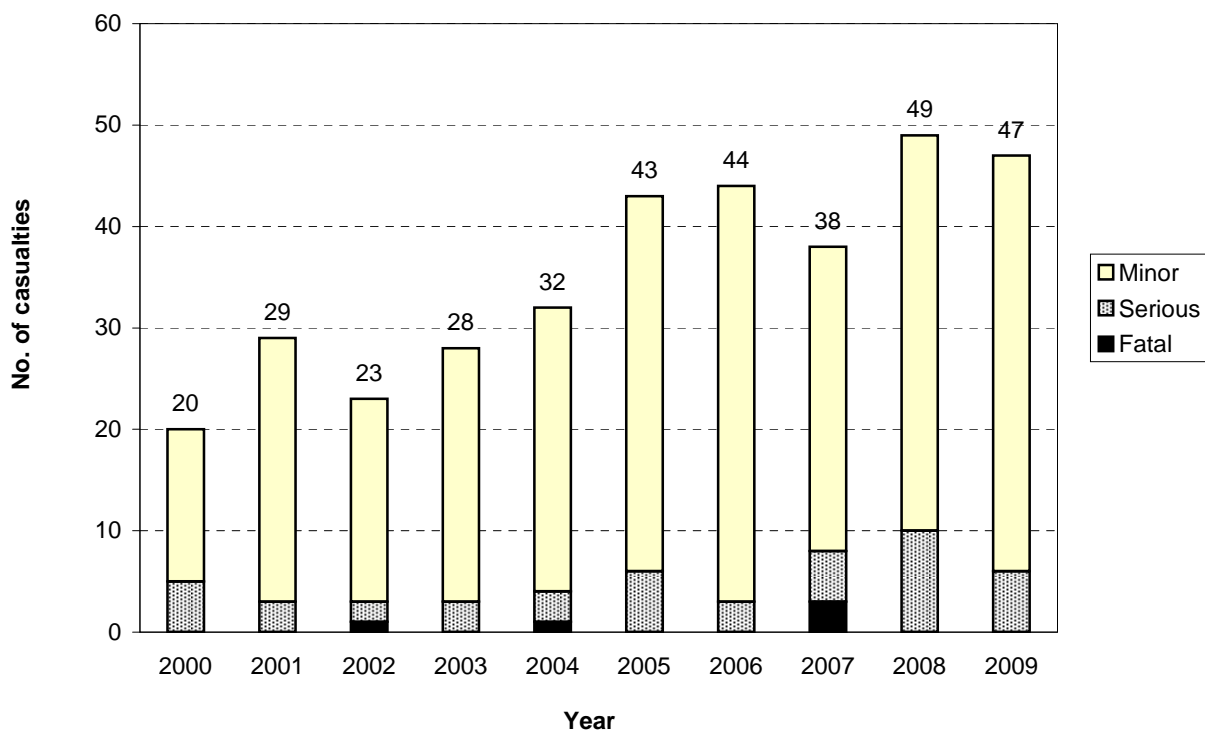
Figure 8.2 Number of casualties
Taupo District - council roads (urban & rural)



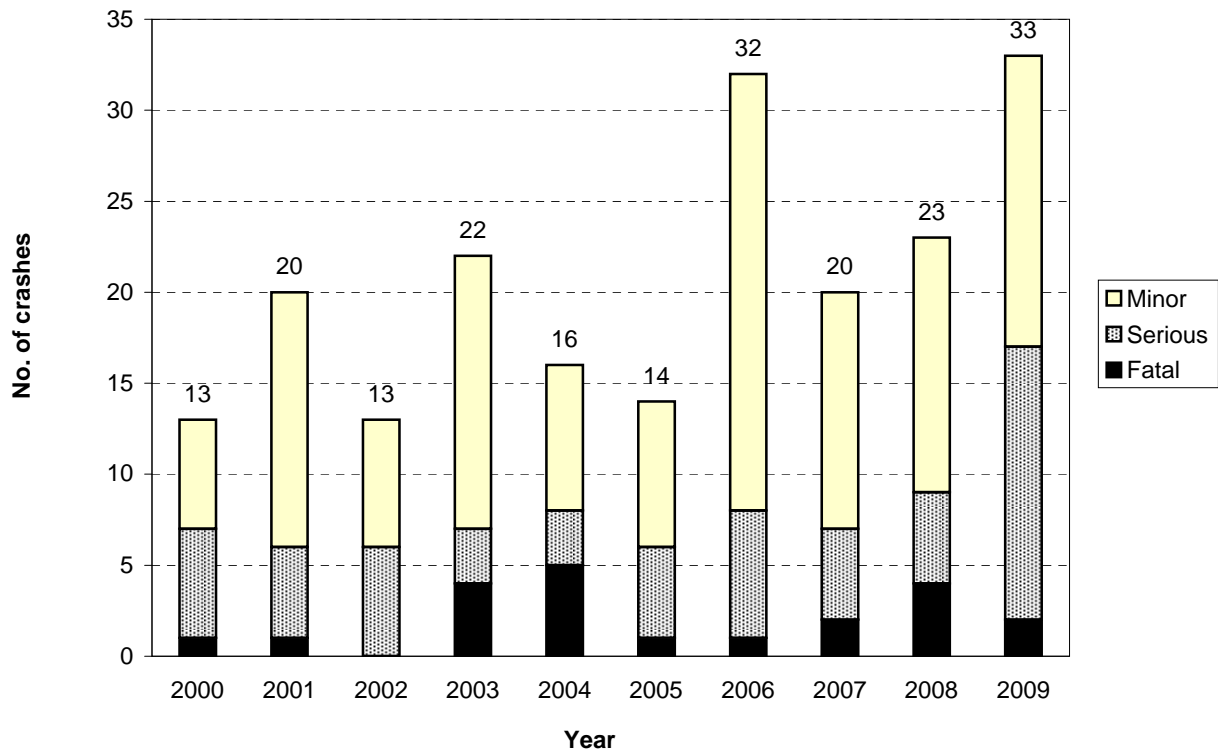
**Figure 8.3 Number of injury crashes
Taupo District - urban council roads**



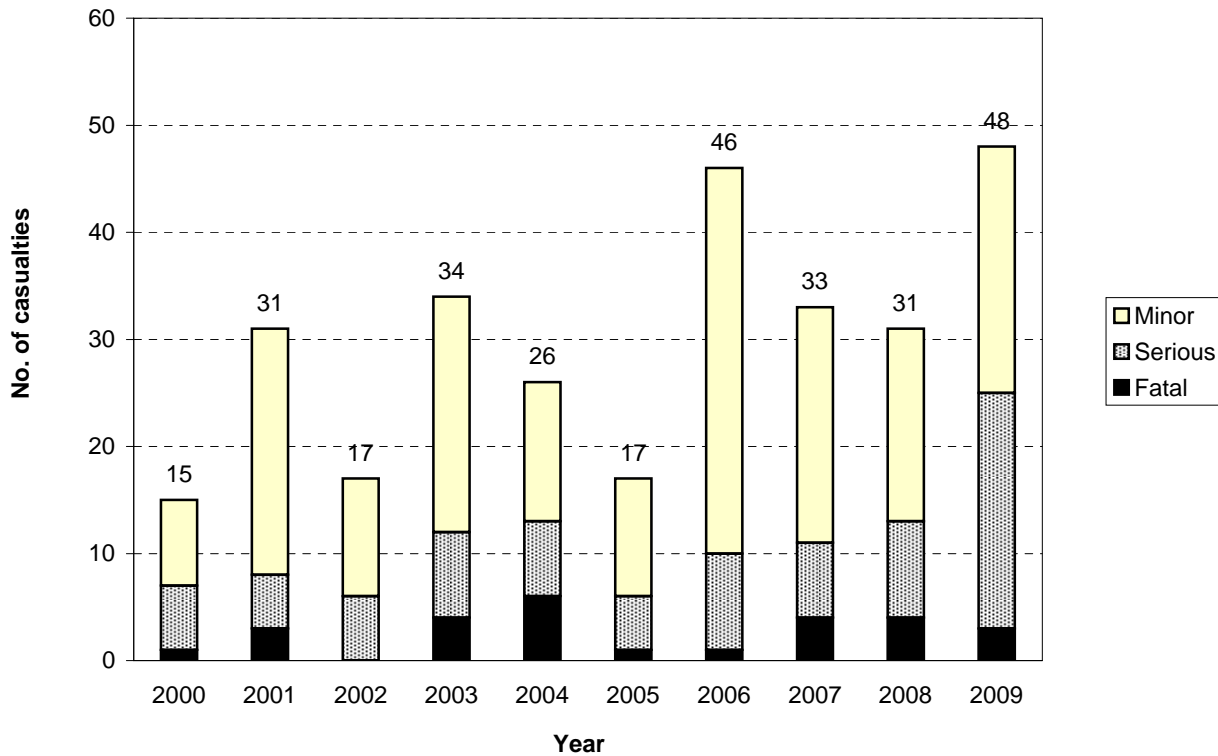
**Figure 8.4 Number of casualties
Taupo District - urban council roads**



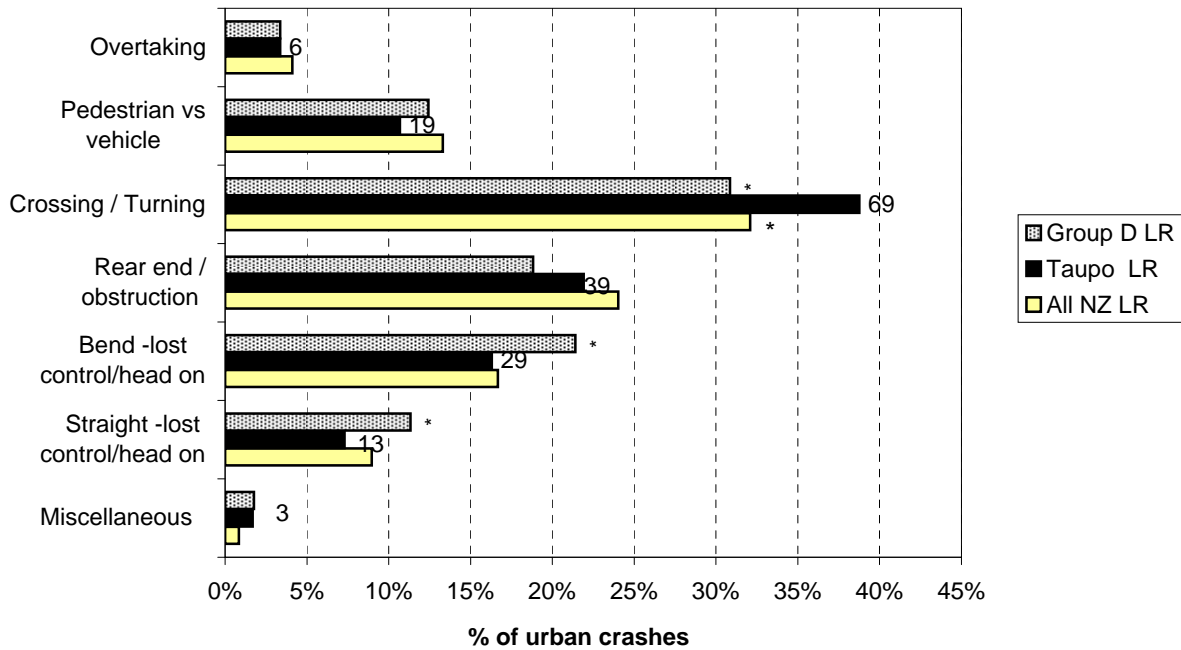
**Figure 8.5 Number of injury crashes
Taupo District - rural council roads**



**Figure 8.6 Number of casualties
Taupo District - rural council roads**

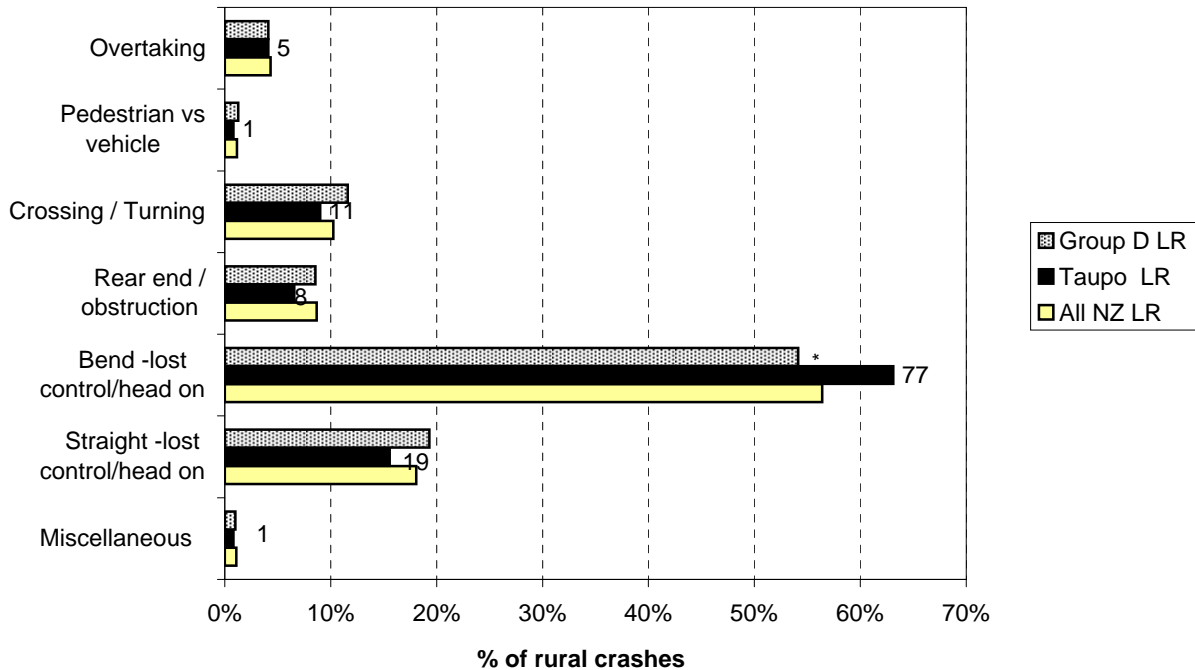


**Figure 8.7 Crash movement type - urban
Taupo District council roads (2005-2009)**



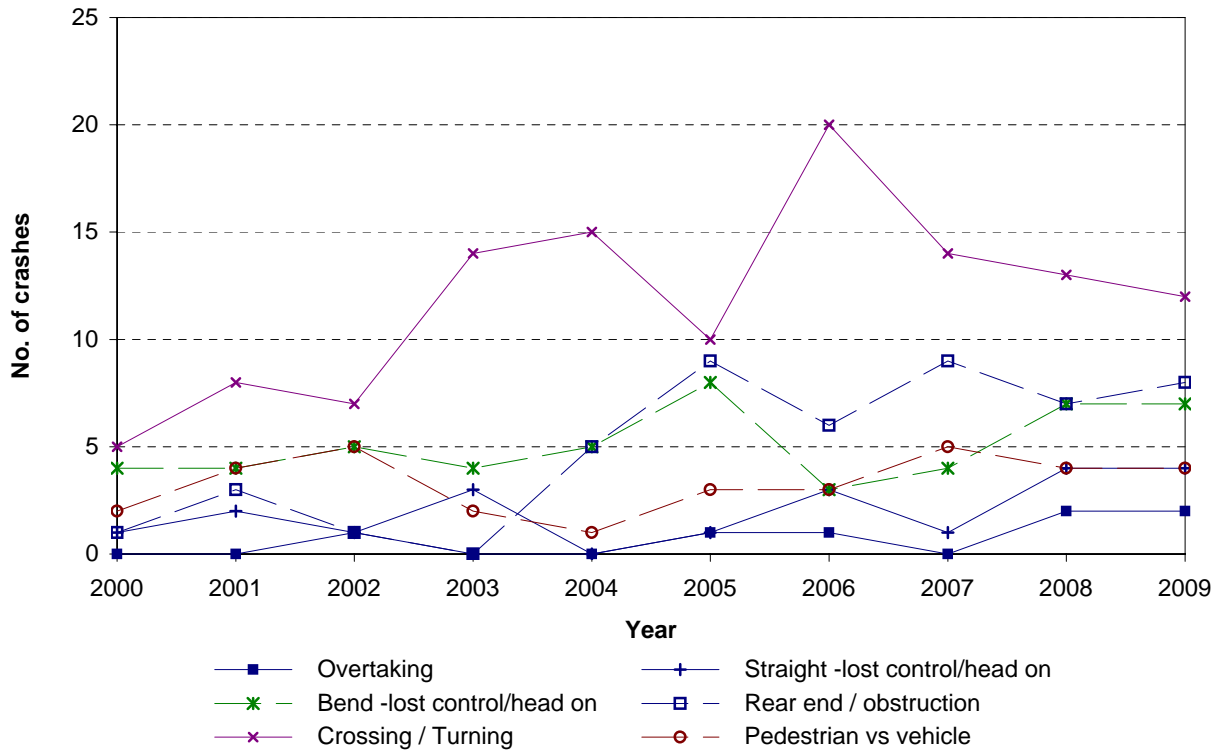
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 8.8 Crash movement type - rural
Taupo District council roads (2005-2009)**

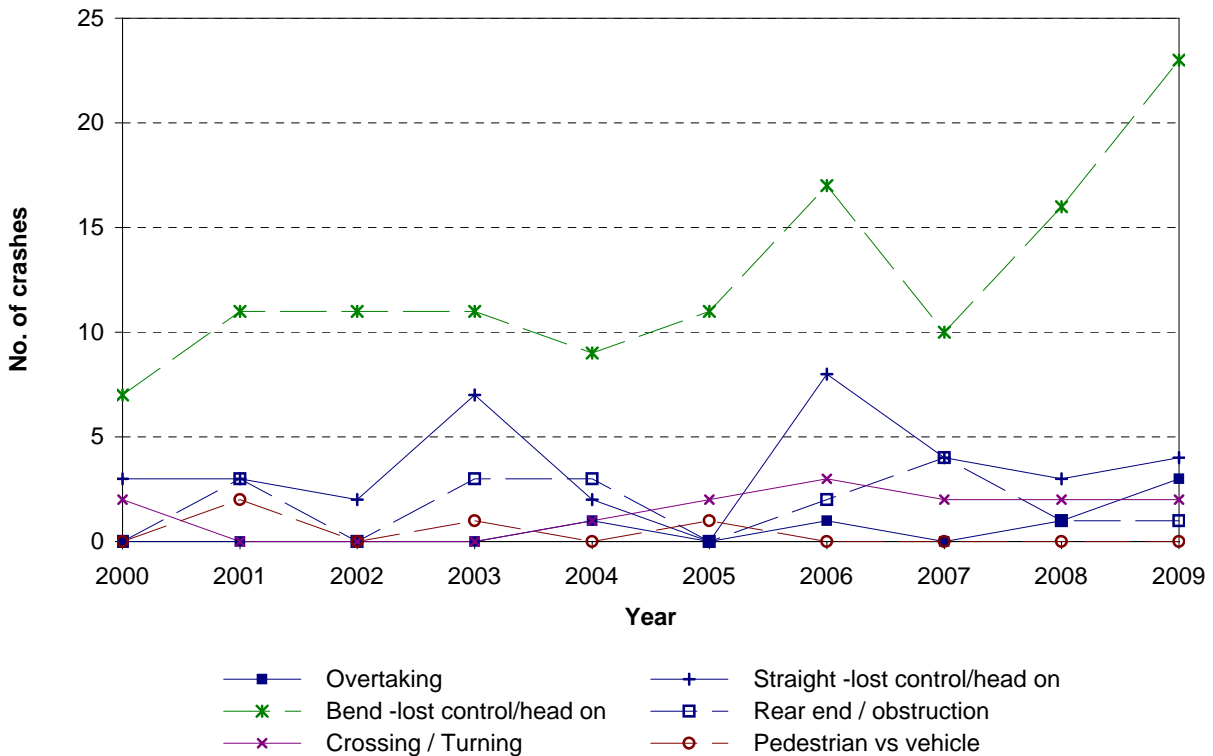


Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

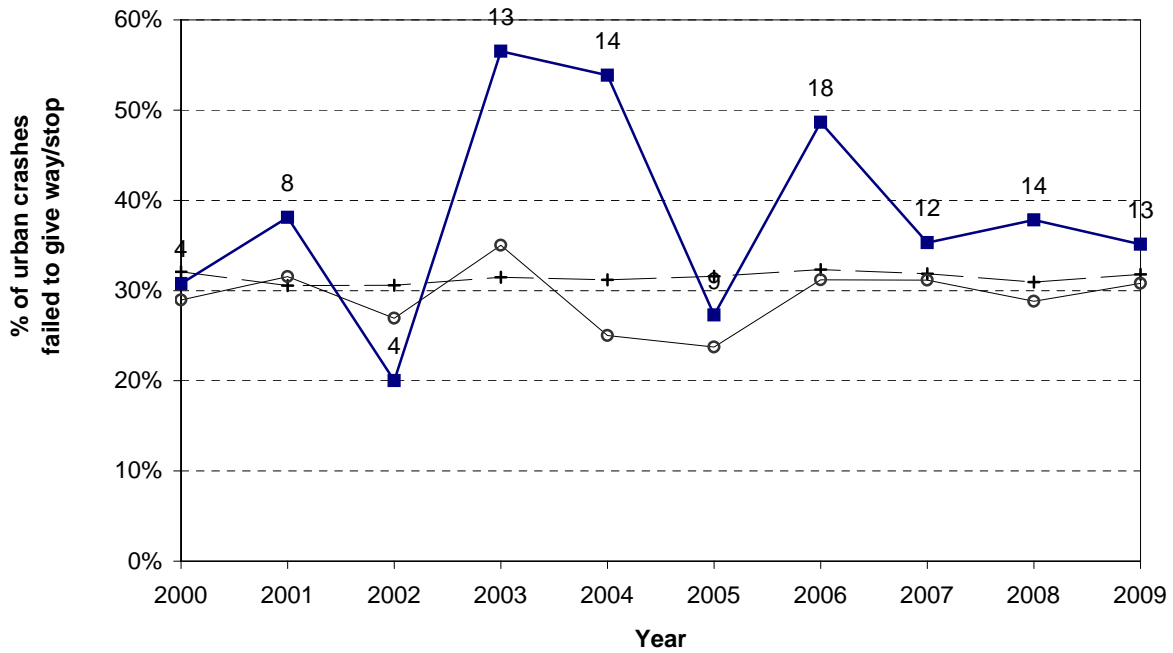
**Figure 8.9 Crash movement type - Trends
Taupo District - urban council roads**



**Figure 8.10 Crash movement type - Trends
Taupo District - rural council roads**



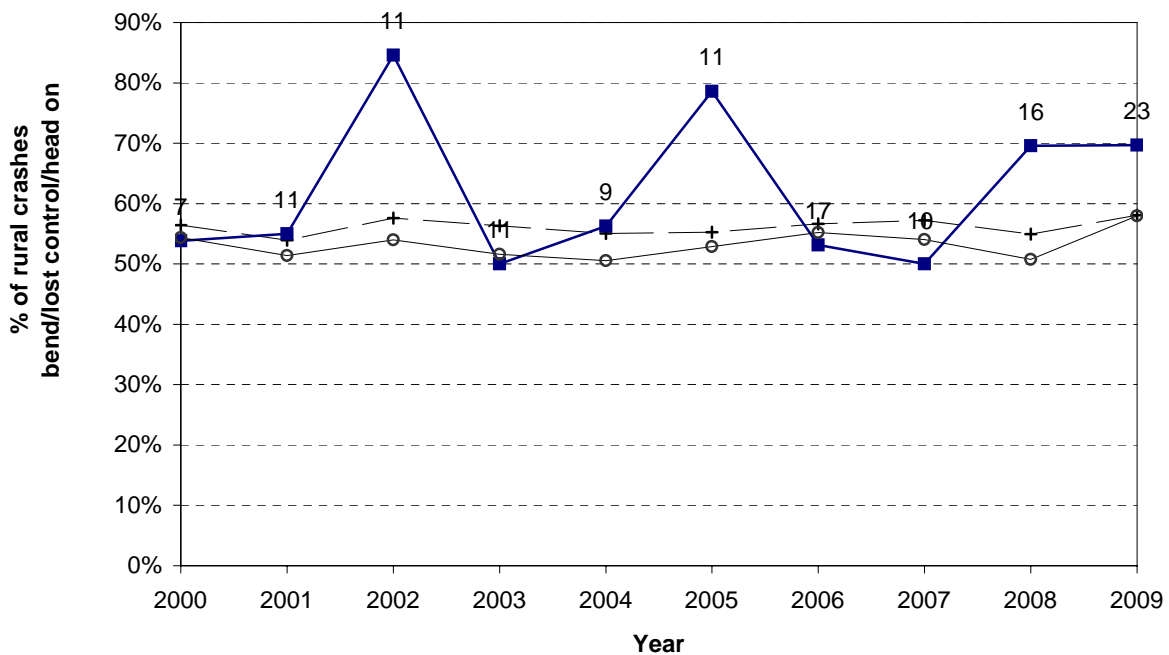
**Figure 8.11 Failed to give way/stop
Taupo District - urban council roads**



Note: While the graph plots percentages, the number of crashes is shown against the data points.

+ All NZ LR ■ Taupo LR ○ Group D LR

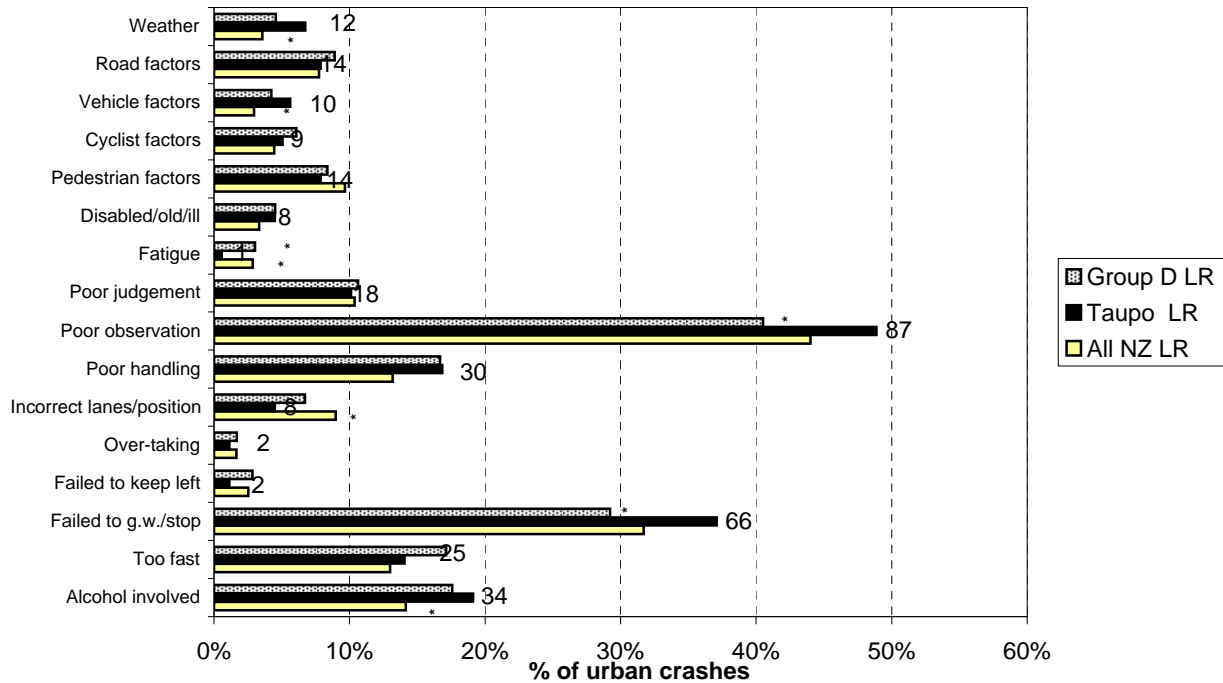
**Figure 8.12 Bend - lost control / head - on
Taupo District - rural council roads**



Note: While the graph plots percentages, the number of crashes is shown against the data points.

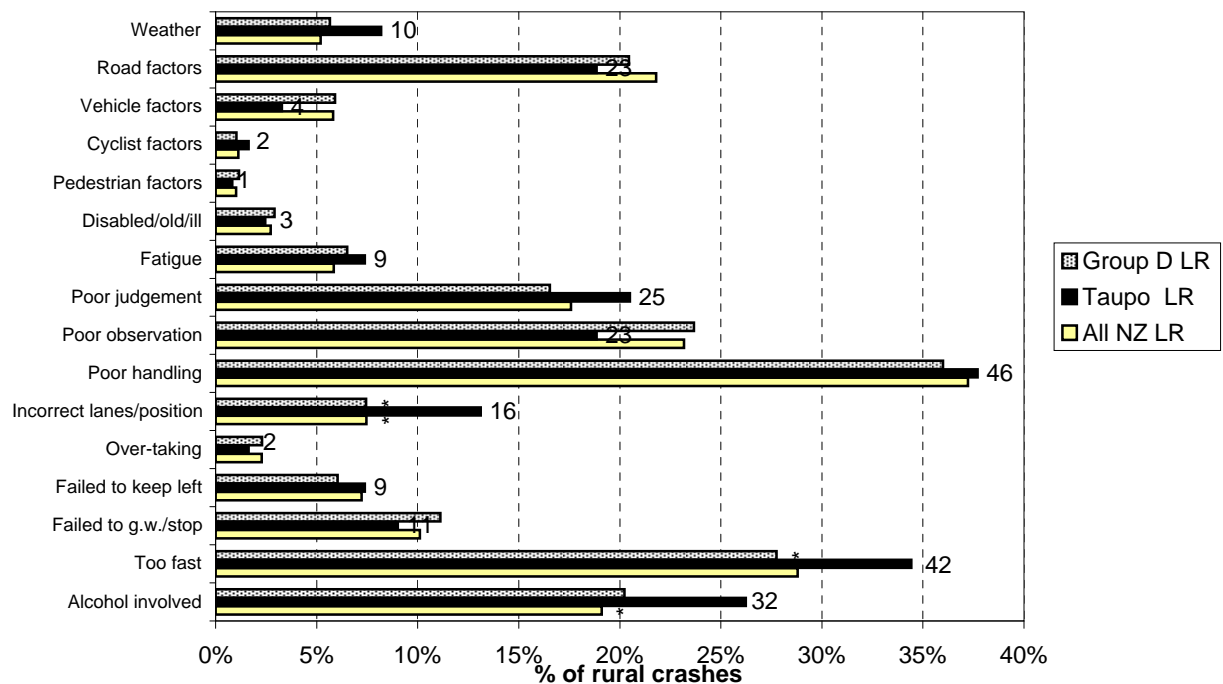
+ All NZ LR ■ Taupo LR ○ Group D LR

**Figure 8.13 Contributing factors - urban
Taupo District council roads (2005-2009)**



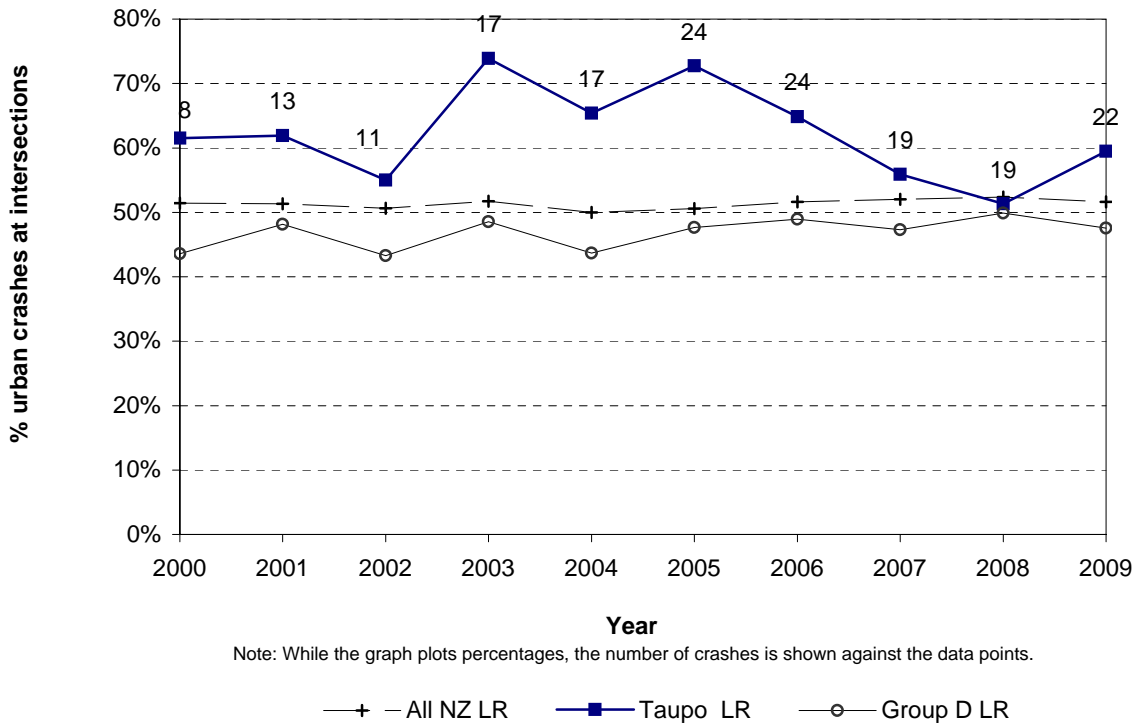
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 8.14 Contributing factors - rural
Taupo District council roads (2005-2009)**

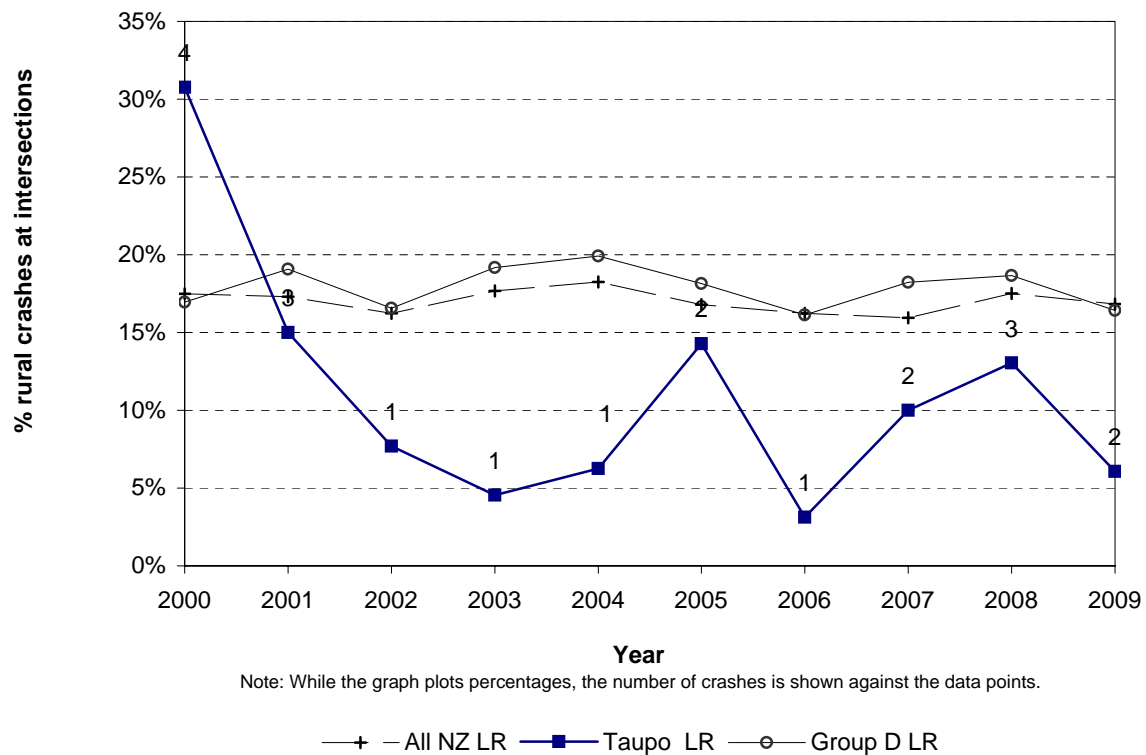


Note: While the graph plots percentages, the number of casualties is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

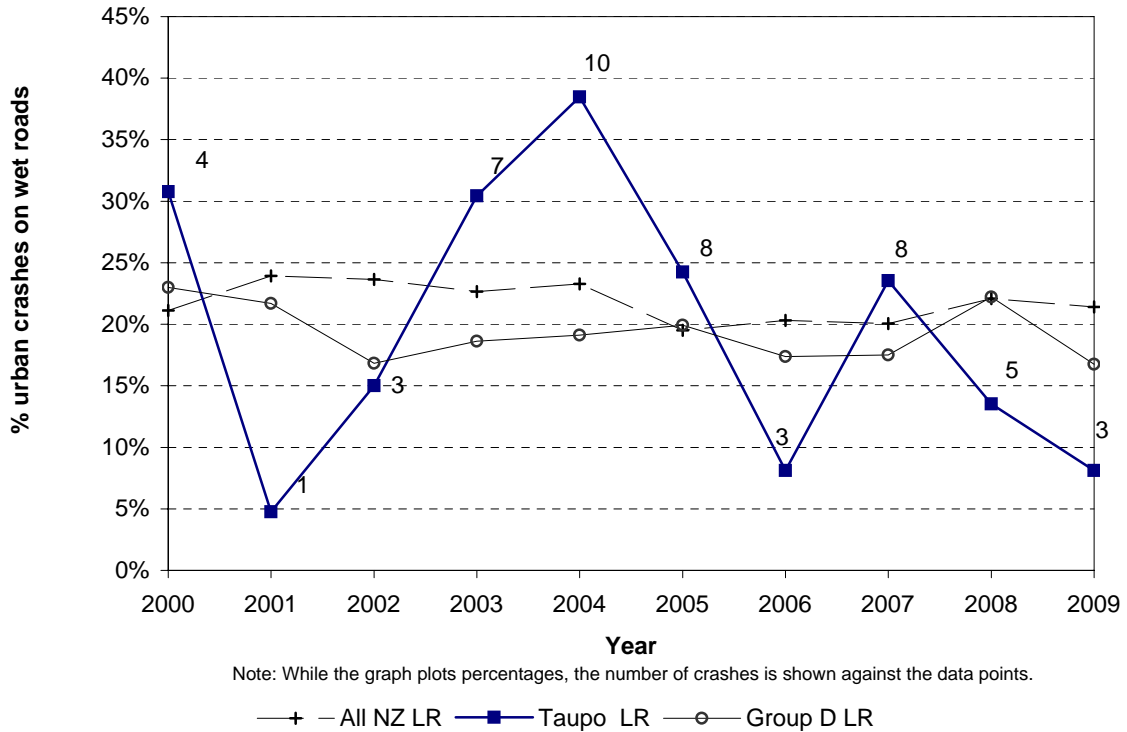
**Figure 8.15 Intersection crashes
Taupo District - urban council roads**



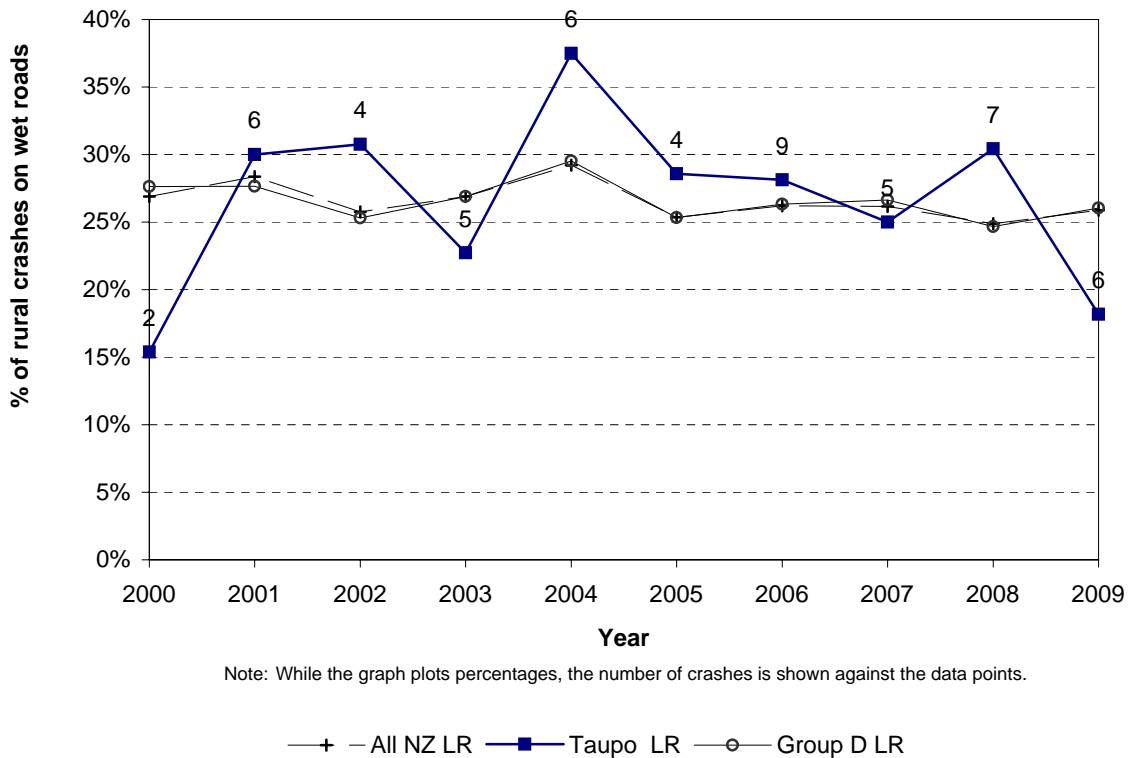
**Figure 8.16 Intersection crashes
Taupo District - rural council roads**



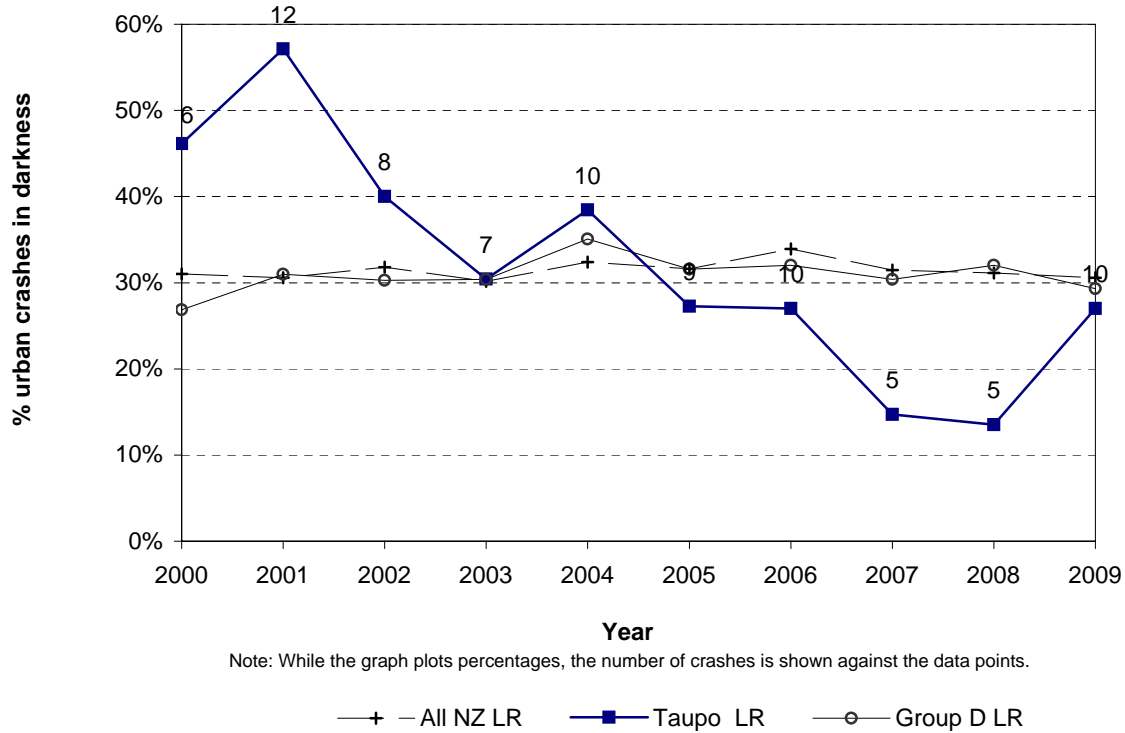
**Figure 8.17 Wet road crashes
Taupo District - urban council roads**



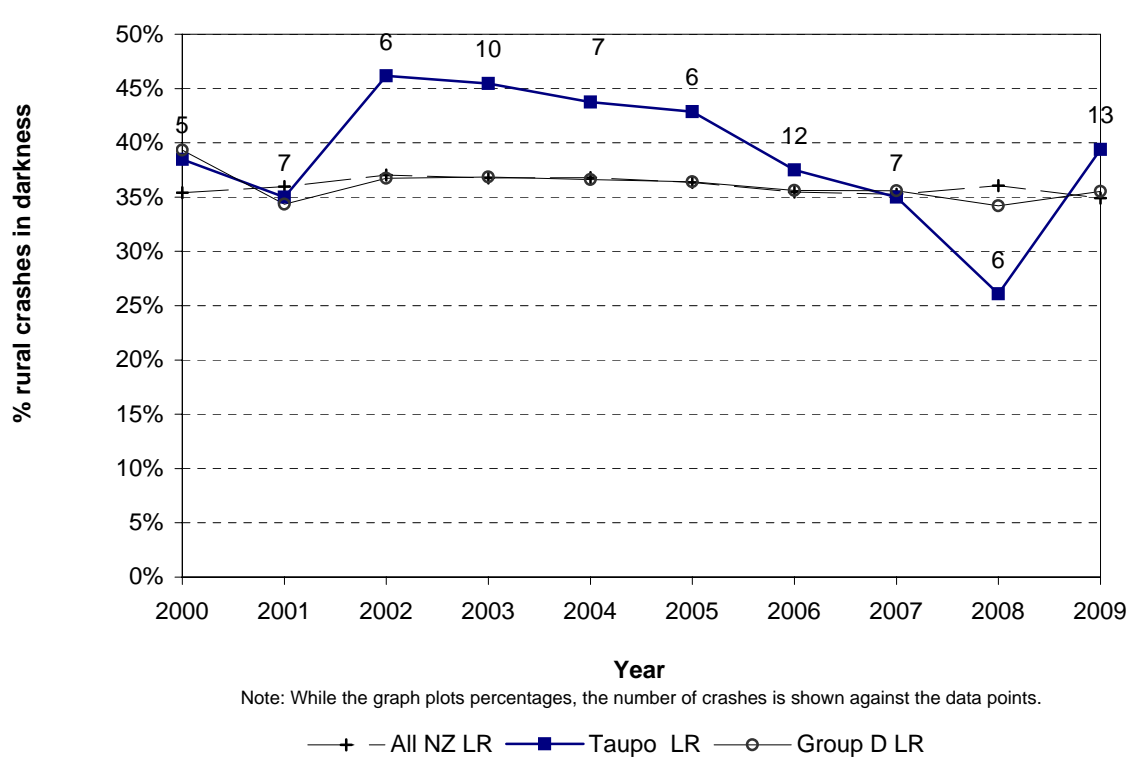
**Figure 8.18 Wet road crashes
Taupo District - rural council roads**



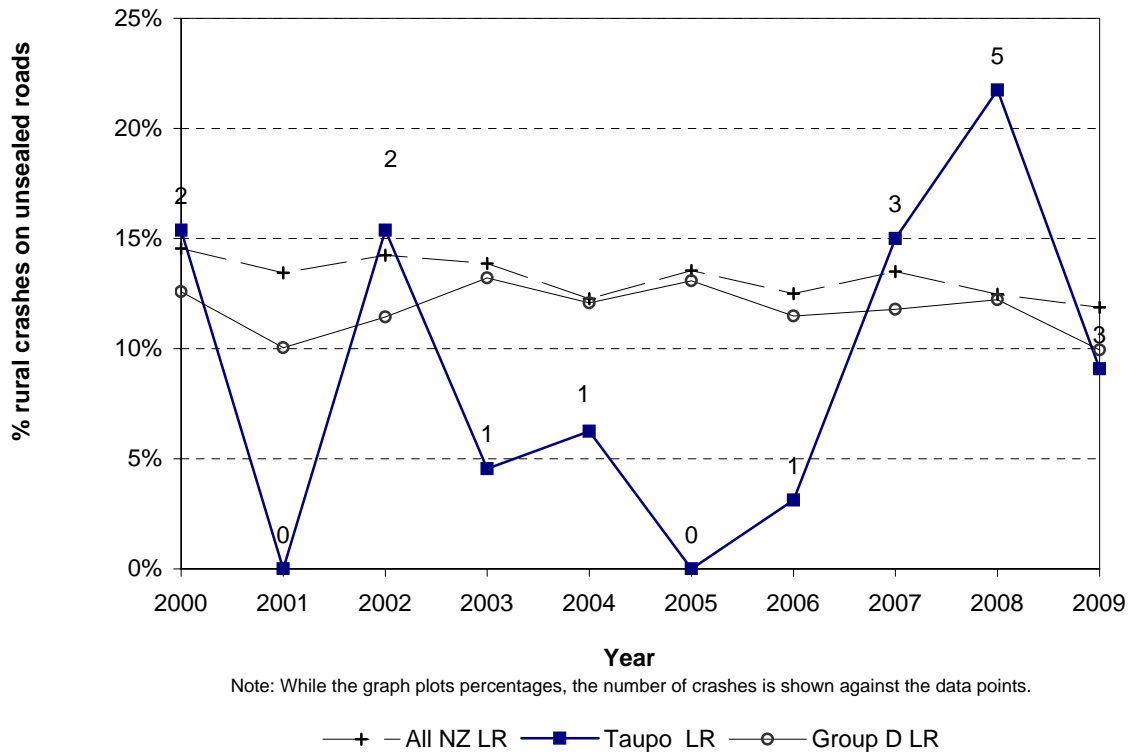
**Figure 8.19 Crashes in darkness
Taupo District - urban council roads**



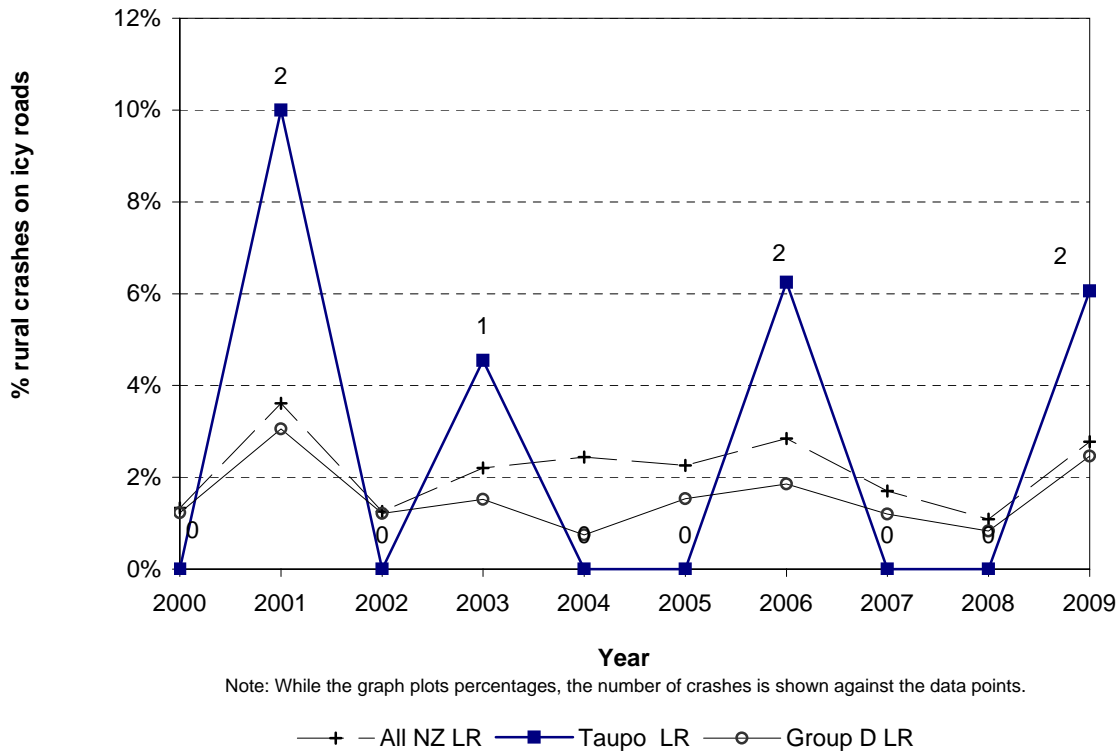
**Figure 8.20 Crashes in darkness
Taupo District - rural council roads**

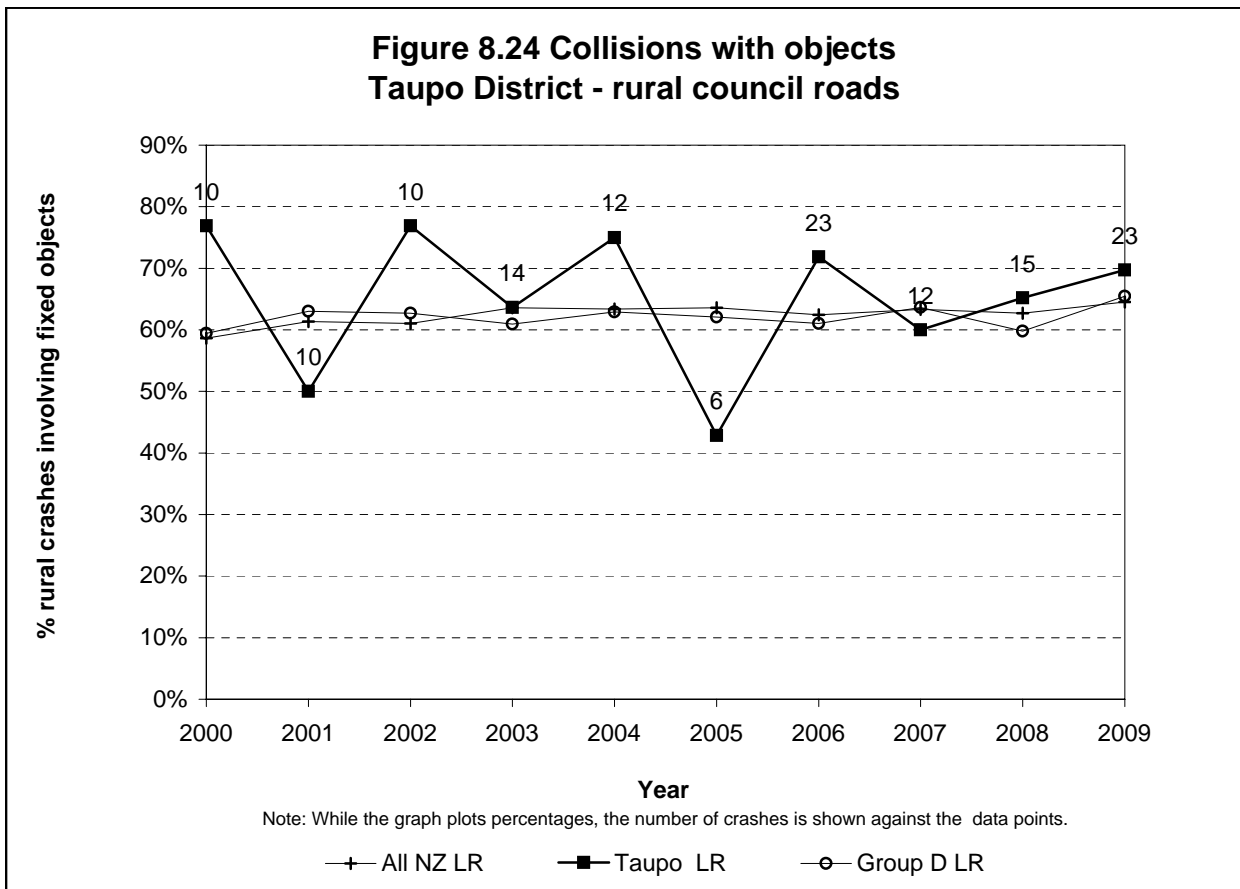
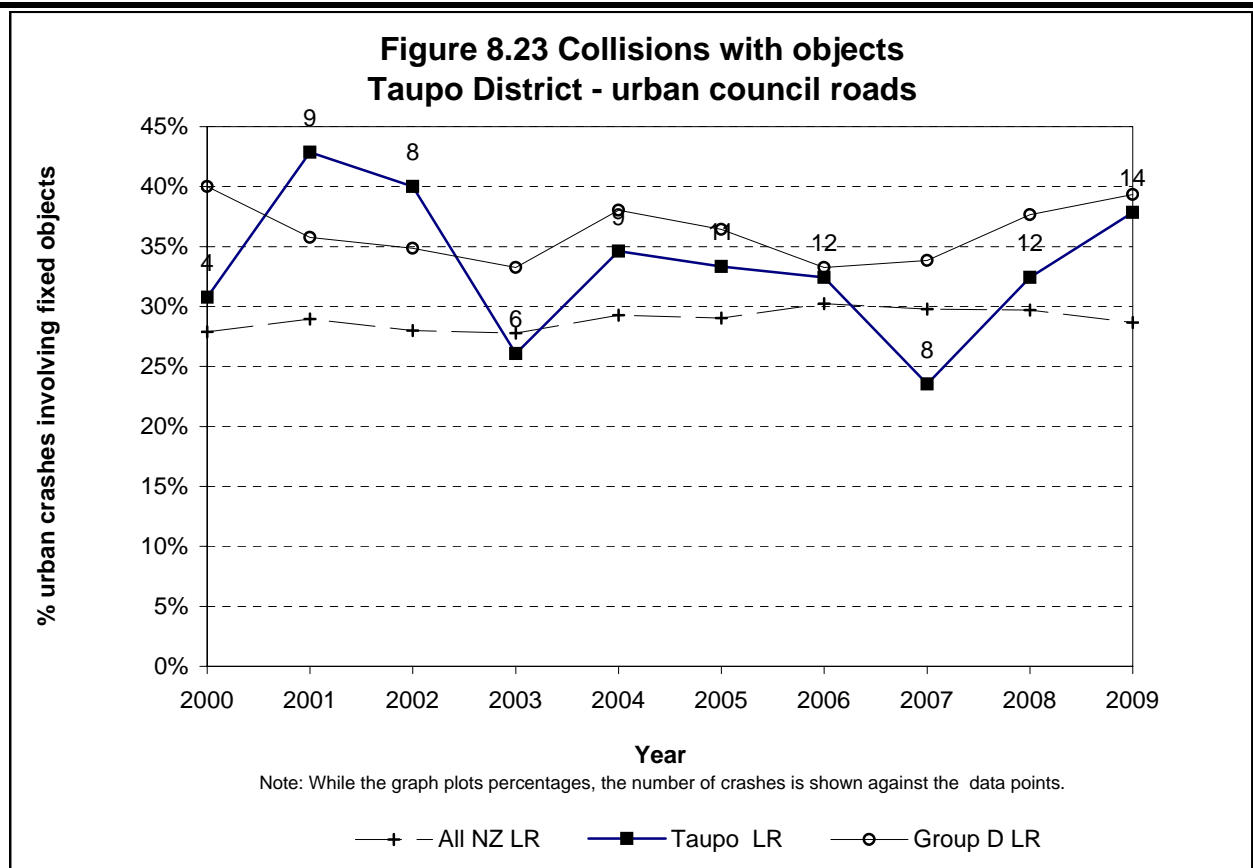


**Figure 8.21 Crashes on unsealed roads
Taupo District - rural council roads**

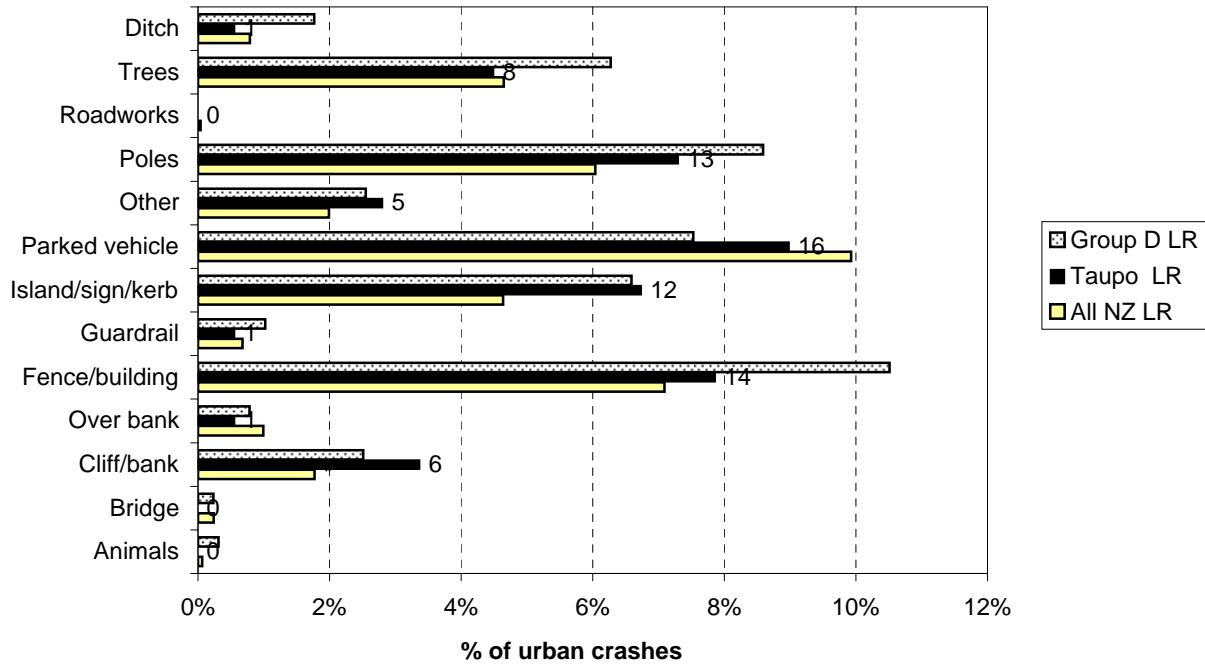


**Figure 8.22 Icy road crashes
Taupo District - rural council roads**



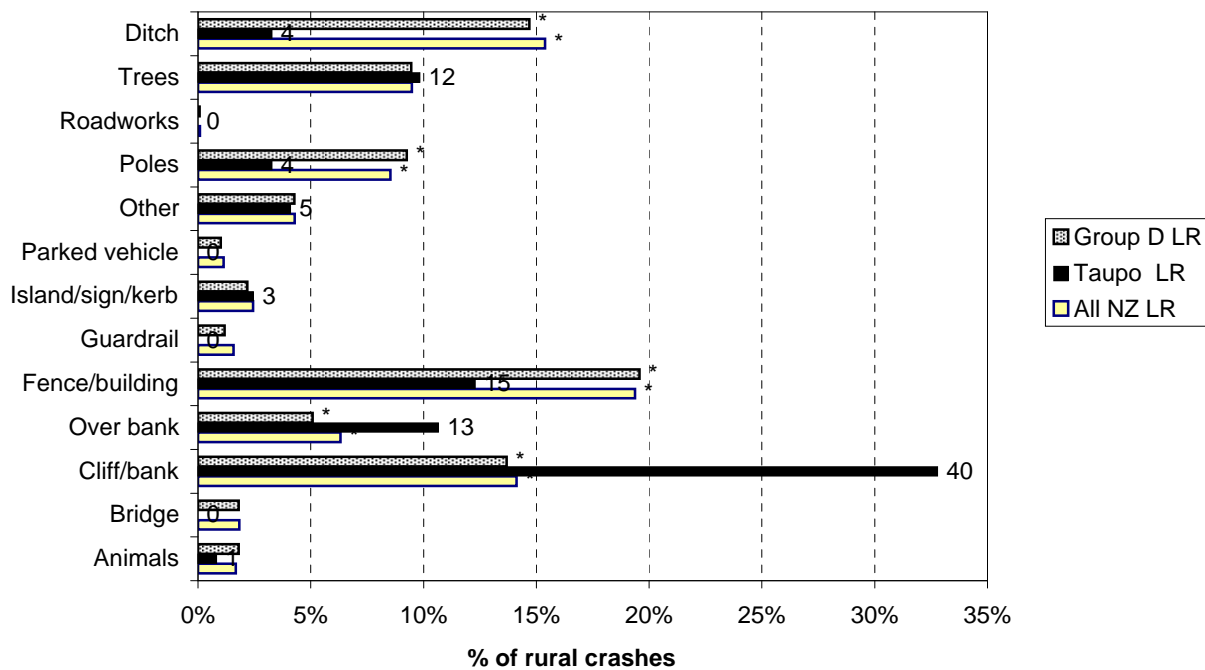


**Figure 8.25 Objects struck - urban
Taupo District council roads (2005-2009)**



Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 8.26 Objects struck - rural
Taupo District council roads (2005-2009)**



Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

Crash Location Statistics

**Table 9.1: Council Roads Black Spot List Urban
(Injury and Non-Injury Crashes)**
Site Radius = 30 metres
Sites with 3 or more injury crashes or more than \$150000 in social costs

CRASH ROAD		SIDE ROAD	2005	2006	2007	2008	2009	TOTAL	Non-Injury	Wet Crash %	Dark Crash %	Crash Costs
SPA ROAD		50 E KAIMANAWA ST		1	2			3	1	33	33	\$3,406,712
TAMAMUTU ST	I	TITIRAUPENGA ST	4	1	2	4	1	12	7	58	17	\$1,612,154
RIFLE RANGE ROAD	I	TAHAREPA ROAD	2	1	4	2	1	10	5		20	\$1,540,338
SPA ROAD	I	TITIRAUPENGA ST	1	2	4	1	1	9	5	22	11	\$941,054
SPA ROAD	I	RUNANGA ST	1	2	1	1	1	6	5	17	33	\$723,468
RUAPEHU ST	I	HEUHEU ST	2	2	3	1		8	7		13	\$673,108
ARROWSMITH AVENUE	I	SHEPHERD ROAD	2				1	3	2			\$671,168
HEUHEU ST	I	TITIRAUPENGA ST	6	4	1	3	7	21	17	14	19	\$588,255
TAHAREPA ROAD	I	ROKINO ROAD	1	1	1			3	2	33	67	\$586,102
TAUHARA ROAD	I	TAHAREPA ROAD	2	5		1	3	11	5	27	9	\$521,368
HEUHEU ST	I	KAIMANAWA ST	2	7	1	3	3	16	12	25	25	\$497,016
KAIMANAWA ST	I	TAMAMUTU ST	1	3	5	1	5	15	11	20	7	\$476,990
PAORA HAPI ST	I	TANIWHA ST	3	3	2	2	3	13	10	46	31	\$390,603
RUAPEHU ST	I	SPA ROAD		2	3	2	2	9	6	22	11	\$318,604
SPA ROAD	I	GASCOIGNE ST	1	4	2		5	12	10	25	25	\$317,700
GILLIES AVENUE	I	TAUPO VIEW ROAD				2	3	5	1		40	\$302,910
ROKOKAWA ST	I	RANGATIRA ST	2	2			1	5	2		60	\$253,276
SPA ROAD	I	A C BATHS AVENUE	1	2	1			4	1	50	25	\$236,690
TAHAREPA ROAD	I	KIDDLE DRIVE	1	1	1	1		4	1	25	50	\$235,830
TITIRAUPENGA ST	I	PAORA HAPI ST	3	2	1	1		7	5	14	29	\$234,060
SPA ROAD	I	KAIMANAWA ST	1	1	2	2	1	7	5	14	29	\$233,212
RUAPEHU ST	I	PAORA HAPI ST		4	1	2		7	5	29		\$230,756
RUAPEHU ST	I	TAMAMUTU ST		3	4		3	10	9	40	30	\$228,076
RIFLE RANGE ROAD	I	MERE ROAD	1	1	1			3			33	\$218,440
TAUHARA ROAD		60 E TAHAREPA ROAD	1	1	1			3			33	\$218,440
RUAPEHU ST	I	TUWHARETOA ST	2	5	1	1		9	8	11	11	\$210,798
RUAPEHU ST	I	HOROMATANGI ST	3	1	1	1	2	8	7	13	25	\$196,600
SHEPHERD ROAD	A	HYDE AVENUE			1	1	2	4	2	25	25	\$177,540
TAHAREPA ROAD	I	CROWN ROAD	1		1	2	2	6	5	50	33	\$161,770
KAIMANAWA ST	I	SCANNELL ST		3	2	1		6	5		17	\$159,314
TAMAMUTU ST	I	RIFLE RANGE ROAD	2	1	2	1		6	5	17	17	\$158,380

**Table 9.2: Council Roads Black Spot List Rural
 (Injury and Non-Injury Crashes)**
Site Radius = 250 metres
Sites with 3 or more injury crashes or more than \$150000 in social costs

CRASH ROAD	SIDE ROAD	2005	2006	2007	2008	2009	TOTAL	Non-Injury	Wet Crash %	Dark Crash %	Crash Costs
POIHIPI ROAD	3000 N SH 1N	3	1	1			5	2	60	60	\$5,382,889
WAIPAPA ROAD	1630 N RANGINUI ROAD		1	1		1	3	1	33	67	\$5,034,757
BROADLANDS ROAD	50 E VIEW ROAD		2	1			3	2		100	\$4,550,072
BROADLANDS ROAD	900 E WHITE ROAD	1		1	1		3	2	33	67	\$4,299,090
POIHIPI ROAD	I WHANGAMATA ROAD	2	2		2	3	9	3	33	33	\$3,326,549
WAIPAPA ROAD	3000 N RANGINUI ROAD			1	1	1	3	1	33	33	\$1,667,477
POIHIPI ROAD	670 S TUKAIRANGI ROAD					4	4	1	50	25	\$1,028,517
BROADLANDS ROAD	1360 S RIVER ROAD	1	3				4	1	75		\$995,014
MAPARA ROAD	I ACACIA HEIGHTS DRIVE		1	1		2	4	3	25	50	\$927,509
HIRANGI ROAD	30 N SH 41	1			1	1	3	2	33	67	\$891,630
ARATIATIA ROAD	100 S VIEW ROAD			2		1	3	2	67		\$888,874
MAPARA ROAD	30 N KAIPO ROAD		1	1	1	1	4		25	75	\$354,760
POIHIPI ROAD	860 W MAPARA ROAD	2		1	2		5	3	40	80	\$294,327
POIHIPI ROAD	30 E ACACIA BAY ROAD	1	2			2	5	3		20	\$293,266
POIHIPI ROAD	2000 N TIROHANGA ROAD	1	1	3	1		6	5	67	33	\$276,620
POIHIPI ROAD	1100 E SH 32		1		2	1	4	2	75	25	\$251,792
WAKEMAN ROAD	460 S ACACIA BAY ROAD		1		2		3	1	33	33	\$215,117
POIHIPI ROAD	600 W KAAHU ROAD			2	1		3	1	100		\$213,157
HUKA FALLS ROAD	50 S HUKA FALLS LOOP ROAD	1	2				3	2	33	67	\$168,309
WHANGAMATA ROAD	1640 W POIHIPI ROAD		1		2		3	2		67	\$163,674

**Table 9.3: State Highway
Urban and Rural Black Spot List
(Injury and Non-Injury Crashes)**

**Urban Site Radius = 30 metres
Rural Site Radius = 250 metres**

Sites with 3 or more injury crashes or more than \$250000 in social costs

CRASH ROAD	SIDE ROAD	2005	2006	2007	2008	2009	TOTAL	Non- Injury	Wet Crash %	Dark Crash %	Crash Costs
SH 1N	3460 N KAURI DRIVE	1	1	2	2	0	6	1	33	0	\$18,036,336
SH 5	I ARROWSMITH AVENUE	7	4	6	4	5	26	14	8	12	\$6,279,560
SH 1N	450 S MAROA ROAD	1	1	0	2	1	5	1	40	0	\$5,544,357
SH 30	170 S WAIPAPA ROAD	1	3	0	1	0	5	1	20	20	\$5,511,936
SH 32	5000 S SH 30	0	0	2	3	0	5	1	40	60	\$5,251,337
SH 5	I TAHARUA ROAD	0	2	2	0	1	5	2	40	60	\$5,203,732
SH 5	1800 N RANGITAIKI TVN	0	0	4	0	2	6	4	67	50	\$5,185,207
SH 1N	I POIHIPI ROAD	4	5	11	9	6	35	17	29	17	\$5,101,774
SH 1N	1320 S TAWHAA ROAD	0	0	0	0	3	3	1	33	0	\$5,074,937
SH 30	110 E POKURU ROAD NORTH	1	1	0	1	1	4	2	100	0	\$5,000,872
SH 30	2480 W WAIPAPA ROAD	1	0	0	1	1	3	1	0	33	\$4,962,237
SH 1N	I GRACE ROAD	3	1	1	0	0	5	3	40	40	\$4,809,903
SH 1N	11300 S RICHMOND AVENUE	2	1	0	0	0	3	1	33	33	\$4,645,616
SH 5	1300 E CAROLINE DRIVE	1	0	1	2	0	4	3	0	25	\$4,624,151
SH 1N	1700 N PALMER MILL ROAD	1	0	0	1	1	3	0	33	33	\$4,404,120
SH 5	270 E KIDDLE DRIVE	1	1	2	0	1	5	4	0	60	\$4,374,483
SH 5	1150 E PALMER MILL ROAD	0	1	1	0	1	3	1	33	33	\$4,349,656
SH 1N	1220 S TUTUKAU ROAD	0	0	1	1	1	3	1	0	0	\$4,347,777
SH 5	460 S PIRIPIRI ROAD	0	0	1	2	0	3	1	67	67	\$4,347,777
SH 1N	3000 E WAITAPU ROAD	0	1	0	1	1	3	2	33	0	\$4,298,212
SH 1N	I KARETOTO ROAD N	10	5	2	9	8	34	21	21	15	\$4,028,070
SH 1N	25 N WAITAHANUI BR	0	0	2	2	0	4	3	25	50	\$3,840,290
SH 1N	I TITIRAUPENGA ST	2	0	1	1	1	5	3	20	20	\$3,525,704
SH 1N	I KAIMANAWA ST	0	1	1	3	1	6	4	17	33	\$3,459,680
SH 1N	I HUKA FALLS ROAD	5	3	4	6	3	21	13	19	0	\$3,346,567
SH 1N	500 S FRETHEY DRIVE	0	2	5	7	2	16	10	81	44	\$3,039,947
SH 1N	750 E OTURERE BR	8	7	11	0	1	27	21	63	33	\$2,679,530
SH 1N	1000 N TUKINO ACCESS	2	1	0	0	3	6	2	0	50	\$2,499,729
SH 41	I SH 47	2	0	2	0	1	5	2	0	60	\$1,800,090
SH 32	980 N WAIHAHA BR	1	0	1	0	1	3	0	0	33	\$1,723,820
SH 5	3000 W MATEA ROAD	0	0	1	1	1	3	0	67	0	\$1,718,920
SH 1N	I HEUHEU PARADE	1	3	1	2	2	9	4	67	22	\$1,687,446
SH 5	A RANGITAIKI TVN	0	1	2	0	0	3	1	33	33	\$1,627,297
SH 1N	I PIHANGA ROAD	3	5	3	1	0	12	7	8	8	\$1,430,630
SH 1N	300 S MANGAMATE CUL	4	2	5	6	8	25	16	76	16	\$1,396,775
SH 1N	A OTURERE BR	4	1	5	1	0	11	8	18	82	\$1,303,007
HUKA FALLS ROAD S	I SH 1N	1	2	2	0	1	6	3	33	33	\$1,108,545
SH 5	3770 S MATEA ROAD	1	1	5	0	1	8	6	75	38	\$1,086,678
SH 1N	1000 S TREE TRUNK GORGE ROAI	0	1	2	1	0	4	1	75	50	\$1,030,396
SH 5	2000 E PALMER MILL ROAD	0	0	2	0	2	4	1	0	25	\$1,028,517
SH 1N	660 E OTURERE BR	0	2	2	1	0	5	3	40	40	\$1,017,669
SH 5	I POHOKURA ROAD	0	0	1	0	2	3	0	67	33	\$991,760
SH 1N	I SPA ROAD	3	3	6	6	2	20	19	15	35	\$966,979
SH 1N	A TONGARIRO BR	1	0	1	3	0	5	4	20	20	\$948,204
SH 1N	500 S PALMER MILL ROAD	1	1	1	0	0	3	1	67	67	\$945,034
SH 5	2000 S POHOKURA ROAD	0	1	1	0	1	3	1	33	33	\$942,196
SH 1N	I LOWELL PLACE	3	2	0	2	3	10	7	40	50	\$917,449
SH 1N	3200 N SH 30	0	2	1	0	0	3	1	0	33	\$902,097
SH 41	350 S MANGAROA ST	0	0	2	0	1	3	2	0	33	\$888,874
SH 5	510 W SH 1N	0	2	1	1	0	4	3	50	50	\$887,329

**Table 9.3: State Highway
Urban and Rural Black Spot List
(Injury and Non-Injury Crashes)**

Urban Site Radius = 30 metres
Rural Site Radius = 250 metres

Sites with 3 or more injury crashes or more than \$250000 in social costs

CRASH ROAD		SIDE ROAD	2005	2006	2007	2008	2009	TOTAL	Non-Injury	Wet Crash %	Dark Crash %	Crash Costs
SH 1N	I	RAINBOW DRIVE S	1	2	0	1	0	4	1	0	50	\$878,290
SH 41	I	OHUANGA ROAD	2	0	1	1	0	4	2	0	0	\$860,270
SH 1N	I	TIROHANGA ROAD	3	1	0	0	1	5	4	0	20	\$857,080
SH 41		440 N OMORI ROAD	1	1	1	0	0	3	2	0	0	\$851,450
SH 1N		3000 N RANGIPO PRISON ROAD	2	0	0	0	1	3	1	0	33	\$830,374
SH 1N		200 N TE TOKI POINT	2	0	1	1	0	4	3	50	50	\$815,687
SH 1N		980 N TREE TRUNK GORGE ROAI	0	1	9	2	4	16	12	75	38	\$795,761
SH 1N		30 S HOROMATANGI ST	0	0	0	0	3	3	2	33	0	\$671,180
SH 1N	I	STORY PLACE	1	4	3	8	3	19	14	11	11	\$607,421
SH 1N	A	THE AVENUE	0	0	1	2	5	8	4	38	50	\$482,887
SH 1N	A	MANGATAWAI BR	1	2	2	1	1	7	3	86	57	\$469,666
SH 1N	I	NORMAN SMITH ST	3	2	2	6	3	16	13	31	6	\$445,359
SH 1N	I	TAUPAHI ROAD	1	3	0	0	1	5	1	60	0	\$400,256
SH 5		20 N PALMER MILL ROAD	0	1	1	2	1	5	2	0	20	\$339,992
SH 1N		50 N WAIHOHONU BR	0	3	1	0	2	6	4	0	50	\$329,145
SH 30		1230 N RANGINUI ROAD	2	1	0	1	0	4	1	0	50	\$313,117
SH 5		100 N WAIPUNGA NO2 BR	2	2	0	0	0	4	1	75	25	\$312,934
SH 5		600 W MATEA ROAD	0	1	1	1	1	4	1	0	25	\$303,317
SH 5		1000 E MATEA ROAD	1	1	1	1	1	5	3	0	20	\$293,449
SH 1N	A	WAIKATO BR	1	0	1	2	1	5	3	0	20	\$289,427
SH 1N		3000 S OHUANGA ROAD	1	2	1	0	2	6	5	50	17	\$280,642
SH 1N		200 N PALMER MILL ROAD	2	0	0	1	1	4	2	0	50	\$257,570
SH 1N		2100 E ROTOPUHA ROAD	1	1	1	0	1	4	2	0	75	\$256,692
SH 1N		1000 S OHAKURI ROAD	0	2	1	1	0	4	2	25	25	\$253,671
SH 1N		10000 S MOUTUTERE STM BR	1	0	0	3	0	4	2	75	0	\$252,670
SH 1N	I	RUAPEHU ST	2	0	3	0	0	5	2	0	20	\$248,908

**Table 9.4 : Urban Council Road Crash Sites
with a Significant Increase in Crashes in 2009
(Injury and Non-Injury Crashes)**

**Site Radius =
30 metres**

CRASH ROAD		SIDE ROAD	2004	2005	2006	2007	2008	2009	TOTAL	Non-Injury	Wet Crash %	Dark Crash %
HEUHEU ST	I	TITIRAUPENGA ST	2	6	4	1	3	7	23	19	22	22
SPA ROAD	I	NUKUHAU ST	3	1	4	2	0	5	15	12	27	27
GILLIES AVENUE	I	TAUPO VIEW ROAD	1	0	0	0	2	3	6	1	17	50
HOROMATANGI ST		100 W RUAPEHU ST	0	1	0	0	0	3	4	4	0	25
TAUHARA ROAD	I	SPA ROAD	0	1	0	0	0	2	3	2	0	33

**Table 9.4a : Rural Council Road Crash Sites
with a Significant Increase in Crashes in 2009
(Injury and Non-Injury Crashes)**

**Site Radius =
250 metres**

CRASH ROAD		SIDE ROAD	2004	2005	2006	2007	2008	2009	TOTAL	Non-Injury	Wet Crash %	Dark Crash %
POIHIPI ROAD		670 S TUKAIRANGI ROAD	1	0	0	0	0	4	5	2	40	20

**Table 9.5 : State Highway Crash Sites
with a Significant Increase in Crashes in 2009
(Injury and Non-Injury Crashes)**

Urban Site Radius = 30 metres
Rural Site Radius = 250 metres

CRASH ROAD	SIDE ROAD	2004	2005	2006	2007	2008	2009	TOTAL	Non-Injury	Wet Crash %	Dark Crash %
SH 1N	300 S MANGAMATE CUL	1	4	2	5	6	8	26	17	77	15
SH 1N	A THE AVENUE	0	0	0	1	2	5	8	4	38	50
SH 1N	I REDOUBT ST	1	2	0	0	0	3	6	5	0	17
SH 1N	30 S HOROMATANGI ST	2	0	0	0	0	3	5	4	20	0
SH 47	4020 W SH 41	0	0	1	0	0	2	3	1	0	0
SH 1N	350 S ORUANUI ROAD	0	0	0	0	1	2	3	1	33	67
SH 5	2100 W MATEA ROAD	0	0	1	0	0	2	3	3	0	0
SH 1N	590 N HEUHEU PARADE	1	0	0	0	0	2	3	3	0	0
SH 1N	1000 S HUKA FALLS ROAD N	0	0	1	0	0	2	3	3	0	0
SH 1N	700 N KIKO ROAD	0	1	0	0	0	2	3	1	33	33
SH 30	540 N SANDEL ROAD	0	0	1	0	0	2	3	3	33	67
SH 1N	300 N ORUANUI ROAD	1	0	0	0	0	2	3	2	0	67
SH 5	I POHOKURA ROAD	0	0	0	1	0	2	3	0	67	33
SH 1N	1320 S TAWHAA ROAD	0	0	0	0	0	3	3	1	33	0
SH 32	I SH 30	0	1	0	0	0	2	3	2	67	0

appendix


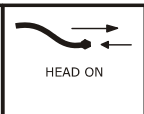


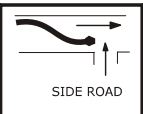


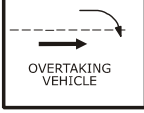
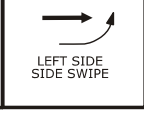







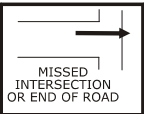
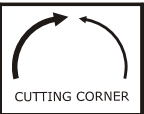
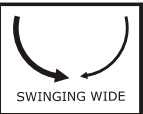
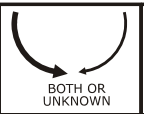
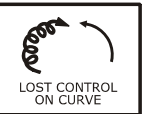





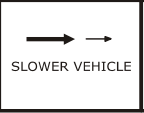

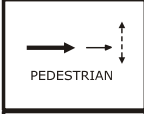
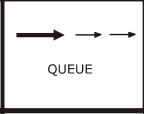
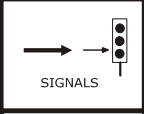
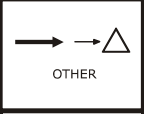

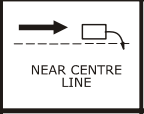

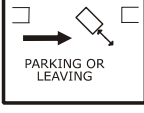
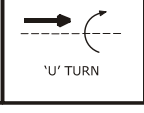
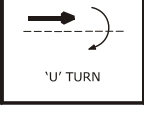

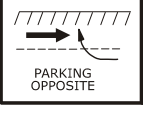


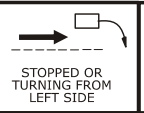
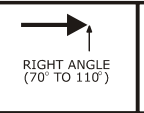
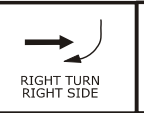
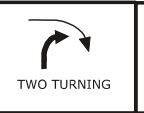
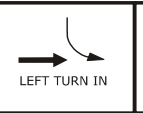
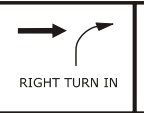
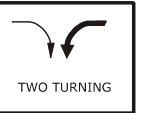
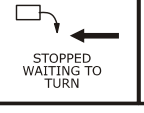
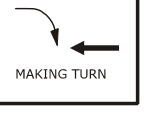
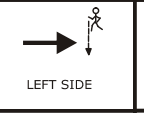
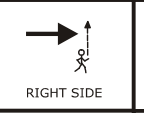
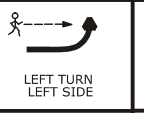
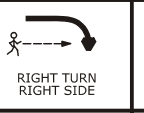





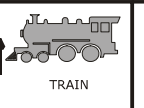
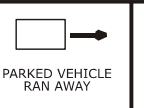

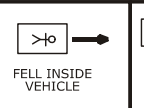
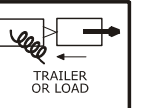
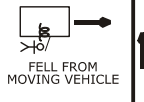
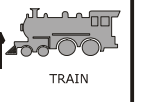
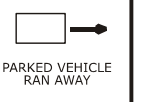

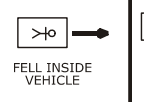
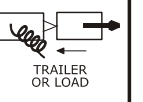


- Groupings of crash types
- Grouping of contributing factors
- General factor list
- General movement types

Explanatory notes for the appendix

1. Each traffic crash report has a diagram and a description of what happened. These are used to classify the movements the vehicles were making when they crashed eg 'collided with parked vehicle', or 'lost control while overtaking'. In this report, crash types are grouped into seven categories. The following page shows the types of crashes which are included in each group.
2. Traffic crash reports also include information on why the crash occurred, or on factors contributing to the crash. In this report the hundreds of contributing factor codes used by New Zealand Transport Agency have been condensed into 16 groups for practical reasons. Lists of the factor groups used in this report, and of all the contributing factors used by New Zealand Transport Agency, are shown on the following pages.
3. Note that in the year 2000 there were some minor changes to the contributing factor groups. The most significant change was that 'inattention' was grouped with 'inadequate check' to form 'poor observation'. This allowed a more accurate assessment of 'fatigue' as a contributing factor, as it now has its own grouping.
4. The factor group 'poor handling' includes factor codes that were only introduced in 1998. This could explain why there may have been a sudden change at this time.
5. The coding of the factors contributing to a crash is subjective. Therefore analysis using contributing factor groups needs to be interpreted with caution. Also, to effectively target safety or enforcement campaigns more analysis of the specific contributing factors involved may be needed.
6. It should be noted that a traffic crash generally has more than one contributing factor. Therefore, adding the number of crashes on graphs showing the number of crashes with a given factor or factor group will be greater than the total number of crashes in the city or district.

Groupings of crash types

Overtaking	AA	AB	AC	AD	AE	AF	AG						
	 PULLING OUT OR CHANGING LANE TO RIGHT	 HEAD ON	 CUTTING IN OR CHANGING LANE TO LEFT	 LOST CONTROL (OVERTAKING VEHICLE)	 SIDE ROAD	 LOST CONTROL (OVERTAKEN VEHICLE)	 WEAVING IN HEAVY TRAFFIC						
Straight - Lost control / Head on	GE	GB	BA	CA	CB	CC	BE						
	 OVERTAKING VEHICLE	 LEFT SIDE SIDE SWIPE	 ON STRAIGHT	 OUT OF CONTROL ON ROADWAY	 OFF ROADWAY TO LEFT	 OFF ROADWAY TO RIGHT	 LOST CONTROL ON STRAIGHT						
Bend - Lost control / Head on	DA	DB	DC	BB	BC	BD	BF						
	 LOST CONTROL TURNING RIGHT	 LOST CONTROL TURNING LEFT	 MISSED INTERSECTION OR END OF ROAD	 CUTTING CORNER	 SWINGING WIDE	 BOTH OR UNKNOWN	 LOST CONTROL ON CURVE						
Rear end / Obstruction	EA	EB	EC	ED	EE	FA	FB						
	 PARKED VEHICLE	 ACCIDENT OR BROKEN DOWN	 NON VEHICULAR OBSTRUCTIONS (INCLUDING ANIMALS)	 WORKMANS VEHICLE	 OPENING DOOR	 SLOWER VEHICLE	 CROSS TRAFFIC						
Crossing / Turning	FC	FD	FE	FF	GA	GD	GF						
	 PEDESTRIAN	 QUEUE	 SIGNALS	 OTHER	 REAR OF LEFT TURNING VEHICLE	 NEAR CENTRE LINE	 TWO TURNING						
Pedestrian vs Vehicle	MA	MB	MC	MD	ME	MF	MG						
	 PARKING OR LEAVING	 "U" TURN	 "U" TURN	 DRIVEWAY MANOEUVRE	 PARKING OPPOSITE	 ENTERING OR LEAVING	 REVERSING ALONG ROAD						
Miscellaneous	GC	HA	JA	JC	KA	KB	KC						
	 STOPPED OR TURNING FROM LEFT SIDE	 RIGHT ANGLE (70° TO 110°)	 RIGHT TURN RIGHT SIDE	 TWO TURNING	 LEFT TURN IN	 RIGHT TURN IN	 TWO TURNING						
Pedestrian vs Vehicle	LA	LB	NA	NB	NC	ND	NE	NF	NG				
	 STOPPED WAITING TO TURN	 MAKING TURN	 LEFT SIDE	 RIGHT SIDE	 LEFT TURN LEFT SIDE	 RIGHT TURN RIGHT SIDE	 LEFT TURN RIGHT SIDE	 RIGHT TURN LEFT SIDE	 MANOEUVRING VEHICLE				
Miscellaneous	PA	PB	PC	PD	PE	PF	QA	QB	QC	QD	QE	QF	QG
	 WALKING WITH TRAFFIC	 WALKING FACING TRAFFIC	 WALKING ON FOOTPATH	 CHILD PLAYING (TRICYCLE)	 ATTENDING TO VEHICLE	 ENTERING OR LEAVING VEHICLE	 FELL WHILE BOARDING OR ALIGHTING	 FELL FROM MOVING VEHICLE	 TRAIN	 PARKED VEHICLE RAN AWAY	 EQUESTRIAN	 FELL INSIDE VEHICLE	 TRAILER OR LOAD

Groupings of contributing factors








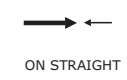
















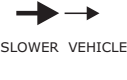











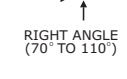









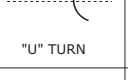
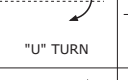

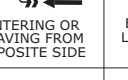
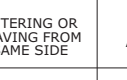






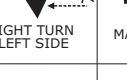





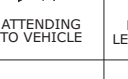
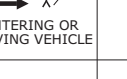

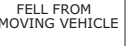





Factor group	Factor codes included
Alcohol involved	100 – 101 103 – 109
Too fast	110 – 119 430 – 432
Failed to give way or stop	300 – 314 320 – 328
Failed to keep left	120 – 128 205
Overtaking	150 – 161
Incorrect lanes or position	129 170 – 183 200 – 204 206 – 209 440 – 448
Poor handling	130 – 134 137 – 149 420 – 429
Poor observation	330 – 360 370 – 379
Poor judgement	380 – 387 400 – 407
Fatigue	410 – 415
Disabled, old age or illness	500 – 507
Pedestrian factors	700 – 731
Cyclist factors	Any factor coded against a cyclist
Vehicle factors	136, 600 – 699
Road factors	135, 800 – 899
Weather	900 – 909

Note:

The following factor codes are not included as they do not fit adequately into any of the above groupings: 102, 106, 190–198, 433, 434, 510–534 and 910–999.

VEHICLE MOVEMENT CODING SHEET

For use with crash data from CAS (Version 2.8 May 2010)

	TYPE	A	B	C	D	E	F	G	O
A	OVERTAKING AND LANE CHANGE	 PULLING OUT OR CHANGING LANE TO RIGHT	 HEAD ON	 CUTTING IN OR CHANGING LANE TO LEFT	 LOST CONTROL (OVERTAKING VEHICLE)	 SIDE ROAD	 LOST CONTROL (OVERTAKEN VEHICLE)	 WEAVING IN HEAVY TRAFFIC	OTHER
B	HEAD ON	 ON STRAIGHT	 CUTTING CORNER	 SWINGING WIDE	 BOTH OR UNKNOWN	 LOST CONTROL ON STRAIGHT	 LOST CONTROL ON CURVE		OTHER
C	LOST CONTROL OR OFF ROAD (STRAIGHT ROADS)	 OUT OF CONTROL ON ROADWAY	 OFF ROADWAY TO LEFT	 OFF ROADWAY TO RIGHT					OTHER
D	CORNERING	 LOST CONTROL TURNING RIGHT	 LOST CONTROL TURNING LEFT	 MISSED INTERSECTION OR END OF ROAD					OTHER
E	COLLISION WITH OBSTRUCTION	 PARKED VEHICLE	 CRASH OR BROKEN DOWN	 NON VEHICULAR OBSTRUCTIONS (INCLUDING ANIMALS)	 WORKMANS VEHICLE	 OPENING DOOR			OTHER
F	REAR END	 SLOWER VEHICLE	 CROSS TRAFFIC	 PEDESTRIAN	 QUEUE	 SIGNALS	 OTHER		OTHER
G	TURNING VERSUS SAME DIRECTION	 REAR OF LEFT TURNING VEHICLE	 LEFT TURN SIDE SIDE SWIPE	 STOPPED OR TURNING FROM LEFT SIDE	 NEAR CENTRE LINE	 OVERTAKING VEHICLE	 TWO TURNING		OTHER
H	CROSSING (NO TURNS)	 RIGHT ANGLE (70° TO 110°)							OTHER
J	CROSSING (VEHICLE TURNING)	 RIGHT TURN RIGHT SIDE	 OPPOSING RIGHT TURNS	 TWO TURNING					OTHER
K	MERGING	 LEFT TURN IN	 RIGHT TURN IN	 TWO TURNING					OTHER
L	RIGHT TURN AGAINST	 STOPPED WAITING TO TURN	 MAKING TURN						OTHER
M	MANOEUVRING	 PARKING OR LEAVING	 "U" TURN	 "U" TURN	 DRIVEWAY MANOEUVRE	 ENTERING OR LEAVING FROM OPPOSITE SIDE	 ENTERING OR LEAVING FROM SAME SIDE	 REVERSING ALONG ROAD	OTHER
N	PEDESTRIANS CROSSING ROAD	 LEFT SIDE	 RIGHT SIDE	 LEFT TURN LEFT SIDE	 RIGHT TURN RIGHT SIDE	 LEFT TURN RIGHT SIDE	 RIGHT TURN LEFT SIDE	 MANOEUVRING VEHICLE	OTHER
P	PEDESTRIANS OTHER	 WALKING WITH TRAFFIC	 WALKING FACING TRAFFIC	 WALKING ON FOOTPATH	 CHILD PLAYING (INCLUDING TRICYCLE)	 ATTENDING TO VEHICLE	 ENTERING OR LEAVING VEHICLE		OTHER
Q	MISCELLANEOUS	 FELL WHILE BOARDING OR ALIGHTING	 FELL FROM MOVING VEHICLE	 TRAIN	 PARKED VEHICLE RAN AWAY	 EQUESTRIAN	 FELL INSIDE VEHICLE	 TRAILER OR LOAD	OTHER

* = Movement applies for left and right hand bends, curves or turns

FACTORS PROBABLY CONTRIBUTING TO CRASHES (Version 1.8- 2 November 2009)

DRIVER CONTROL

100 Alcohol or drugs

- 101 Alcohol suspected
- 102 Alcohol test below limit
- 103 Alcohol test above limit or test refused
- 104 Alcohol test result unknown
- 105 Intoxicated non-driver (pedestrian / cyclist / passenger)
- 106 (MOT only) dead driver not suspect, tested neg
- 107
- 108 Drugs suspected
- 109 Drugs proven

110 Too fast for conditions

- 111 Cornering
- 112 On straight
- 113 To give way at intersection
- 114 Approaching railway crossing
- 115 When passing stationary school bus
- 116 At temporary speed limit
- 117 At crash or emergency

120 Failed to keep left

- 121 Swung wide on bend
- 122 Swung wide at intersection
- 123 Cutting corner on bend
- 124 Cutting corner at intersection
- 125 On straight section
- 126 Vehicle crossed raised median
- 127 Driving or riding abreast (cyclists more than 2 abreast)
- 128 Wandering or wobbling
- 129 Too far left / right

130 Lost control

- 131 When turning
- 132 Under heavy braking
- 133 Under heavy acceleration
- 134 While returning to seal from unsealed shoulder
- 135 Due to road conditions (requires road series code)
- 136 Due to vehicle fault (requires vehicle series code)
- 137 Avoiding another vehicle, pedestrian, party or obstacle on roadway
- 138 On unsealed road
- 139 End of seal

140 Failed to signal in time

- 141 When moving to left, pulling over to left
- 142 When turning left
- 143 When pulling out or moving to the right
- 144 When turning right
- 145 Incorrect Signal

150 Overtaking

- 151 Overtaking line of traffic or queue
- 152 Deliberately in the face of oncoming traffic
- 153 Failed to notice oncoming traffic
- 154 Misjudged speed or distance of oncoming traffic
- 155 At no passing line
- 156 With insufficient visibility
- 157 At an intersection without due care
- 158 On left without due care
- 159 Cut in after overtaking
- 160 Vehicle signalling right turn
- 161 Without care at a pedestrian crossing

170 Wrong lane or turned from wrong position

- 171 Turned right from incorrect lane
- 172 Turned left from incorrect lane
- 173 Travelled straight ahead from turning lane or flush median
- 174 Turned right from left side of road
- 175 Turned left from near centre line
- 176 Turned into incorrect lane
- 177 Weaving or cut in on multi-lane roads
- 178 Moved left to avoid slow vehicle
- 179 Long vehicle tracked outside lane

180 In line of traffic

- 181 Following too closely
- 182 Travelling unreasonably slowly
- 183 Motorist crowded cyclist
- 184 Incorrect merging /diverging manoeuvre

190 Sudden action

- 191 Braked
- 192 Turned left
- 193 Turned right
- 194 Swerved to avoid pedestrian
- 195 Swerved to avoid animal
- 196 Swerved to avoid crash or broken down vehicle
- 197 Swerved to avoid vehicle
- 198 Swerved to avoid object or for unknown reason
- 199 Avoiding approaching emergency vehicle

200 Forbidden movements

- 201 Wrong way in one way street, motorway or roundabout
- 202 When turning or U turning contrary to a sign
- 203 Contrary to "in" or "out" only driveway sign
- 204 Driving or riding on footpath
- 205 On incorrect side of island or median
- 206 Contrary to "no entry" sign
- 207 In Car Park
- 208 Motor vehicle in cycle lane
- 209 Bus / Transit lane
- 210 Cyclist riding on ped-xing / ped signals

VEHICLE CONFLICTS

300 Failed to give way

- 301 At Stop sign
- 302 At Give Way sign
- 303 When turning to non-turning traffic
- 304 When deemed turning by markings, not geometry
- 305 When turning left, to opposing right turning traffic
- 306 To pedestrian on a crossing
- 307 When turning at signals to pedestrians
- 308 When entering roadway from driveway
- 309 To traffic approaching or crossing from the right
- 310 Failed to give way at one lane bridge / road
- 311 Failed to give way to pedestrian on footpath or verge
- 312 Entering roadway not from driveway or intersection
- 313 To emergency vehicle
- 314 Driver waved through

320 Did not stop

- 321 At stop sign
- 322 At steady red light
- 323 At steady red arrow
- 324 At steady amber light
- 325 At steady amber arrow
- 326 At flashing red lights (Rail Xing, Fire Stn etc)
- 327 For police or flag-person
- 328 For school patrol / kea crossing

330 Inattentive: failed to notice

- 331 Vehicle slowing, stopping or stationary in front
- 332 Bend in road
- 333 Indication of vehicle in front
- 334 Traffic lights
- 335 Intersection or its Stop / Give Way control
- 336 Other regulatory sign / markings
- 337 Warning sign
- 338 Direction, information signs / markings
- 339 Road-works signs
- 340 Lane use arrows / markings?
- 341 Obstructions on Roadway

350 Attention diverted by:

- 351 Passengers
- 352 Scenery or persons outside vehicle
- 353 Other traffic
- 354 Animal or insect in vehicle
- 355 Trying to find intersection, house number, destination
- 356 Advertising or signs
- 357 Emotionally upset /road rage
- 358 Cigarette, radio, heater, AC, glove box, obj under drivers feet/pedals etc
- 359 Cell phone
- 360
- 361 Navigation device
- 362 CB radio/ non cell comms device
- 363 Driver dazzled

370 Did not see or look for another party until too late

- 371 Behind when reversing / manoeuvring
- 372 Behind when changing lanes position or direction (includes U-turns)
- 373 Behind when pulling out from parked position
- 374 Behind when opening door or leaving vehicle
- 375 When required to give way to traffic from another direction
- 376 When required to give way to pedestrians.
- 377 When visibility obstructed by other vehicles
- 378 When visibility limited by roadside features
- 379 When first in queue on receiving green light

380 Misjudged speed, distance, size or position of:

- 381 Other vehicle coming from behind or alongside
- 382 Other vehicle coming from another direction with right of way
- 383 Pedestrian movement or intention
- 384 Towed vehicle, or while towing a vehicle
- 385 Size or position of fixed object or obstacle
- 386 Of own vehicle
- 387 Misjudged intentions of another party

GENERAL DRIVER

400 Inexperience

- 401 In driving in fast, complex or heavy traffic
- 402 New driver showed inexperience
- 403 Driving unfamiliar vehicle
- 404 Overseas / migrant driver fails to adjust to NZ road rules and road conditions
- 405 Driver under instruction
- 406 At towing trailer / other vehicle
- 407 Driver over-reacted
- 408 Unsupervised cyclist

410 Fatigue (drowsy, tired, fell asleep)

- 411 Long trip
- 412 Lack of sleep
- 413 Exhaust fumes
- 414 Worked long hours before driving
- 415 Exceeded driving hours

420 Incorrect use of vehicle controls

- 421 Started in gear
- 422 Stalled engine
- 423 Wrong pedal
- 424 Footrest, stand
- 425 Ignition turned off (steering locked)
- 426 Lights not switched on
- 427 Foot slipped or caught under pedal
- 428 Parking brake not fully applied
- 429 Trailer coupling or safety chain not secured

430 Showing off

- 431 Racing
- 432 Playing chicken
- 433 Wheel spins / wheelies / doughnuts / drifting
- 434 Intimidating driving

440 Parked or stopped

- 441 Inadequately lit at night: (not lit by street lights or park lights off)
- 442 At point of limited visibility
- 443 Not as close as practicable to side of road
- 444 On incorrect side of road
- 445 Double parked
- 446 In 'No Stopping' area
- 447 Not clear of rail crossing
- 448 In cycle or Transit lane

GENERAL PERSON

500 Illness and disability

- 501 Illness with no warning e.g. heart attack, unexpected epilepsy)
- 502 Physically disabled
- 503 Defective vision
- 504 Medical illness (not sudden) flu, diabetes
- 505 Mental illness (depression, psychosis)
- 506 Suicidal (but not successful)
- 507 Impaired ability due to old age

510 Intentional or criminal

- 511 Deliberate homicide (only if succeeded)
- 512 Intentional collision
- 513 Committed suicide (only if succeeded)
- 514 Evading enforcement
- 515 Object deliberately thrown at or dropped on vehicle / shot at
- 516 Object thrown from vehicle
- 517 Stolen vehicle

520 Driver or passenger, boarding, leaving , in vehicle

- 521 Boarding moving vehicle
- 522 Intentionally leaving moving vehicle
- 523 Riding in insecure position
- 524 Interfered with driver
- 525 Opened door inadvertently
- 526 Overloaded vehicle (with passengers)
- 527 Child playing in parked vehicle

530 Miscellaneous person

- 531 Casualty drowned
- 532 Casualty thrown from vehicle
- 533 Equestrian not keeping to verge
- 534 Cyclist or M/cyclist wearing dark clothing

VEHICLES

600 Lights and reflectors at fault or dirty

- 601 Dazzling headlights
- 602 Headlights inadequate or no headlights
- 603 Headlights failed suddenly
- 604 Brake-lights or indicators faulty or not fitted
- 605 Tail-lights inadequate or no tail-lights
- 606 Reflectors inadequate or no reflectors
- 607 Lights or reflectors obscured

610 Brakes

- 611 Parking brake failed
- 612 Parking brake defective
- 613 Service brake failed
- 614 Service brake defective
- 615 Jack-knifed

620 Steering

- 621 Defective
- 622 Failed suddenly

630 Tyres

- 631 Puncture or blow-out
- 632 Worn tread on tyre
- 633 Incorrect tyre type
- 634 Mixed treads / space savers

640 Windscreen or mirror

- 641 Shattered windscreen
- 642 Windscreen or rear window dirty
- 643 Rear vision mirror not adjusted correctly
- 644 No rear vision mirror
- 645 Windscreen or rear window misted/frosted
- 646 Inadequate or no sun-visors
- 647 Inadequate or no windscreen wipers
- 648 Cycle / Motorcycle visor, glasses, goggles or screen

650 Mechanical

- 651 Engine failure
- 652 Transmission failure (including chains and gears)
- 653 Accelerator or throttle jammed

660 Body or chassis

- 661 Body, chassis or frame (cycle, m/c) failure
- 662 Suspension failure
- 663 Failure of door catch or door not shut
- 664 Inadequate mudguards
- 665 Inadequate tow coupling
- 666 Inadequate or no safety chain
- 667 Bonnet catch failed
- 668 Wheel off
- 669 Broken axle
- 670 Inconspicuous colour
- 671 Blind spot
- 672 Seat belt / restraint failed
- 673 Air-bag failed to inflate (fully)

680 Load

- 681 Load interferes with driver
- 682 Not well secured or load moved
- 683 Over-hanging
- 684 Load obscured vision
- 685 Excess dimensions not adequately indicated
- 686 Over dimension vehicle or load
- 687 Load too heavy
- 688 Towed vehicle or trailer too heavy or incompatible

690 Miscellaneous vehicle

- 691 Emergency Vehicle attending emergency
- 692 Vehicle caught fire
- 693 Being towed
- 694 Air-bag contributed to crash or injury
- 695 Seatbelt / restraint absent or unusable
- 696 Dangerous goods

PEDESTRIANS

700 Walking along road

- 701 Not keeping to footpath
- 702 Not keeping to side of road
- 703 Not facing oncoming traffic
- 704 Not on outside of blind curve
- 705 Wheeled ped inconsiderate or dangerous on footpath

710 Crossing road

- 711 Walking heedless of traffic
- 712 Stepping out from behind vehicles
- 713 Running heedless of traffic
- 714 Failed to use pedestrian crossing when one within 20 metres
- 715 Waiting on roadway for moving traffic
- 716 Confused by traffic or stepped back
- 717 Suddenly stepped onto pedestrian crossing
- 718 Not complying with traffic signals or school patrols
- 719 Misjudged speed and / or distance of vehicle

720 Miscellaneous

- 721 Pushing, working on or unloading vehicle
- 722 Playing on road or unnecessarily on road
- 723 Working on road
- 724 Wearing dark clothing
- 725 Vision obscured by umbrella or clothing
- 726 Child escaped from supervision
- 727 Unsupervised child
- 728 Sitting / lying on road
- 729 Pedestrian to /from school bus
- 730 Pedestrian behind reversing / manoeuvring vehicle
- 731 Overseas pedestrian
- 732 Pedestrian attention diverted eg cigarette, cell phone, music player

ROAD

800 Slippery

- 801 Rain
- 802 Frost or ice
- 803 Snow or hail
- 804 Loose material on seal
- 805 Mud
- 806 Oil / Diesel / Fuel
- 807 Painted markings
- 808 Recently graded
- 809 Surface bleeding / defective

810 Surface

- 811 Potholed
- 812 Uneven
- 813 Deep loose metal
- 814 High crown
- 815 Curve not well banked
- 816 Edge badly defined or gave way
- 817 Under construction or maintenance
- 818 Unusually narrow
- 819 Broken glass

820 Obstructed

- 821 Fallen tree or branch
- 822 Slip or subsidence
- 823 Flood waters, large puddles, ford
- 824 Road works not adequately lighted
- 825 Road works not adequately signposted
- 826 Roadside object fell on vehicle
- 827 Object flicked up by vehicle

830 Visibility limited

- 831 Curve
- 832 Crest
- 833 Building
- 834 Trees
- 835 Hedge or fence
- 836 Scrub or long grass
- 837 Bank
- 838 Temporary obstruction, dust or smoke
- 839 Parked vehicle

840 Signs and signals

- 841 Damaged, removed or malfunction
- 842 Badly located
- 843 Ineffective or inadequate
- 844 Necessary
- 845 Signals turned off

850 Markings

- 851 Faded
- 852 Difficult to see under weather conditions
- 853 Markings necessary
- 854 Not visible due to geometry or vehicles
- 855 Old markings not adequately removed

860 Street lighting

- 861 Failed
- 862 Inadequate
- 863 Glare on wet road
- 864 Pedestrian crossing not adequately lighted

870 Raised islands and roundabouts

- 871 Traffic island(s) difficult to see
- 872 Traffic island(s) ineffective, badly located or designed
- 873 Cyclist squeeze point

MISCELLANEOUS

900 Weather

- 901 Heavy rain
- 902 Dazzling sun
- 903 Strong wind
- 904 Fog or mist
- 905 Snow, sleet or hail

910 Animals

- 911 Household pet rushed out or playing
- 912 Farm animal straying
- 913 Farm animal attended, but inadequate warning or unexpected
- 914 Farm animal attended, but out of control
- 915 Wild animal

920 Entering or leaving land use

- 921 Roadside stall
- 922 Service station
- 923 Specialised liquor outlet
- 924 Take away foods
- 925 Shopping complex
- 926 Car parking building / area
- 927 Other commercial
- 928 Industrial site
- 929 Private house / farm
- 930 Other non-commercial
- 931 Mobile shop or vendor

999 Unknown