

Waitakere City
Road Safety Report
2003 to 2007



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April 2008

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Introduction and general information

Land Transport New Zealand 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 Land Transport New Zealand.

This report helps identify road safety issues in Waitakere City area ('the city') 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 local 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 Waitakere City. 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 Land Transport New Zealand's crash database. This database includes all crashes involving injury and non-injury for which Police reports have been completed and forwarded to Land Transport New Zealand. Mostly five-year data (2003 to 2007) has been used, but 10-year data (1998 to 2007) has been used to analyse trends.

Local 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 local authorities (Group A) along with data for all New Zealand.

The peer group used for comparison with Waitakere City is Group A which consists of major urban areas with some rural areas on the outskirts. (Population over 100000 and/or rural crashes less than 30 percent). Local 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.

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:

Open road speed	http://www.transport.govt.nz/speed1/
Urban speed	http://www.transport.govt.nz/speed2/
Safety belts	http://www.transport.govt.nz/belts-index/
Cycle helmets	http://www.transport.govt.nz/cycle-helmets-2007-1/

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/public-attitudes-index/>

General explanatory notes

1. Crash and casualty information in this report generally includes data for both local roads and state highways. Some tables and charts can separate this information, however figures 8.1–8.26 provide information for local roads only.
2. Crash and casualty rates are based on 2007 populations estimates updated from the 2006 census, traffic flows from the year 2005, and the average of five year crash data (2003–2007).
3. Traffic flows are based on Road Asset Maintenance and Management (RAMM) data from December 2004. Caution should be exercised when comparing traffic flow based crash rates in one authority with those of other authorities. Different road controlling authorities update flow data in RAMM at different times and some data will be more up to date than other data.
4. With four to five categories of road for each local 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 2003 to 2007 is available. The graph includes all casualties irrespective of culpability.

NOTE: Ethnicity data should be treated with cautions 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 the appendix for detailed descriptions of:
 - crash movement types and crash movement groupings (for Figures 4.1–4.4)
 - grouping of factors contributing to crashes and factors contributing to crashes (for Figures 5.1–5.14)

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	1997	2001	2002	2003	2004
	1999	2002	2003	2004	2005
Northland	41%	52%	54%	59%	68%
Auckland	63%	63%	67%	67%	67%
Waikato	58%	65%	69%	68%	75%
Bay of Plenty	48%	54%	63%	60%	63%
Gisborne	53%	56%	56%	60%	55%
Hawkes Bay	57%	65%	72%	73%	79%
Taranaki	69%	70%	75%	70%	73%
Manawatu-Wanganui	64%	67%	63%	62%	69%
Wellington	62%	56%	65%	63%	72%
Nelson-Marlborough	74%	67%	72%	68%	71%
West Coast	58%	64%	71%	62%	70%
Canterbury	68%	69%	69%	68%	69%
Otago	62%	79%	79%	77%	83%
Southland	55%	68%	68%	61%	73%
New Zealand	60%	64%	67%	67%	70%

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

Figure 1.2 Crashes per 100 million vehicle kilometres travelled

	Local roads		State highways	
	Urban	Rural	Urban	Rural
Waitakere City	36	26	33	16
Group A	35	24	38	12
All NZ	36	26	32	16

Figure 1.3 Casualties per 100 million vehicle kilometres travelled

	Local roads		State highways	
	Urban	Rural	Urban	Rural
Waitakere City	48	35	42	20
Group A	44	34	51	17
All NZ	46	38	43	25

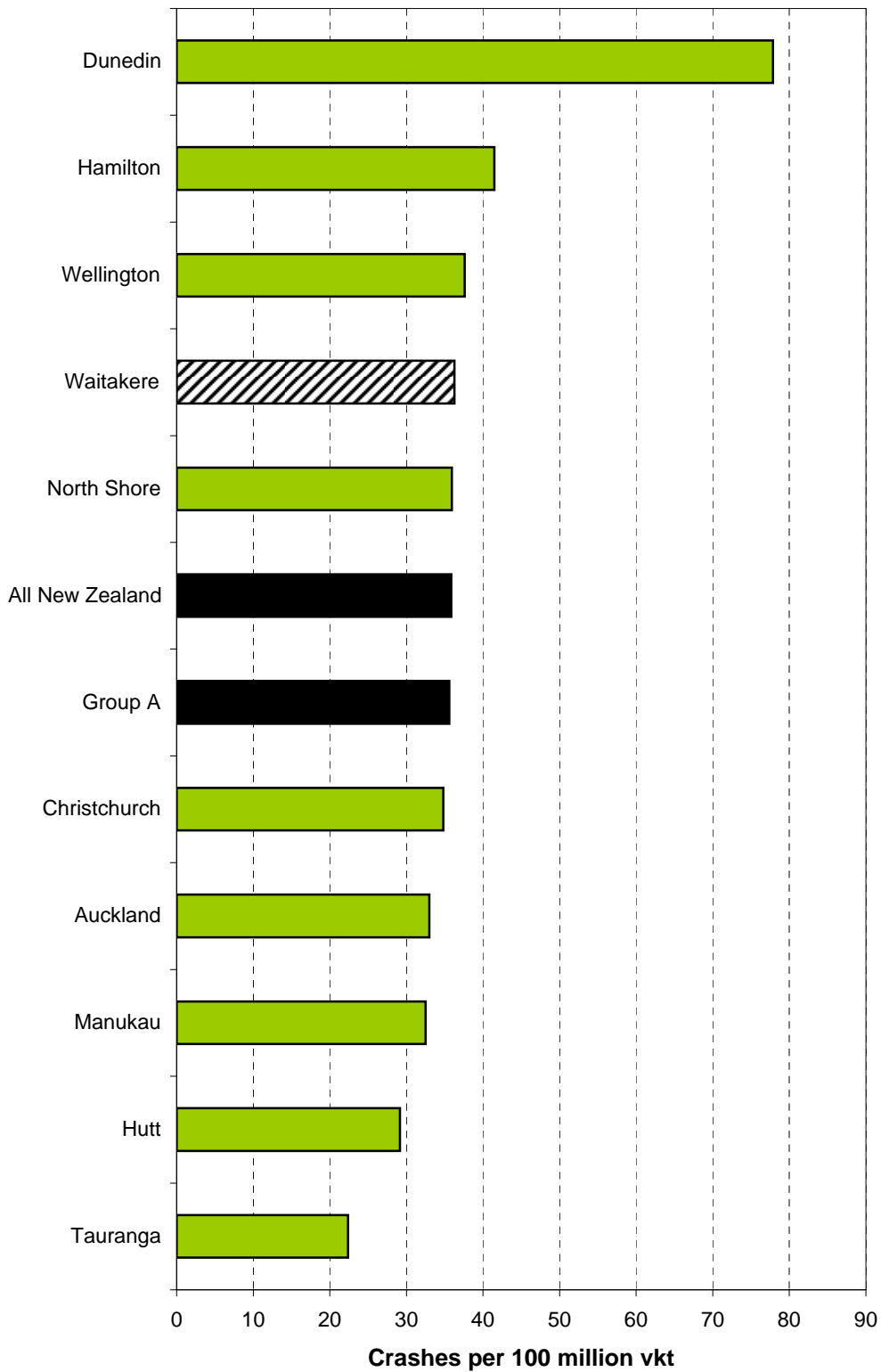
Figure 1.4 Peer group crash and casualty rates

Group A

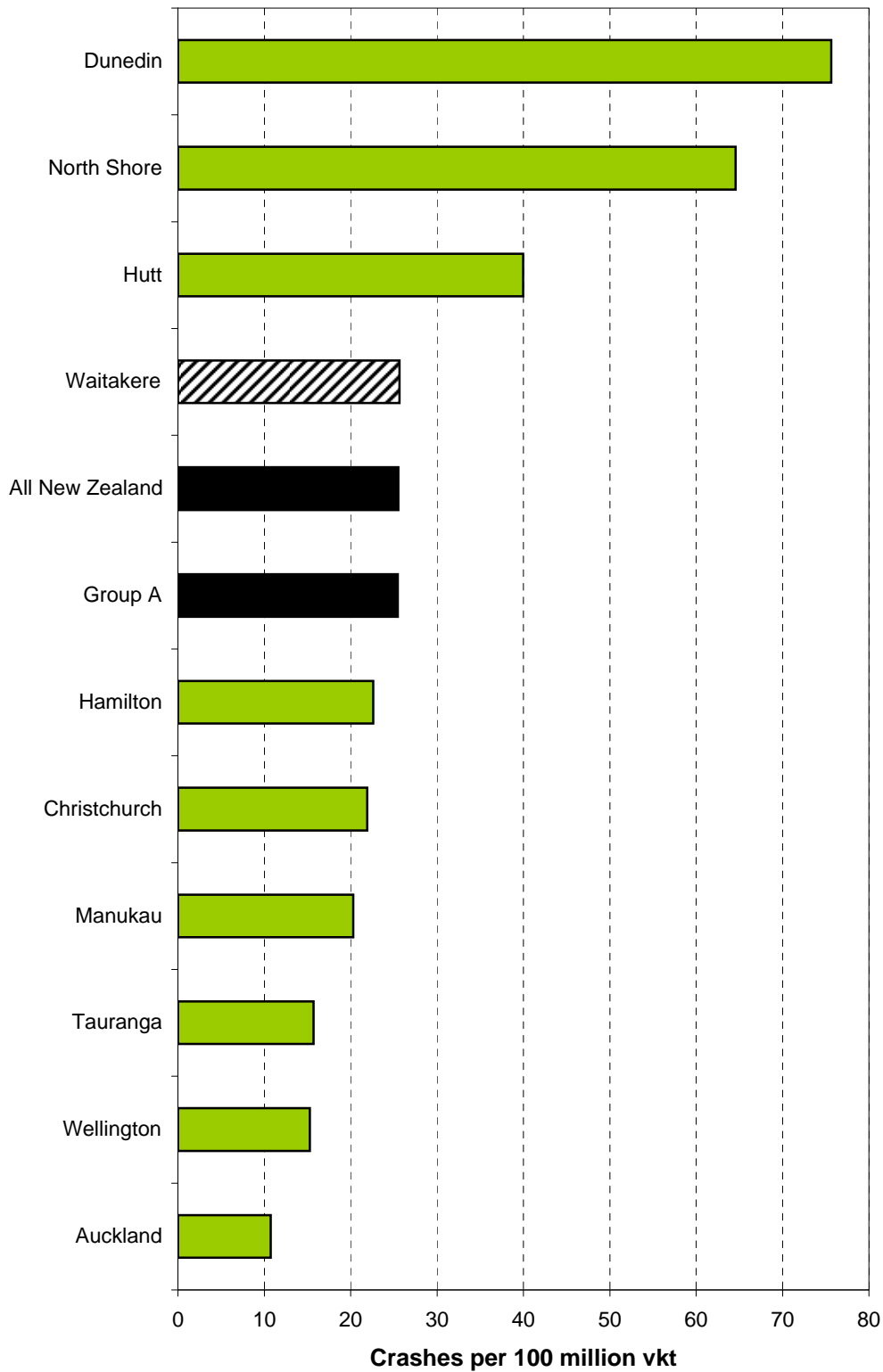
City or District	Crashes per					Casualties per					2007 Population	% of rural crashes
	10,000 Population (5 year average)	100 million vehicle kilometres travelled				10,000 Population (5 year average)	100 million vehicle kilometres travelled					
		Local roads		State highways			Local roads		State highways			
		Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural		
Auckland	27	33	11	175	15	34	41	16	238	20	433200	21
Christchurch	23	35	22	23	13	30	44	30	30	18	365700	10
Dunedin	41	78	76	59	21	59	110	109	86	33	122500	24
Hamilton	22	41	23	36	17	28	52	26	46	23	136600	11
Hutt	19	29	40	18	8	24	35	55	20	11	101500	24
Manukau	18	33	20	57	11	24	42	30	80	17	354800	23
North Shore	20	36	65	46	11	25	45	82	62	16	220200	19
Tauranga	15	22	16	27	8	20	28	23	38	14	108800	16
Waitakere	20	36	26	33	16	27	48	35	42	20	198400	14
Wellington	20	38	15	56	10	25	44	17	76	14	190500	16
Group A	23	36	25	37	13	29	45	36	50	18	2232200	18
All New Zealand	131	36	26	32	16	36	46	38	43	25	4227700	41

Group A : Major urban areas with some rural areas on the outskirts. (Population > 97500 and/or rural crashes less than 30 percent)
 Crashes and casualties per 100 million VKT are based on five years of reported injury on-road crash data (2003-2007) and December (2005) VKT.
 Crashes and casualties per 10,000 population are based on five year average crash data (2003-2007) and Statistics NZ 2006 population estimates.

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



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



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

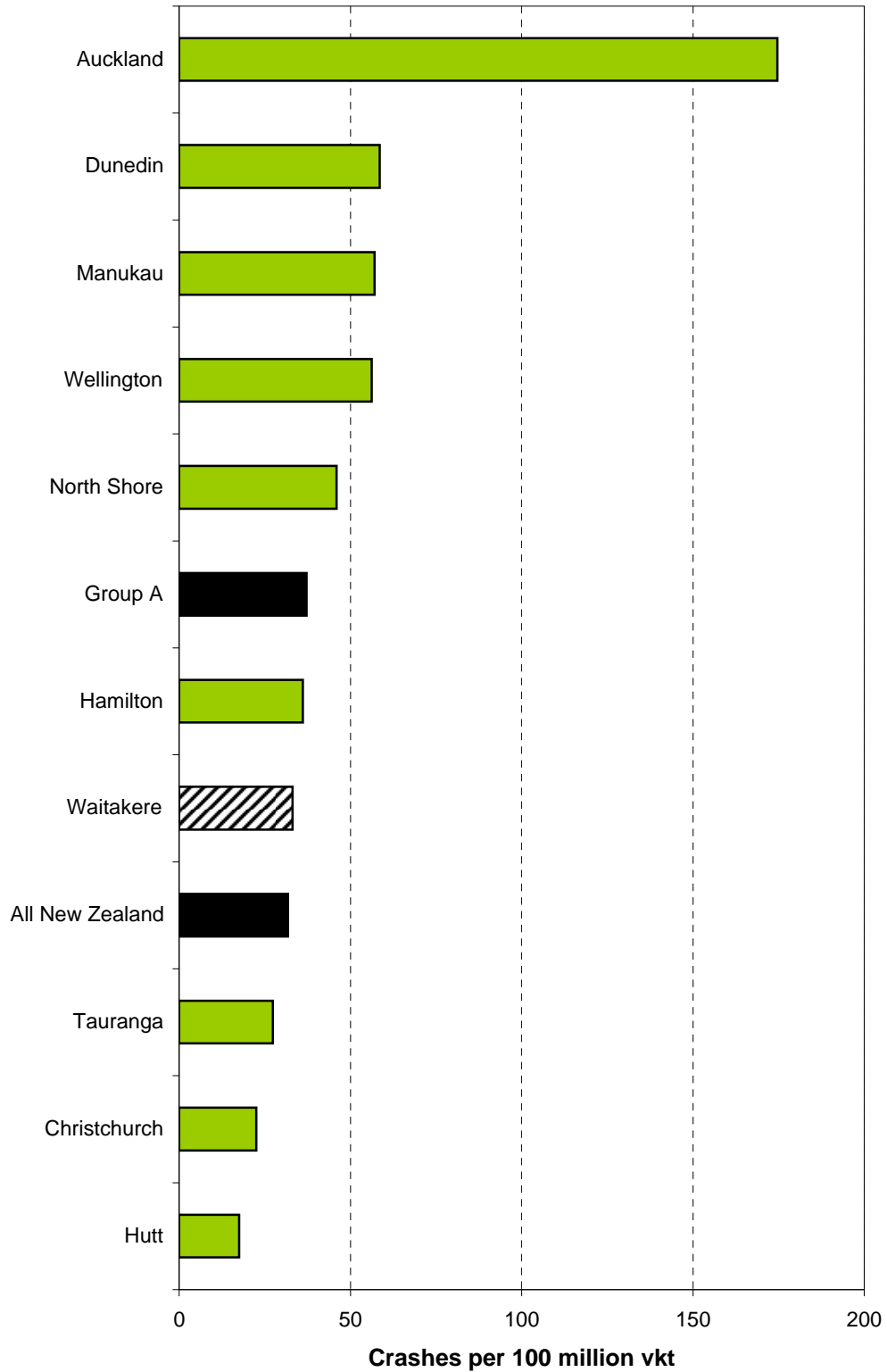
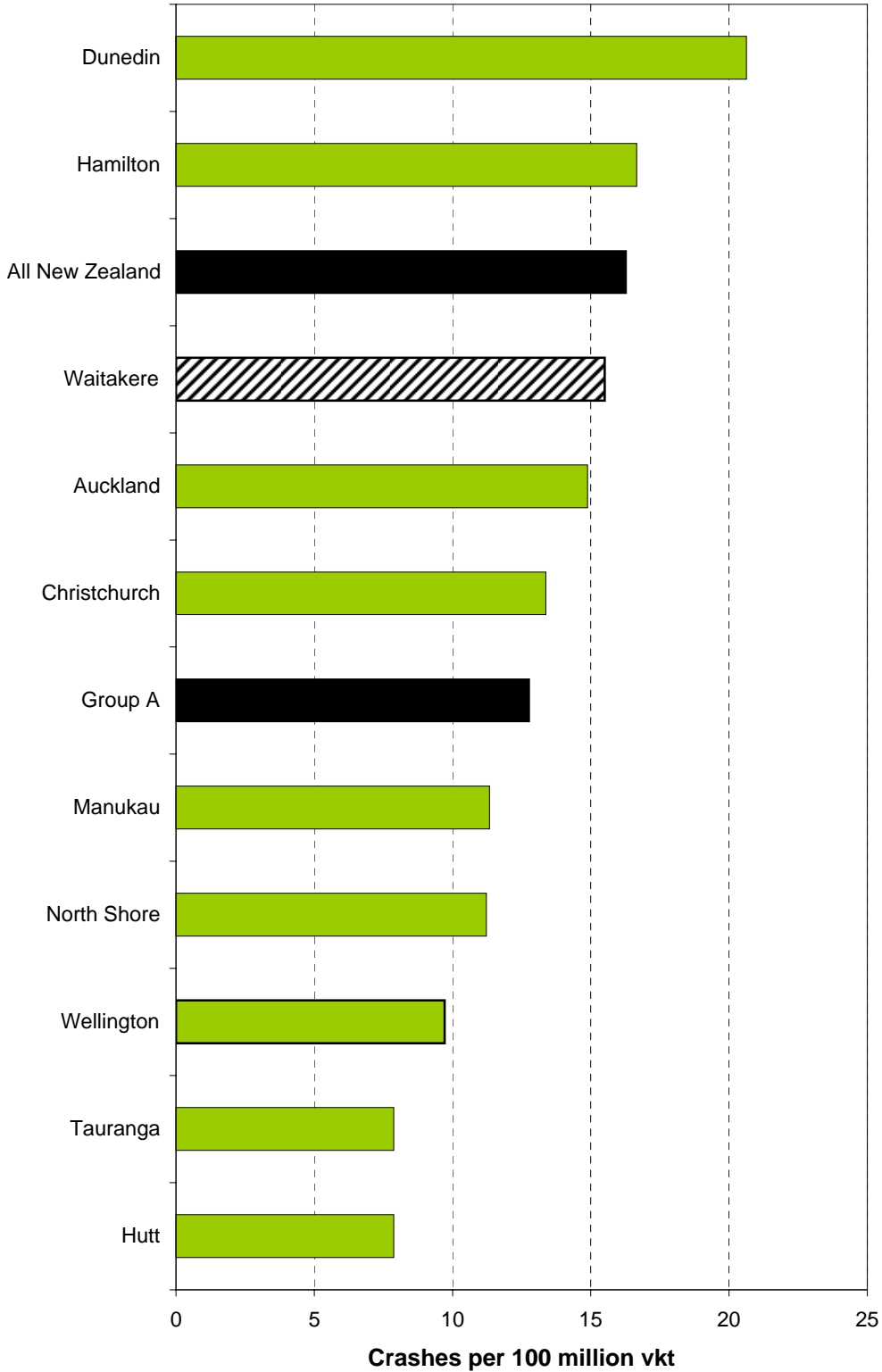


Figure 1.8 Crashes per 100 million vehicle-kilometres travelled - rural state highways



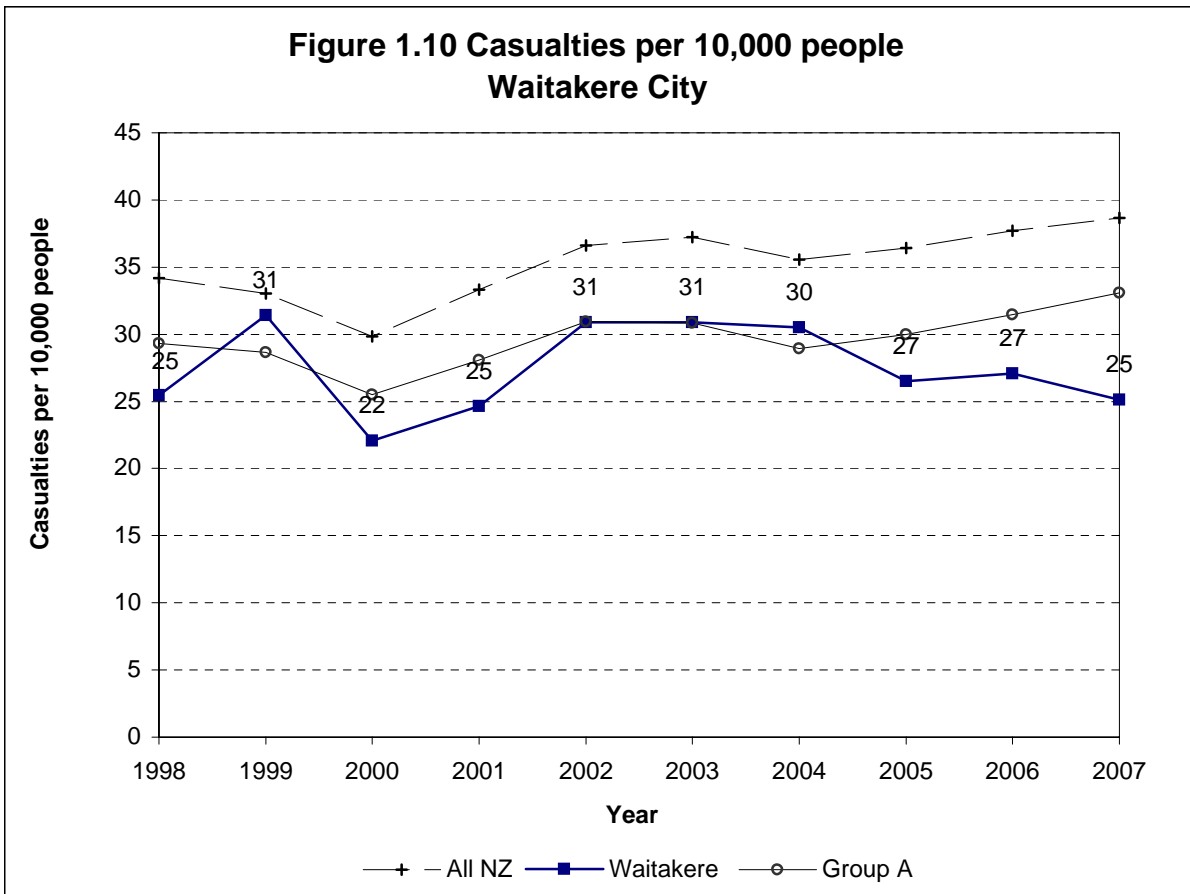
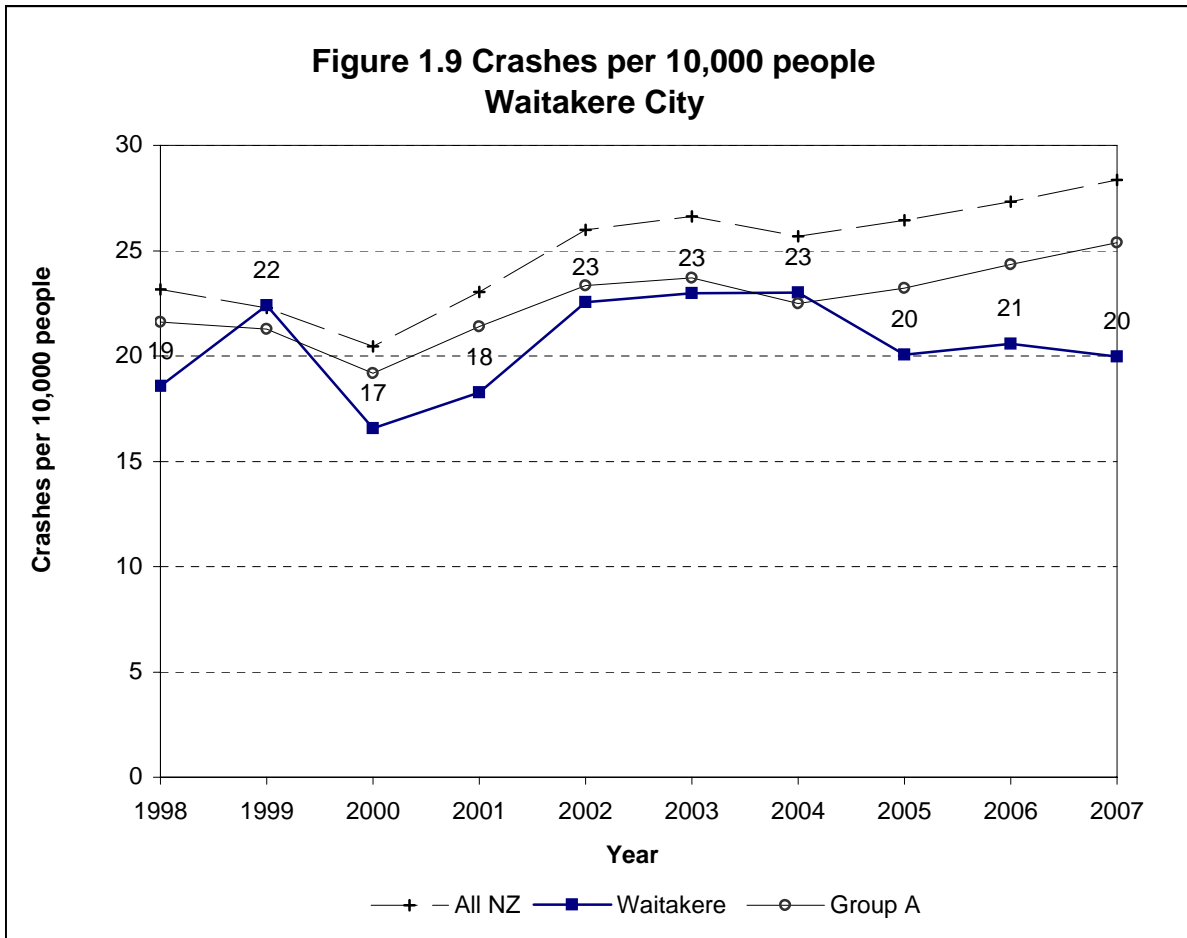


Figure 1.11 Social cost of crashes in Waitakere City in 2007

		Waitakere City	New Zealand
Local roads	urban	\$78.25	\$1,609.18
	rural	\$7.59	\$891.74
State highways	urban	\$2.57	\$323.26
	rural	\$8.14	\$1,533.31
Total		\$96.56	\$4,357.48

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 \$3.19 million (in June 2007 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 2007 update', available at the Ministry of Transport's website:
[http://www.transport.govt.nz/socialcost/Social-cost-June-2007-update\[1\].pdf](http://www.transport.govt.nz/socialcost/Social-cost-June-2007-update[1].pdf)

The average social cost per reported crash (in June 2007 dollars) are estimated at:

Rural fatal crash	\$4,016,000
Rural serious crash	\$735,000
Rural minor crash	\$88,000
Urban fatal crash	\$3,539,000
Urban serious crash	\$626,000
Urban minor crash	\$79,000

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 2003 to 2007 - whole City

	2003	2004	2005	2006	2007	Total	%	Group A
Fatal crashes	6	7	6	7	5	31	2%	1%
Serious crashes	72	59	48	66	48	293	14%	15%
Minor crashes	349	370	332	329	343	1723	84%	83%
Total injury crashes	427	436	386	402	396	2047	100%	100%
Non-injury crashes	1351	1324	1214	1167	1257	6313		

Figure 2.2: Crash numbers and severity 2003 to 2007 - urban roads

	2003	2004	2005	2006	2007	Total	%	Group A
Fatal crashes	3	6	4	7	4	24	1%	1%
Serious crashes	63	53	45	58	41	260	15%	15%
Minor crashes	298	314	278	282	301	1473	84%	84%
Total injury crashes	364	373	327	347	346	1757	100%	100%
Non-injury crashes	1216	1171	1059	1037	1134	5617		

Figure 2.3: Crash numbers and severity 2003 to 2007 - rural roads

	2003	2004	2005	2006	2007	Total	%	Group A
Fatal crashes	3	1	2	0	1	7	2%	2%
Serious crashes	9	6	3	8	7	33	11%	14%
Minor crashes	51	56	54	47	42	250	86%	83%
Total injury crashes	63	63	59	55	50	290	100%	100%
Non-injury crashes	135	153	155	130	123	696		

Figure 2.4: Casualty numbers and severity 2003 to 2007 - whole City

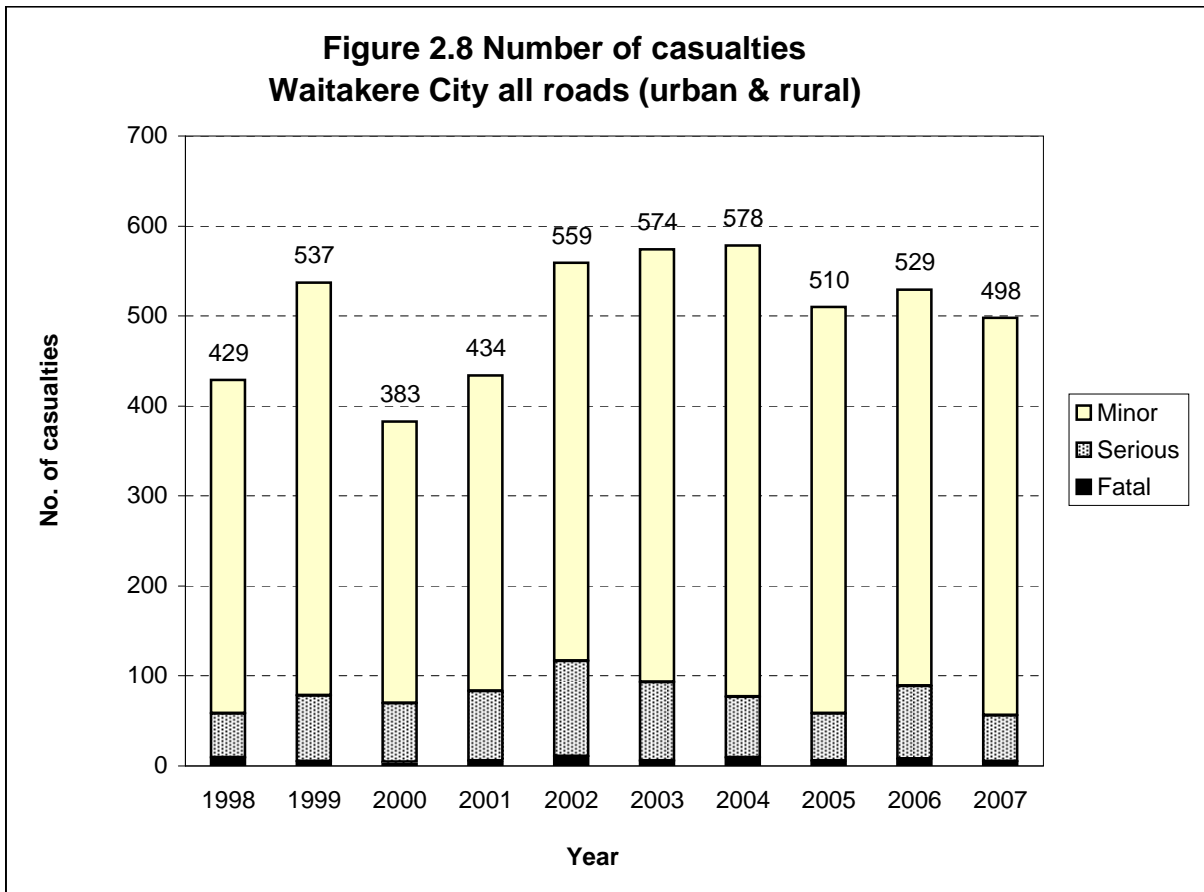
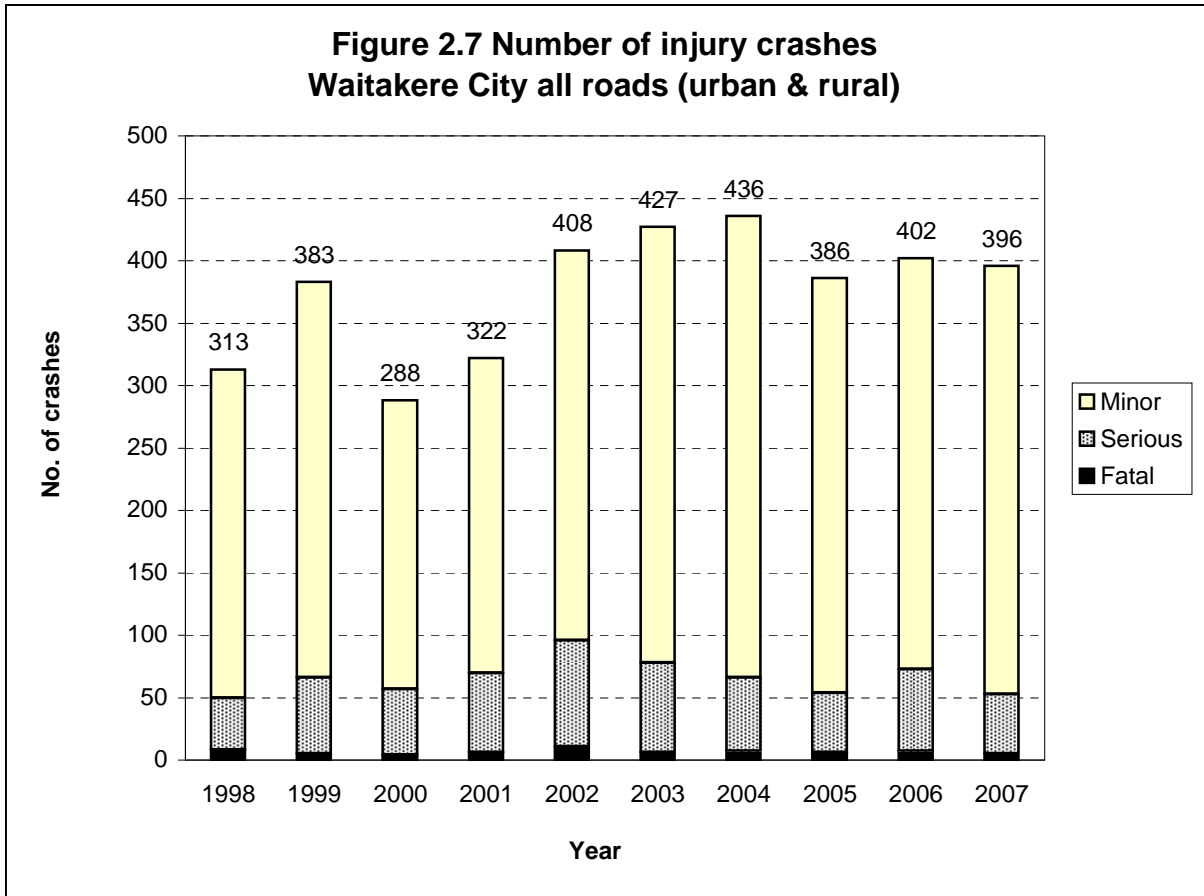
	2003	2004	2005	2006	2007	Total	%	Group A
Fatal casualties	6	9	6	8	5	34	1%	1%
Serious casualties	87	68	52	81	51	339	13%	13%
Minor casualties	481	501	452	440	442	2316	86%	85%
Total casualties	574	578	510	529	498	2689	100%	100%

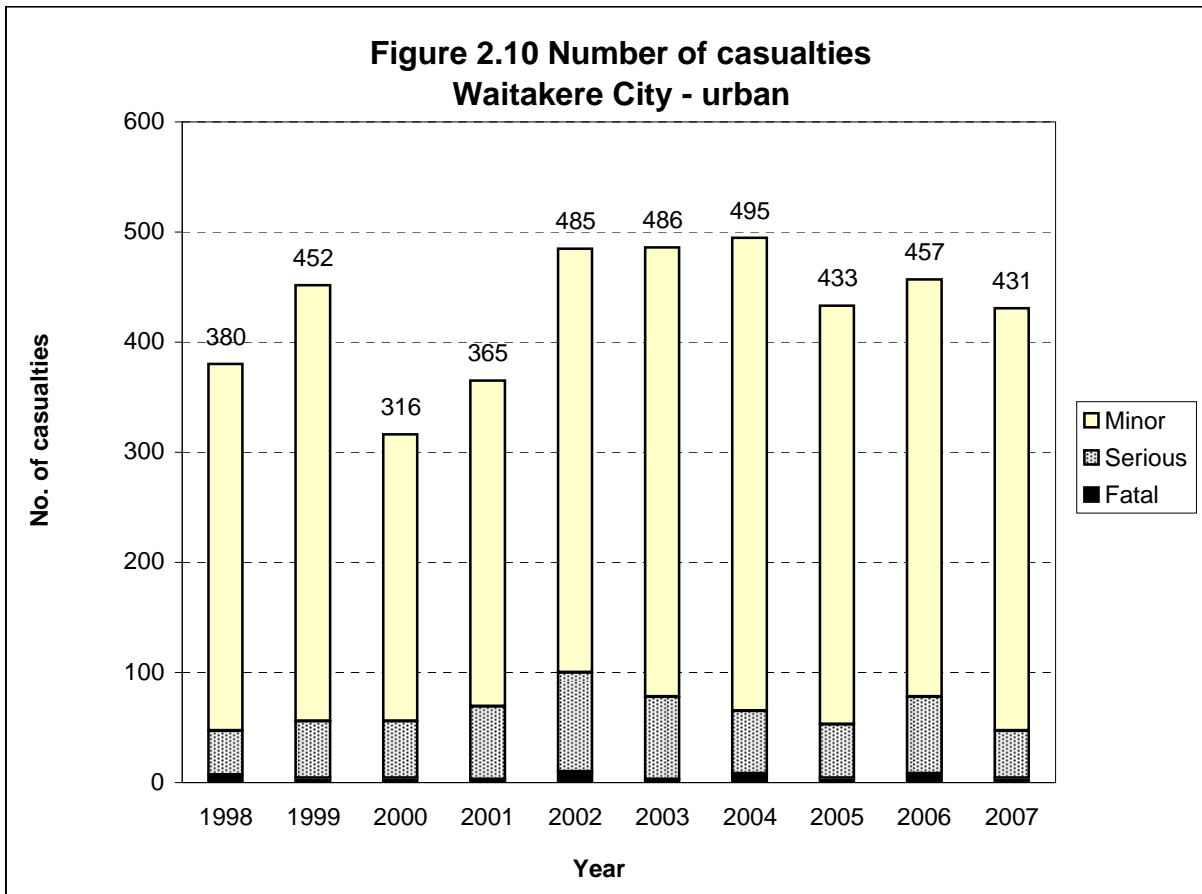
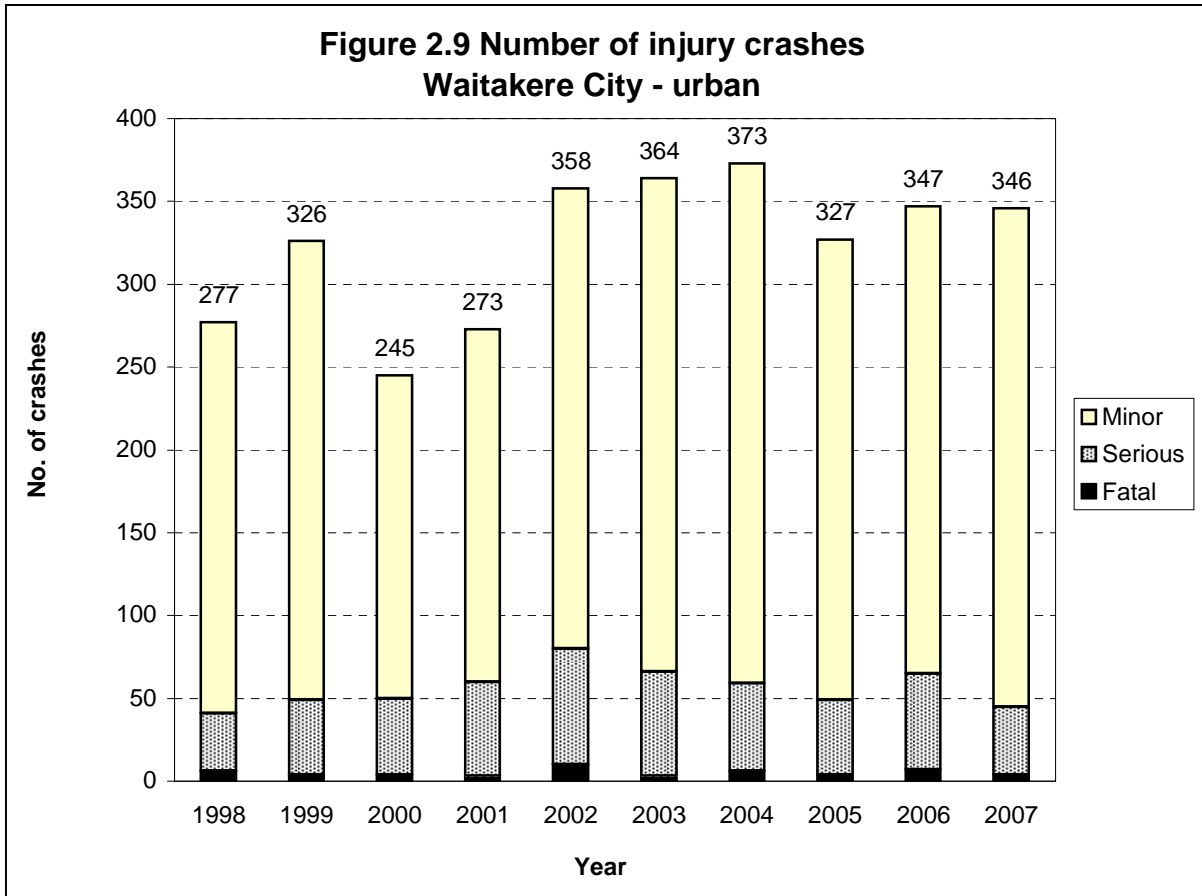
Figure 2.5: Casualty numbers and severity 2003 to 2007 - urban roads

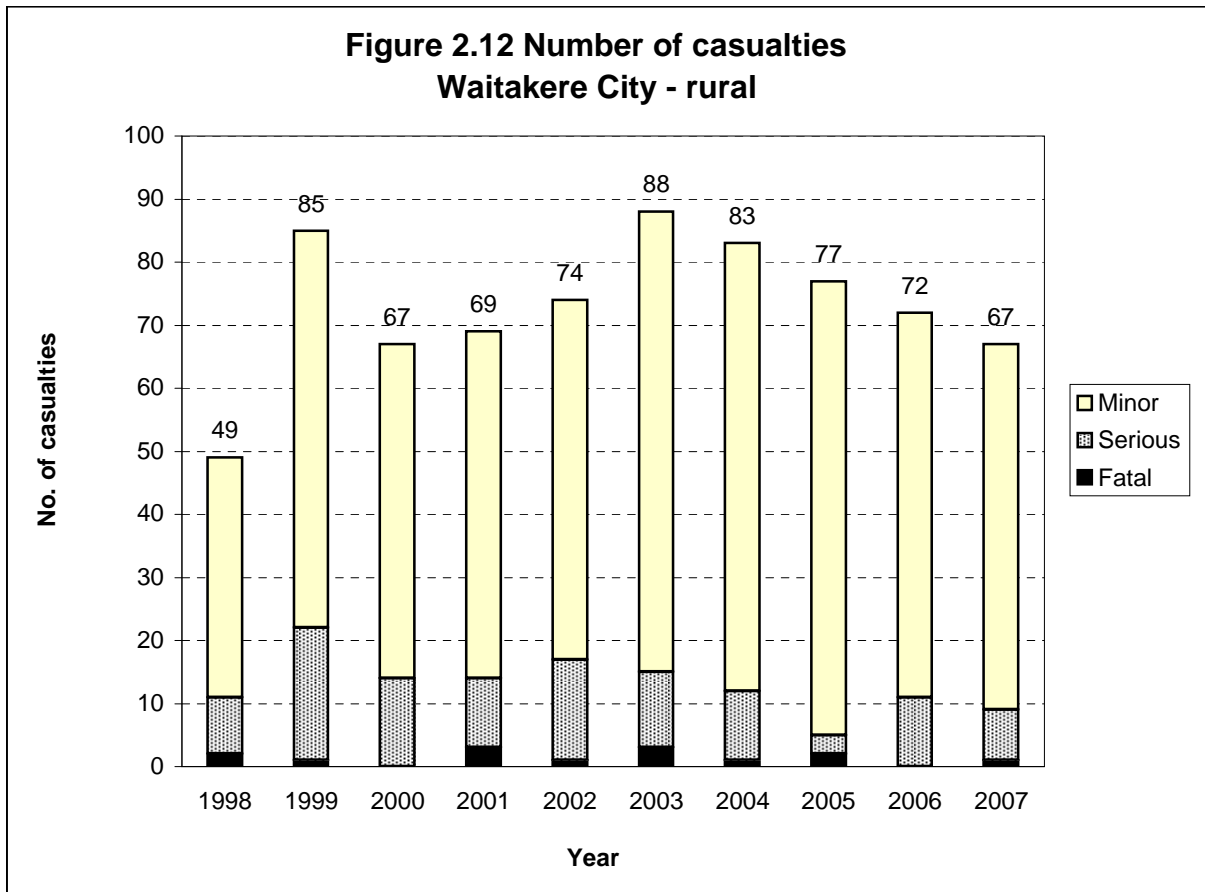
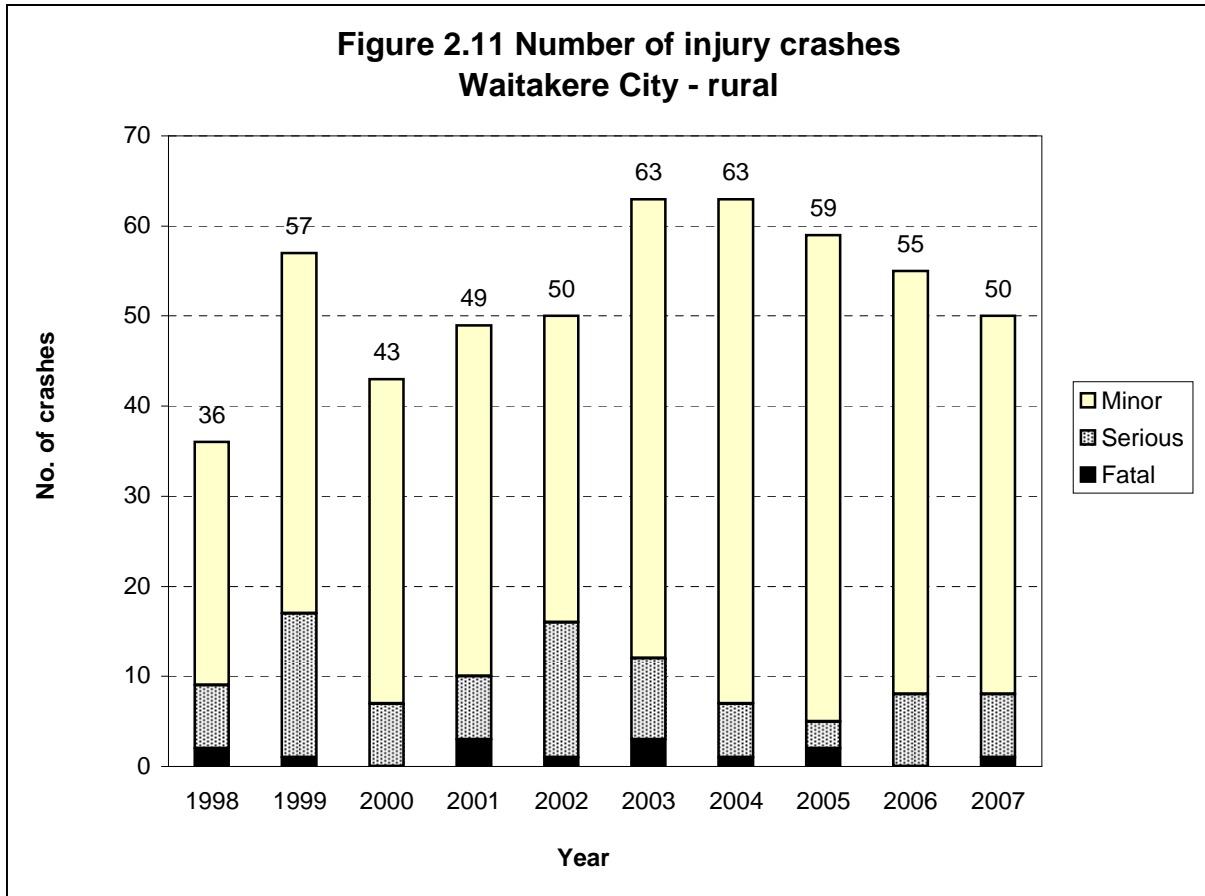
	2003	2004	2005	2006	2007	Total	%	Group A
Fatal casualties	3	8	4	8	4	27	1%	1%
Serious casualties	75	57	49	70	43	294	13%	13%
Minor casualties	408	430	380	379	384	1981	86%	86%
Total casualties	486	495	433	457	431	2302	100%	100%

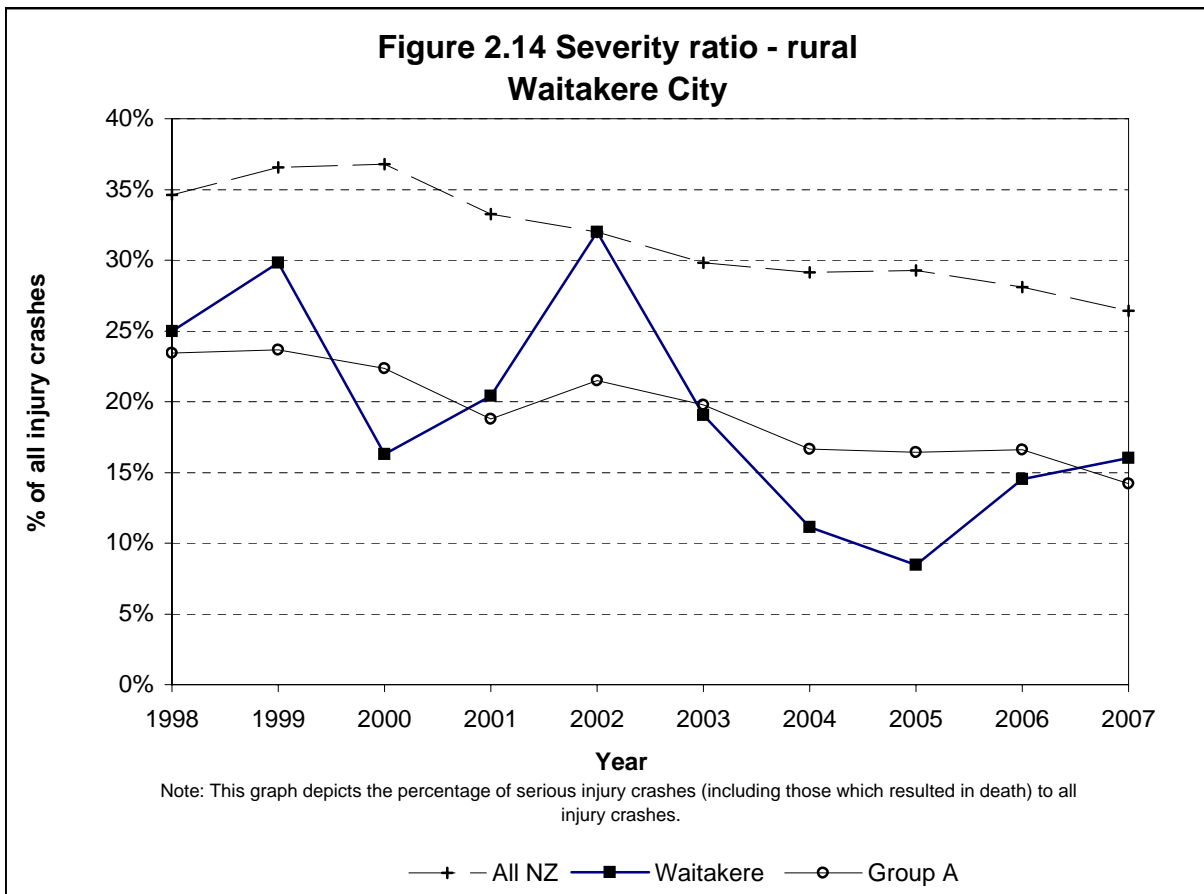
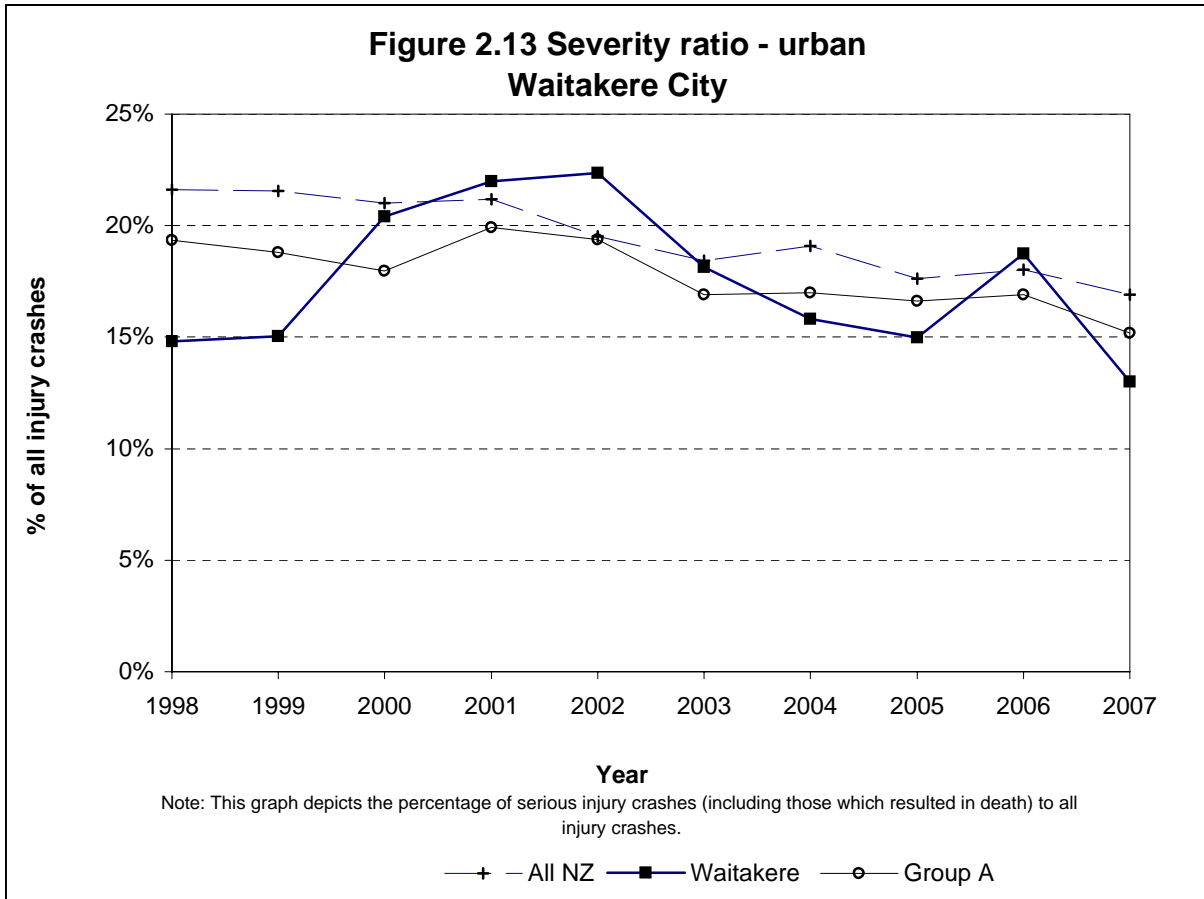
Figure 2.6: Casualty numbers and severity 2003 to 2007 - rural roads

	2003	2004	2005	2006	2007	Total	%	Group A
Fatal casualties	3	1	2	0	1	7	2%	2%
Serious casualties	12	11	3	11	8	45	12%	13%
Minor casualties	73	71	72	61	58	335	87%	85%
Total casualties	88	83	77	72	67	387	100%	100%

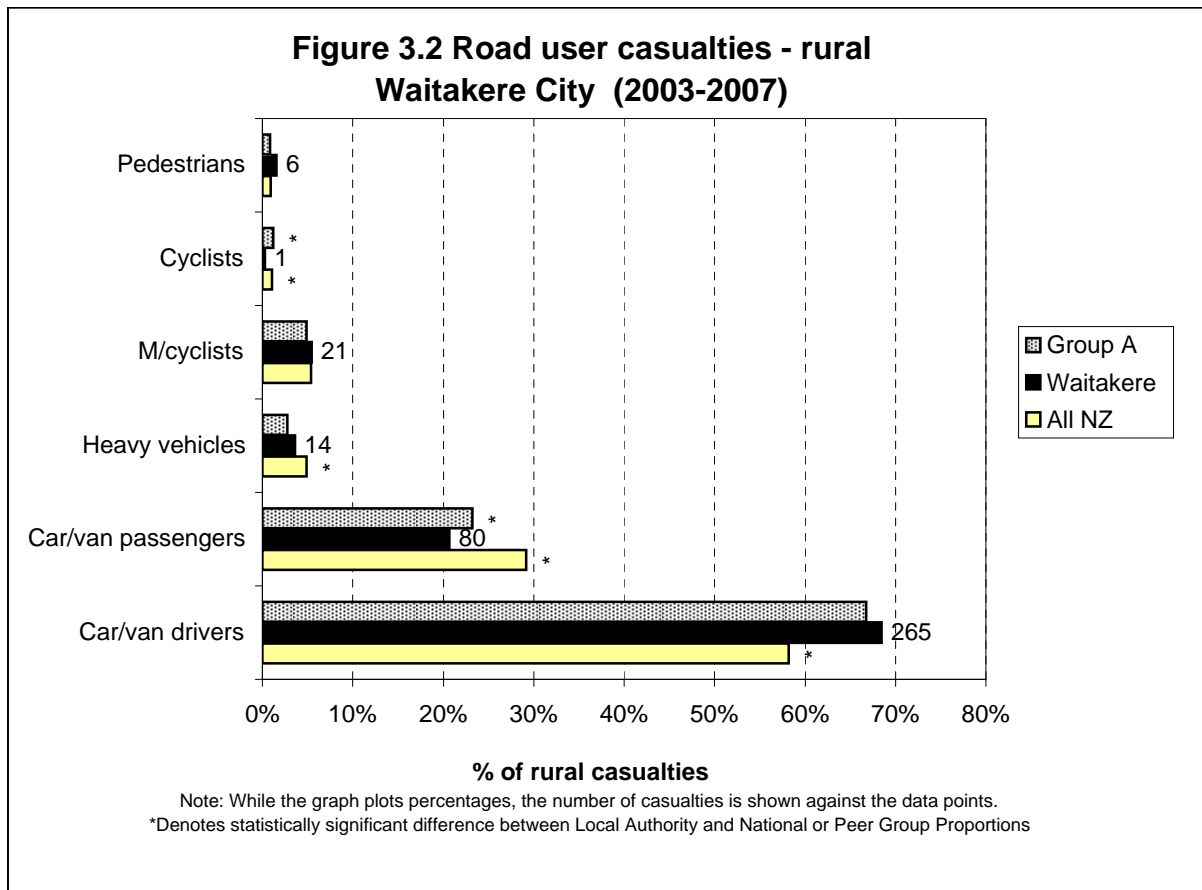
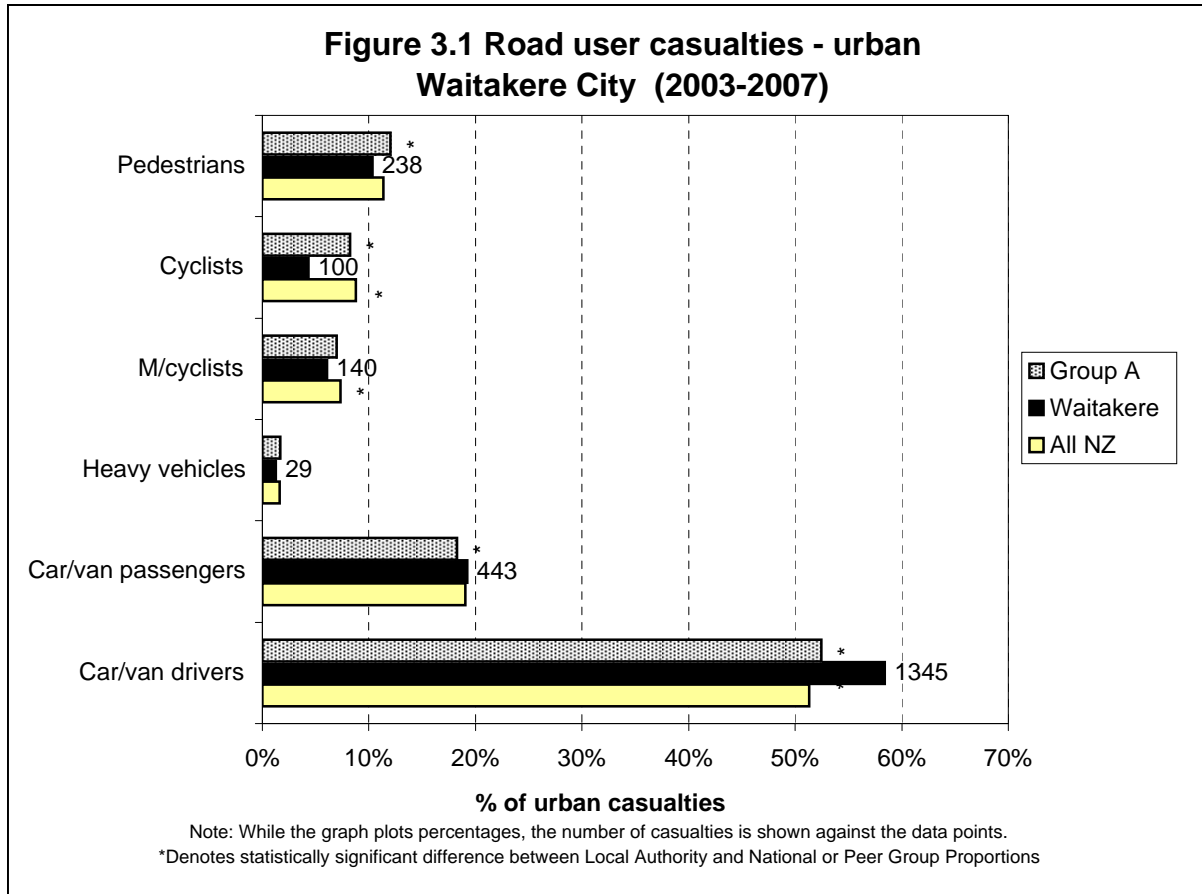


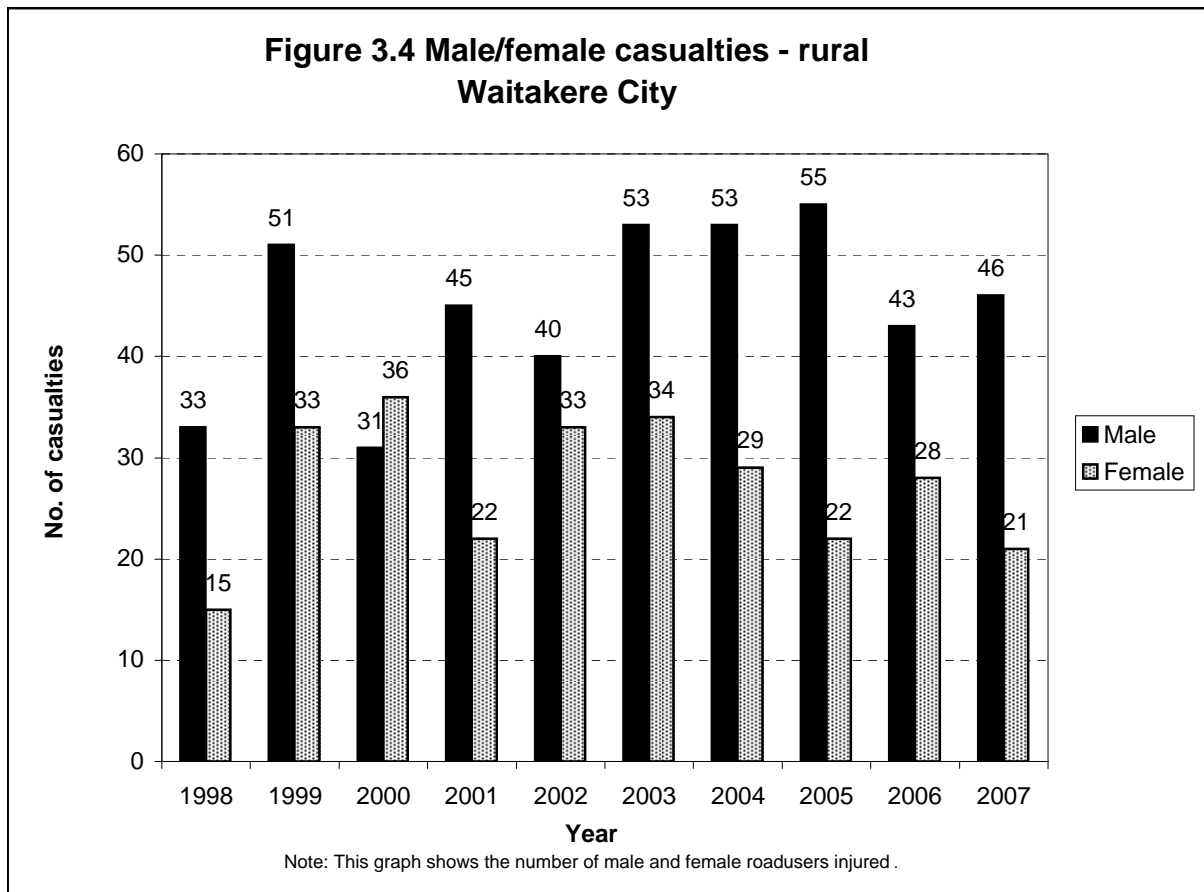
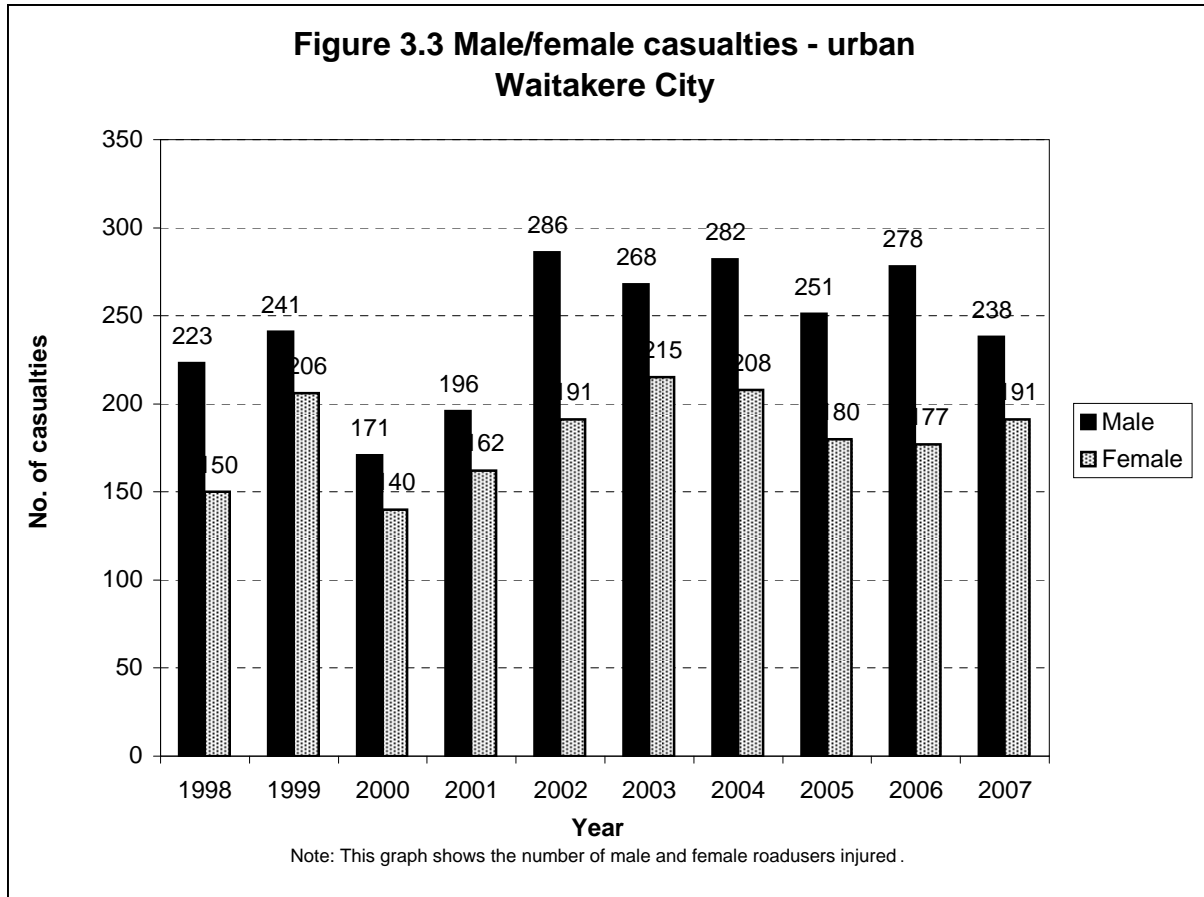




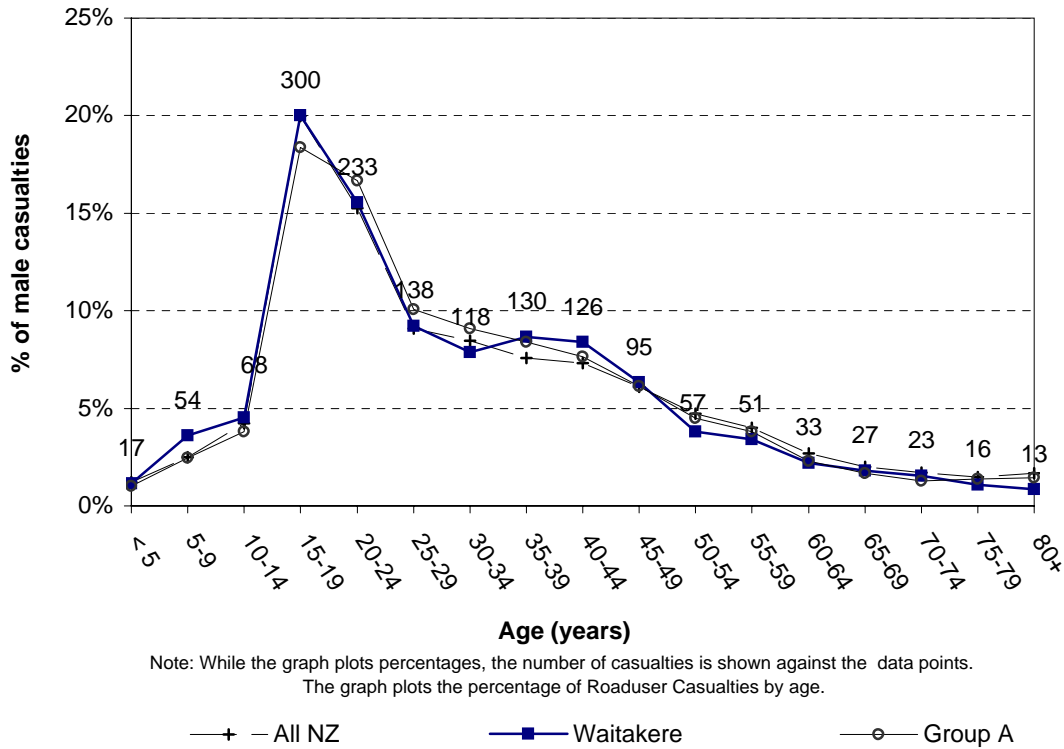


Road user statistics

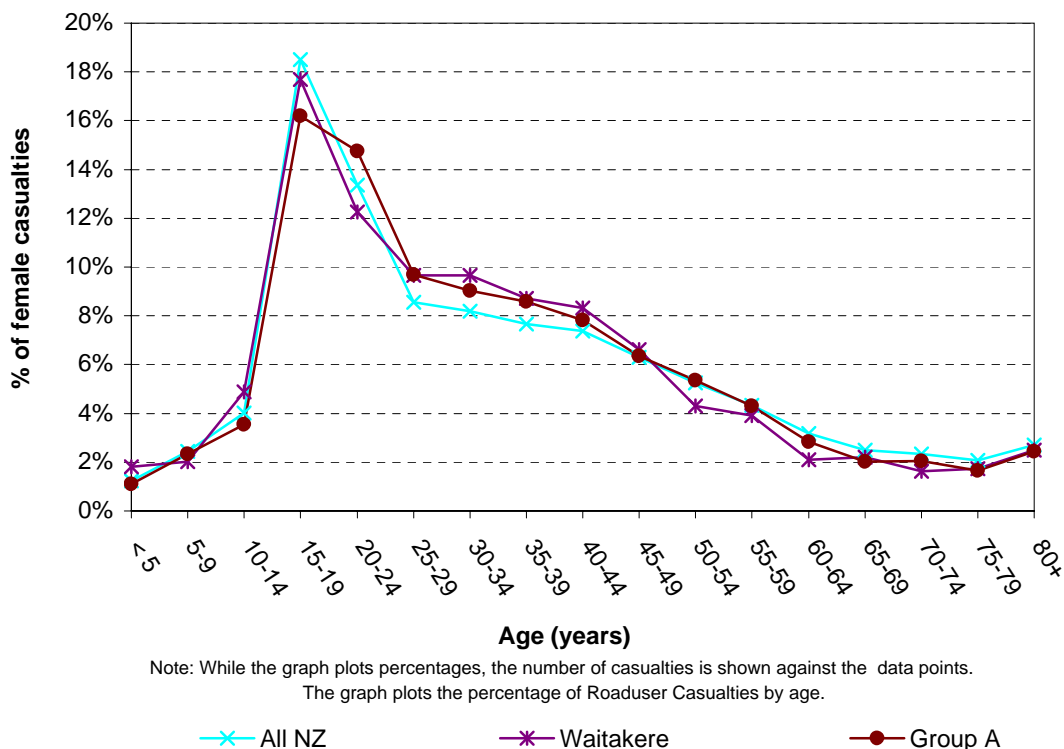


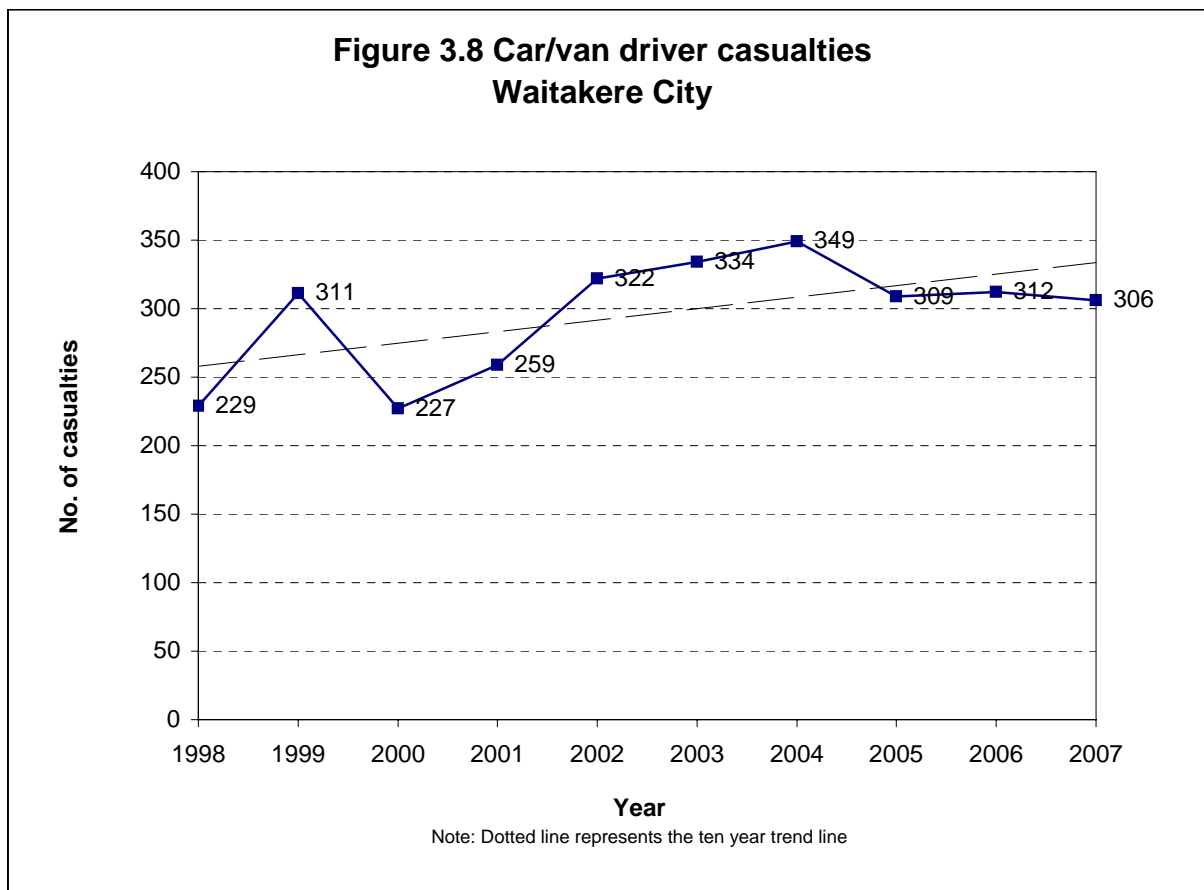
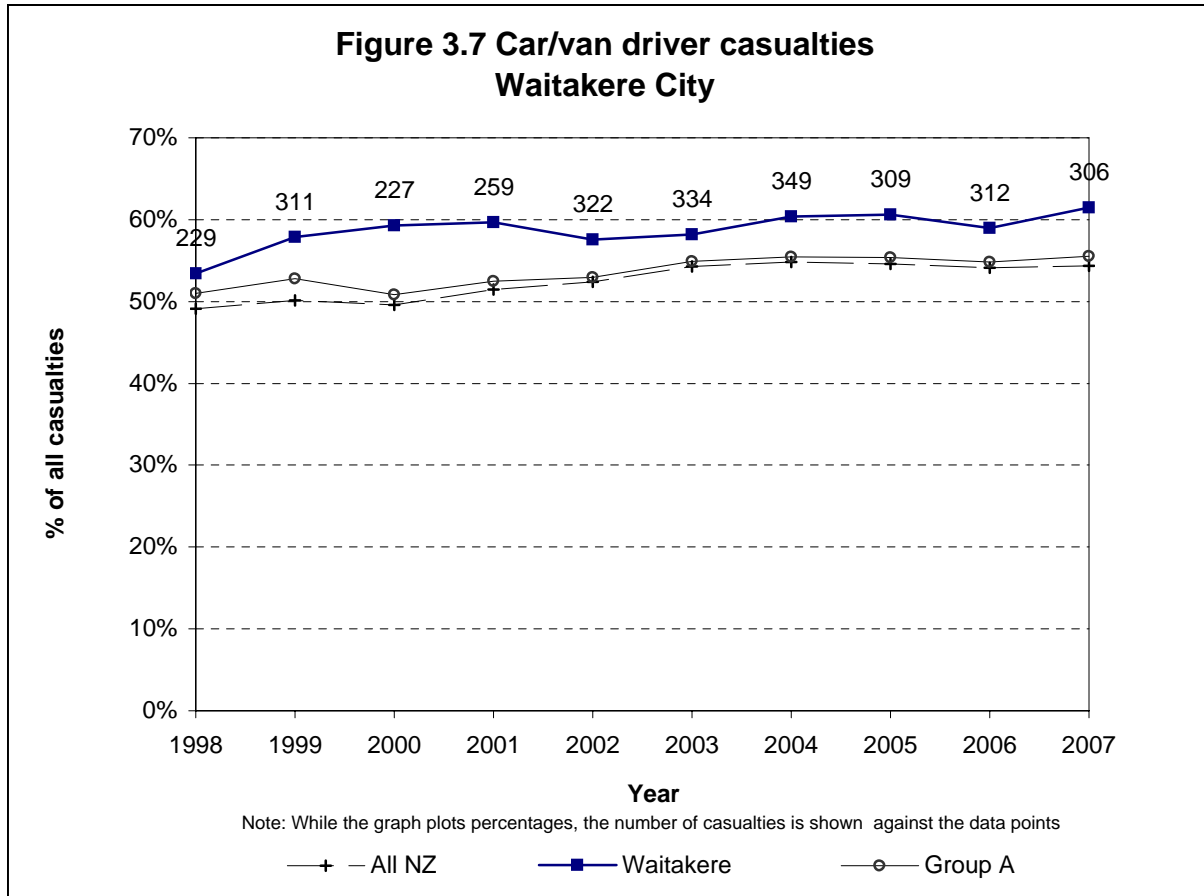


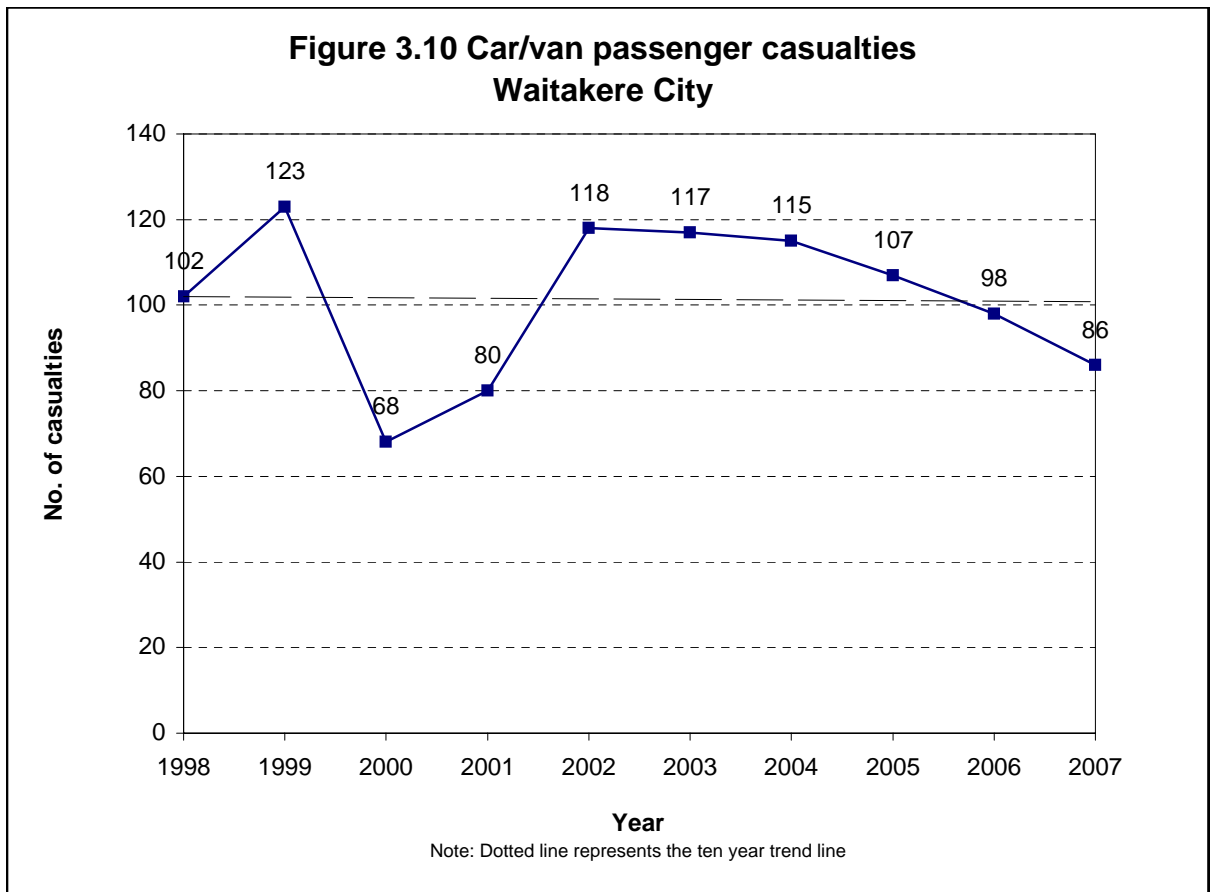
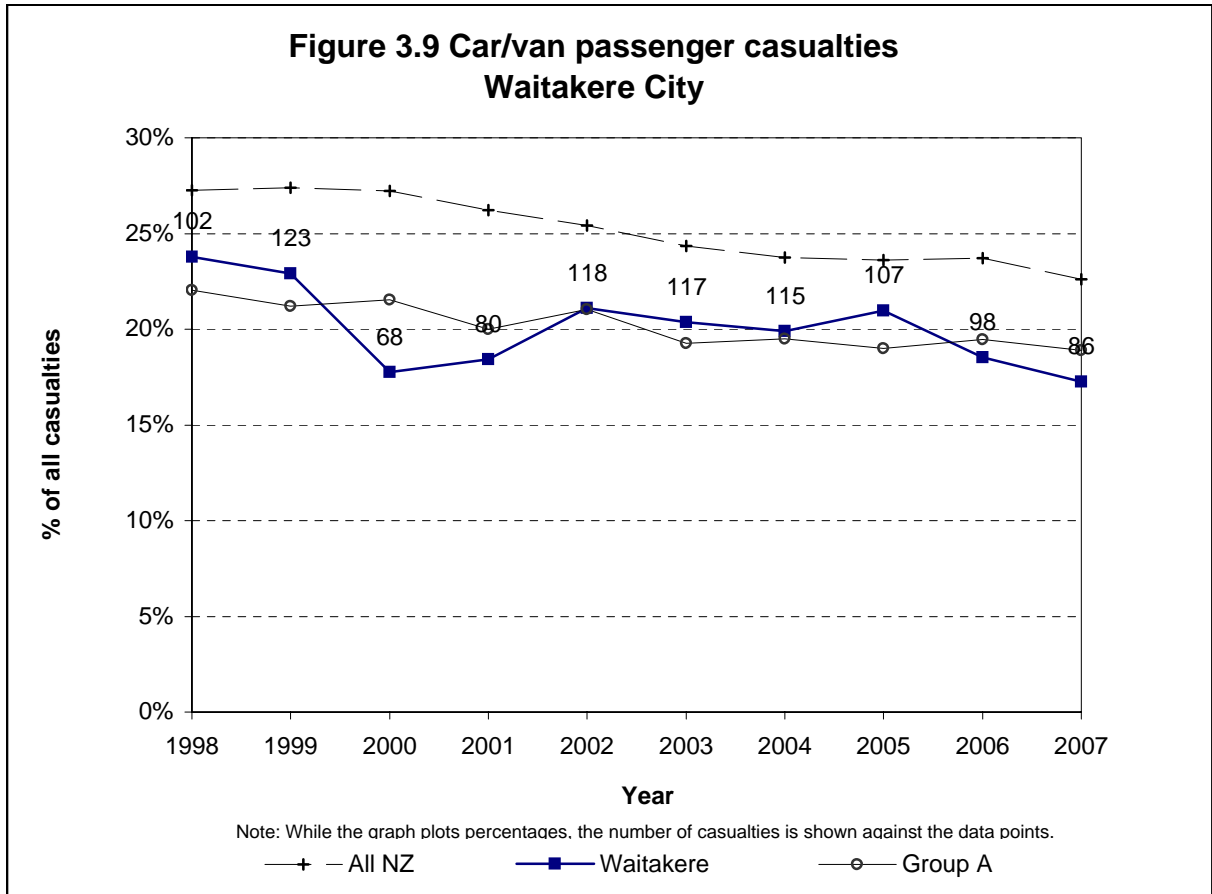
**Figure 3.5 Male casualties by age
Waitakere City (2003-2007)**

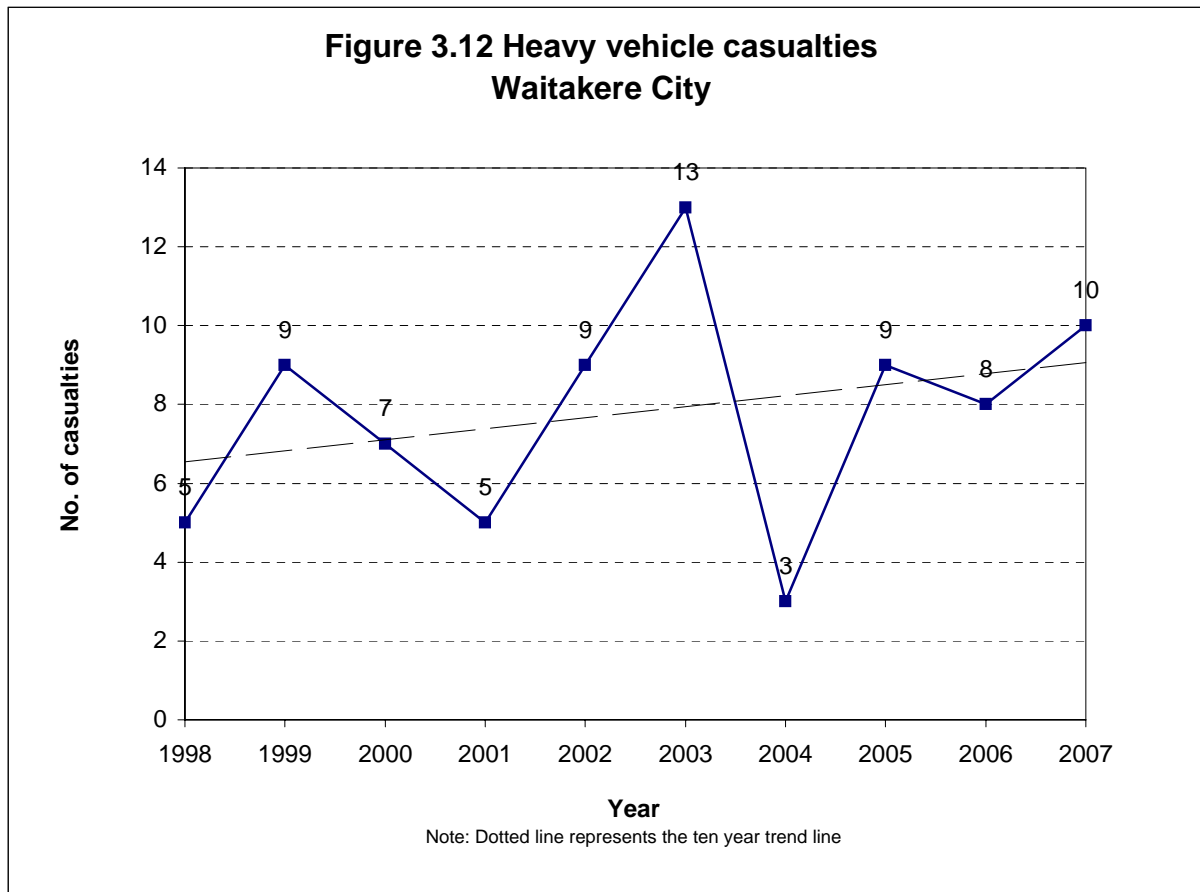
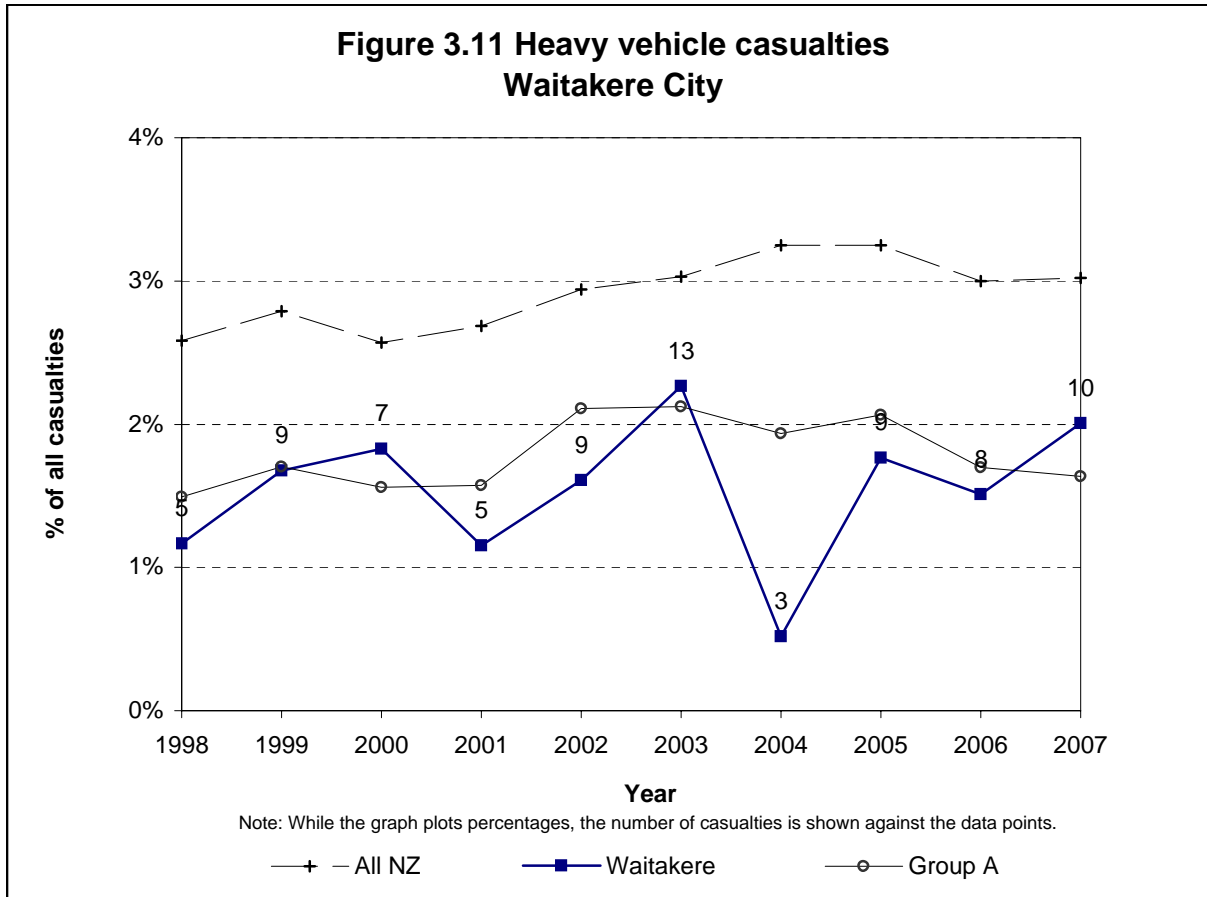


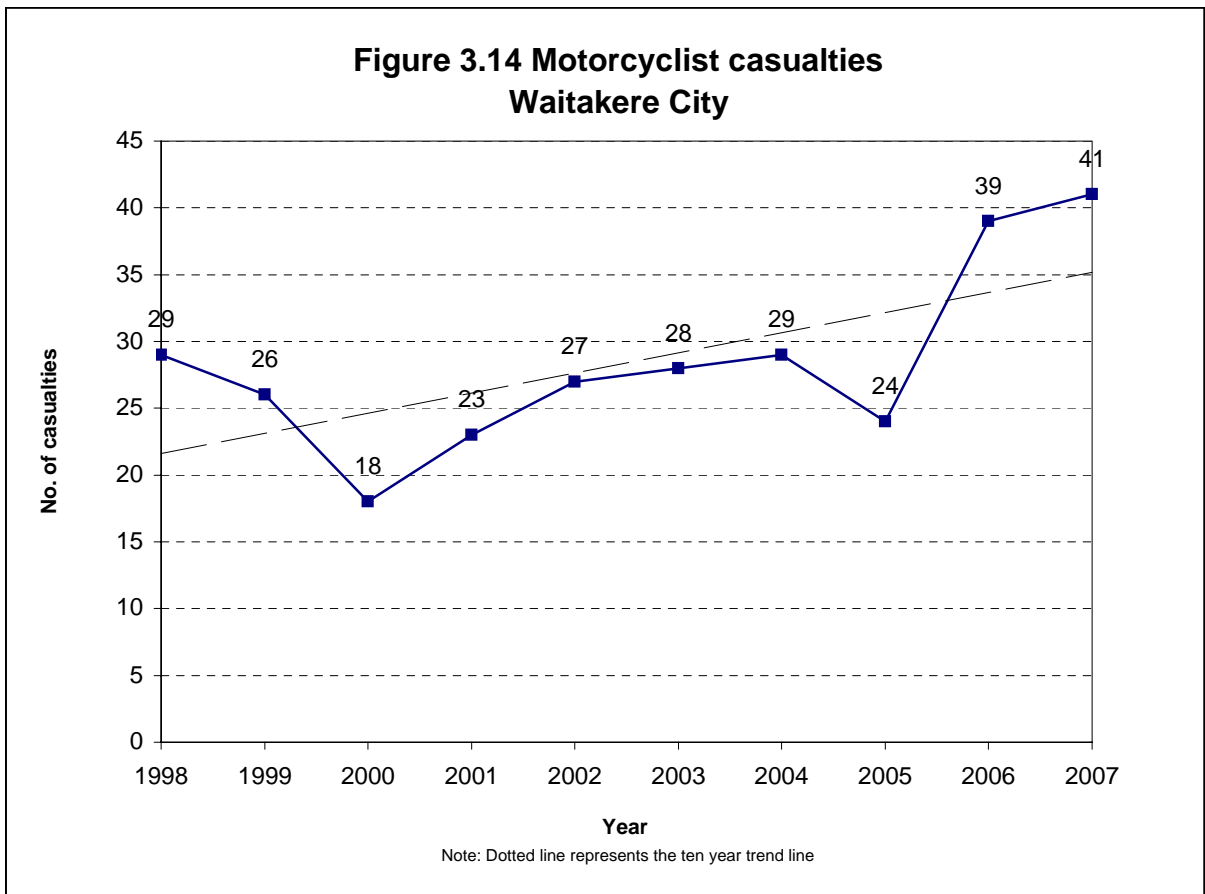
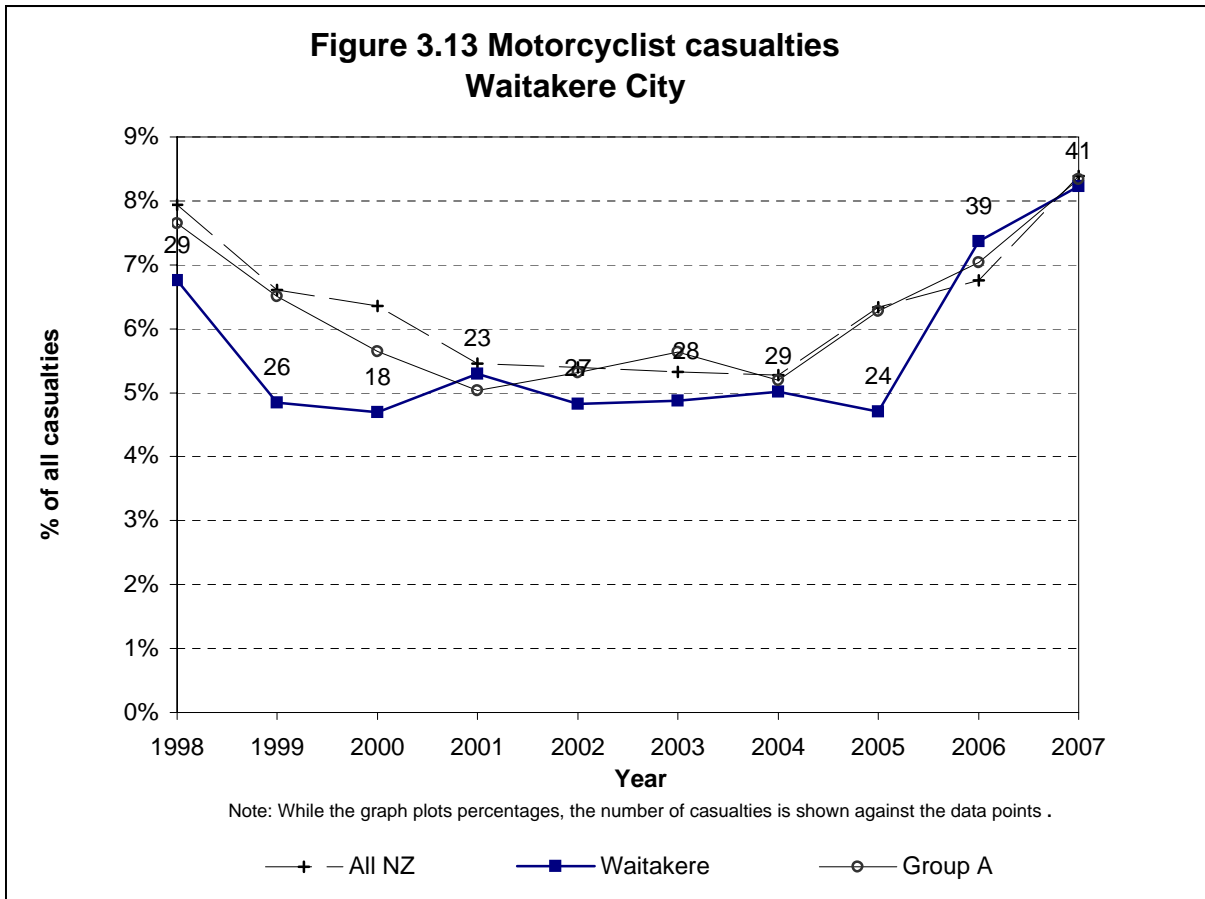
**Figure 3.6 Female casualties by age
Waitakere City (2003-2007)**



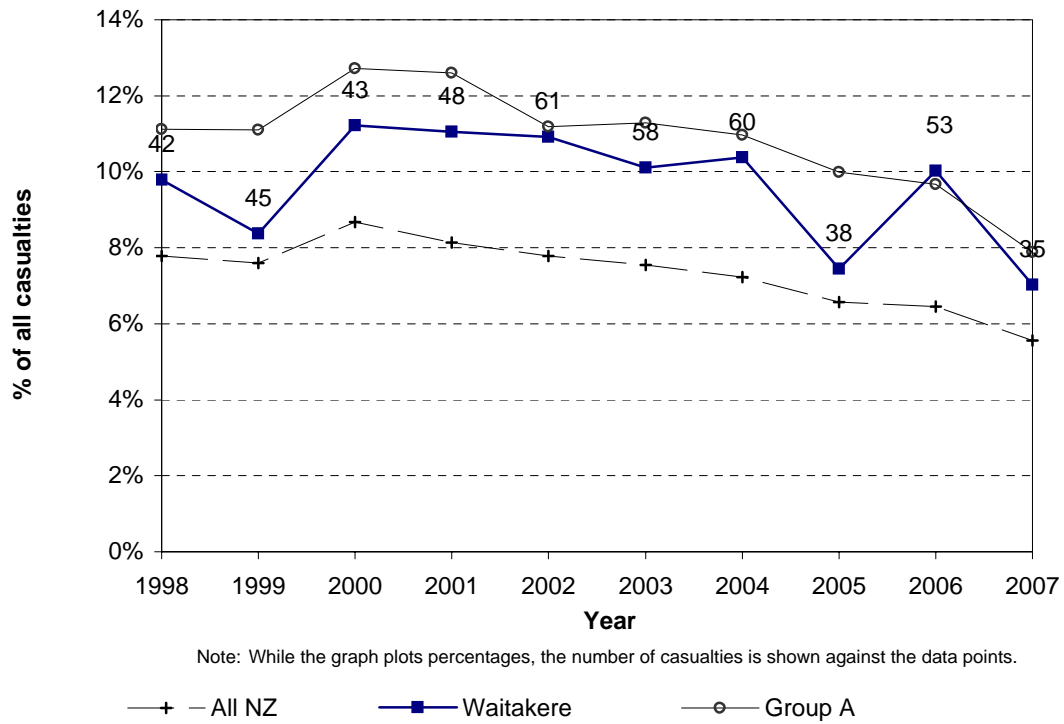




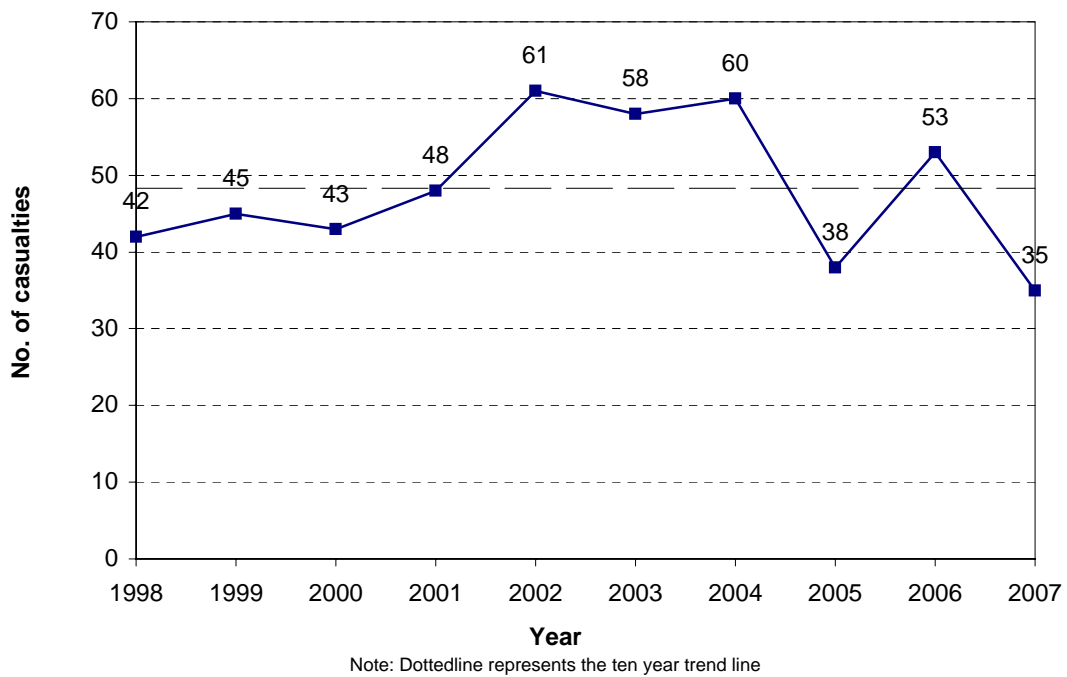


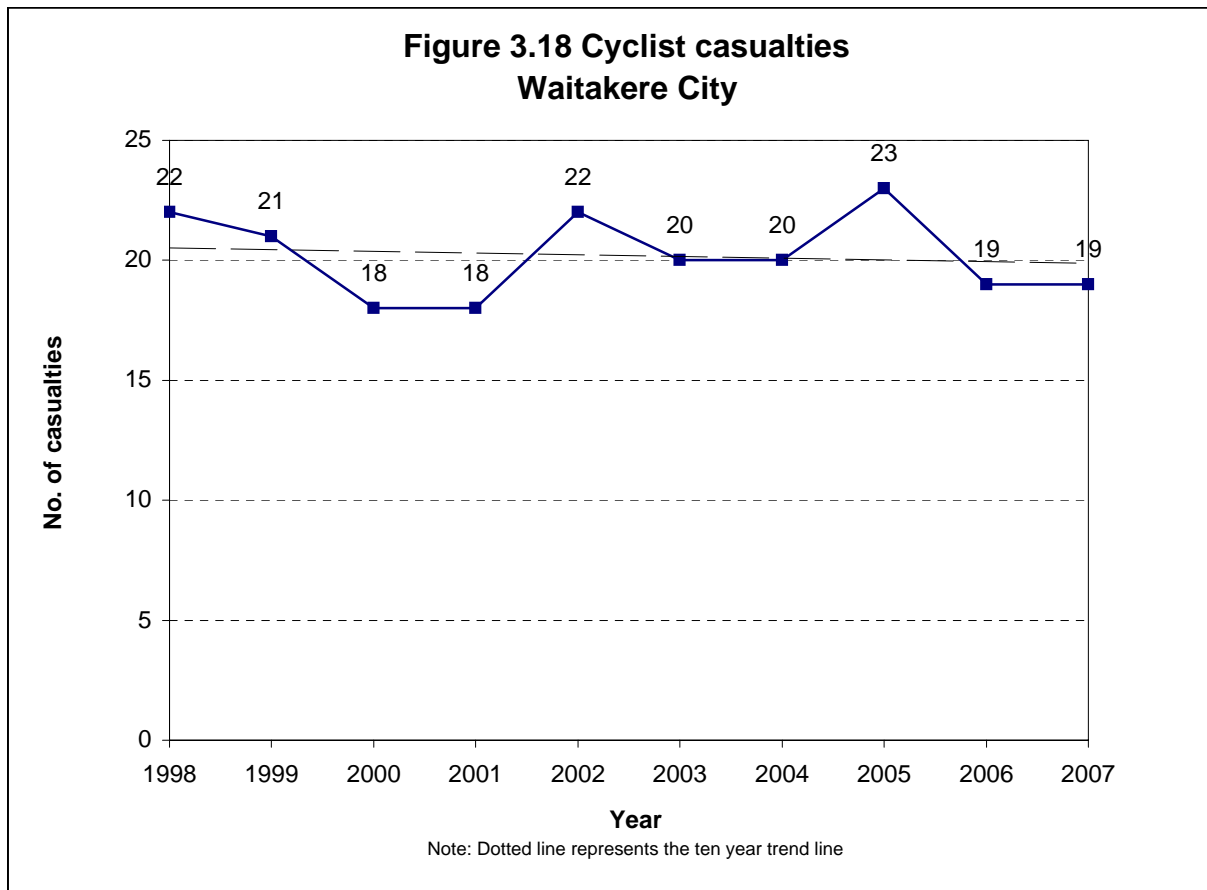
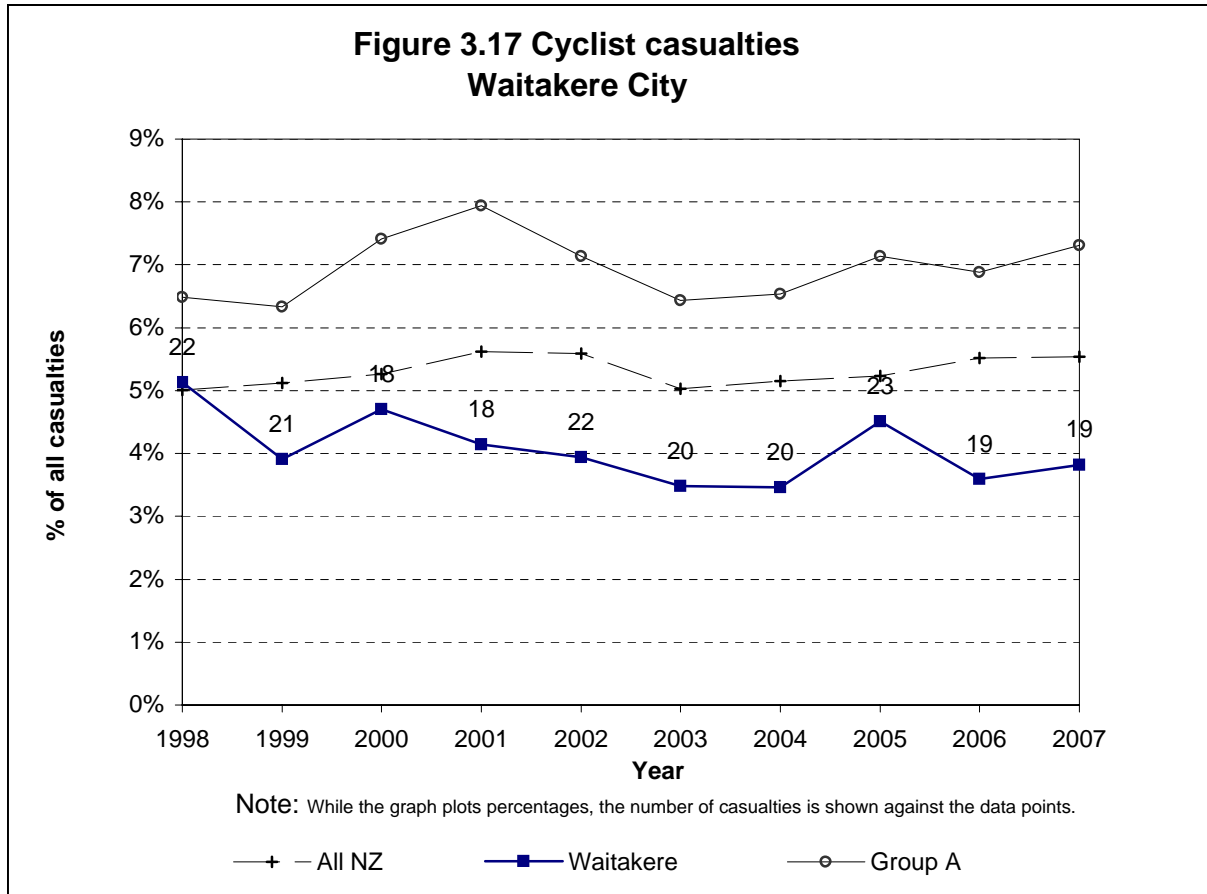


**Figure 3.15 Pedestrian casualties
Waitakere City**

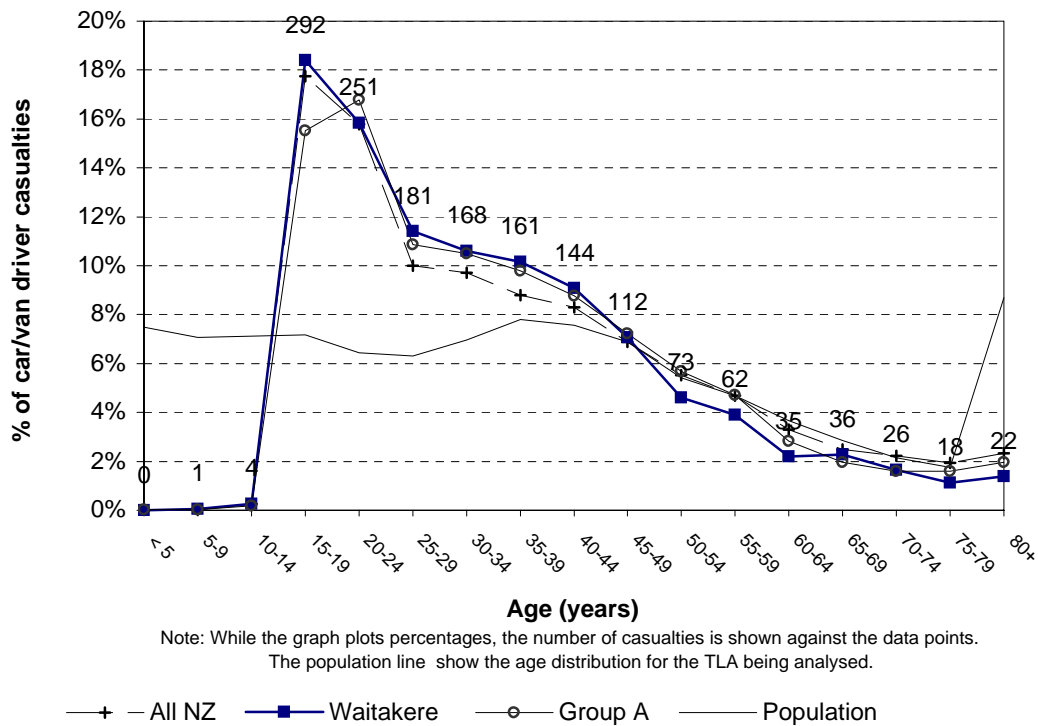


**Figure 3.16 Pedestrian casualties
Waitakere City**

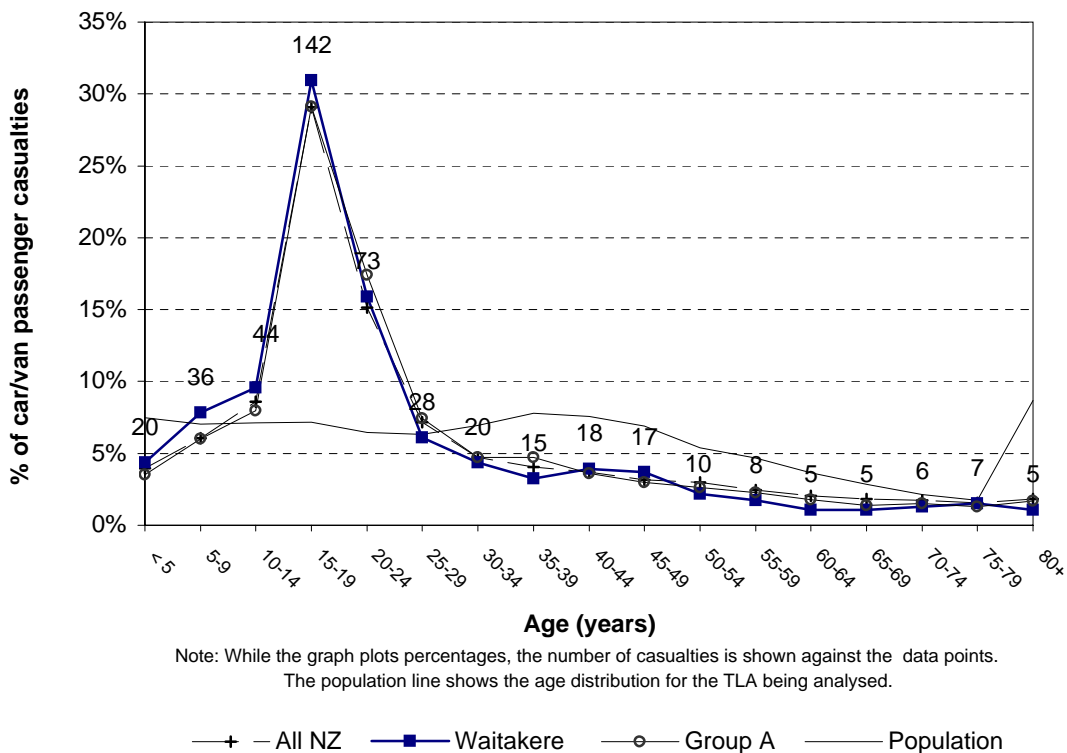




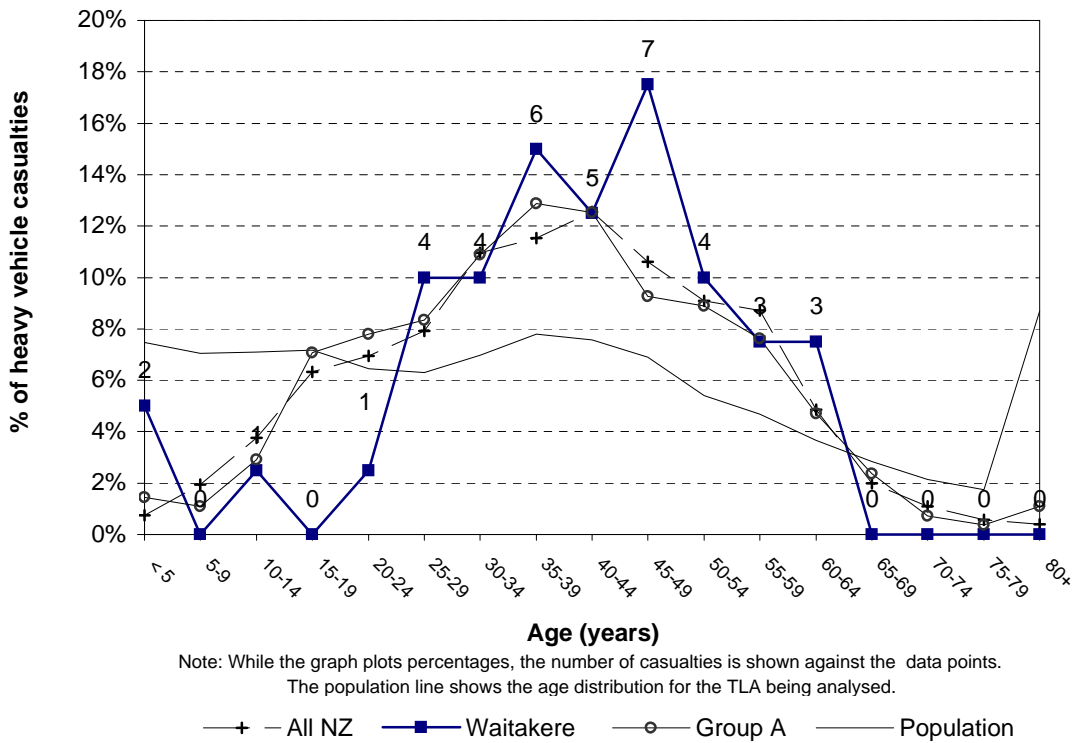
**Figure 3.19 Car/van driver casualty age
Waitakere City (2003-2007)**



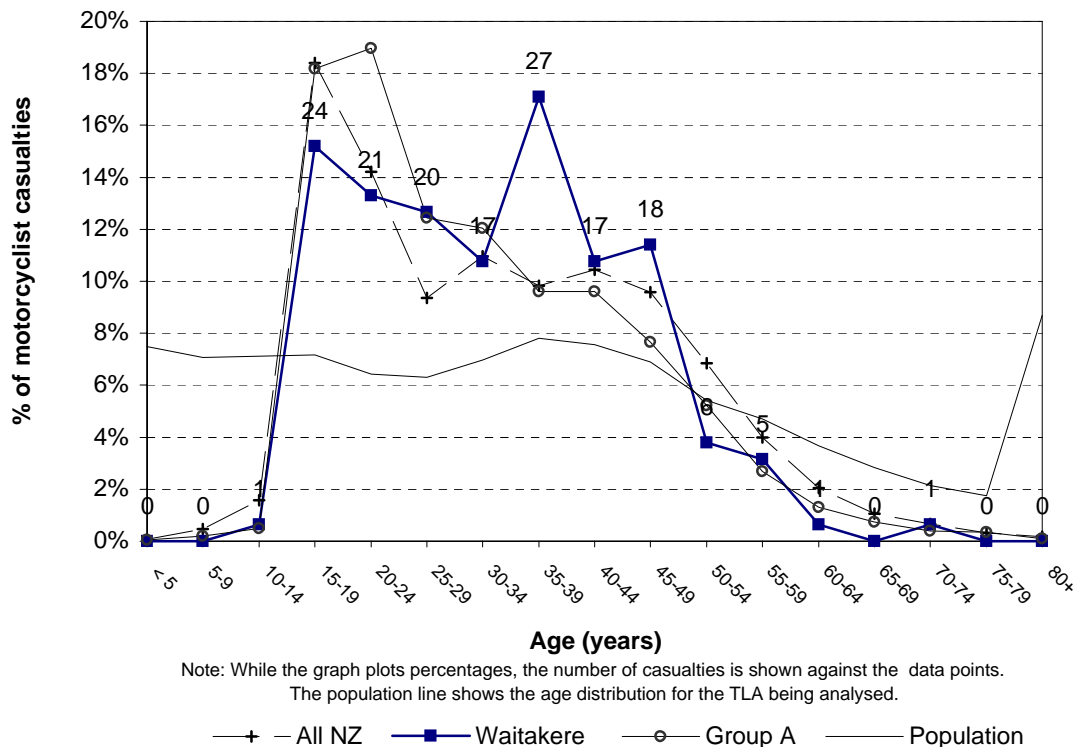
**Figure 3.20 Car/van passenger casualty age
Waitakere City (2003-2007)**



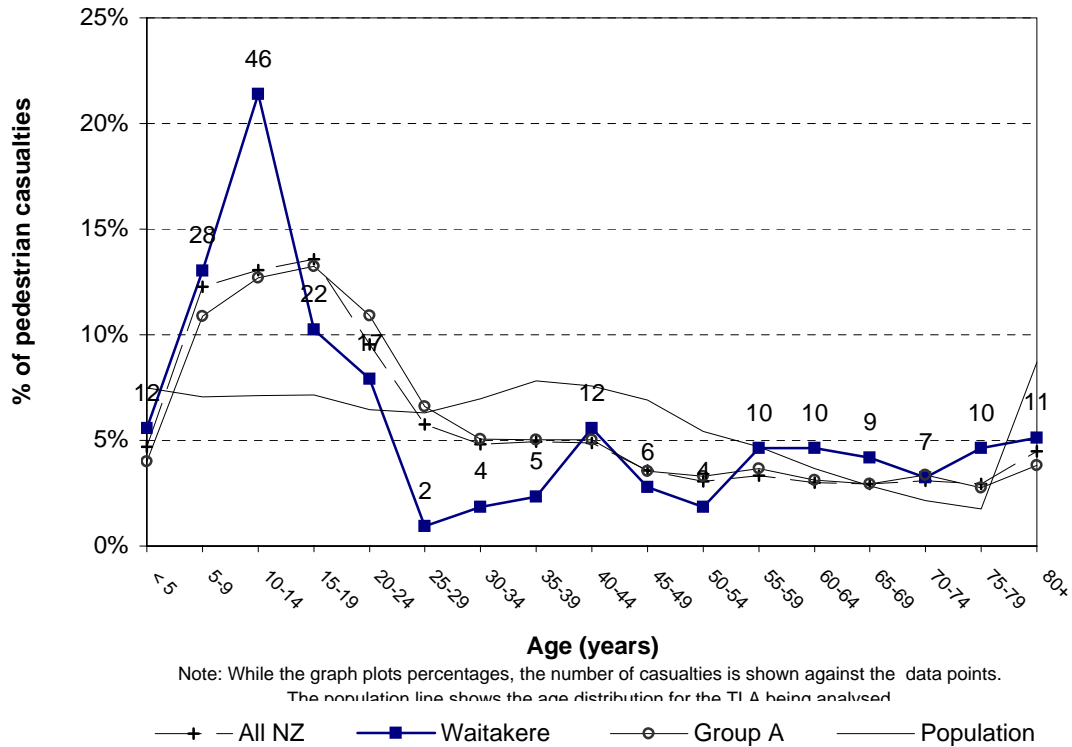
**Figure 3.21 Heavy vehicle casualty age
Waitakere City (2003-2007)**



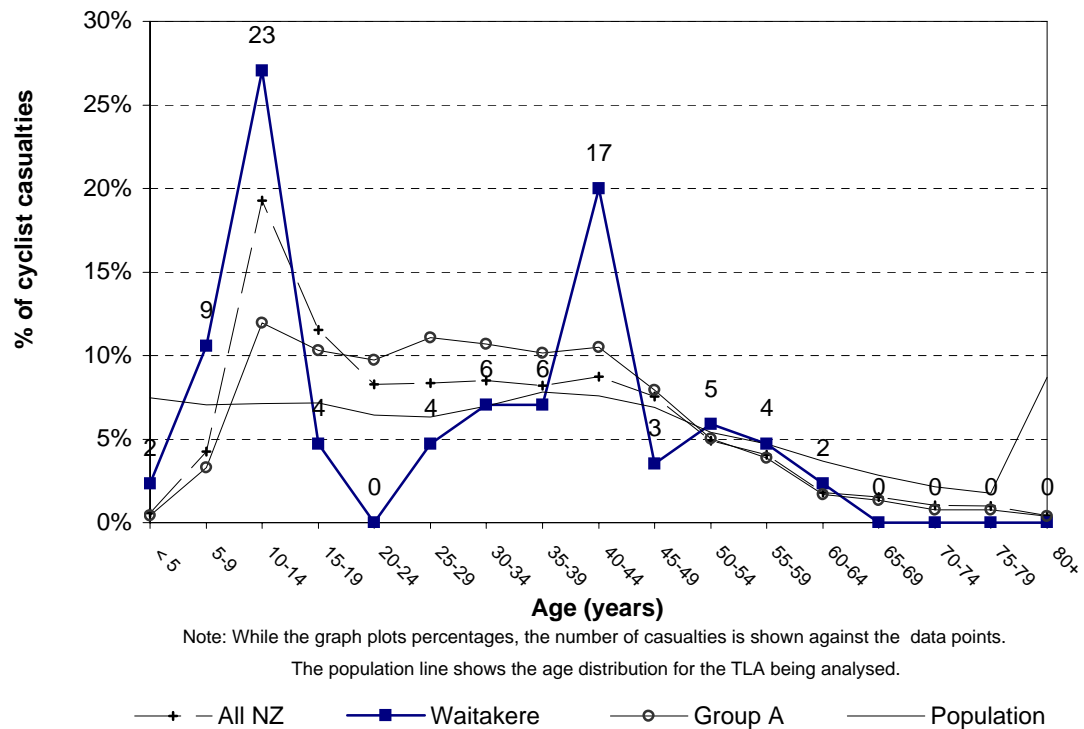
**Figure 3.22 Motorcyclist casualty age
Waitakere City (2003-2007)**



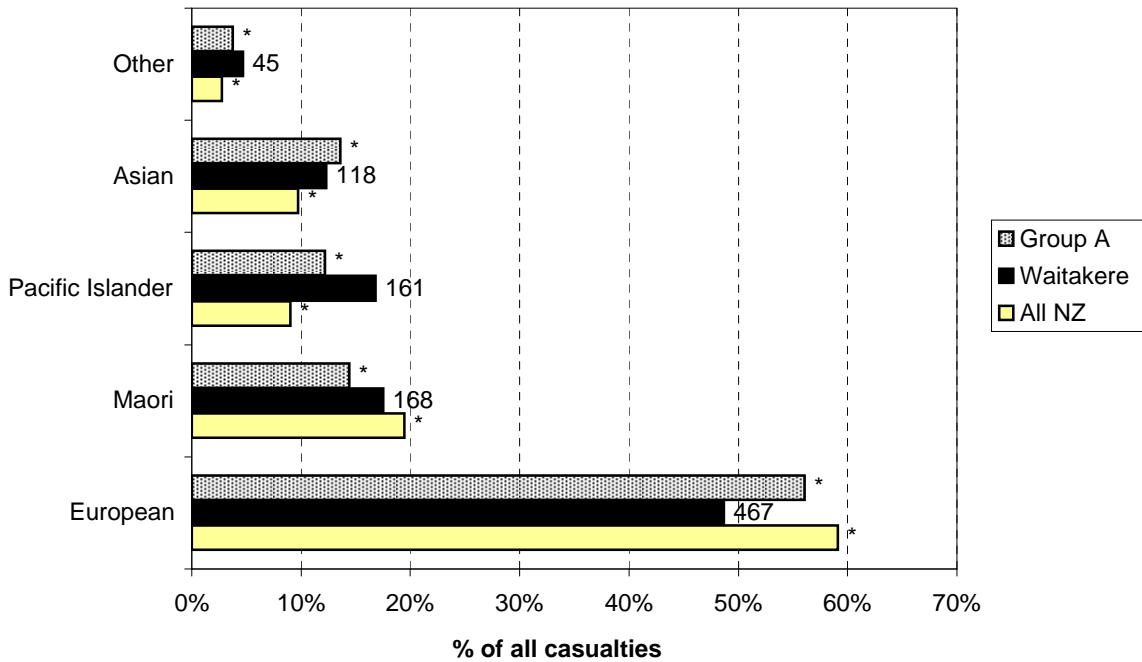
**Figure 3.23 Pedestrian casualty age
Waitakere City (2003-2007)**



**Figure 3.24 Cyclist casualty age
Waitakere City (2003-2007)**

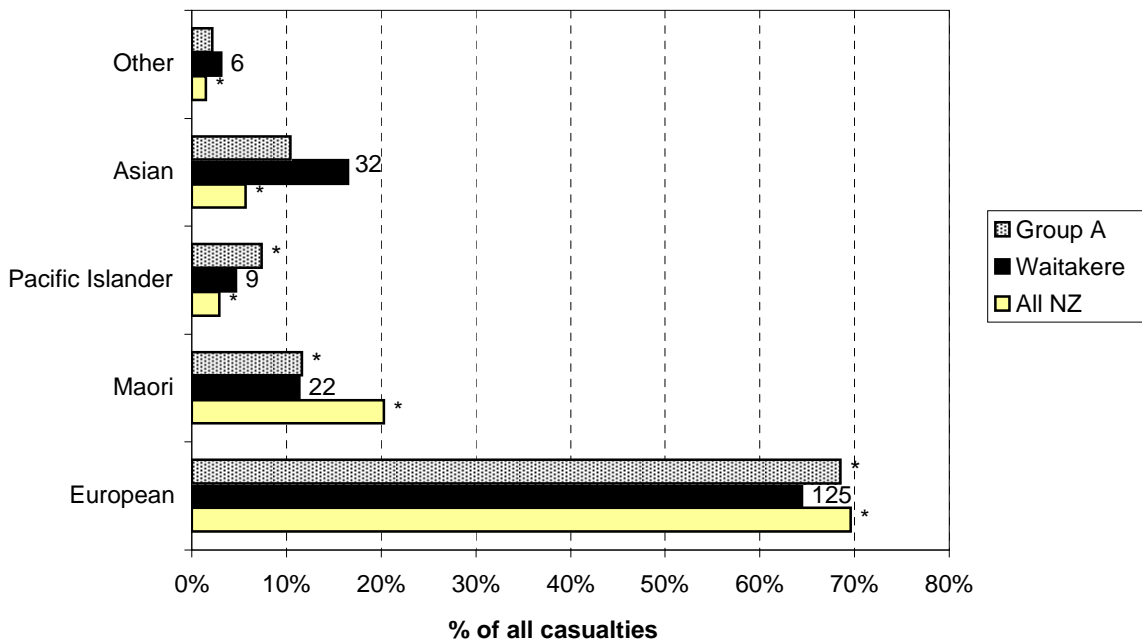


**Figure 3.25 Casualty ethnicity - urban
Waitakere City (2003-2007)**



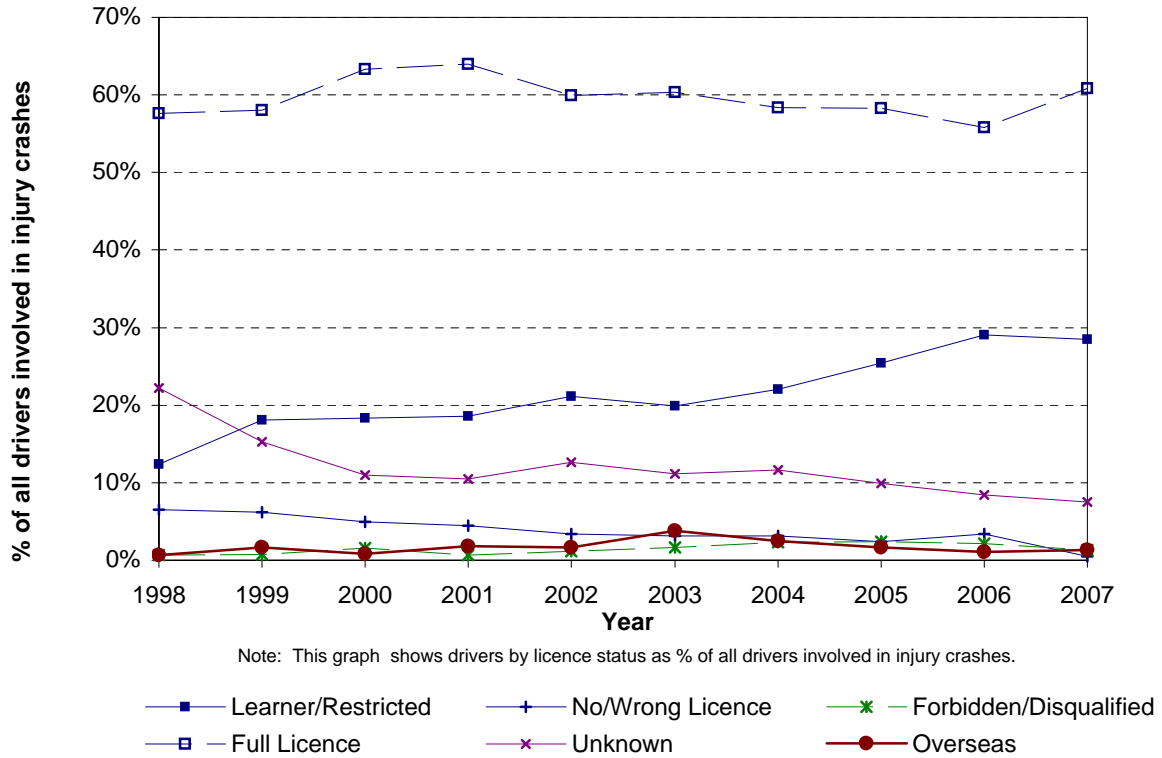
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

**Figure 3.26 Casualty ethnicity - rural
Waitakere City (2003-2007)**

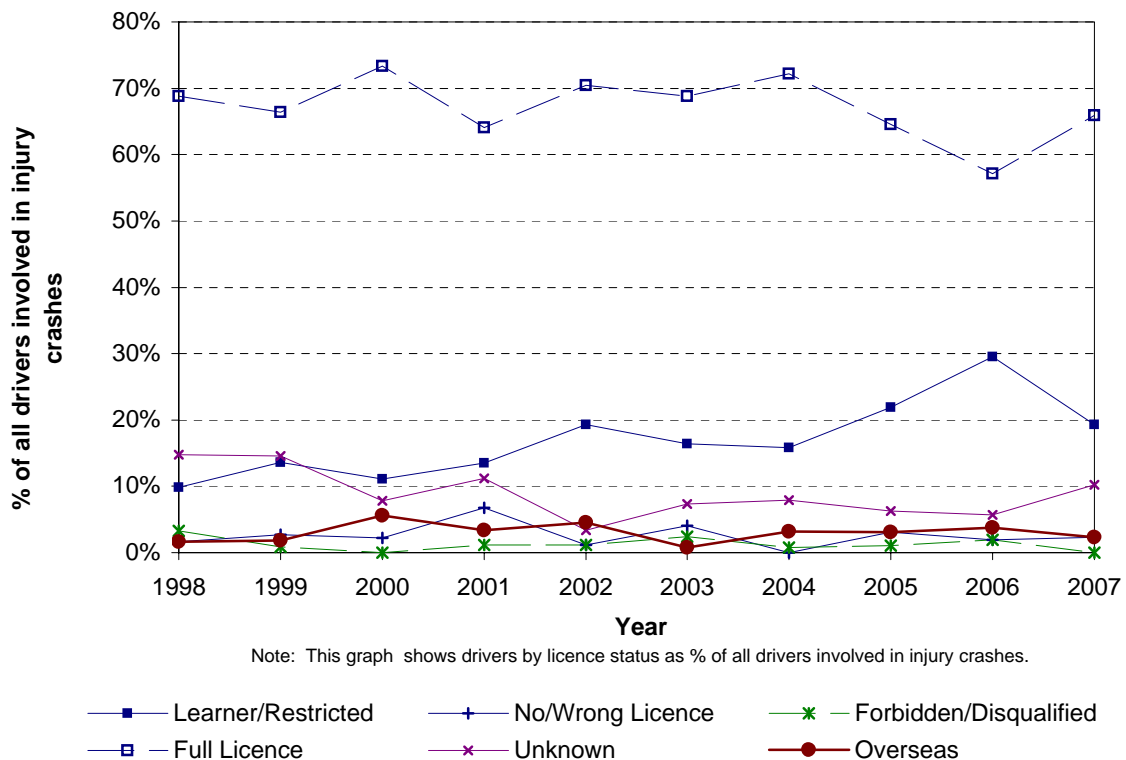


Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

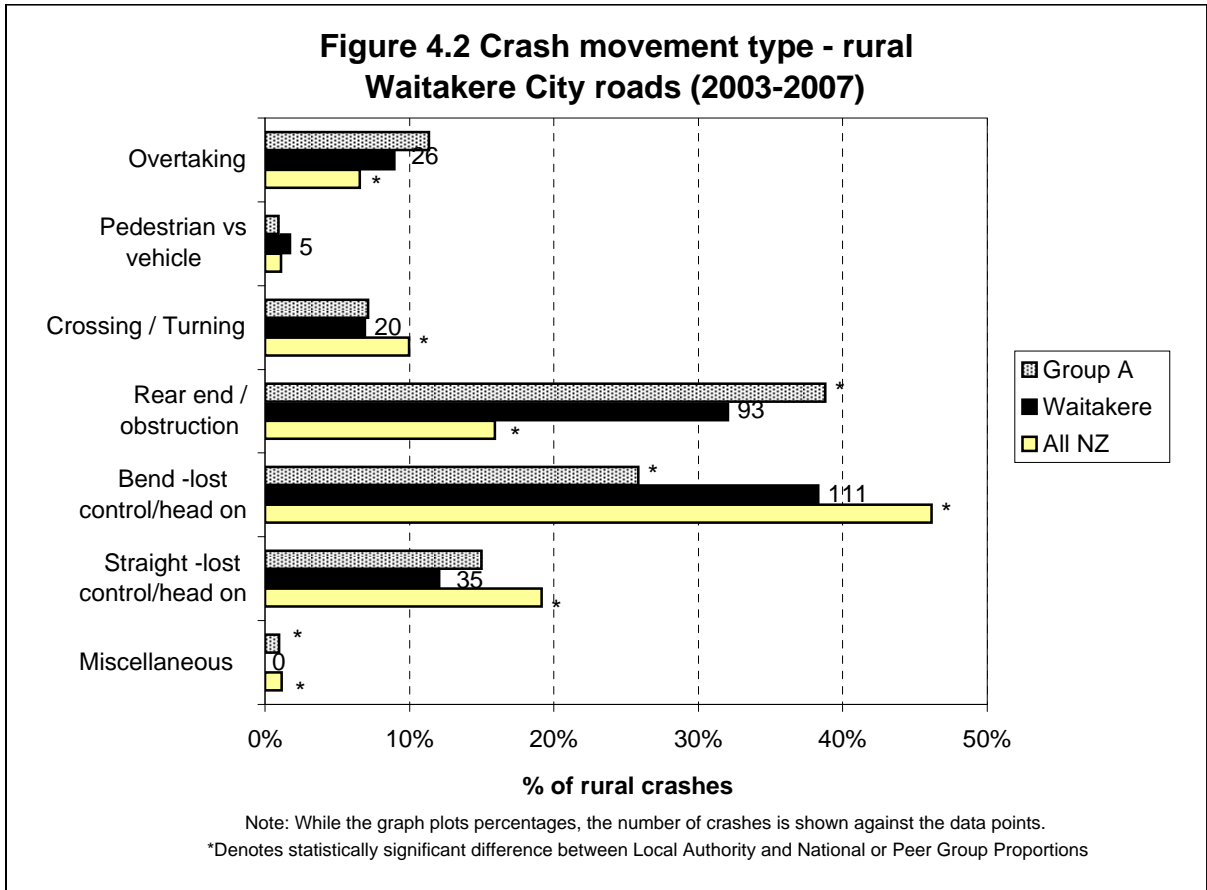
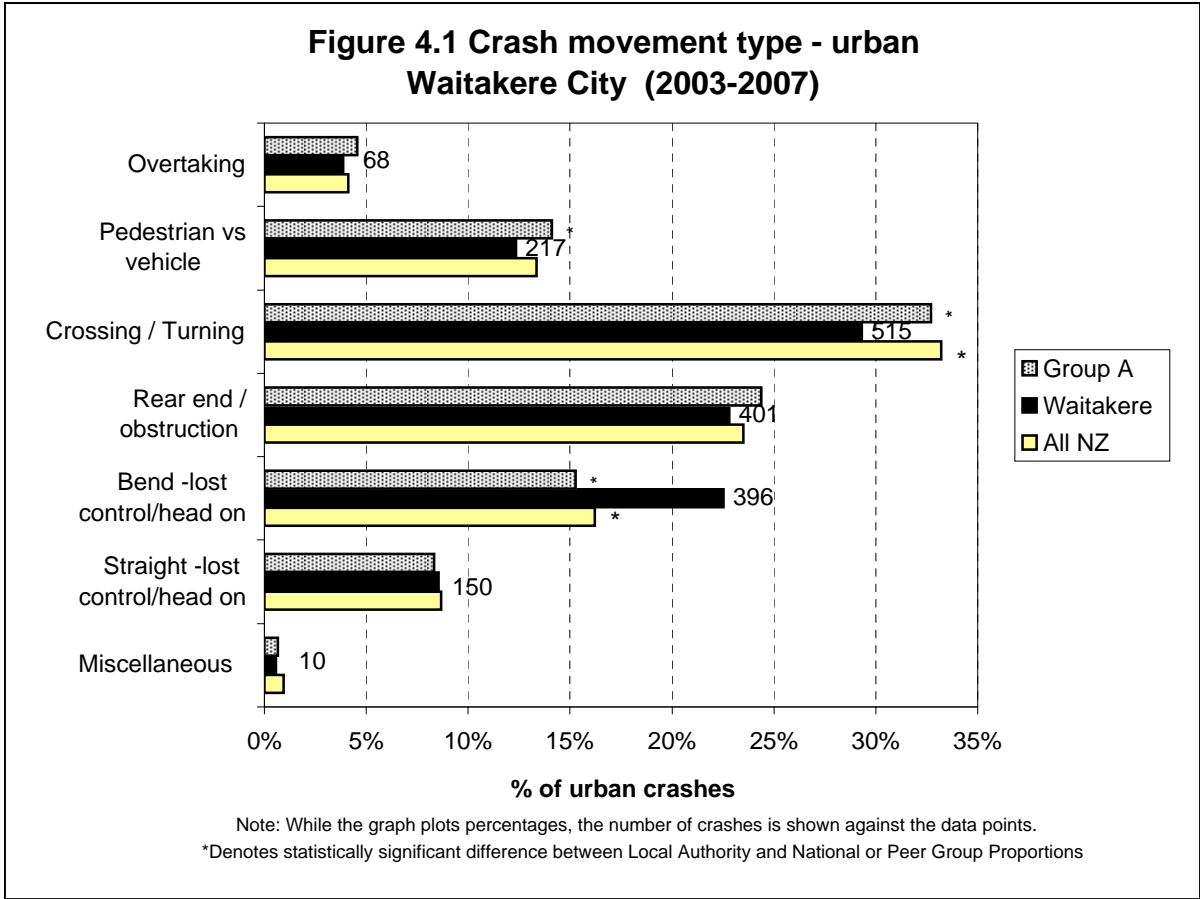
**Figure 3.27 Licence status - urban
Waitakere City**

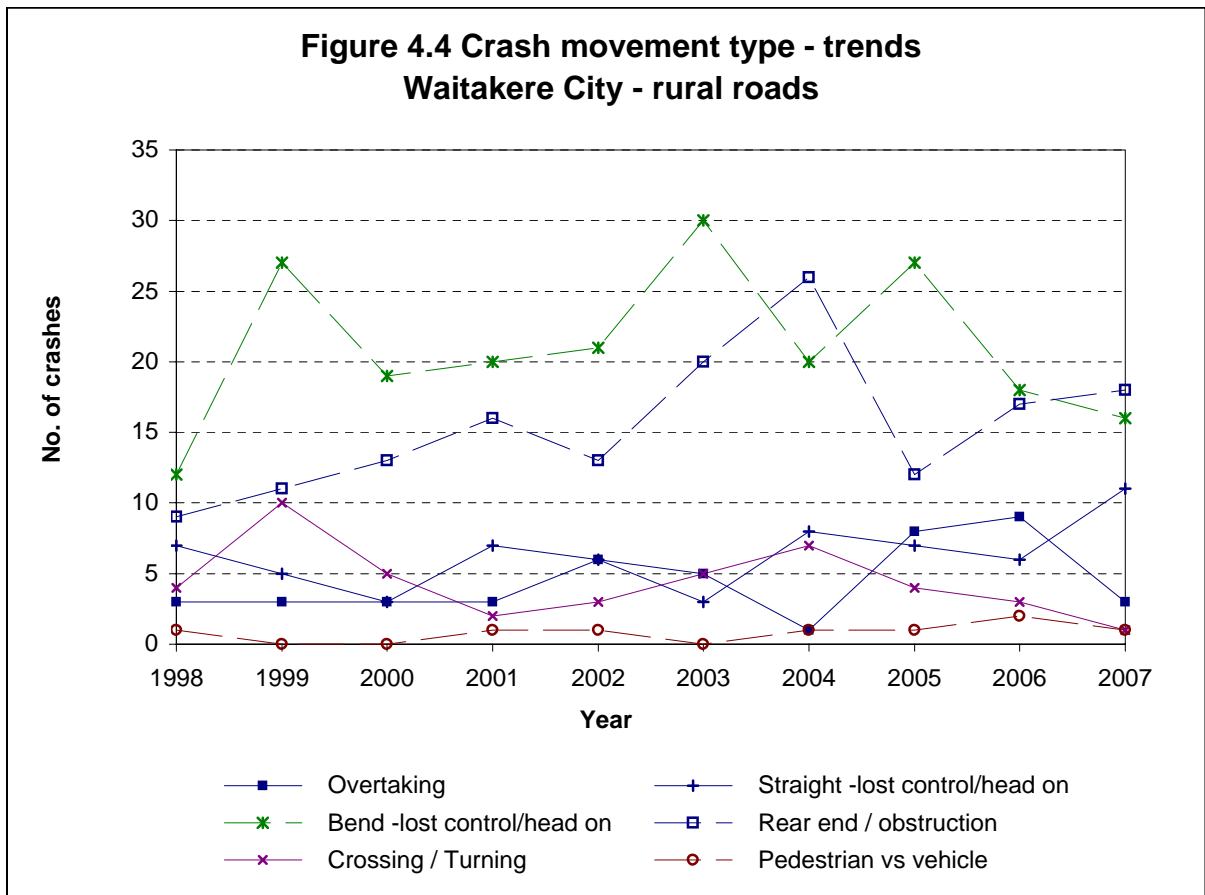
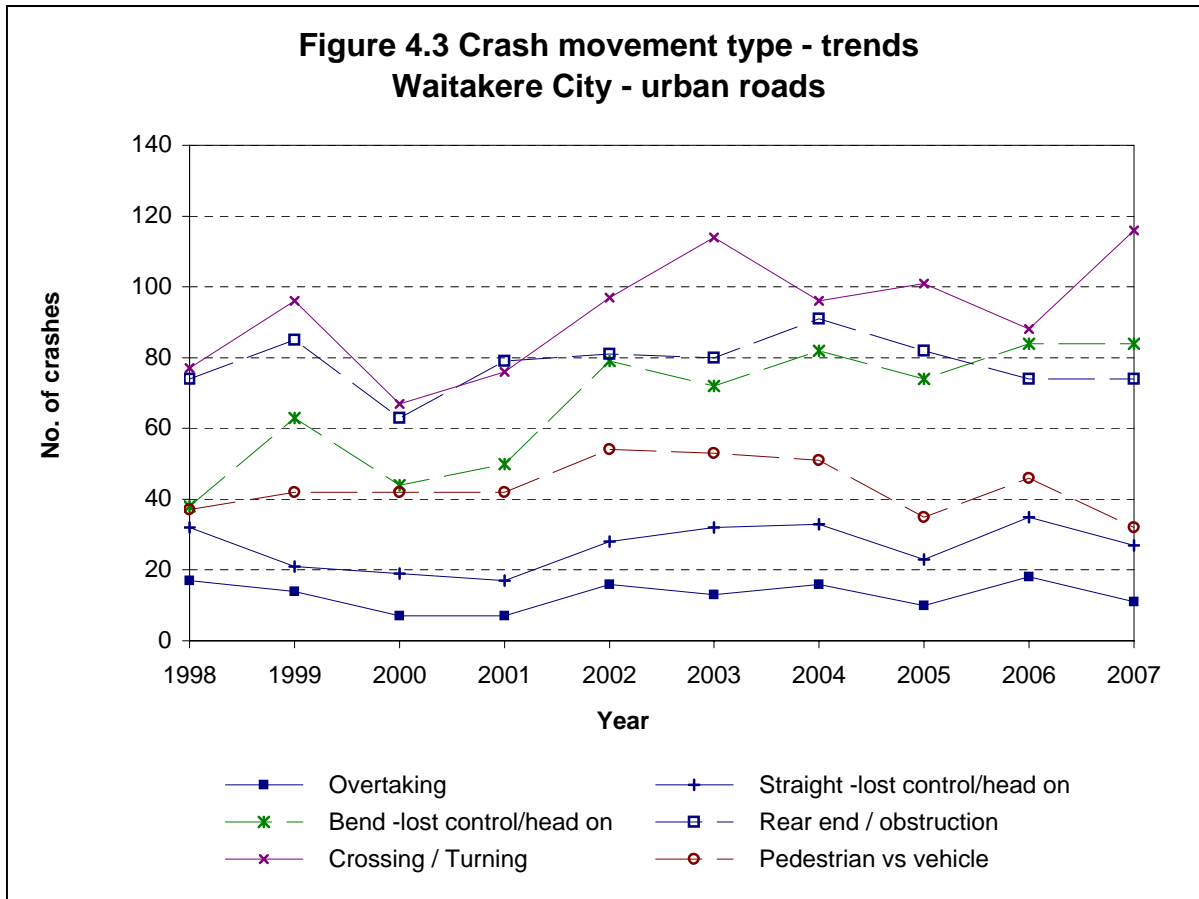


**Figure 3.28 Licence status - rural
Waitakere City**

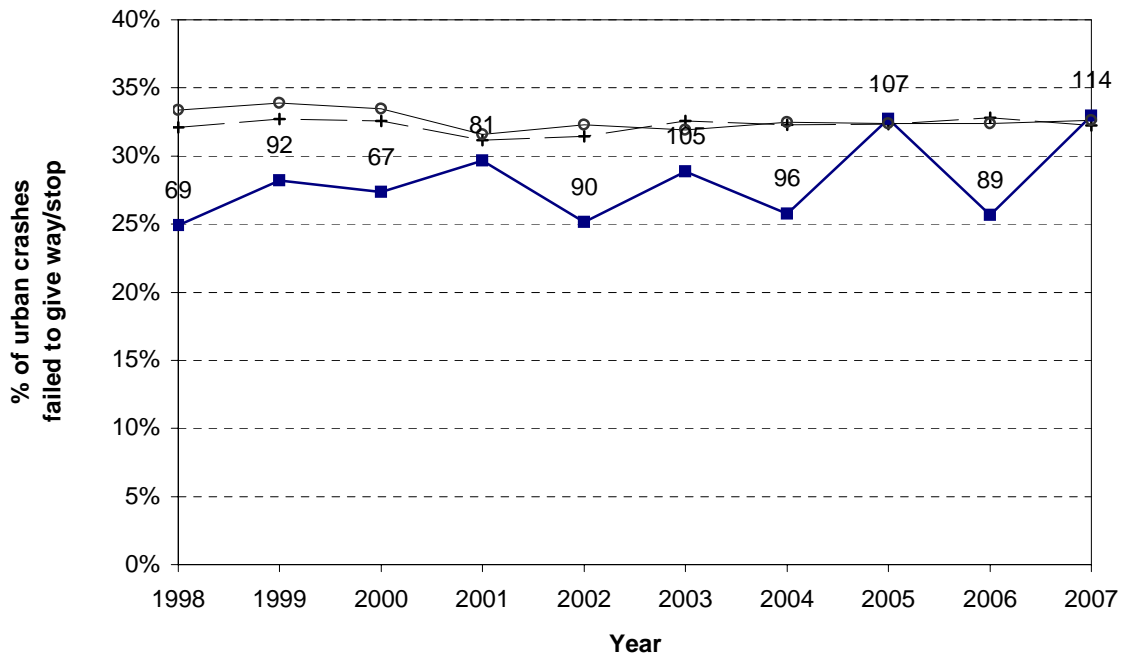


Crash type statistics





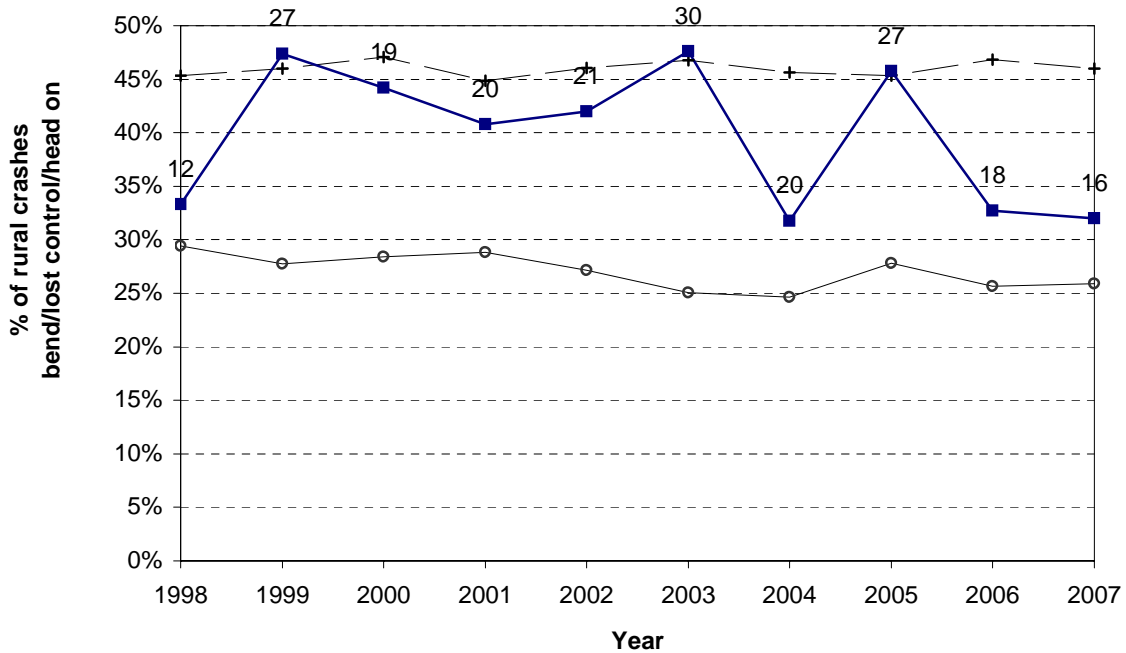
**Figure 4.5 Failed to give way / stop
Waitakere City - urban roads**



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

—+— All NZ —■— Waitakere —○— Group A

**Figure 4.6 Bend - lost control / head - on
Waitakere City - rural roads**

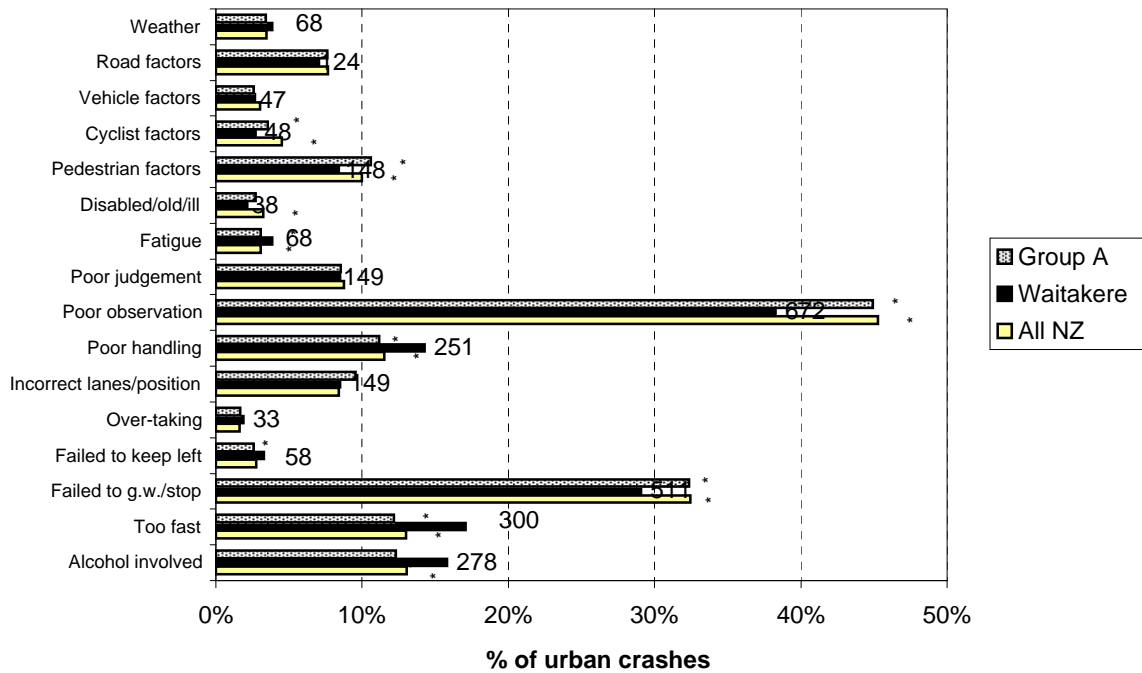


Note: While the graph plots percentages, the number of crashes is shown against the data points.

—+— All NZ —■— Waitakere —○— Group A

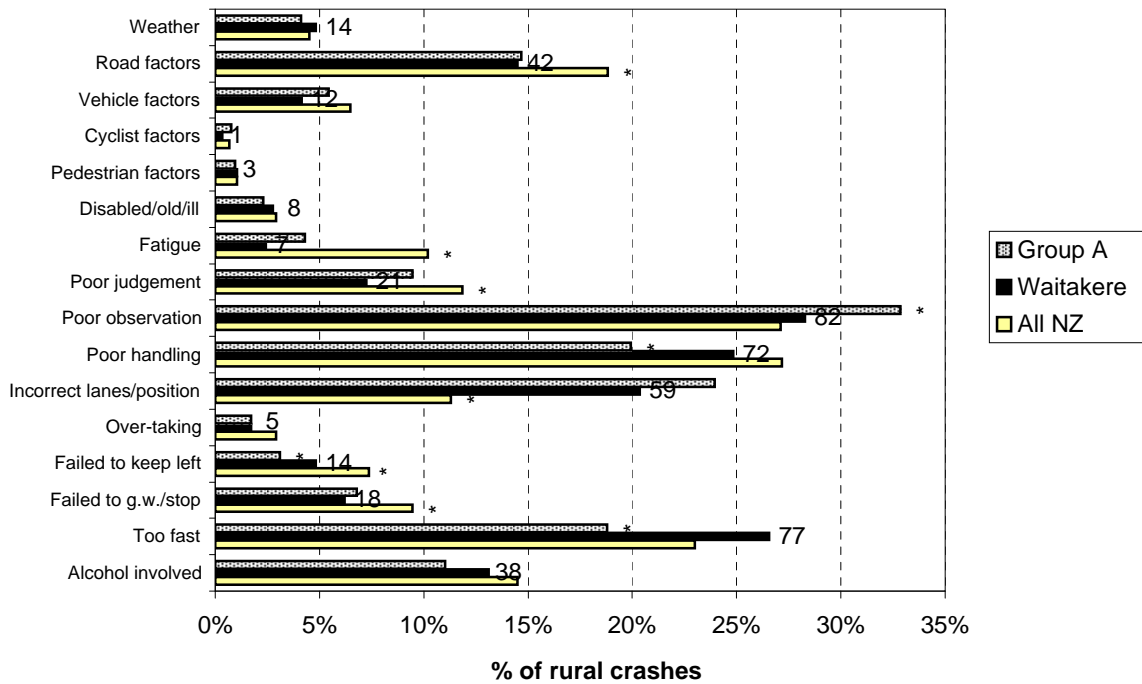
Crash factor statistics

**Figure 5.1 Contributing factors - urban
Waitakere City (2003-2007)**

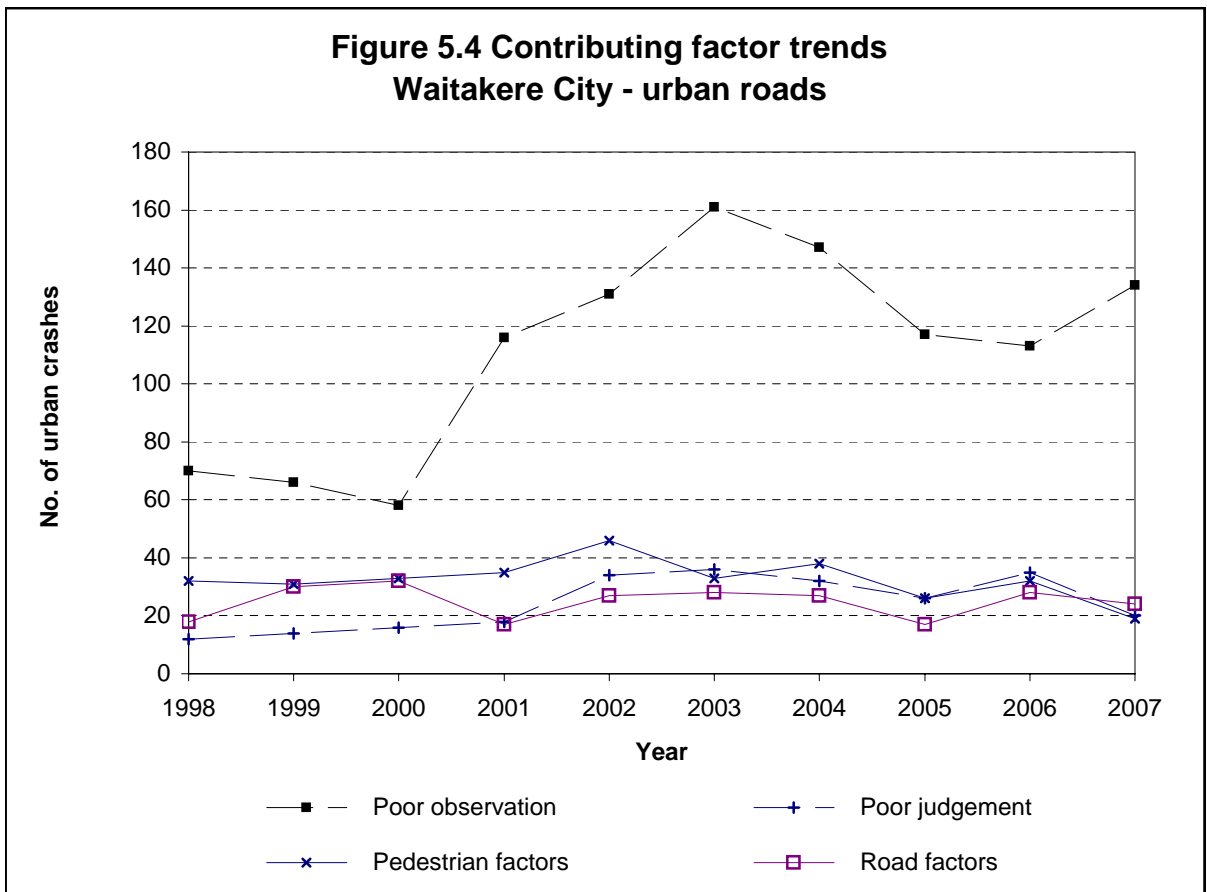
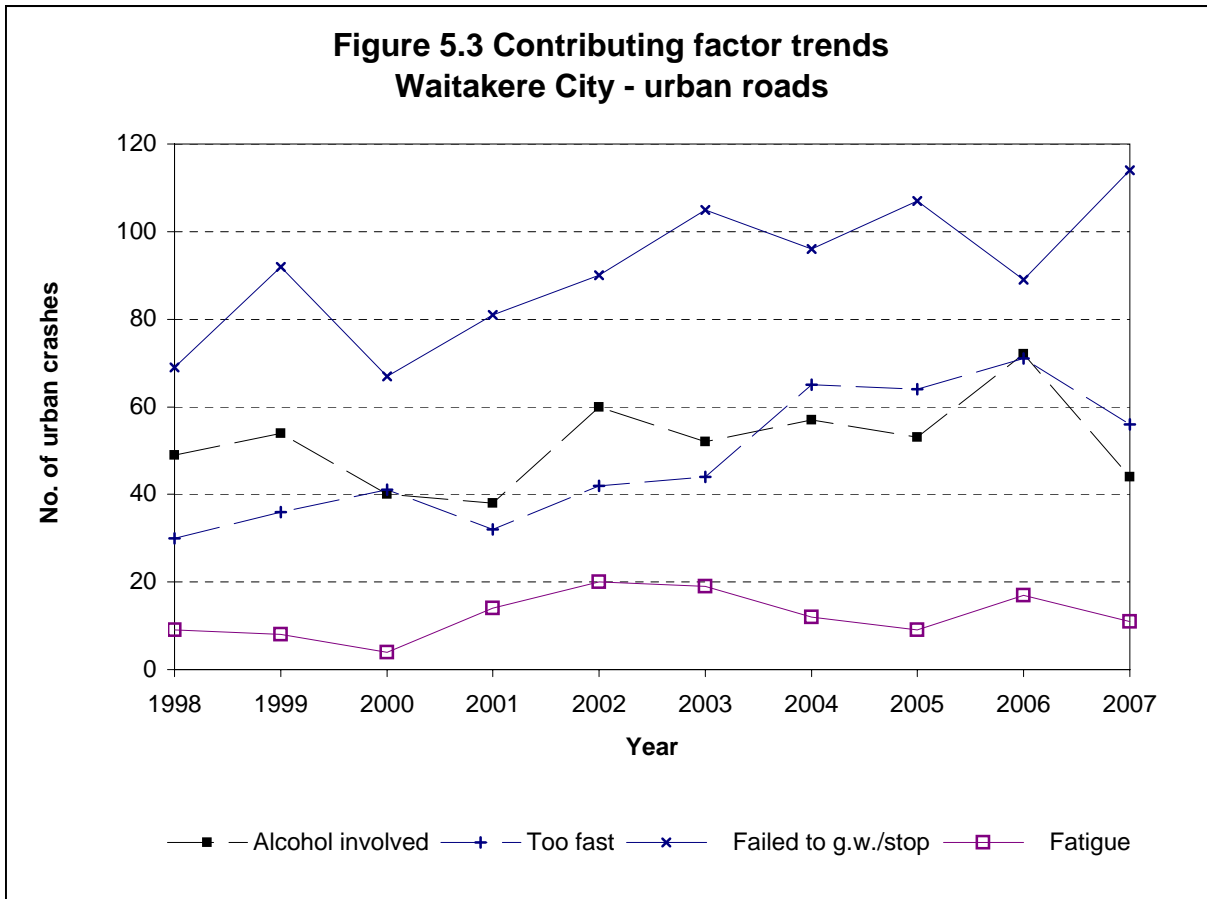


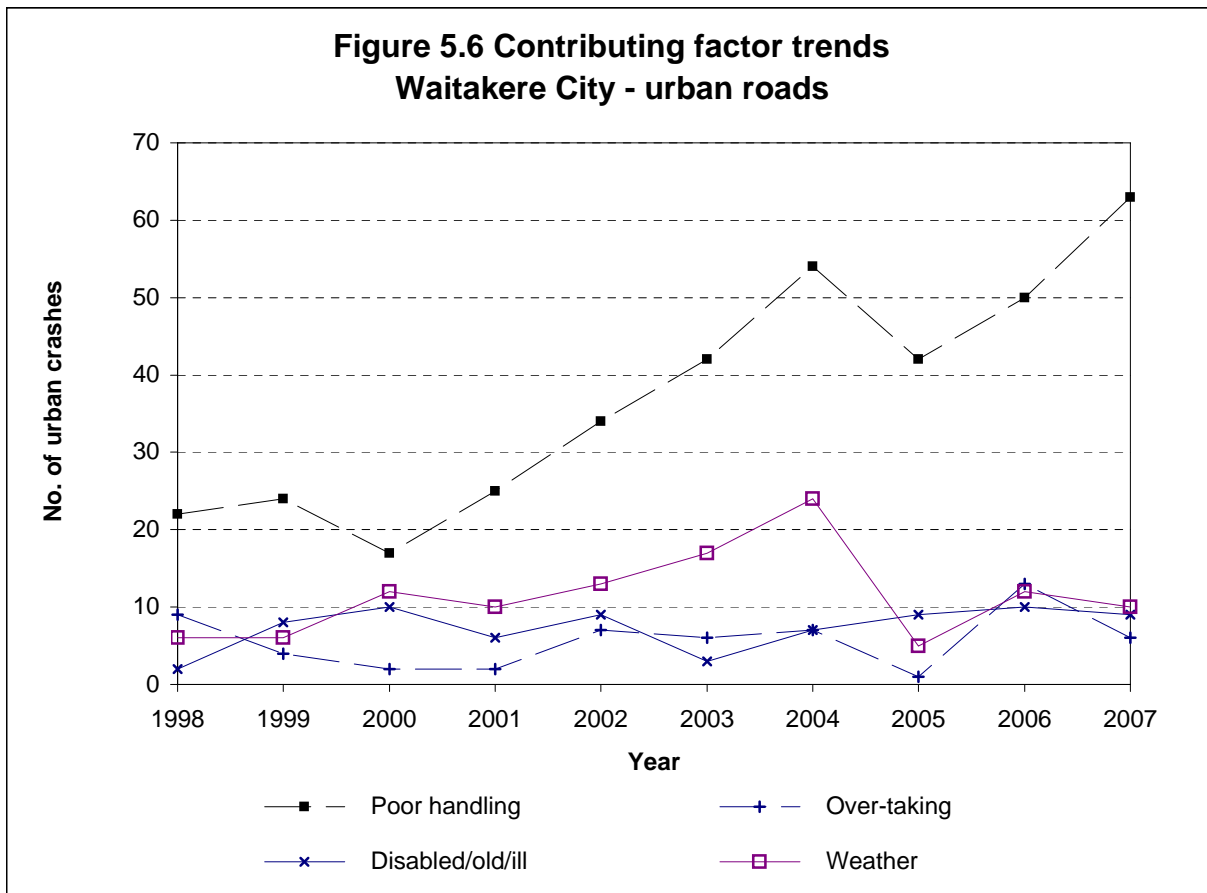
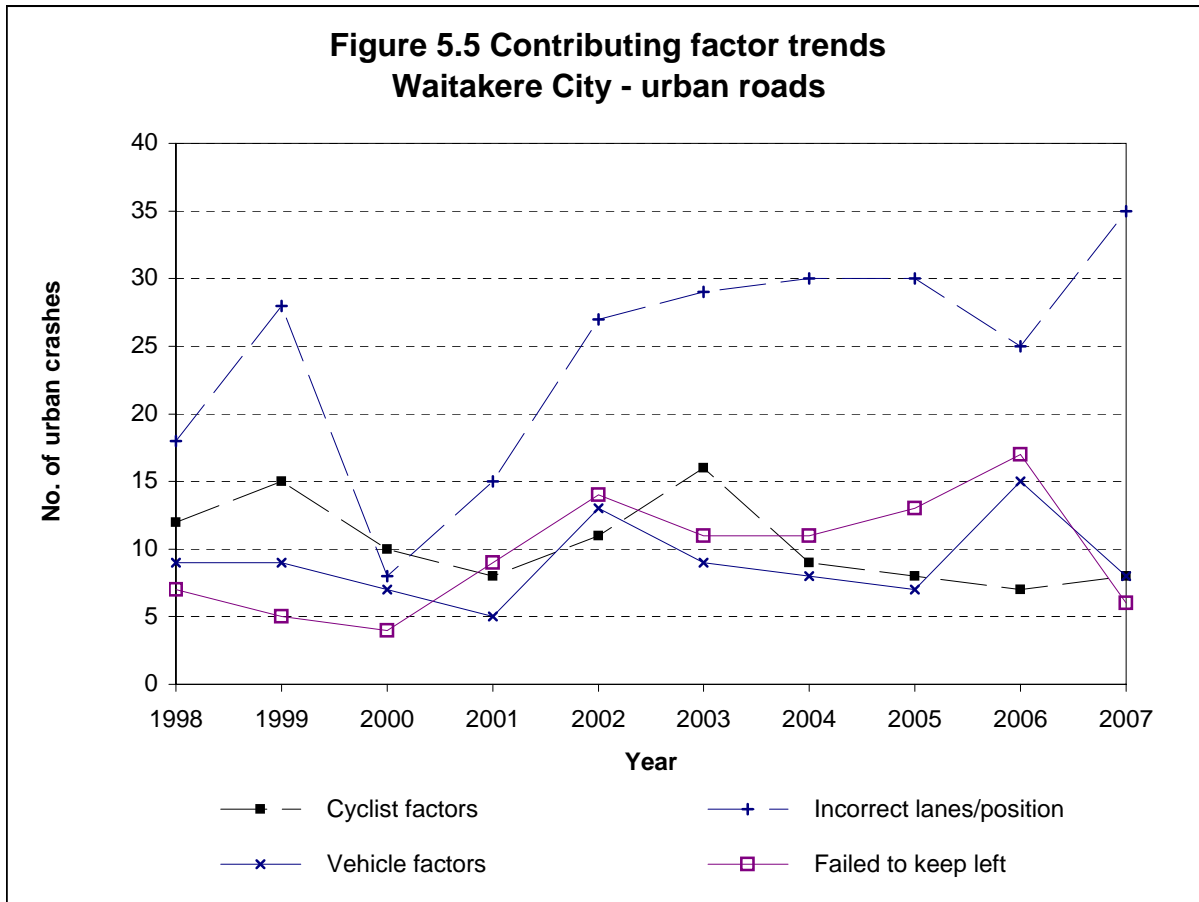
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

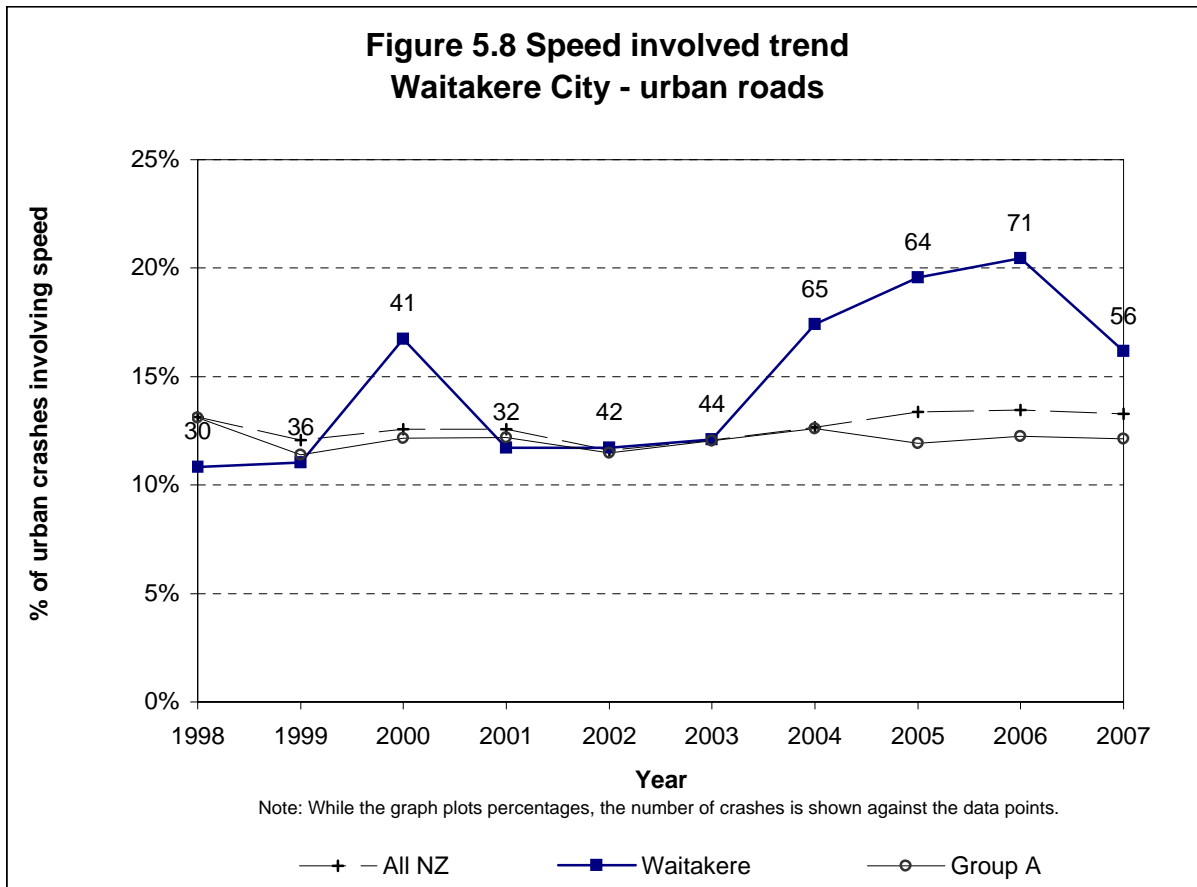
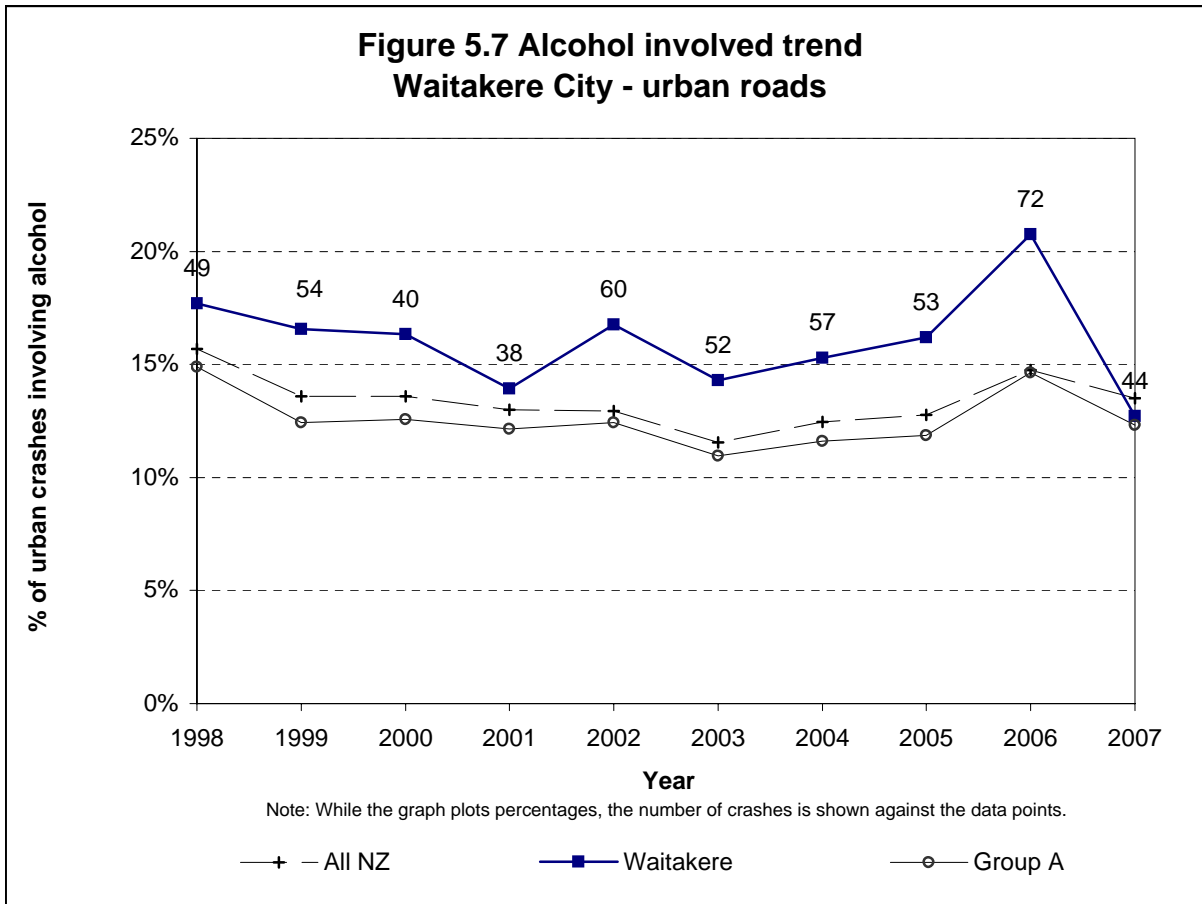
**Figure 5.2 Contributing factors - rural
Waitakere City (2003-2007)**

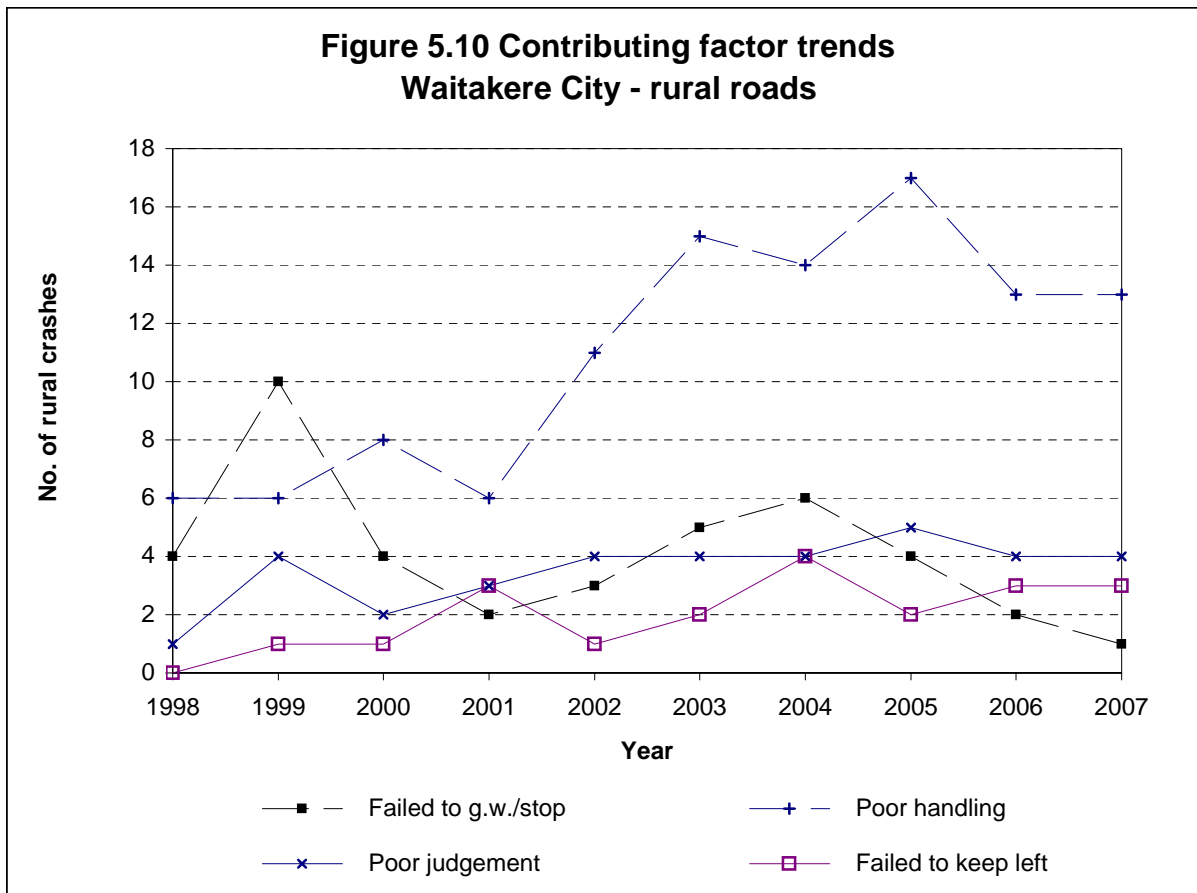
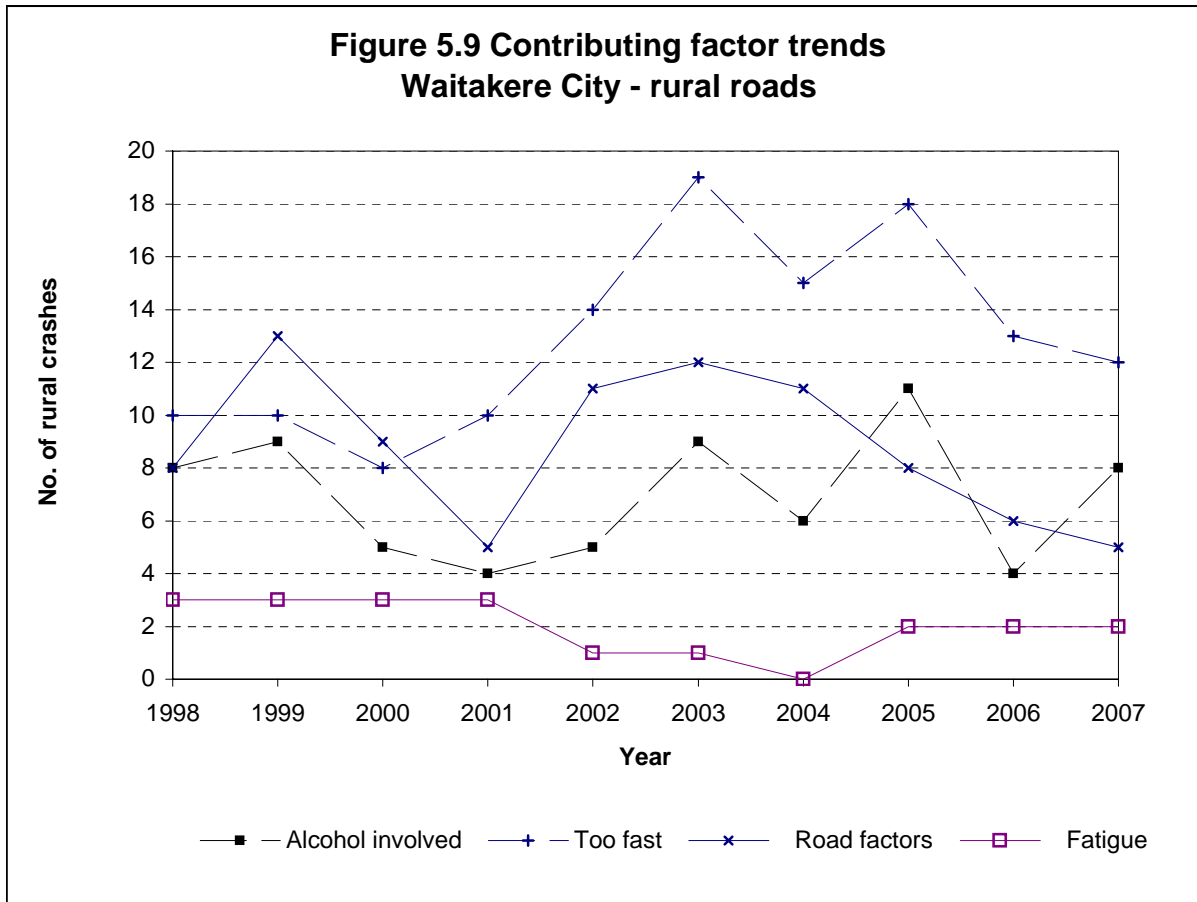


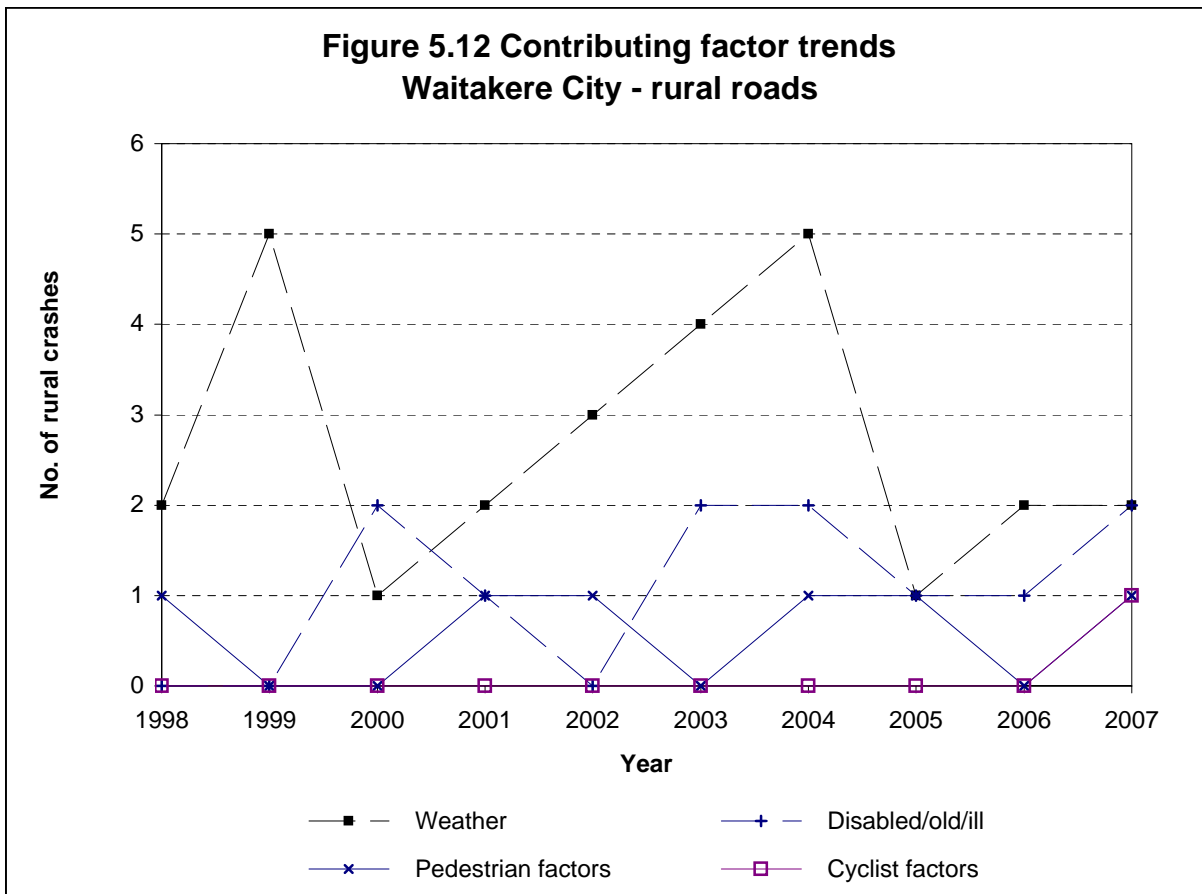
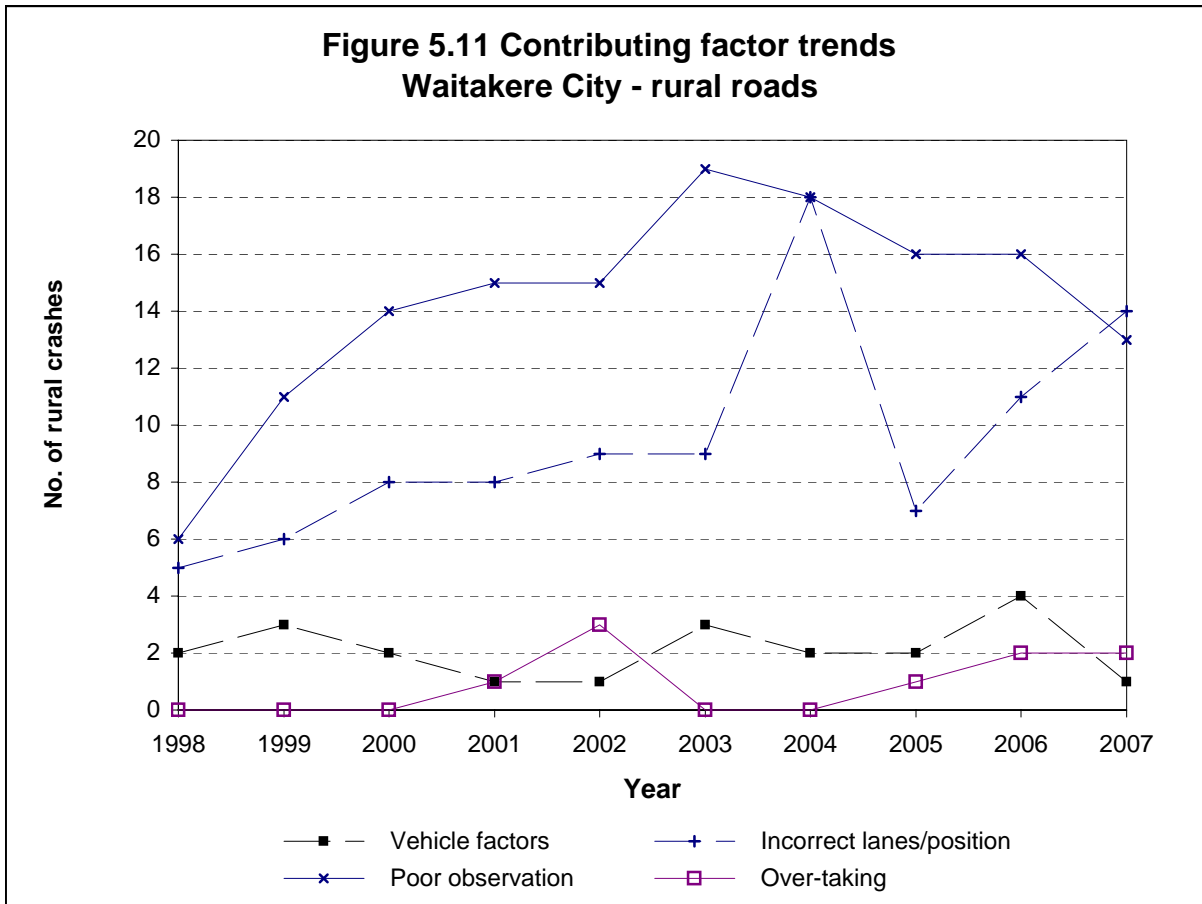
Note: While the graph plots percentages, the number of casualties is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions



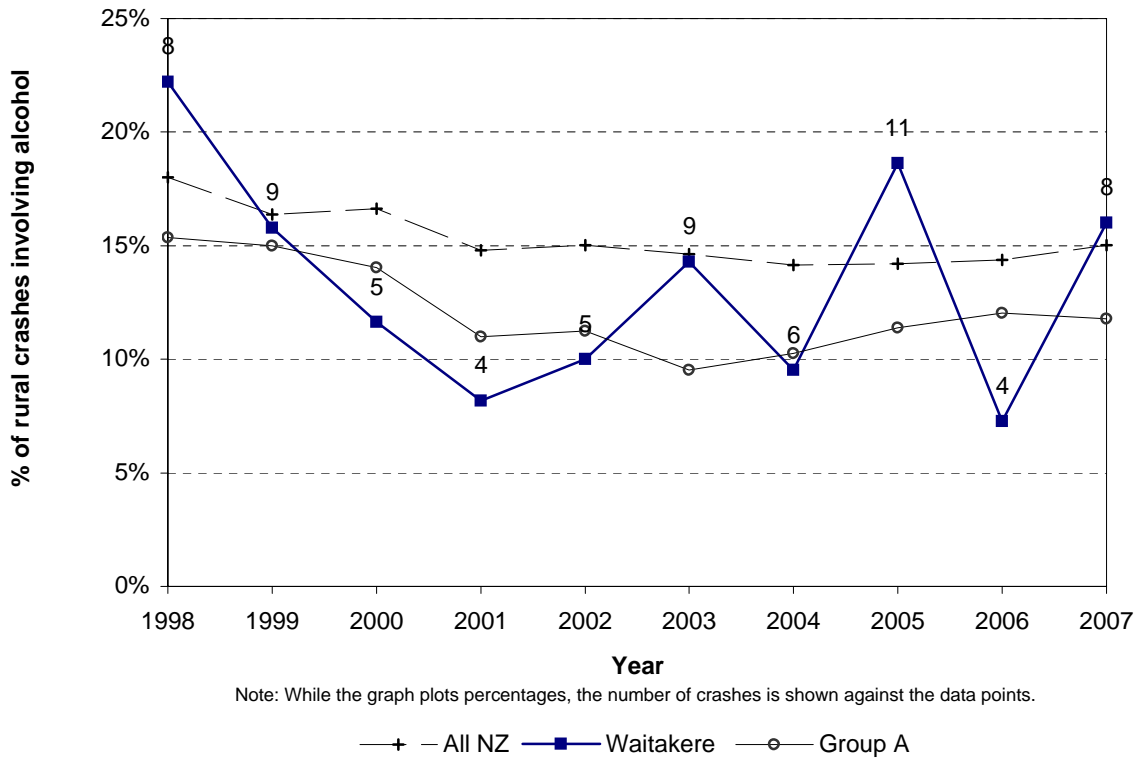




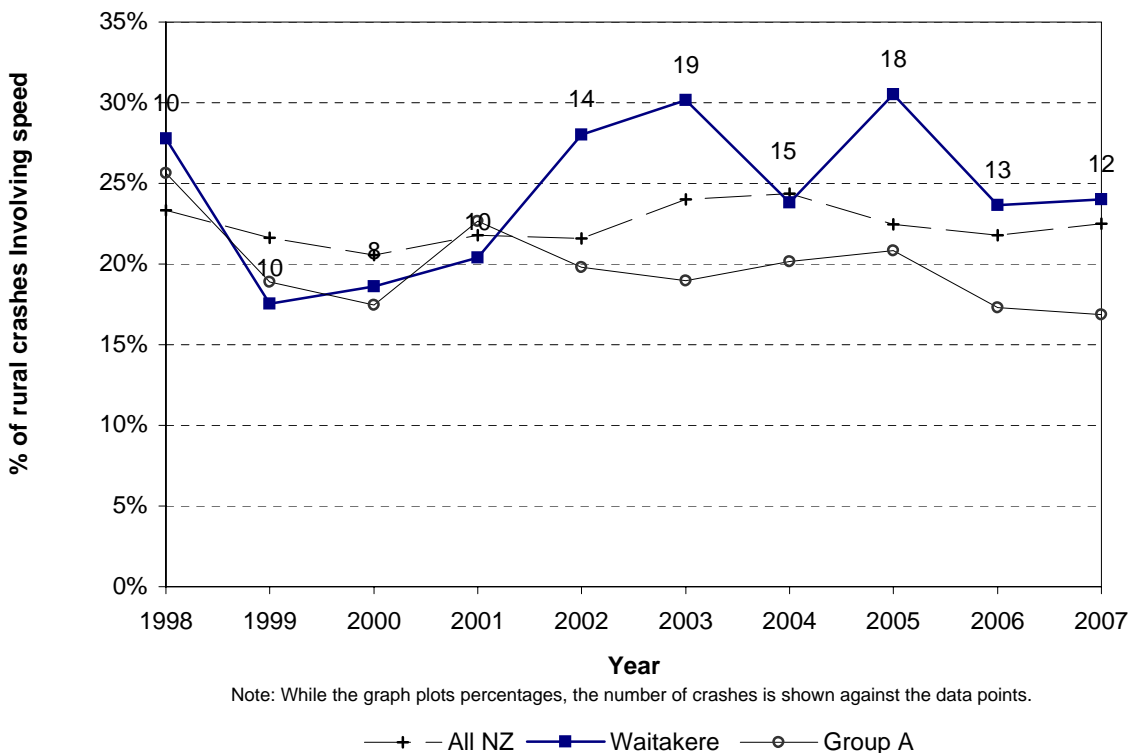




**Figure 5.13 Alcohol involved trend
Waitakere City - rural roads**

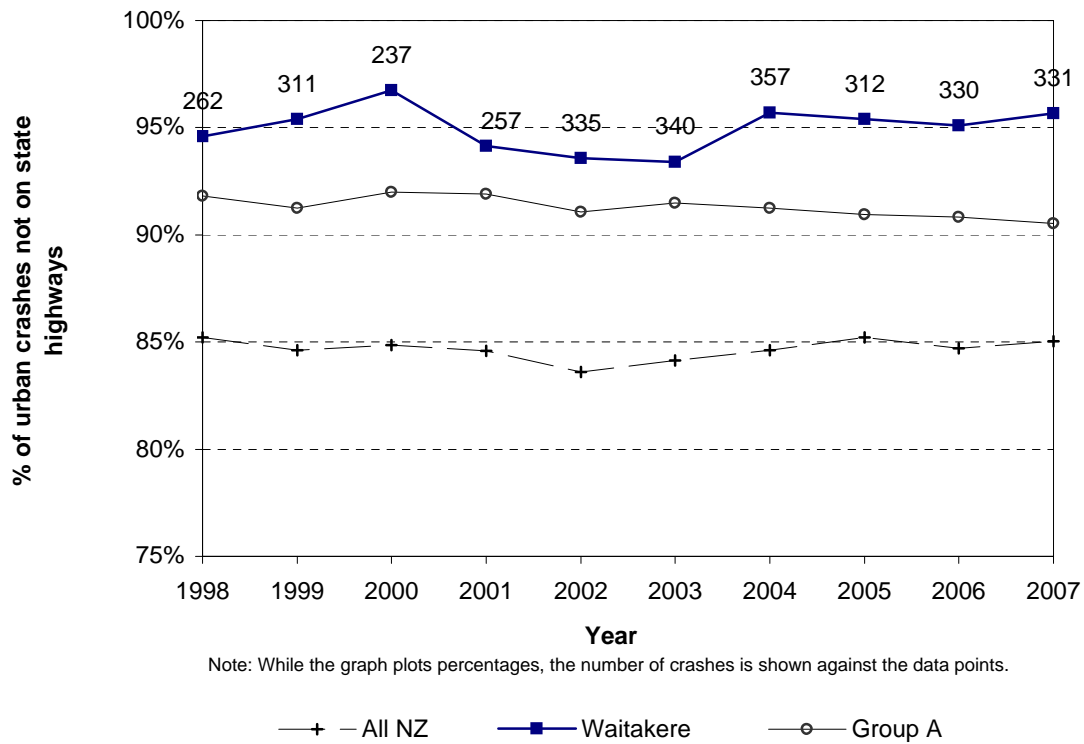


**Figure 5.14 Speed involved trend
Waitakere City - rural roads**

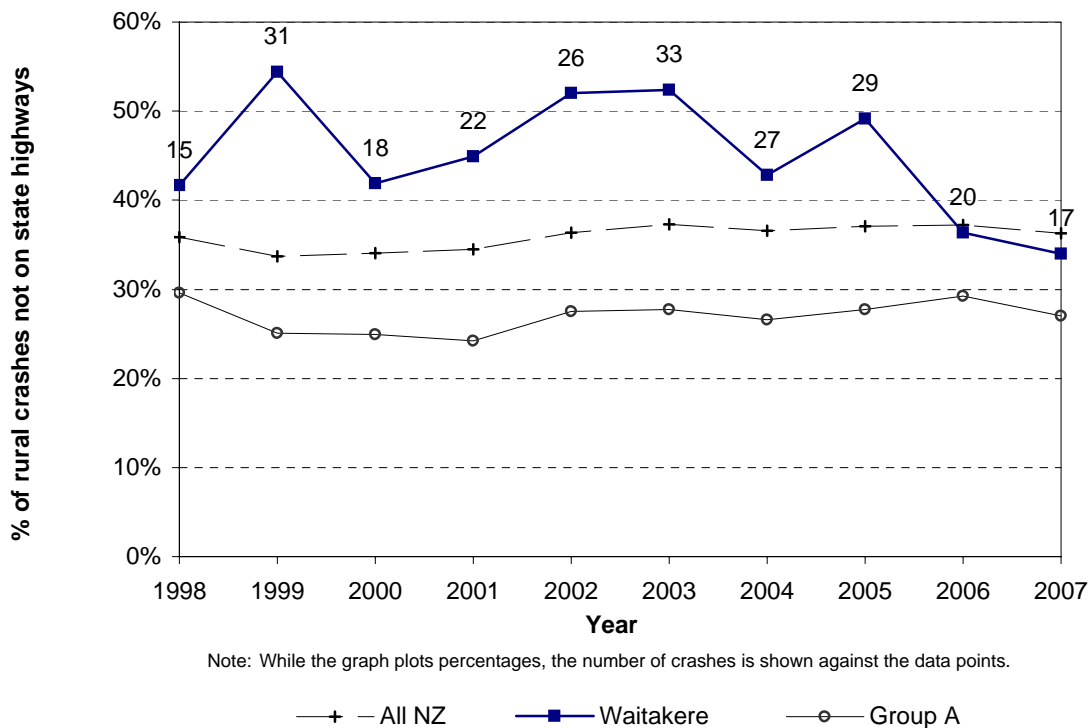


Environmental statistics

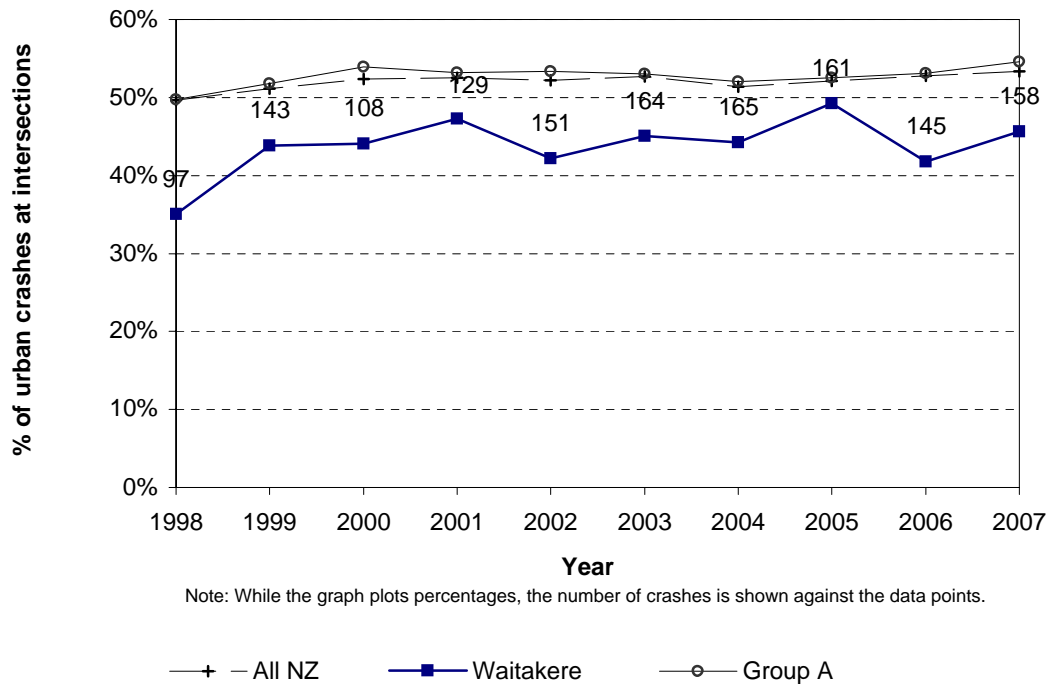
**Figure 6.1 Crashes not on state highways
Waitakere City - urban roads**



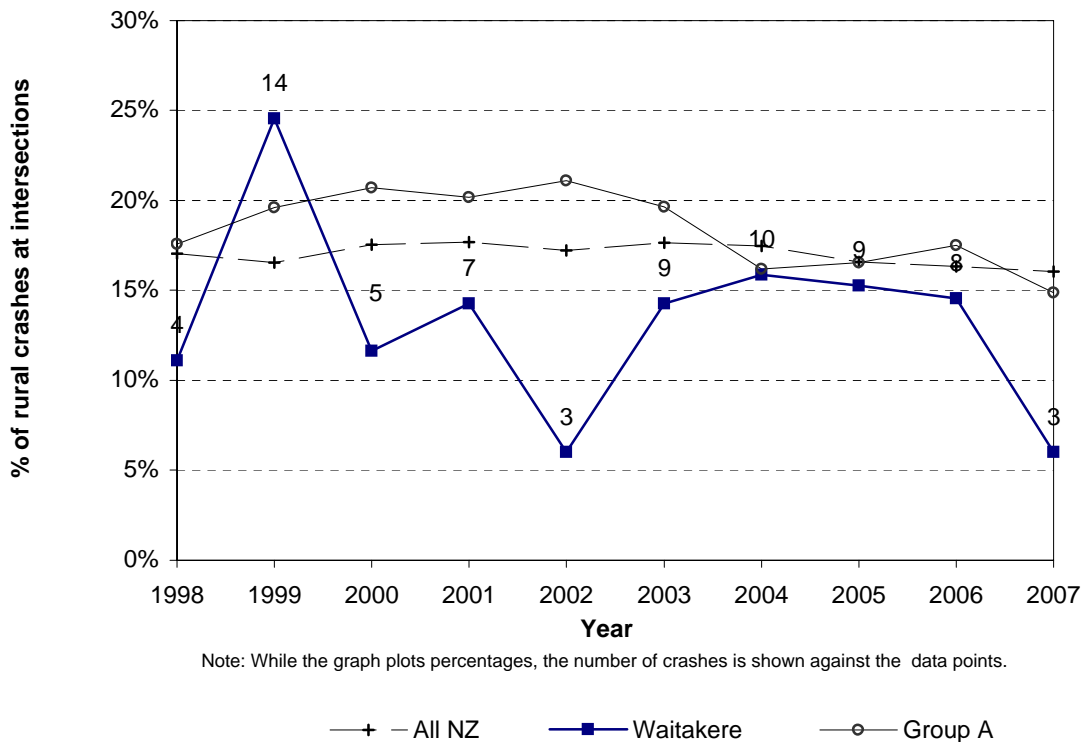
**Figure 6.2 Crashes not on state highways
Waitakere City - rural roads**

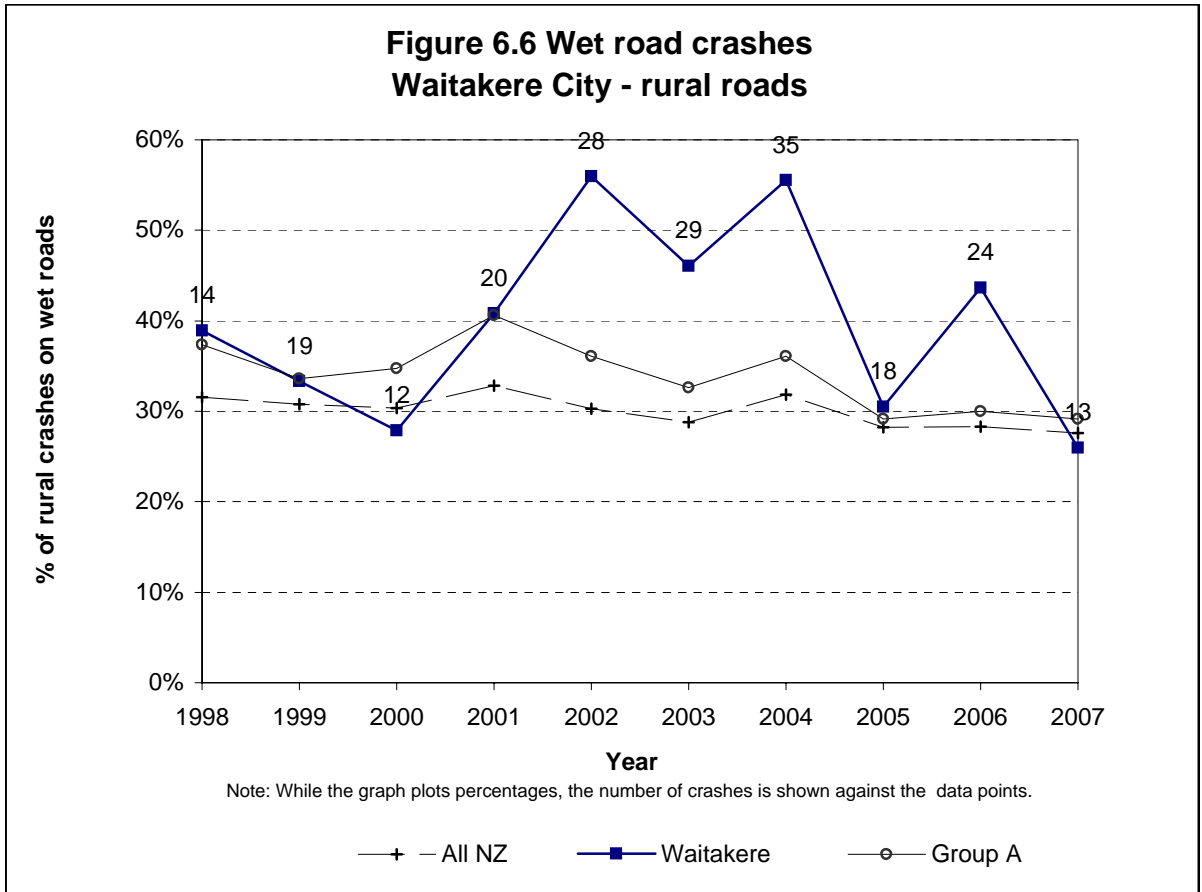
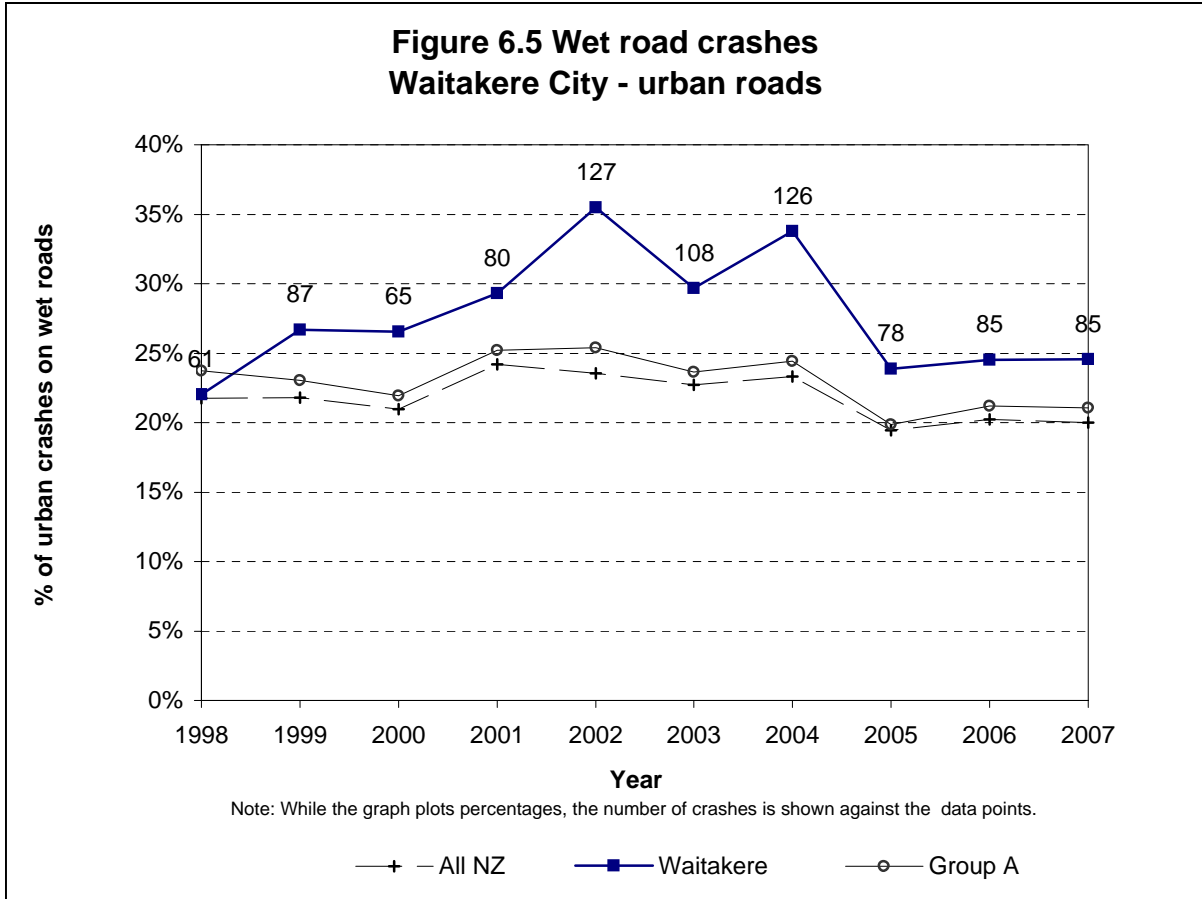


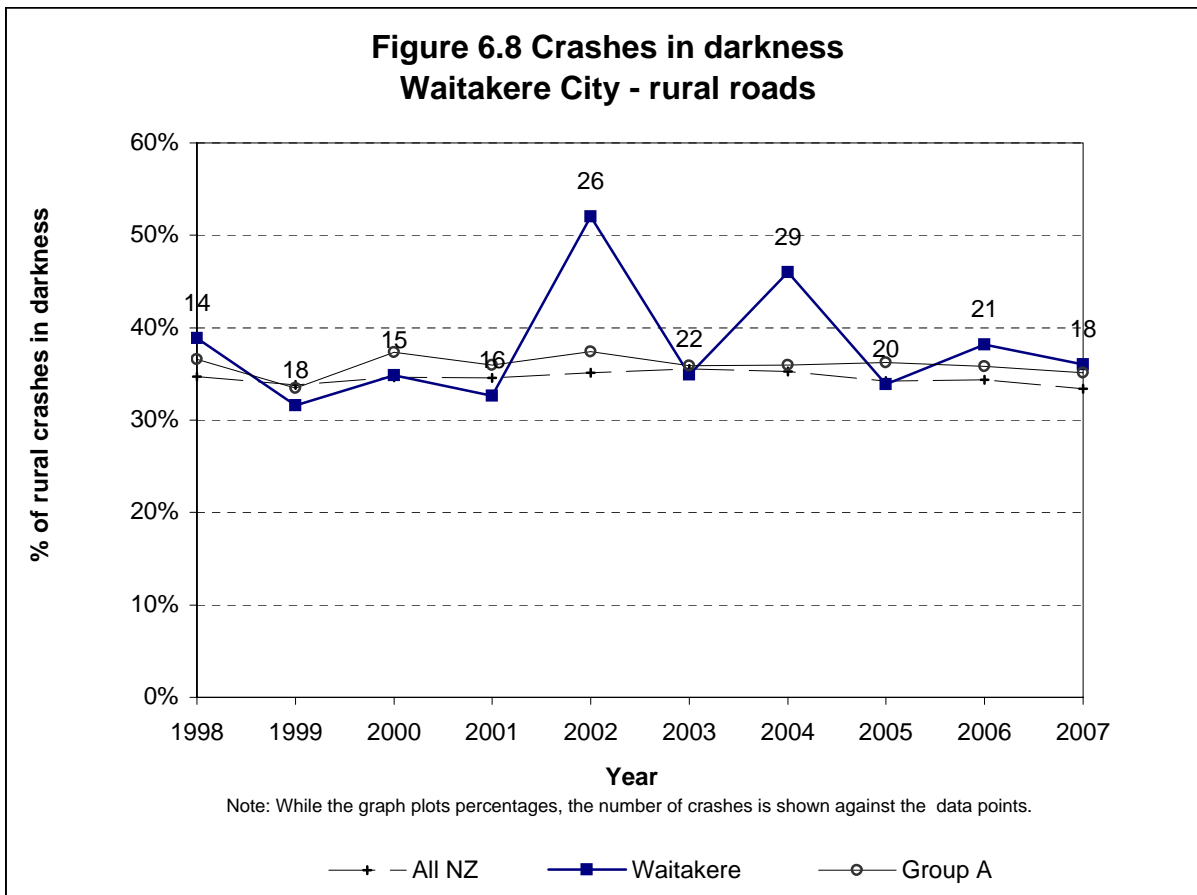
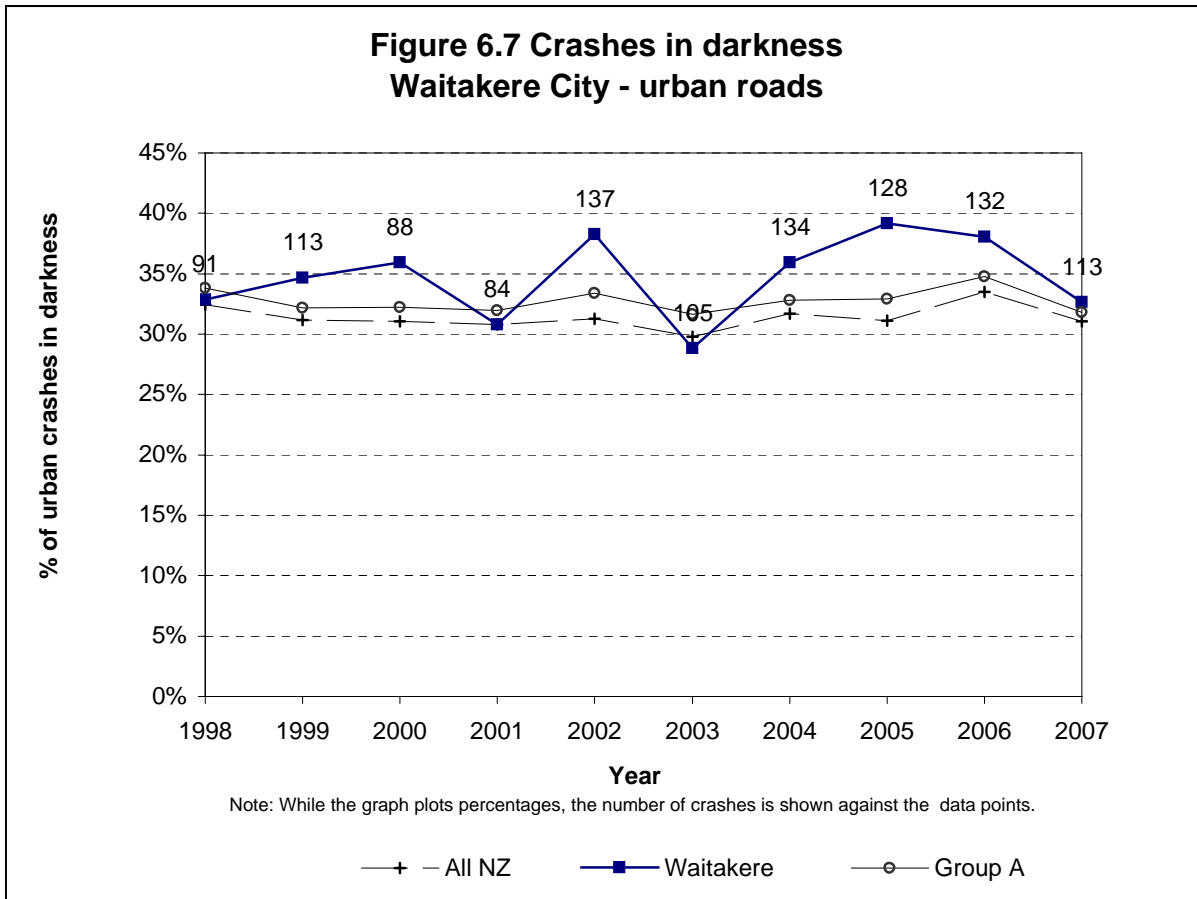
**Figure 6.3 Intersection crashes
Waitakere City - urban roads**



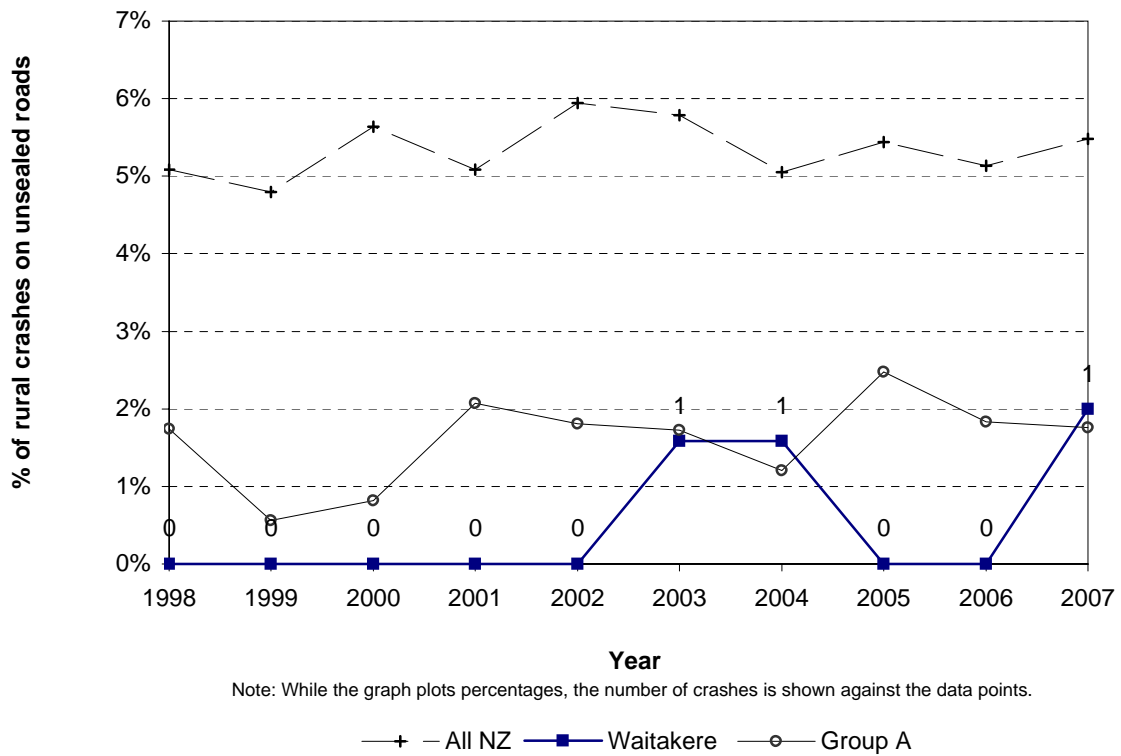
**Figure 6.4 Intersection crashes
Waitakere City - rural roads**



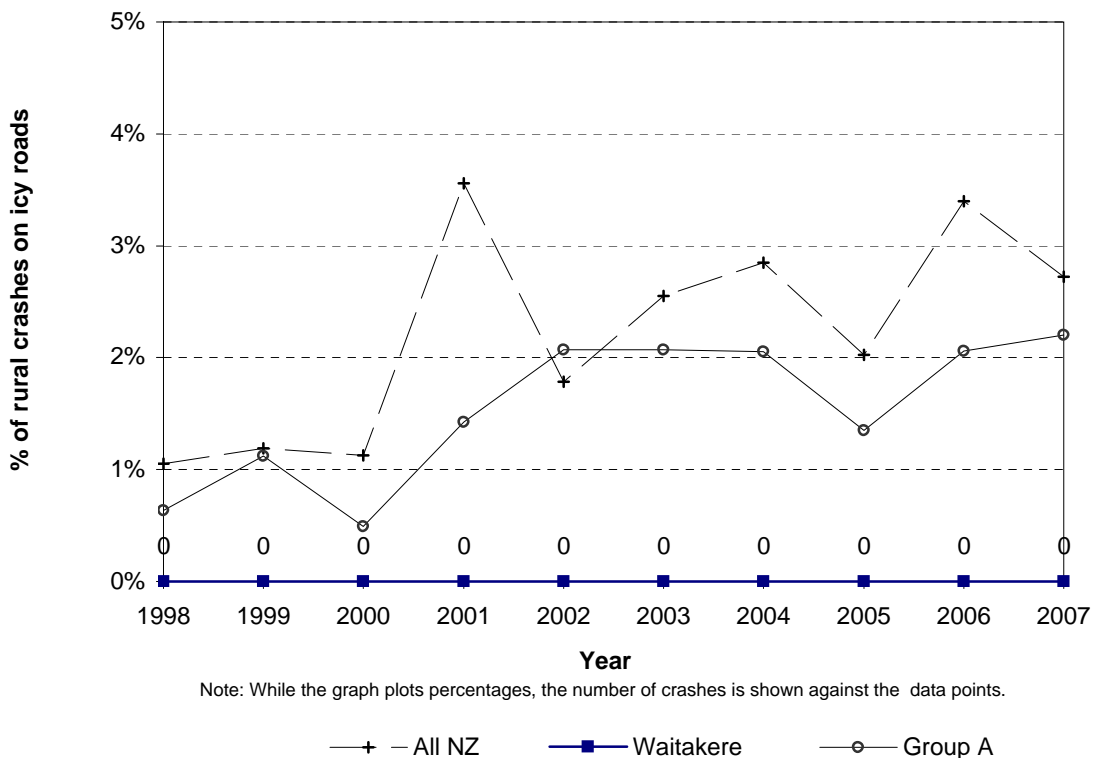




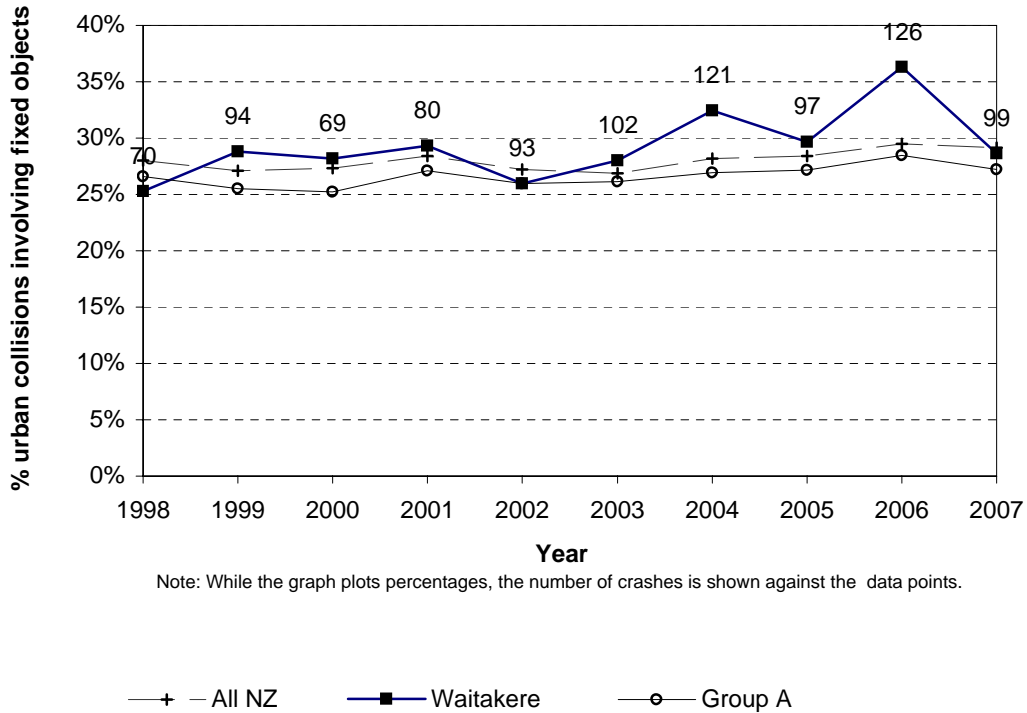
**Figure 6.9 Unsealed road crashes
Waitakere City - rural roads**



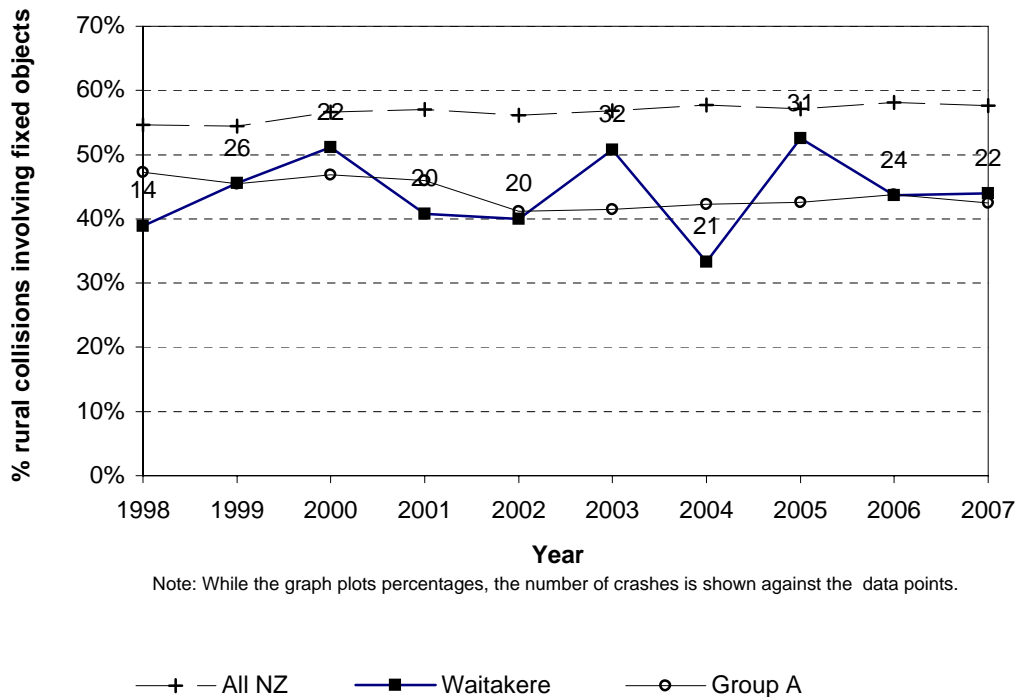
**Figure 6.10 Icy road crashes
Waitakere City - rural roads**

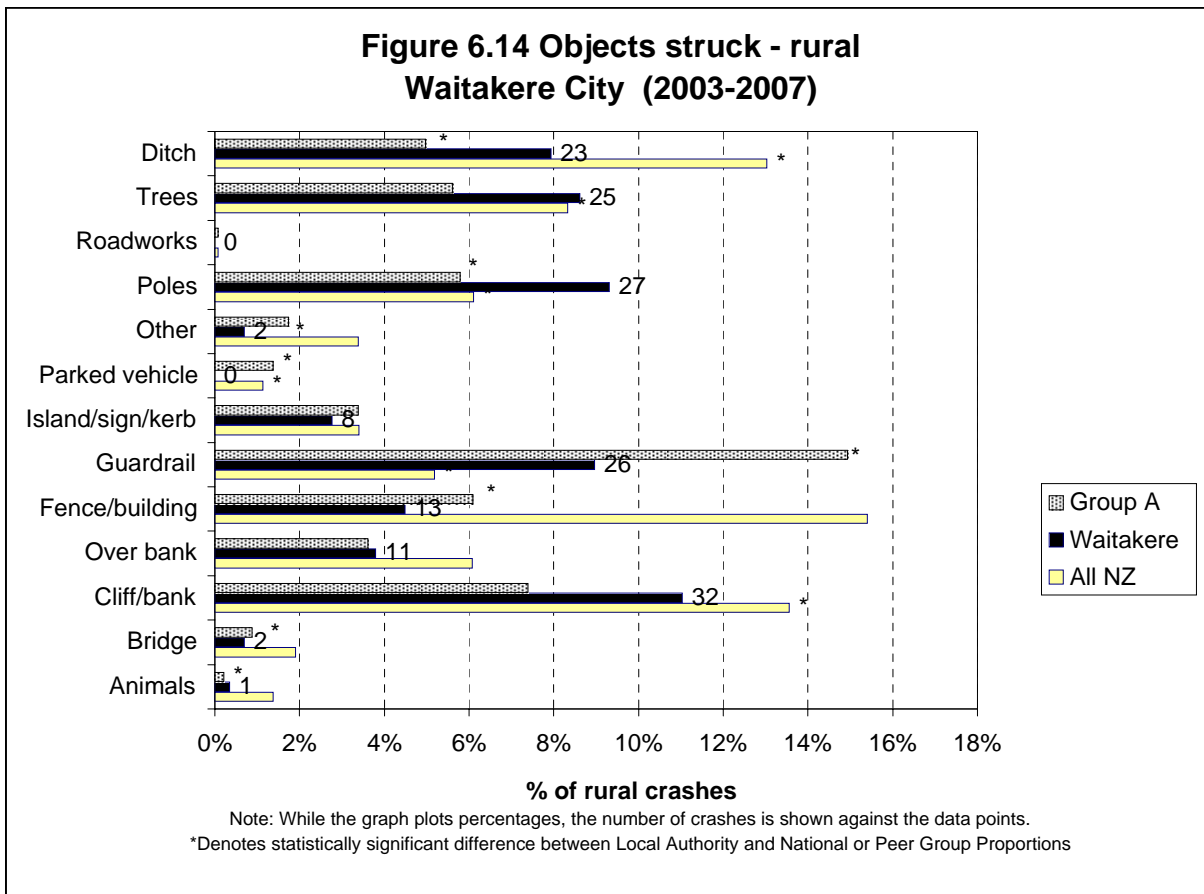
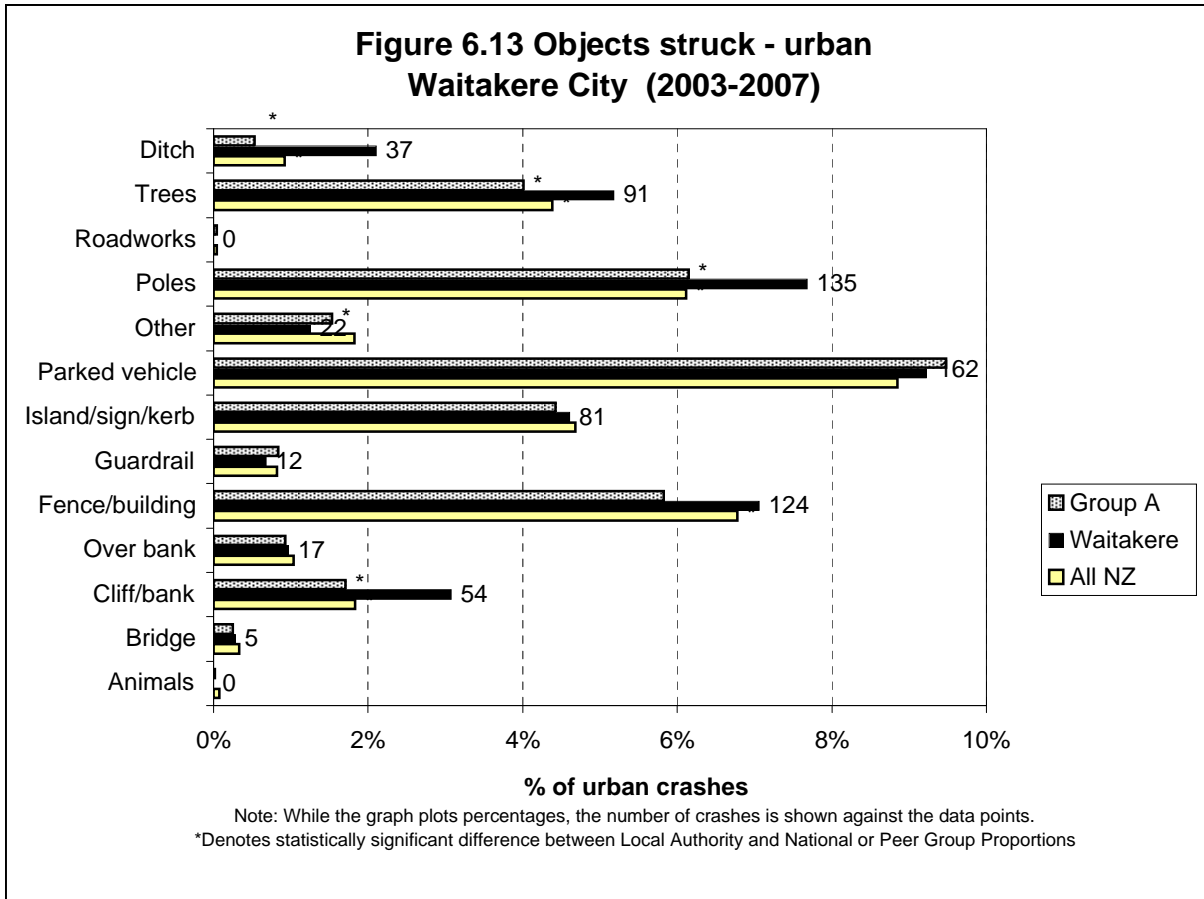


**Figure 6.11 Collisions with objects
Waitakere City - urban roads**



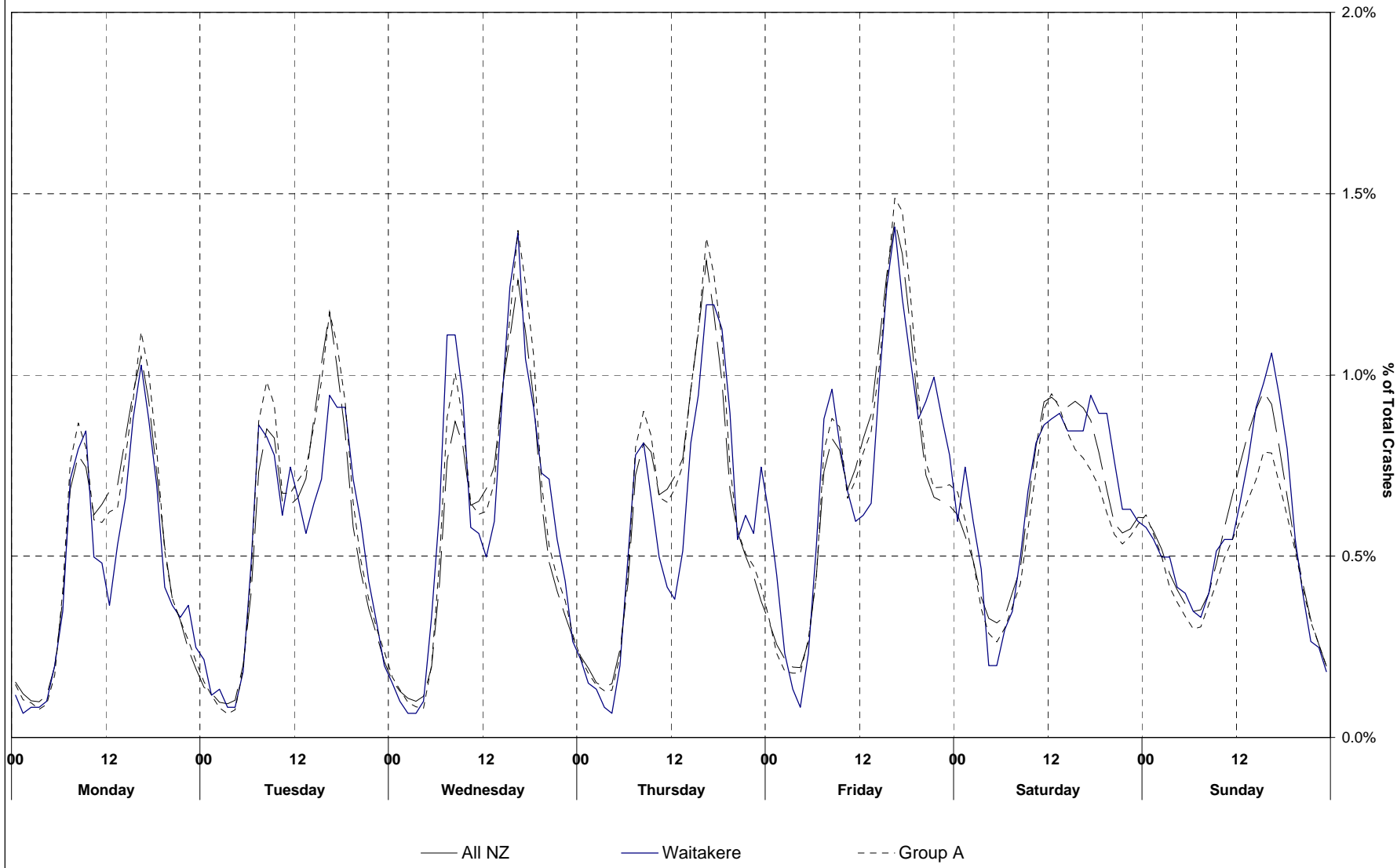
**Figure 6.12 Collisions with objects
Waitakere City - rural roads**



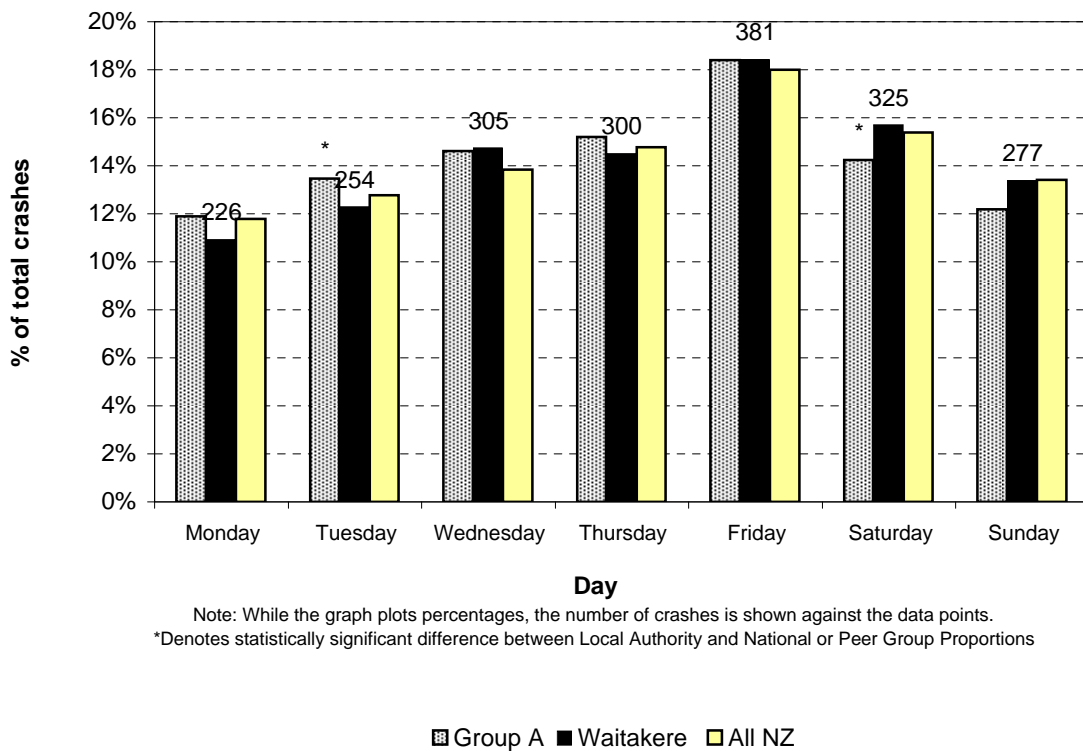


Date and time statistics

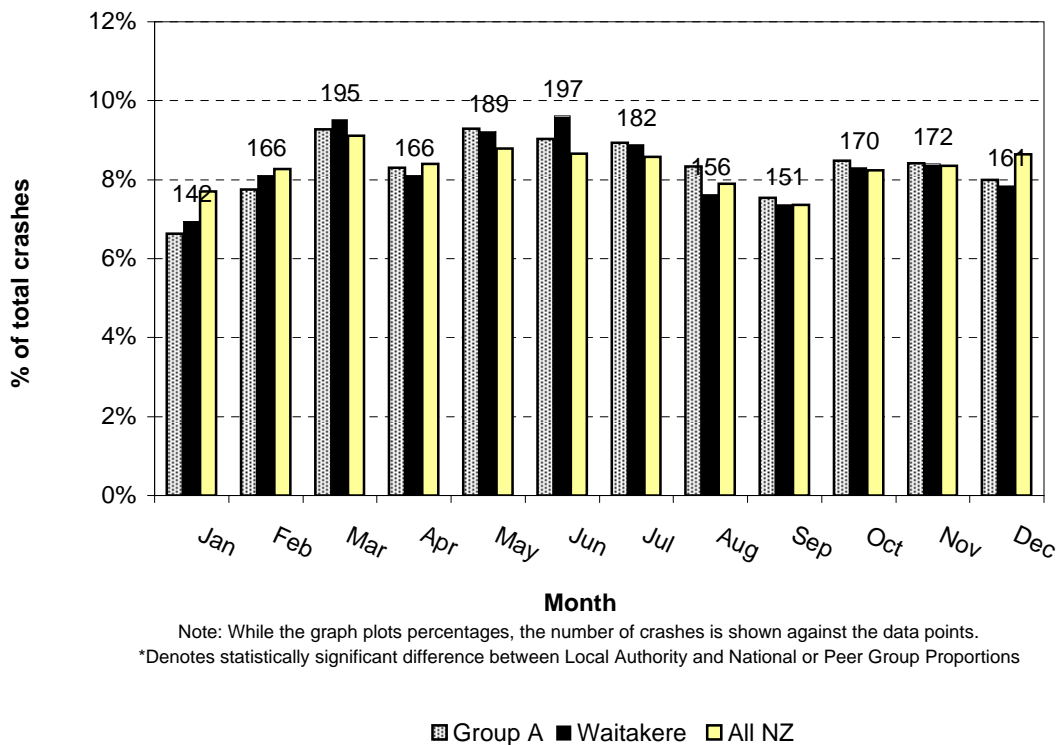
**Figure 7.1 Time pattern over average week
Waitakere City (2003-2007)**



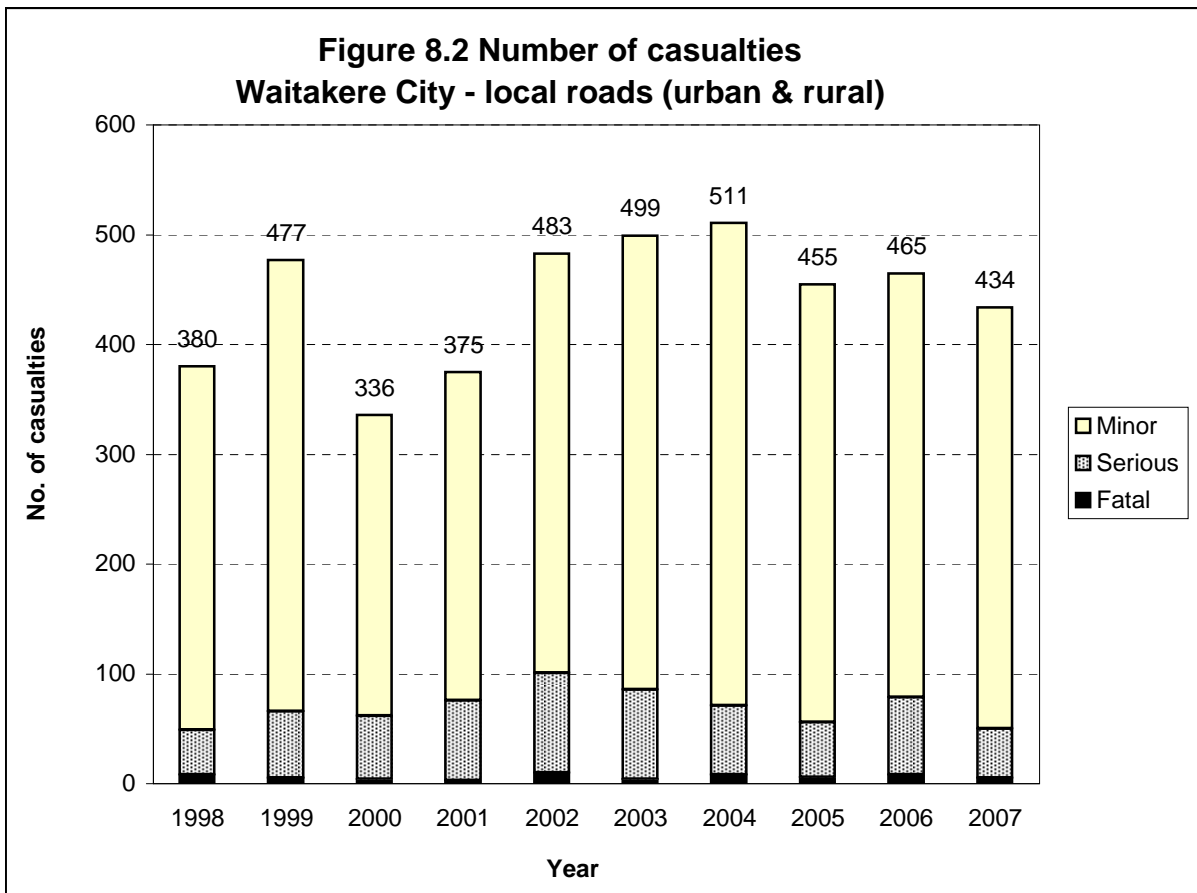
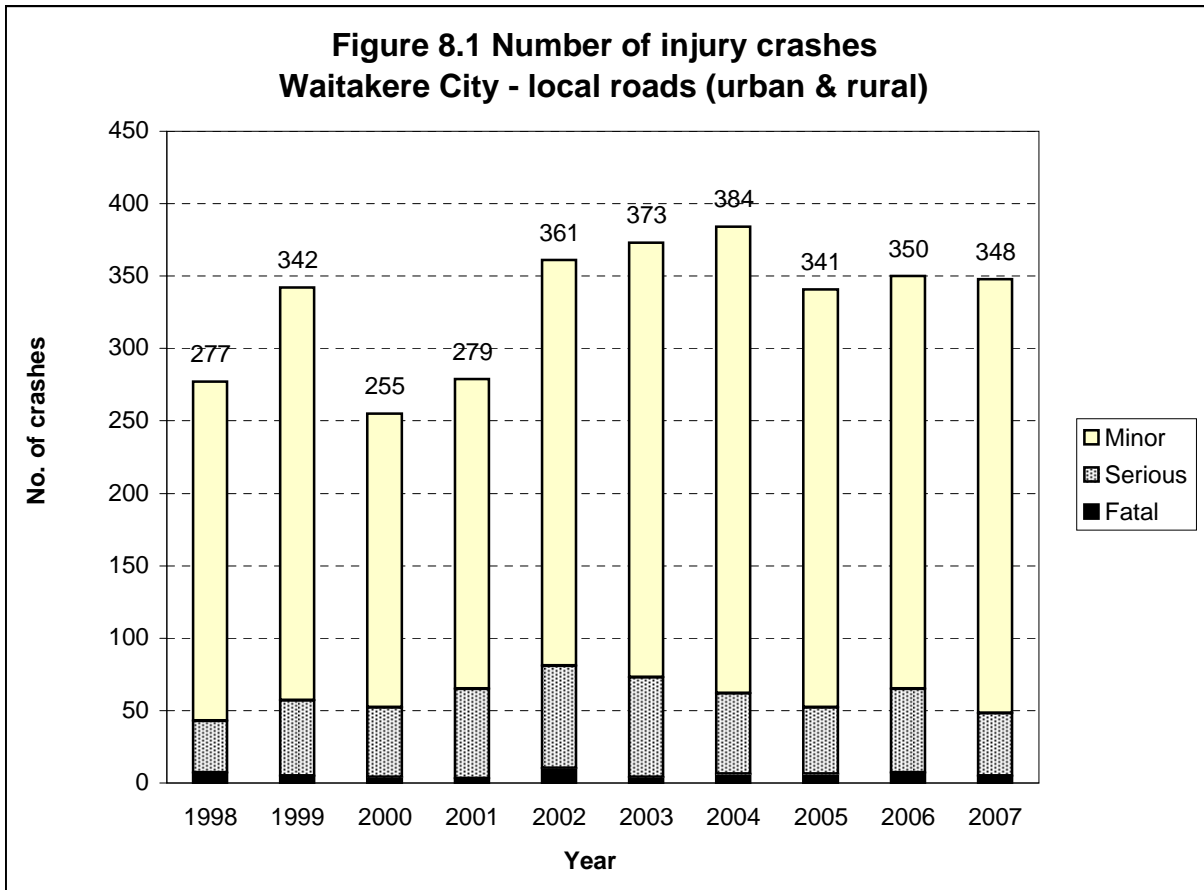
**Figure 7.2 Day of week (6 a.m. to 6 a.m.)
Waitakere City (2003-2007)**

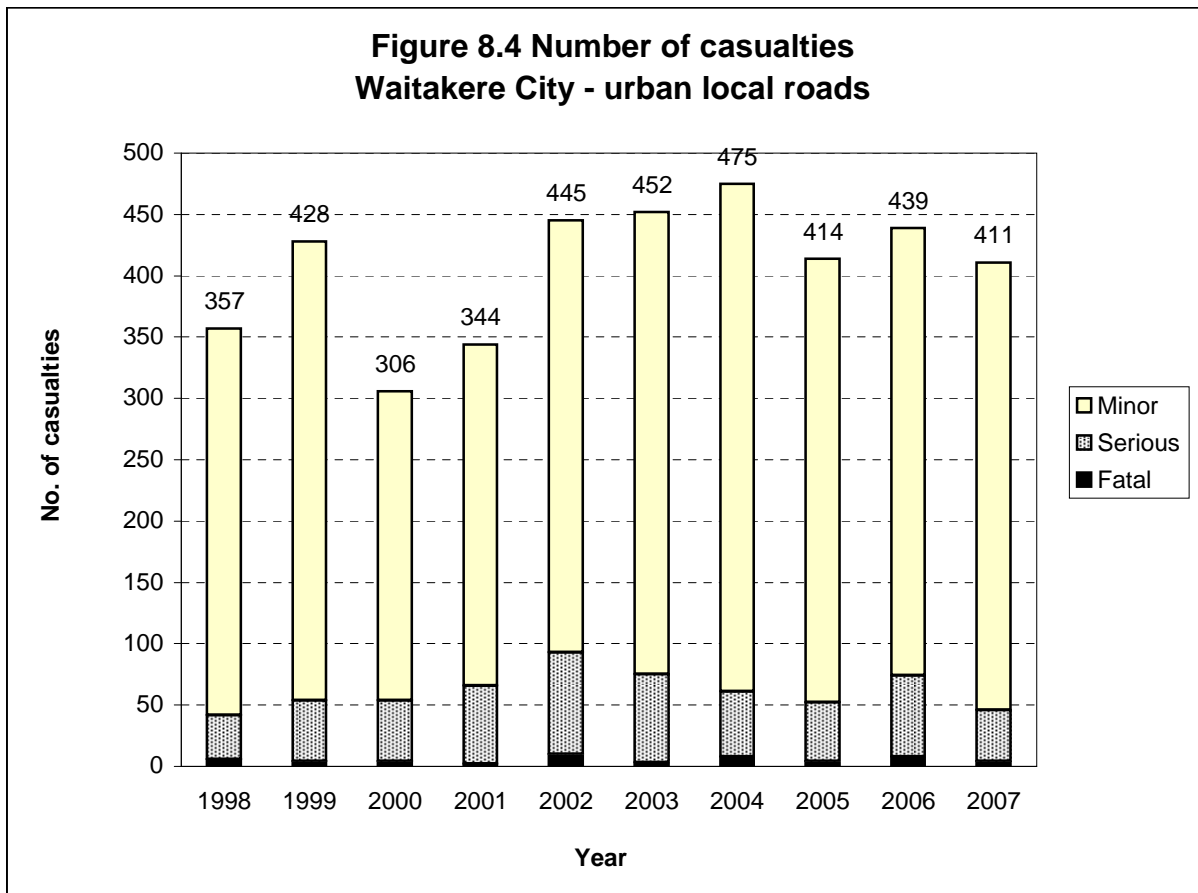
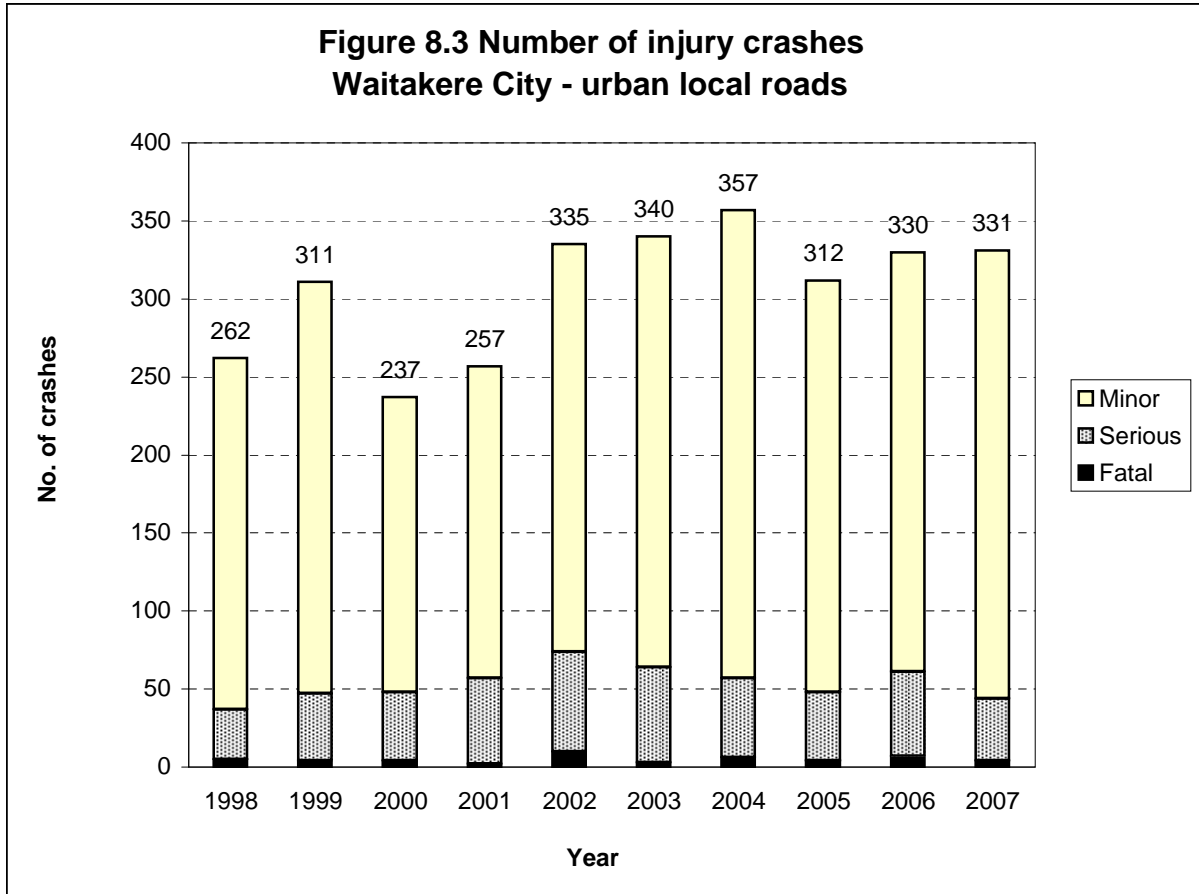


**Figure 7.3 Month of year
Waitakere City (2003-2007)**

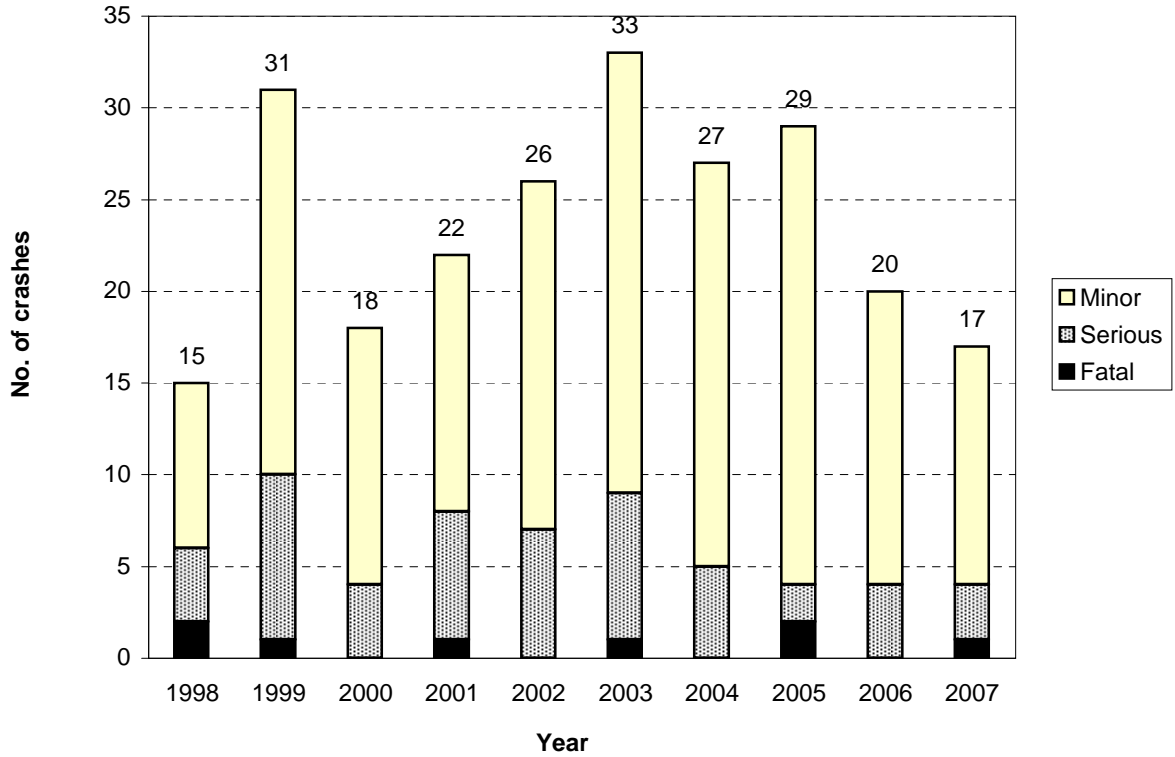


Local road statistics

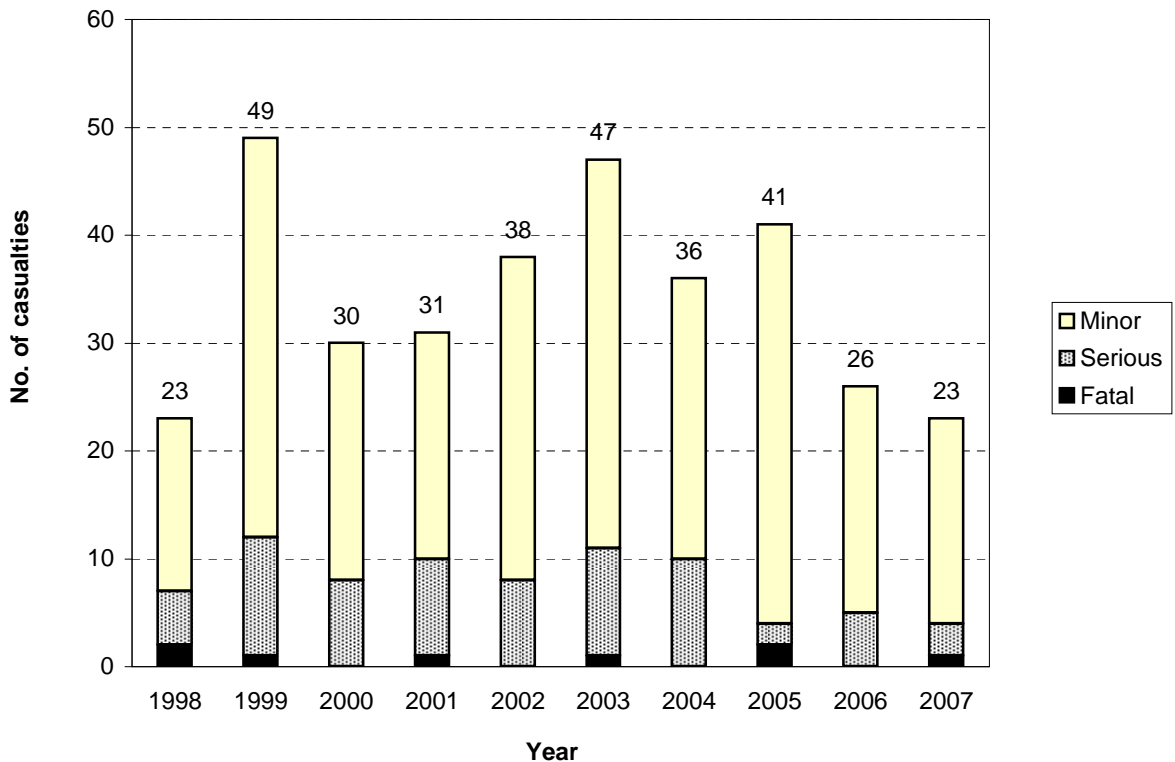




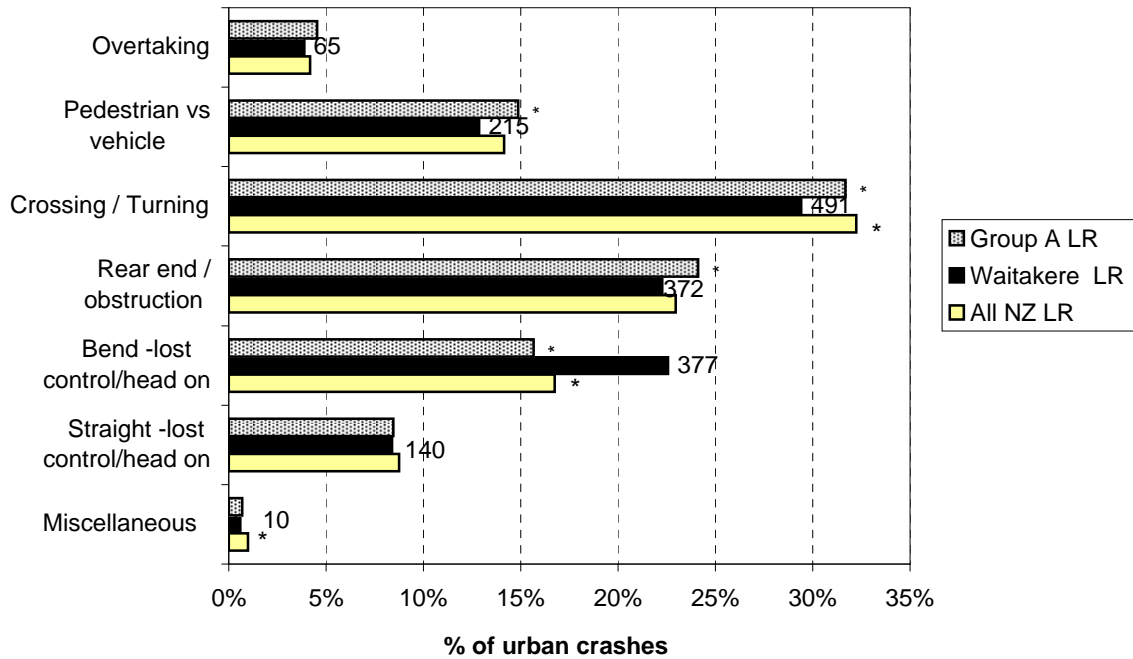
**Figure 8.5 Number of injury crashes
Waitakere City - rural local roads**



**Figure 8.6 Number of casualties
Waitakere City - rural local roads**

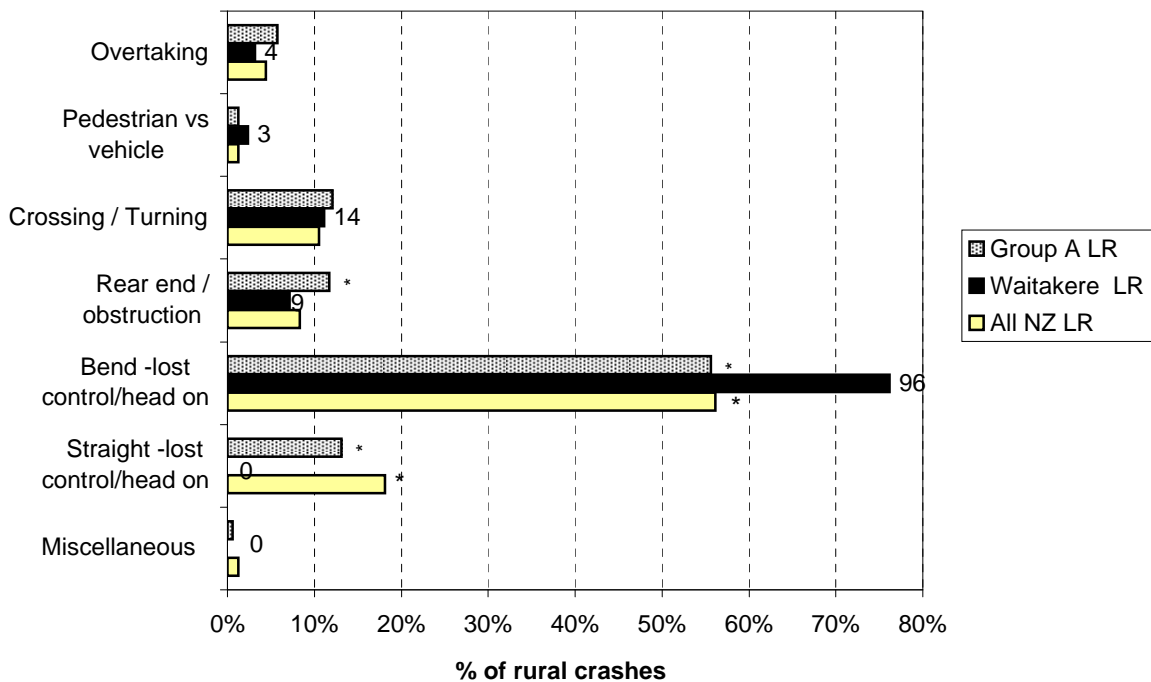


**Figure 8.7 Crash movement type - urban
Waitakere City local roads (2003-2007)**

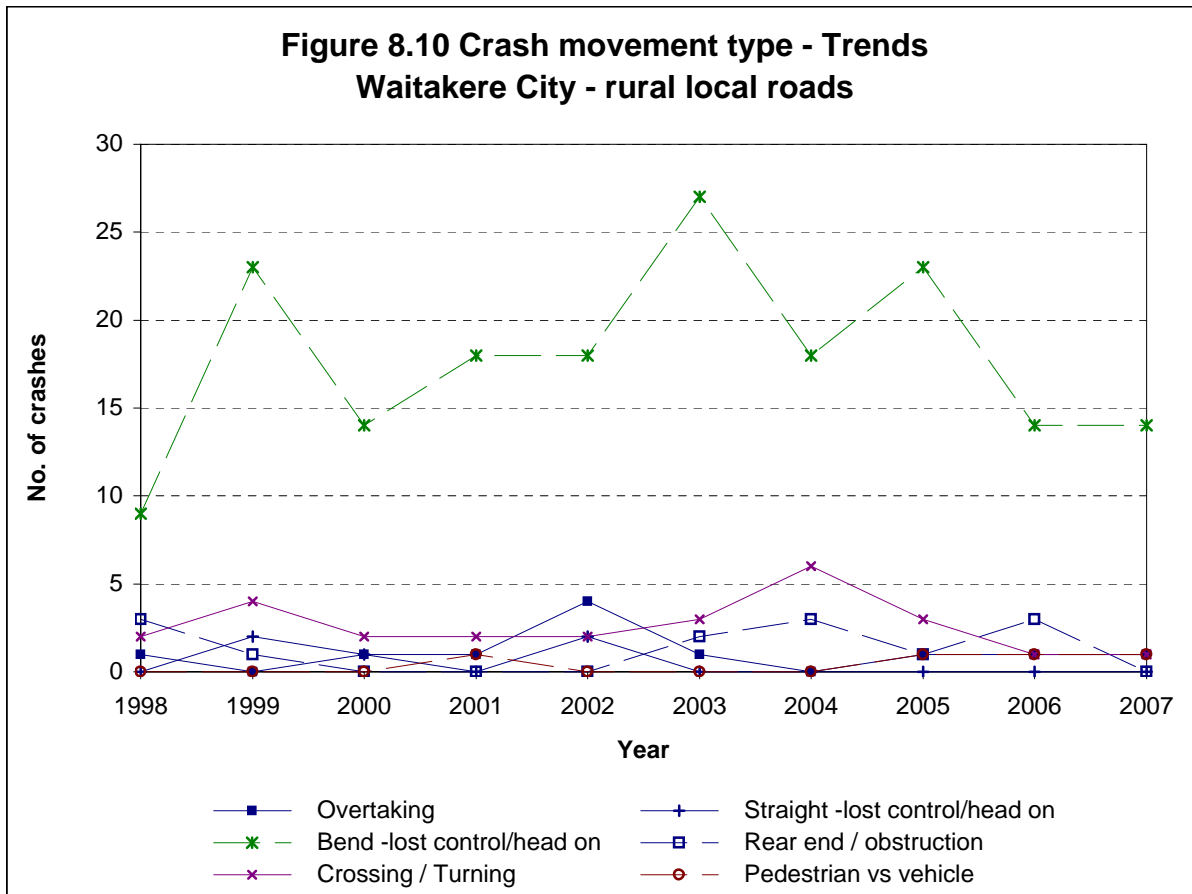
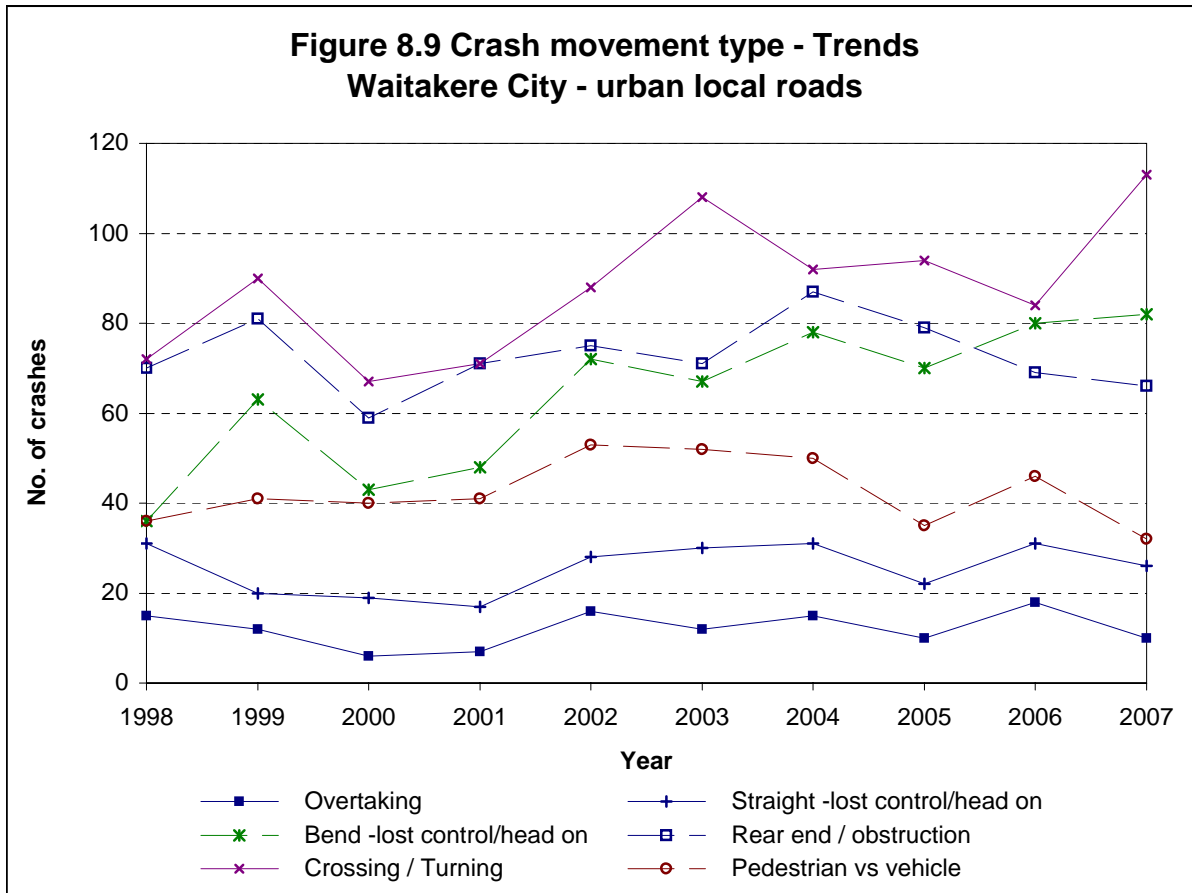


Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

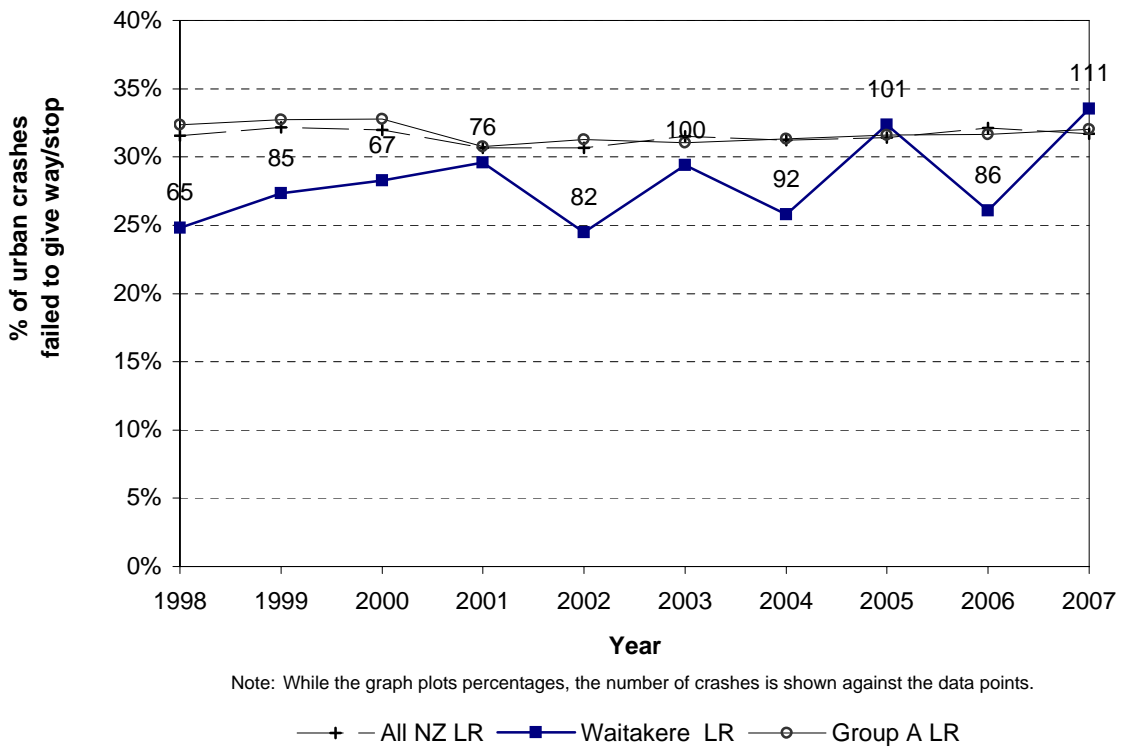
**Figure 8.8 Crash movement type - rural
Waitakere City local roads (2003-2007)**



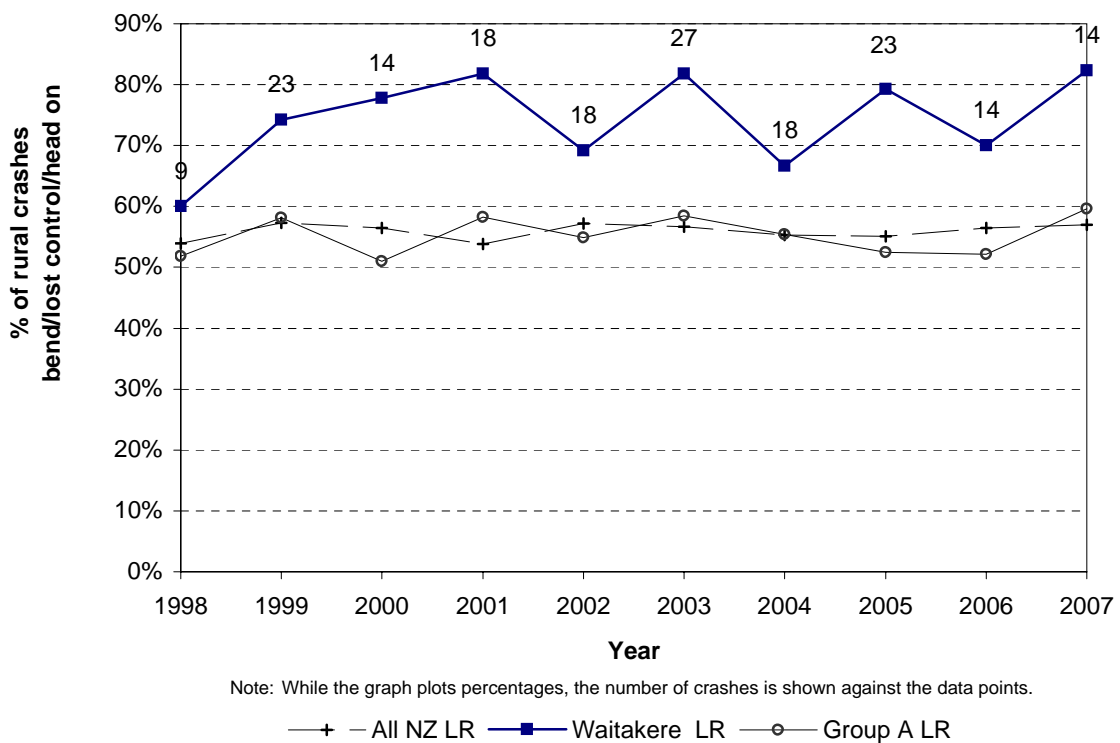
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions



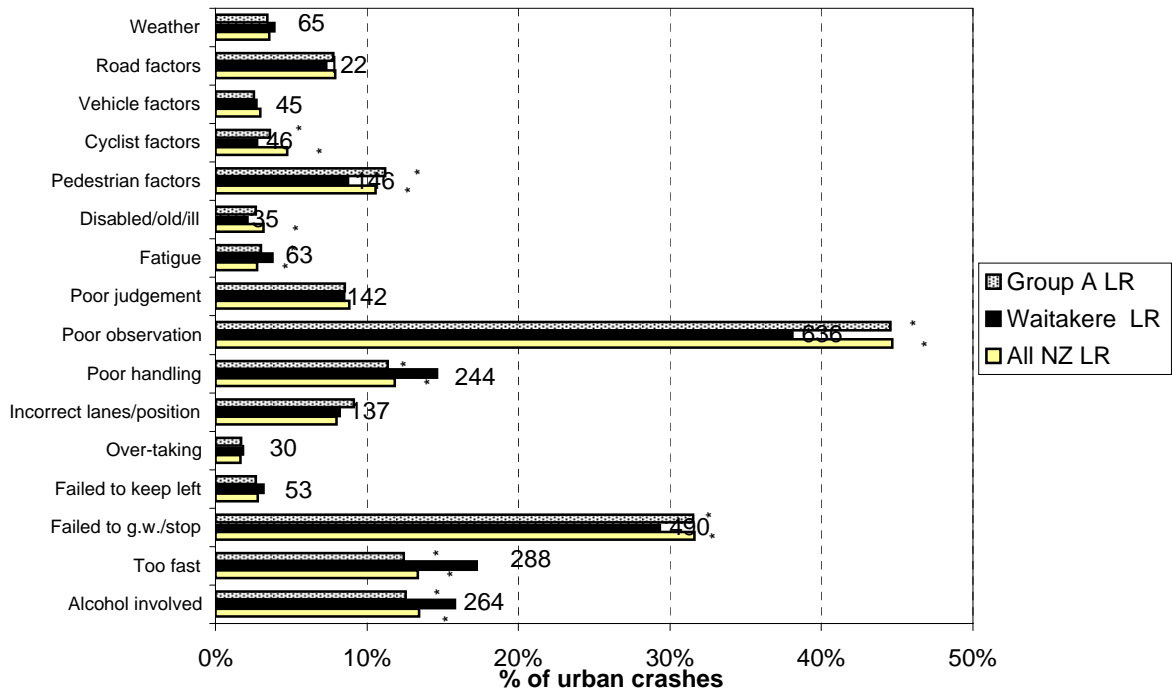
**Figure 8.11 Failed to give way/stop
Waitakere City - urban local roads**



**Figure 8.12 Bend - lost control / head - on
Waitakere City - rural local roads**

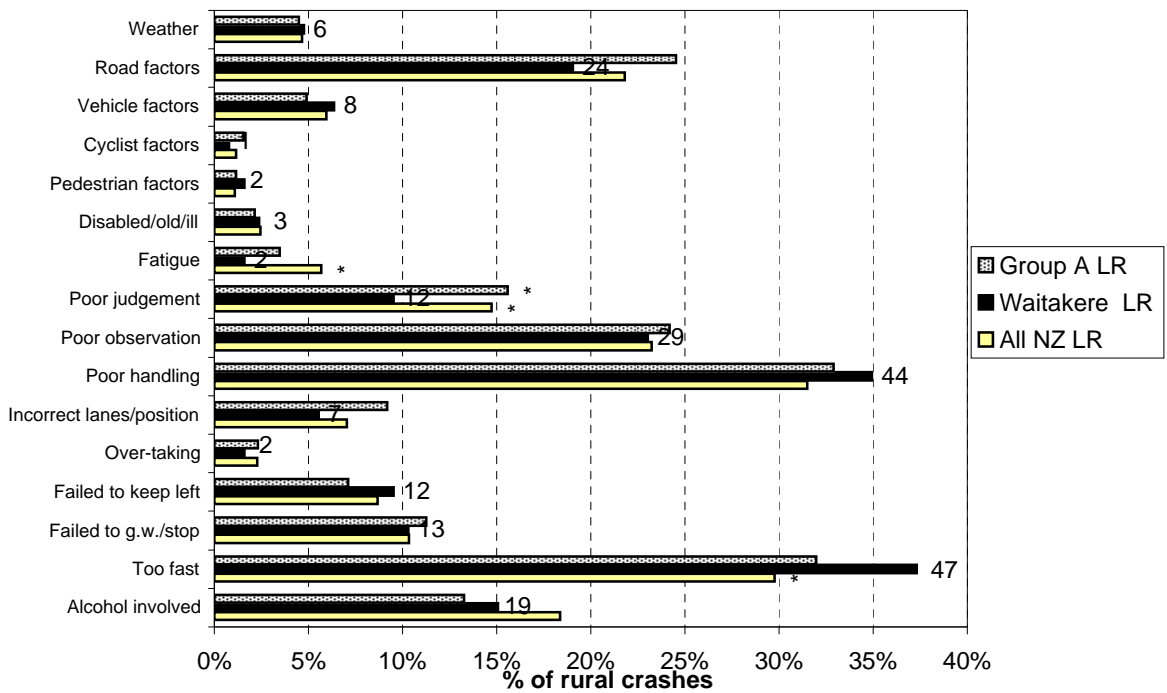


**Figure 8.13 Contributing factors - urban
Waitakere City local roads (2003-2007)**

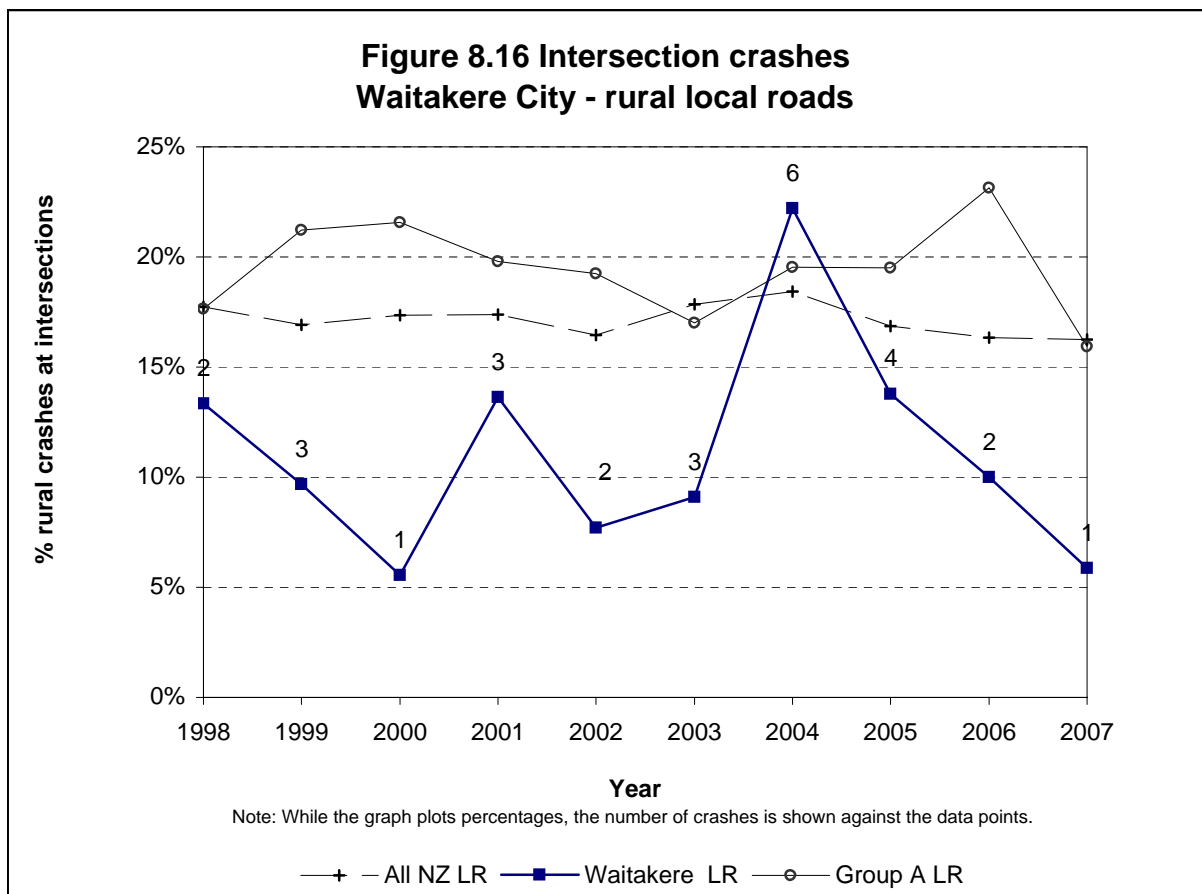
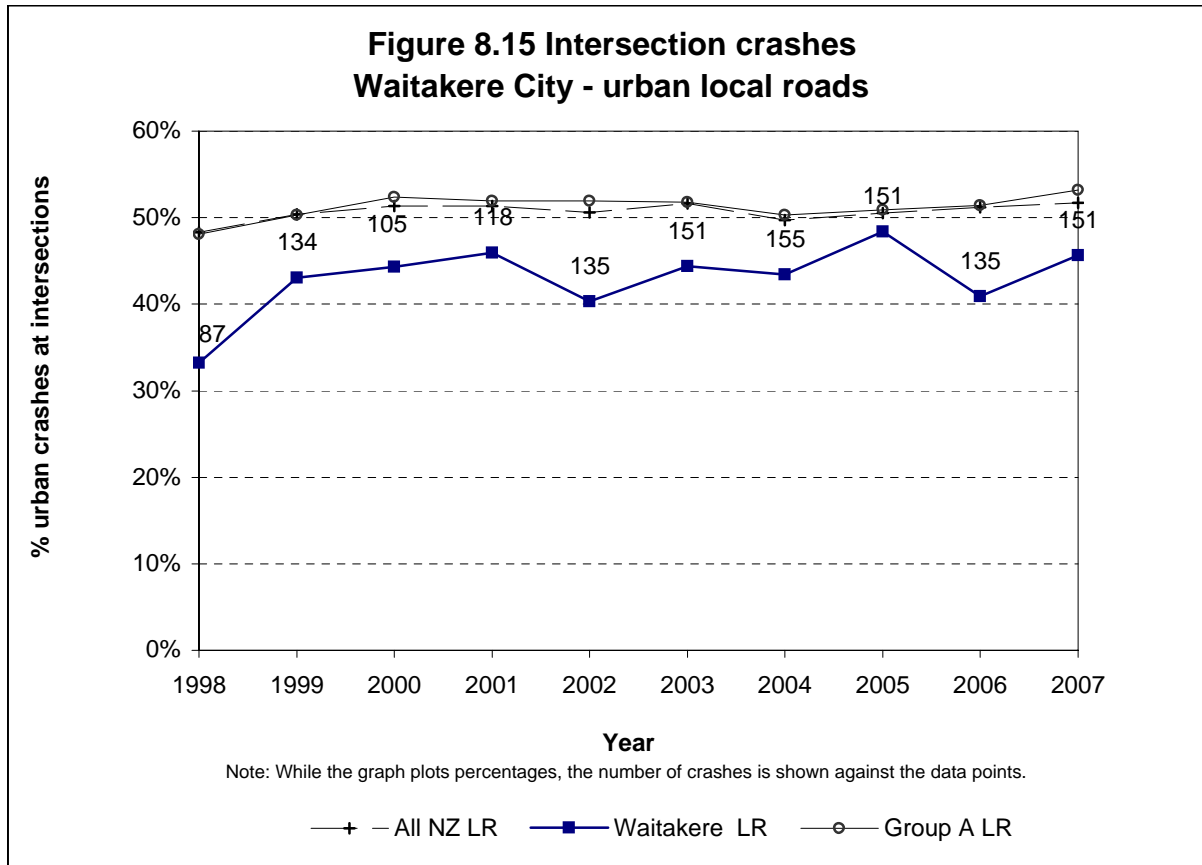


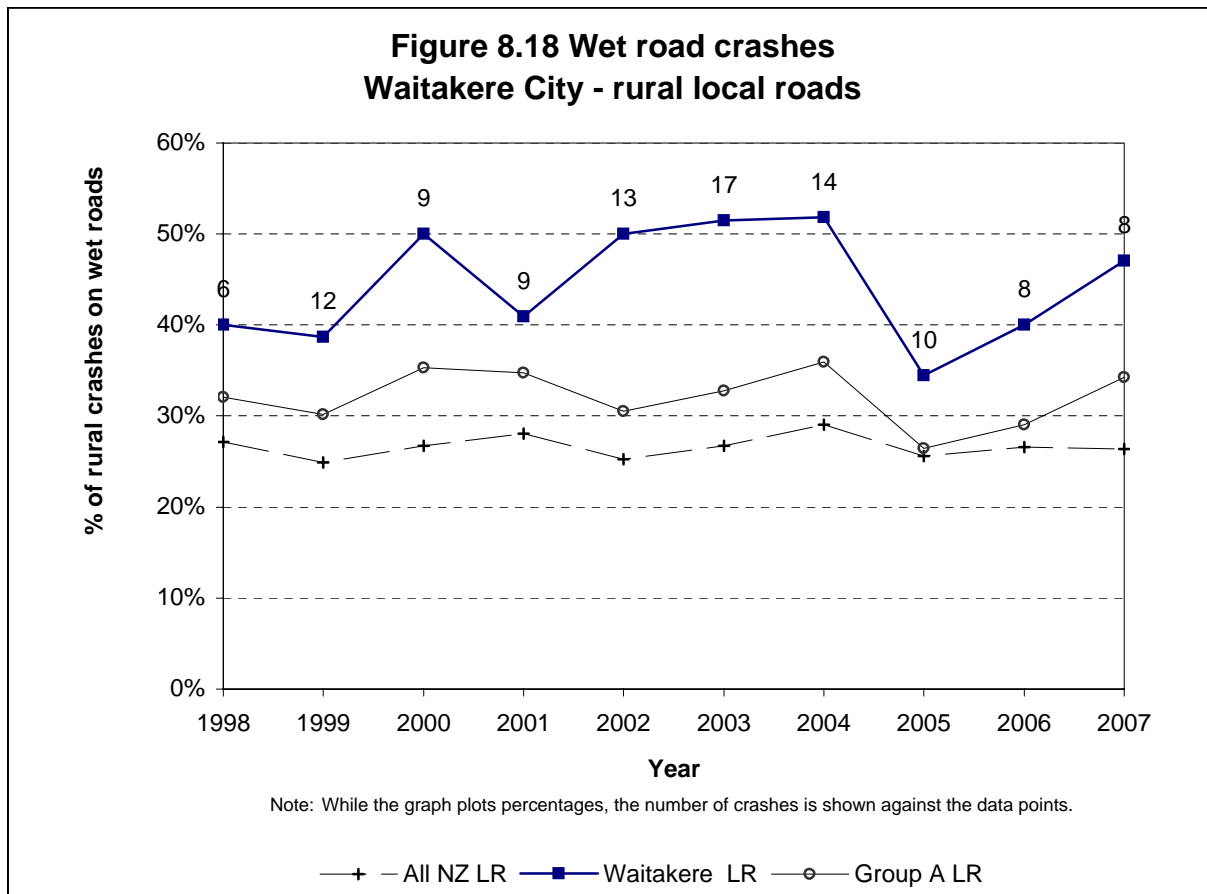
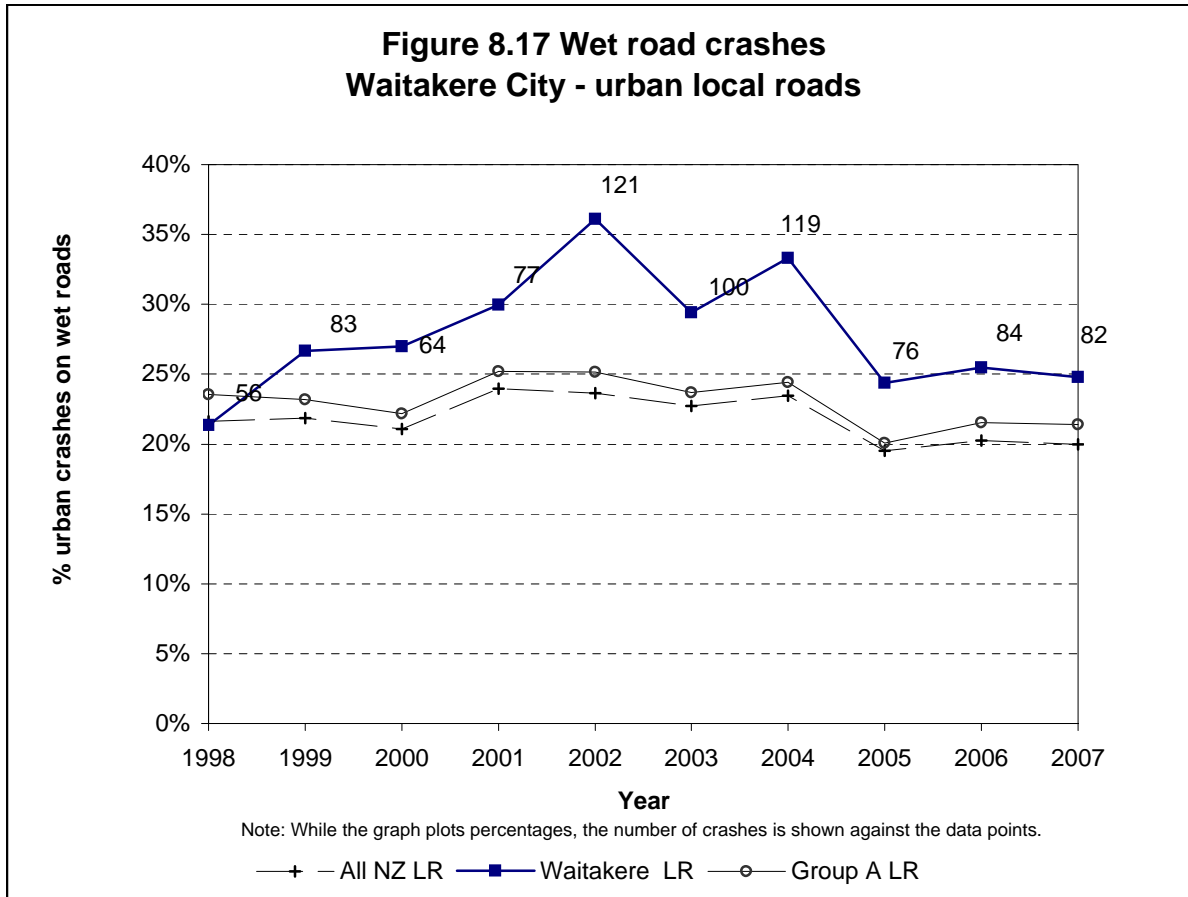
Note: While the graph plots percentages, the number of crashes is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions

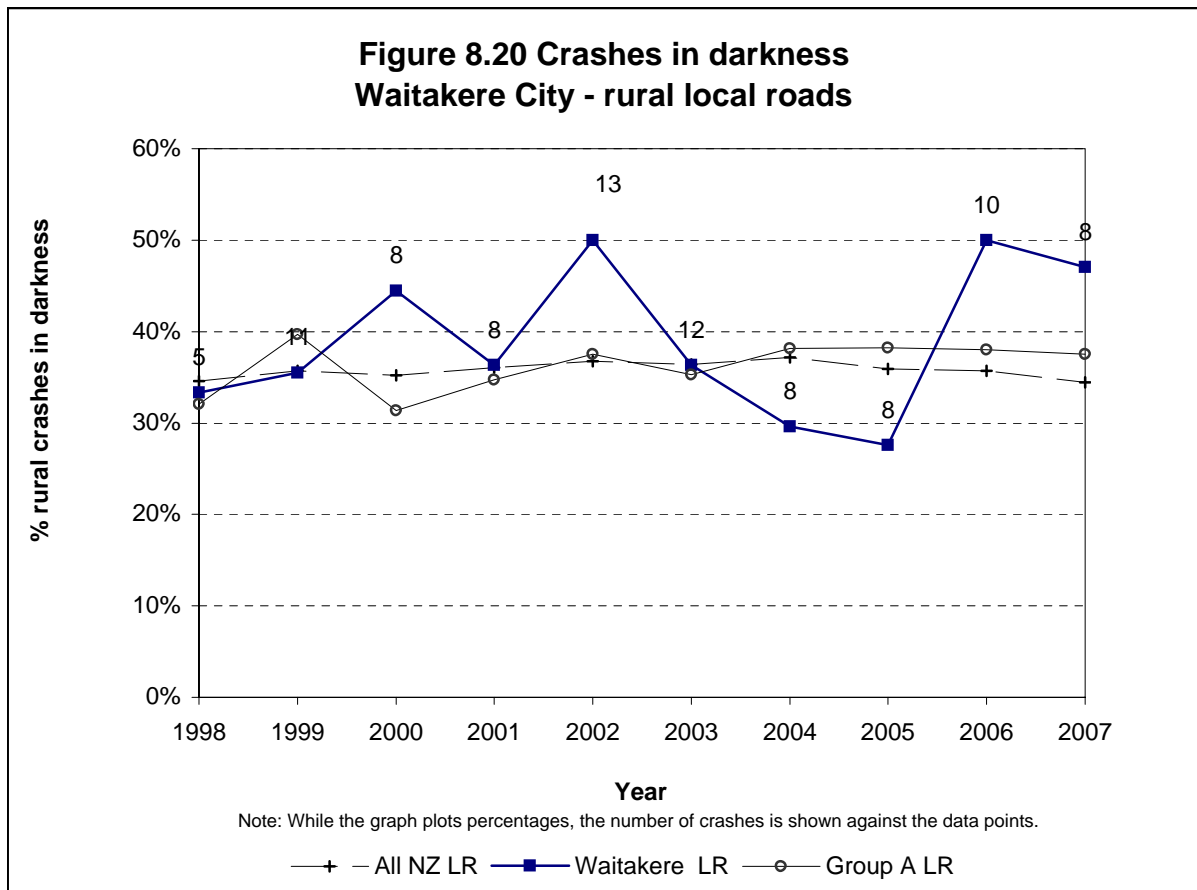
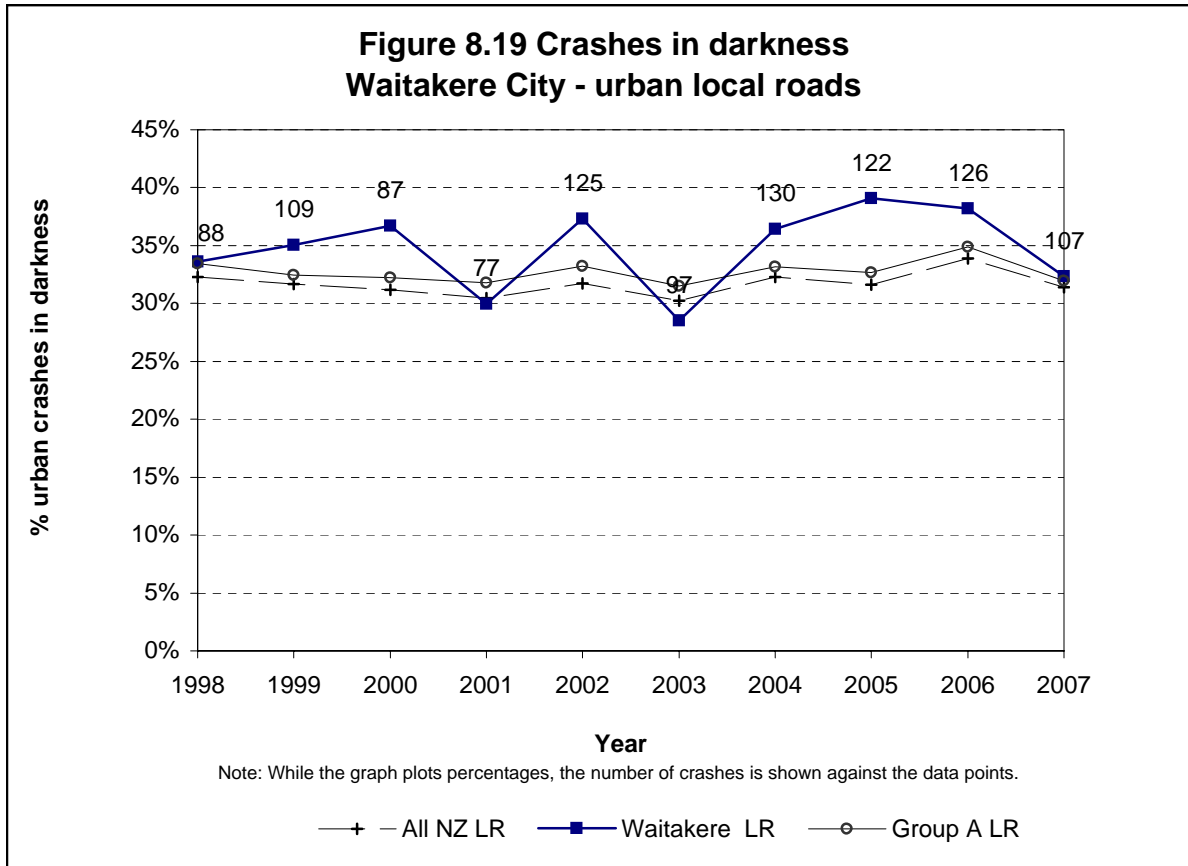
**Figure 8.14 Contributing factors - rural
Waitakere City local roads (2003-2007)**



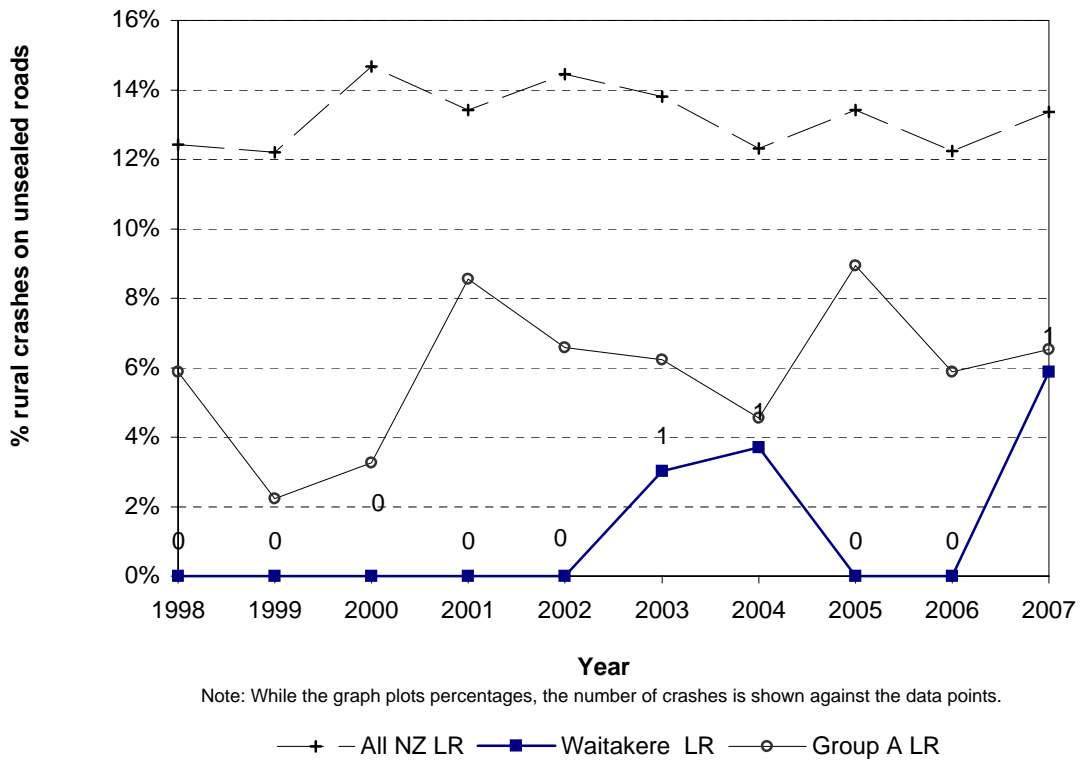
Note: While the graph plots percentages, the number of casualties is shown against the data points.
*Denotes statistically significant difference between Local Authority and National or Peer Group Proportions



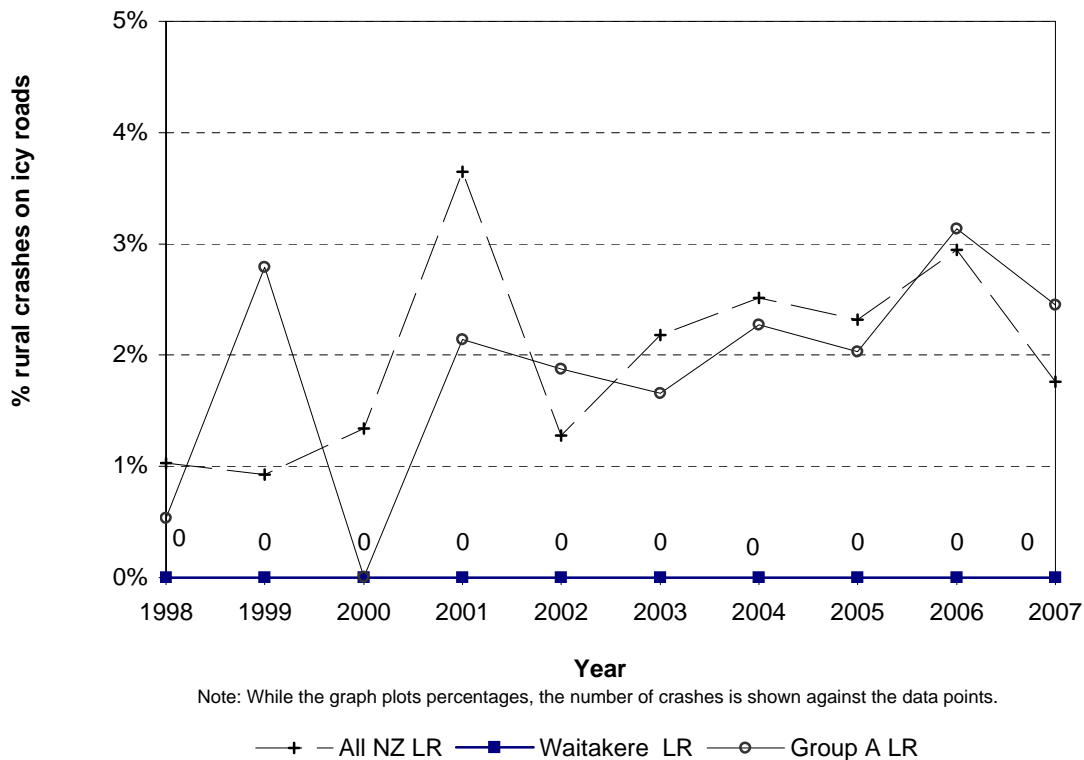


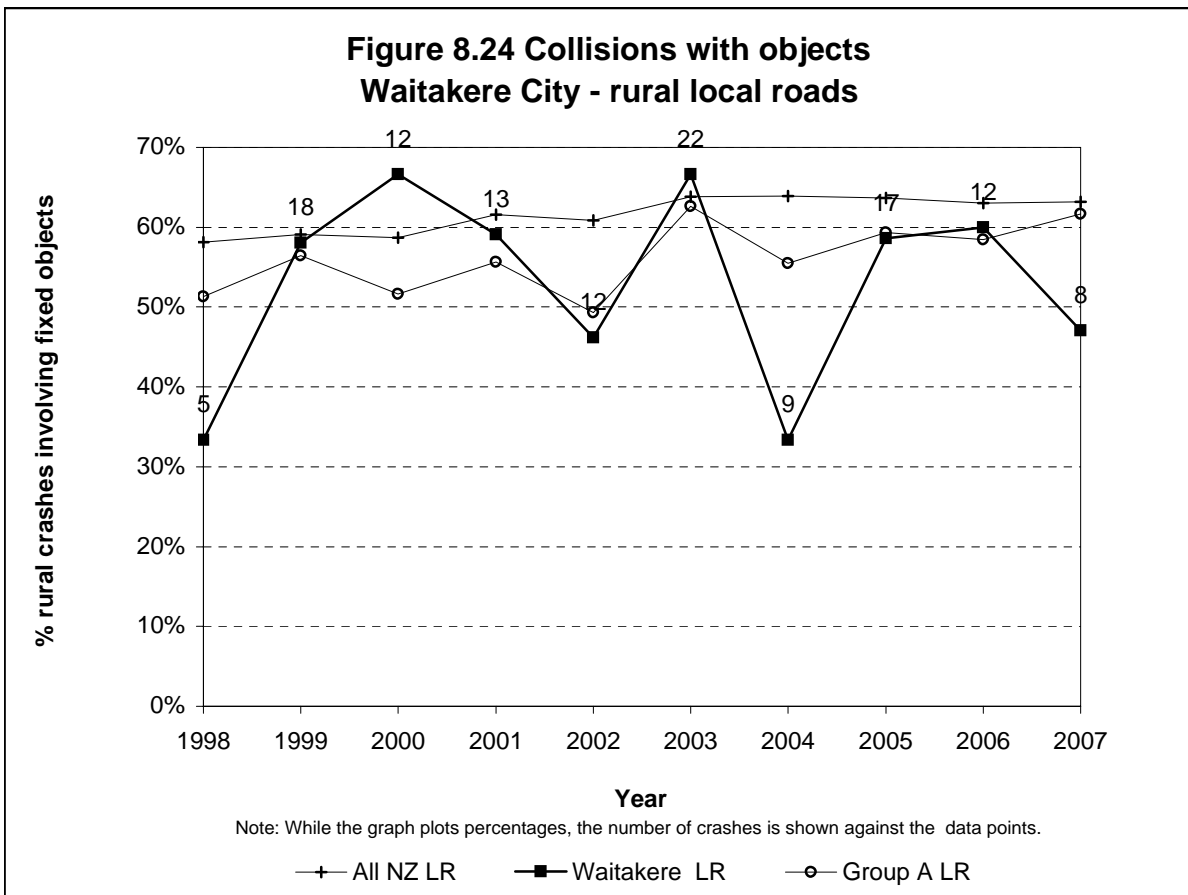
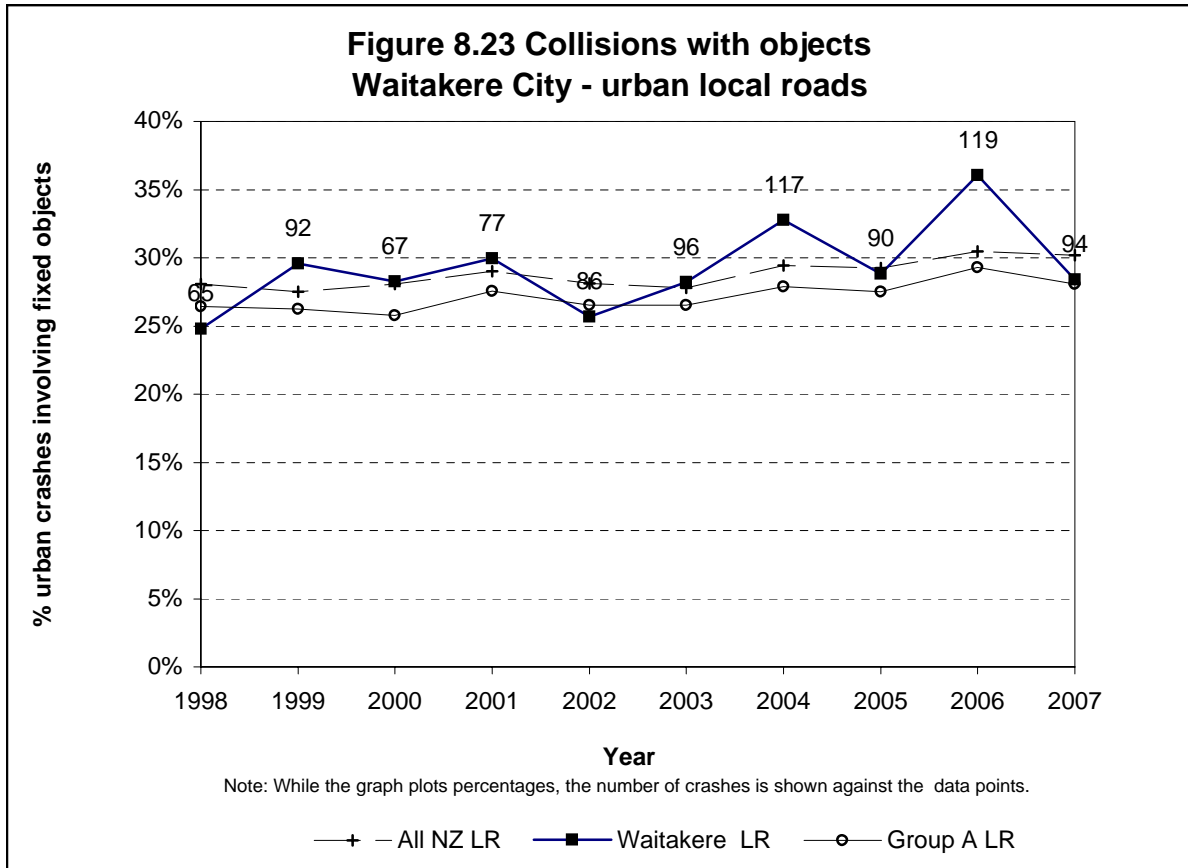


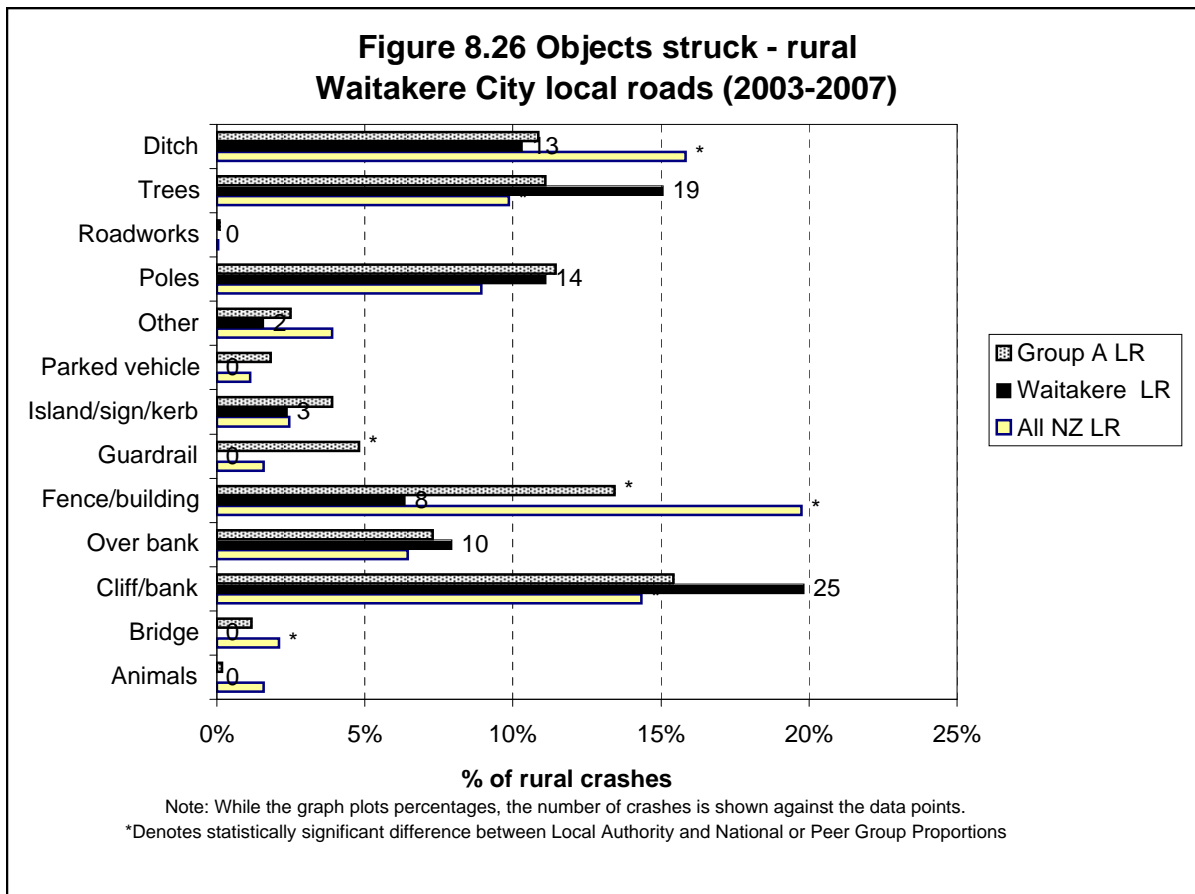
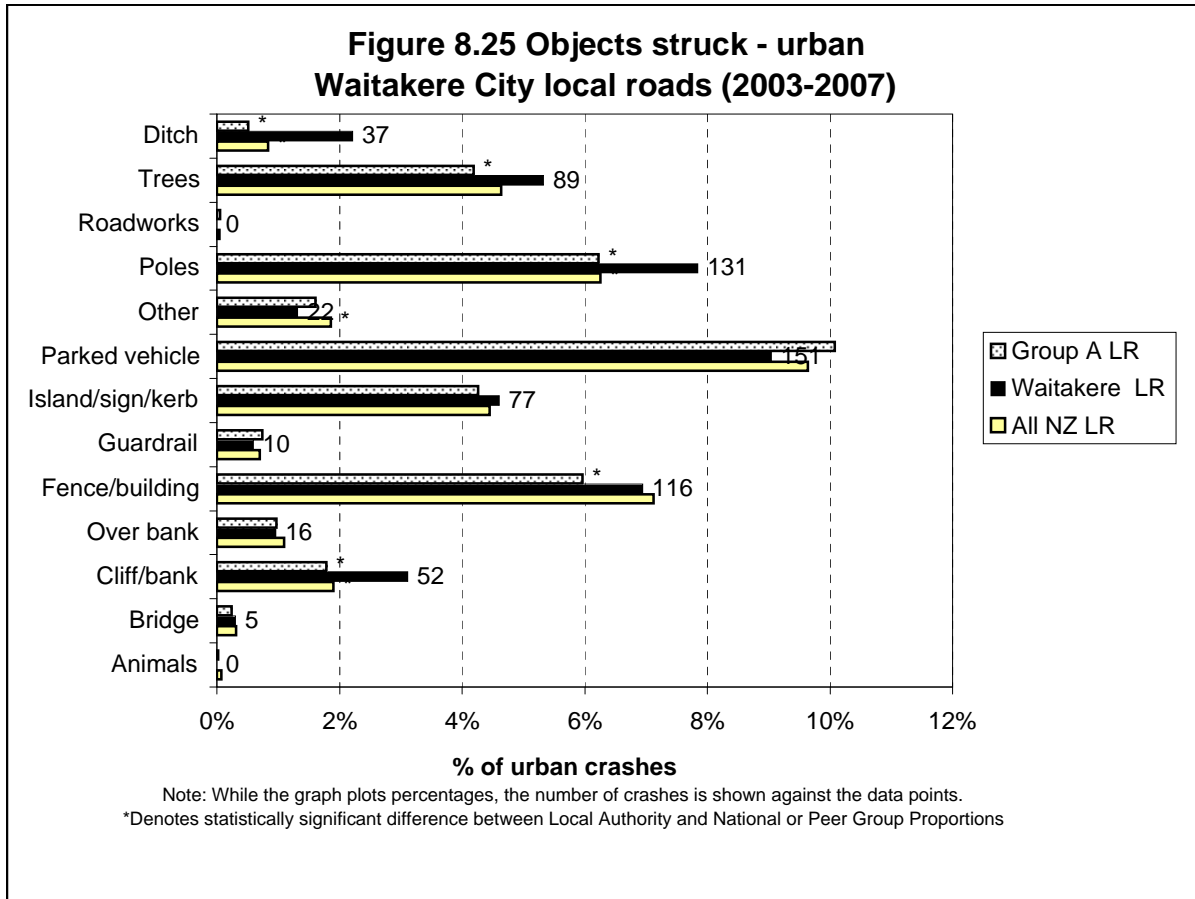
**Figure 8.21 Crashes on unsealed roads
Waitakere City - rural local roads**



**Figure 8.22 Icy road crashes
Waitakere City - rural local roads**







appendix


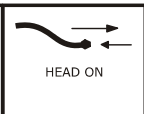


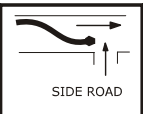


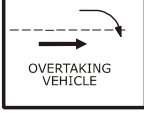
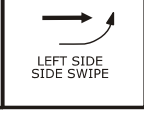







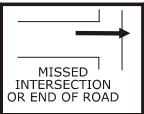
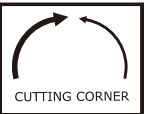
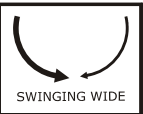
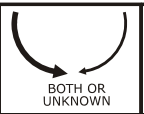
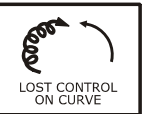





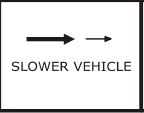

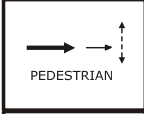
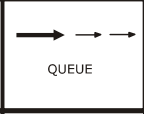
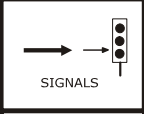
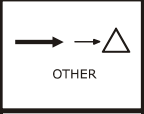

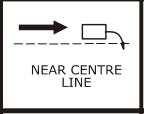

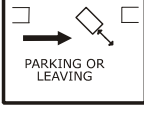
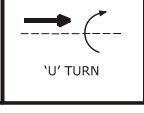
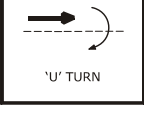

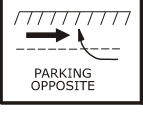


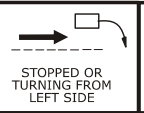
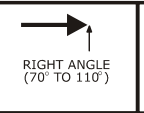
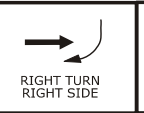
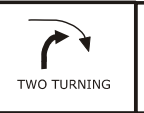
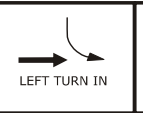
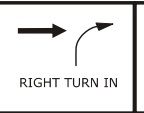
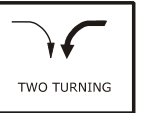
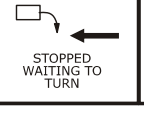
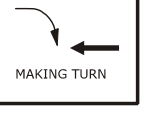
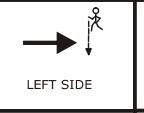
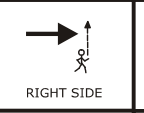
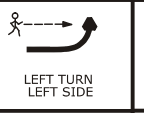
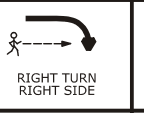





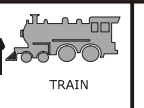
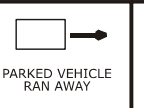

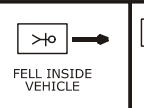
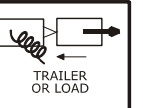


- Groupings of crash types
- Grouping of contributing factors

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 Land Transport New Zealand 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 Land Transport New Zealand, 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						
Miscellaneous	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
	 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.

FACTORS PROBABLY CONTRIBUTING TO CRASHES (Version 1.6–March 2006)

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 Visibly intoxicated non-driver (pedestrian / cyclist / passenger)
 - 106 Dead driver not suspected, tested negative (MOT only)
 - 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

- 180 **In line of traffic**
 - 181 Following too closely
 - 182 Travelling unreasonably slowly
 - 183 Motorist crowded cyclist
- 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
- 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

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 Car slowing, stopping or stopped 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
 - 358 Cigarette, radio, glove box etc, obj under drivers feet/pedals etc
 - 359 Cell phone / navigation device or any communications device
 - 360 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 strange vehicle
 - 404 Overseas driver fails to adjust to local 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
 - 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 etc
 - 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 blowout
- 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 from school bus
- 730 Pedestrian behind reversing / manoeuvring vehicle
- 731 Overseas pedestrian

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