

Traffic Standards and Guidelines
1996/97 Survey

RSS 6

Pedestrian Crossings



October 1998

Survey of Traffic Standards and Guidelines

The Land Transport Safety Authority (LTSA) is a stand-alone authority responsible for promoting safety in Land Transport at reasonable cost. Part of its function is to “monitor adherence to safety standards within the land transport system”.

To support this objective the regional engineering sections of the Land Transport Safety Authority undertake a survey programme that assesses the implementation effectiveness of various safety standards by road-controlling authorities.

The purpose of these surveys is to:

- assist and advise road controlling authorities on the implementation of selected traffic standards and guidelines that affect traffic safety;
- measure the uptake of standards and guidelines by road controlling authorities;
- provide a national summary of the uptake and compliance with standards and guidelines and report findings to road controlling authorities and other interested parties; and
- identify changes to improve standards, guidelines or traffic rules.

The surveys are usually carried out in two parts:

- Part 1 uses a questionnaire to look at the systems and procedures a road controlling authority has in place to deliver on the standard.
- Part 2 uses a field survey to measure where possible the actual delivery from the users viewpoint. It essentially provides a snapshot of road safety delivery at the date of the survey.

This report presents the national results of the latest of these surveys.

I believe you will find the information of value and will be able to use it to improve road safety in New Zealand.

Please contact the Regional Engineer at the LTSA's Auckland, Wellington or Christchurch Office if you would like further information or assistance with implementing traffic standards or guidelines.



Rob Martyn,
General Manager, Operations

Executive Summary

Introduction

- This report details the results of surveys of pedestrian crossings in New Zealand carried out by the Land Transport Safety Authority (LTSA) in May/June 1997.
- Interview surveys were conducted at a sample of 31 road controlling authorities (RCAs) to investigate standards, procedures and programmes used for installing pedestrian crossings.
- Field surveys were conducted at a sample of sites to obtain a 'snapshot' of the on-road situation relative to the standards, verify responses to the interview and to discuss problems or successes on-site with RCA staff.

Results

Questionnaires

- Almost all of the RCAs surveyed used the *Manual of Traffic Signs and Markings* as their main reference source for markings, signposting and other devices associated with crossings. Other standards were sometimes used in conjunction with it
- RCAs' own estimates of crossings meeting the standards they used ranged between 0 and 100%, with a national average of 80%
- Most RCAs (94%) used the pedestrian crossing warrant to establish whether or not a new crossing was justified. However nationally it was estimated that only 62% of crossings met the warrant criteria
- Only 26% of RCAs claimed to have floodlit all crossings used at night
- Very few RCAs (13%) monitored the skid resistance of the pavement on approaches to crossings, or had a programme to maintain skid resistance at appropriate levels
- Most RCAs (68%) had at some time installed indicators of crossings additional to those allowed in the *Traffic Regulations 1976*. In not one case had the required LTSA approval been sought.

Field Surveys

The performance of RCAs was measured against legal requirements of the *Traffic Regulations 1976* and also against standards and recommendations found in *Technical Recommendation 11 Recommended Practice for Pedestrian Crossings (TR11)* and the *Manual of Traffic Signs and Markings (Signs Manual)*.

- Only 18% of sites complied in all respects with the full range of legal requirements measured. The average New Zealand site complied with 82% of the legal requirements
- The average New Zealand site complied with 53% of TR11 and Signs Manual recommendations measured. Only 1 site out of 268 fully complied with all of the recommendations of TR11.
- Nationally, compliance with visibility requirements ranged from 81 to 98% over 5 separate criteria
- 98% regulatory compliance was achieved for crossing width
- Only 45% of diamond markings and 58% of pedestrian crossing warning signs comply with location requirements. Generally they are located too close to the crossing

Recommendations

- As the standards and guidelines for pedestrian facilities are found in several documents consideration should be given to incorporating aspects of TR11 more fully into the Signs Manual or producing a specific document incorporating all relevant pedestrian issues
- Non-compliance with legal requirements highlights the need for RCAs to check crossings to ensure their obligations are met. The LTSA should produce a summary document identifying RCAs' legal obligations (see Traffic Note No 1, June 1998)
- Clear guidance on floodlighting and improved skid resistance in advance of crossings is desirable. This information should be contained within any pedestrian crossing guide

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1. Introduction

This report details the results of surveys of Road Controlling Authorities (RCAs) carried out by the Land Transport Safety Authority (LTSA) in May/June 1997.

The standards and guidelines surveyed were:

- *Manual of Traffic Signs and Markings*, LTSA and Transit New Zealand ('Signs Manual');
- *Technical Recommendation TR11: Recommended Practice for Pedestrian Crossings*, RCM Dunn & G W Main, Road Research Unit, National Roads Board ('TR11'); and
- *The Traffic Regulations 1976*;
- *NZS 6701 Street Lighting* ('NZS6701').

2. Purpose of the Surveys

The purpose of the surveys was to:

- Establish what standards and guidelines RCAs used
- Measure performance against current standards and guidelines
- Provide a national summary of results and report to interested parties
- Identify any justifiable changes to standards, guidelines, or traffic rules

3 Methodology

3.1 Sample selection

A sample of 31 RCAs was chosen for inclusion in the surveys. The sample was weighted towards authorities not included in the LTSA's survey the previous year.

3.2 Interview surveys

Interview surveys were conducted with representatives in each authority. Survey forms were sent in advance to allow time to research answers if necessary. Questions centred on the standards and guidelines used for installing and maintaining pedestrian crossings.

3.3 Field surveys

Up to 10 randomly selected pedestrian crossings were surveyed for each RCA with staff from the authority being invited to take part. The purpose of the field surveys was to evaluate the extent to which various standards and guidelines relating to the installation of crossings were met.

4 Results

4.1 Interview Surveys

Table A1 in the Appendix is a summary of the replies received to the questionnaire. It is split into a number of sections, which are discussed below.

4.1.1 Pedestrian Crossing Location

Information provided on the location of pedestrian crossings showed:

- The Auckland Region had a much higher proportion of crossings located mid-block (87%) compared to the other regions (30 -39%);
- Most crossings (approximately 90%) were established on two lane rather than multi lane roads (data was not available for 3 Auckland RCAs); and
- The proportion of crossings outside schools (41%) compared with other locations was relatively consistent across regions.

4.1.2 Pedestrian Crossing Warrant

The pedestrian crossing warrant was originally established by the Transport Department and uses the product of vehicle and pedestrian flows to establish a threshold. The warrant is currently published in the Signs Manual and in TR11.

Most RCAs (94%) used the warrant to establish whether or not a new crossing could be justified. However, nationally it was estimated that only 62% of crossings met the warrant criteria, and in Christchurch Region the estimate was 32%.

Over half of the RCAs (55%) had at some time removed unwarranted crossings.

4.1.3 Use of Standards

The RCAs were asked to define standards used at crossings in relation to four categories:

- Markings (bar markings, centre lines, diamonds, no stopping lines)
- Signposting (PW 30 'Pedestrian Crossing' warning signs and PW 33 'School Pedestrian Crossing' signs)
- Devices (black and white poles, 'fluoro' discs, belisha beacons etc)
- Lighting (use of floodlighting or street lighting to illuminate the crossing)

Some RCAs did not provide full responses, missing out information in some categories. RCAs often used more than one standard or guideline for each category.

Most RCAs used the Signs Manual as their main reference source for markings, signposting and devices. This was sometimes in conjunction with the Traffic Regulations, TR11 or their own 'in house' guidelines.

NZS 6701 was the most commonly used reference for lighting of crossings, sometimes in conjunction with TR11, the Signs Manual or the RCA's own policy documents.

RCAs estimated that 80% of crossings complied with standards they had adopted. This is viewed with some concern because:

- few RCAs are using the desirable standards defined in TR11; and
- the RCA estimations were found to be over-optimistic (see section 4.2)

4.1.4 Skid Resistance

Very few RCAs (13%) monitored skid resistance on the approaches to crossings, either as part of an overall skid resistance monitoring programme, or as a separate programme. Even fewer (7%) had a programme to maintain skid resistance to appropriate levels.

4.1.5 Additional Indicators of Pedestrian Crossings

Within the Auckland and Wellington LTSA regions, 63% and 73% of RCAs respectively had used a pedestrian crossing indicator additional to those allowed by the Traffic Regulations. Examples are fluoro discs (now legalised) or flashing amber lights. Only 8% of RCAs had used additional indicators in the Christchurch region.

The Traffic Regulations require LTSA approval before any RCA uses additional devices, but in not one case had approval been sought. This highlights a situation where RCAs may not be aware of the requirement to obtain LTSA approval.

4.1.6 Floodlighting

Only a quarter of RCAs claimed to floodlight all crossings used at night. Many rely on route lighting to illuminate the crossings on major roads and, on minor roads, amenity lighting is often the only illumination. Many RCAs attempted to locate their crossings near existing street lighting poles.

4.1.7 Maintenance Cycles

Maintenance methods varied for markings, signs, devices and lighting.

- All RCAs used fixed maintenance cycles for markings, ranging from 3 months to 24 months. The majority (84%) used either a 6 or a 12 month cycle. The mean cycle time in the Auckland region was 8 months compared to just over 10 months in the Christchurch region

4.2 Field Surveys

4.2.1 Compliance with Standards

Table A2 in the Appendix summarises compliance with standards for each RCA and also shows LTSA regional comparisons.

4.2.2 Compliance with Approach Visibility

(a) Visibility of Crossing Markings

The Traffic Regulations require a pedestrian crossing to be located so that all of its length is visible at an approach distance of 30 metres. This requirement provides very little driver perception or reaction time and is adequate only for slow approach speeds. Compliance with this requirement was very high nationally at 98%..

TR11 recommends that bars of the crossing be seen from the inter-visibility distance, which is based on the safe stopping speed of approaching traffic. Compliance nationally was 83%.

(b) Visibility of Diamond Markings

The Traffic Regulations require diamond markings to be located so approaching drivers have a clear sighting of them from at least 50 metres. Nationally, compliance was 81%. There are no recommendations in TR11 for the visibility of diamond markings.

(c) Visibility of Black and White Poles

The Traffic Regulations do not stipulate any approach visibility requirements for the black and white poles. TR11 recommends they be visible from the inter-visibility distance. Compliance nationally was 85%.

(d) Visibility of Pedestrian Crossing Warning (PW30 or PW33) Signs

The Signs Manual recommends where these signs are installed they should be located so approaching drivers have an uninterrupted view of them from at least 60 metres in urban areas. Compliance nationally was 91%.

4.2.3 Compliance with Location and Size Requirements

(a) Pedestrian Crossing 'Width'

The width of a pedestrian crossing is determined by the length of the parallel bars. The Traffic Regulations require the bars to be at least 2 metres long. TR11 recommends bar lengths of between 3 to 5 metres.

Compliance with the Traffic Regulations requirements was 98% nationally. Measured against TR11, compliance dropped to 34% nationally.

(b) Pedestrian Crossing Length

The length of a crossing is the distance between opposite kerbs of the roadway. There are no requirements in the Traffic Regulations governing the length of a pedestrian crossing. TR11 recommends that crossings be no longer than 10 metres where there is no central refuge island. Where refuge islands are used, each side of the crossing should be no longer than 5 metres.

National compliance with the TR11 recommendations was low at 36%, ranging from 26% in Christchurch Region to 50% in Auckland Region.

(c) Location of Diamond Markings

The Traffic Regulations require diamond markings to be painted, where practicable, at least 50 metres in advance of the crossing. In 11% of cases no diamond was marked and in another 44% of cases the diamond was less than 50 meters from the crossing. In most of these cases it would have been practical to have marked the diamond 50 metres in advance of the crossing.

(d) Location of Black and White Poles

The Traffic Regulations require poles to be located within 2 metres of some part of the crossing, whereas TR11 recommends they be located between 0.75 and 1.00 metre from the approach side of the crossing. National compliance with the regulations was 82%. When measured against the recommendations in TR11, compliance was only 15% nationally.

(e) Height of Black and White Poles

The Traffic Regulations require poles to be at least 2 metres high whereas TR11 recommends that they should be at least 3 metres. Nationally, there was 89% compliance with the regulations and 36% compliance with TR11.

(f) Location of Pedestrian Crossing Warning (PW30 and PW33) Signs

There is no legal requirement for warning signs to be erected ahead of a pedestrian crossing. The decision is made at the discretion of the RCA.

Nationally, 38% of sites had warning signs erected. The split was 65% of Auckland Region sites, 33% of Wellington Region sites and 20% of Christchurch Region sites.

The Signs Manual provides guidance on sign location based on the operating speeds of vehicles using the road. Compliance with the Signs Manual recommendations where warning signs were erected was 58% nationally. Non-compliance was due to signs located too close to the crossing.

4.2.4 Average Site Compliance with Legal Requirements or Recommended Practice

Table 1 shows the performance of RCAs based on overall compliance with Traffic Regulations requirements, and TR11 and Signs Manual recommendations.

The average New Zealand site complied with 82% of regulatory requirements, and 53% of TR11 and Signs Manual requirements. In general terms, RCAs in Auckland Region performed the best, followed by those in Wellington Region and then Christchurch Region.

4.2.5 Sites that Fully Comply with Legal Requirements or Recommended Practice

Table 2 shows the number and percentage of sites surveyed in each RCA area that fully comply with the Traffic Regulations, TR11 or the Signs Manual.

Nationally, only 47 out of 268 sites (18%) complied fully with the Traffic Regulations. Most sites failed to meet the regulations in at least one of the requirements surveyed. For example this may have been a black and white pole that was too short or a diamond marking located too close to the crossing. Only 1 of the 268 sites complied with all of the TR11 and Signs Manual recommended standards measured in the surveys.

TABLE 1: PERFORMANCE BASED ON AVERAGE SITE COMPLIANCE

	Average Site Compliance (Percent)		
	Traffic Regulations		TR11 & Signs Manual
TNZ Napier	95.7	Rangitikei	68.9
Auckland	90.6	TNZ Wanganui	68.5
TNZ Wanganui	89.9	Auckland	67.4
Buller	87.8	TNZ Napier	66.7
Waipa	87.7	Rodney	66.4
South Waikato	87.1	TNZ Hamilton	63.3
Tasman	87.1	South Waikato	59.5
Porirua	86.9	Central Hawkes Bay	59.1
Franklin	86.6	Far North	59.1
Rangitikei	85.8	Franklin	58.9
TNZ Hamilton	85.2	Porirua	57.7
TNZ West Coast	84.9	Buller	56.4
Stratford	83.9	Tasman	56.0
Far North	83.7	Waipa	53.3
Rodney	82.7	Napier	52.0
Central Otago	82.5	Central Otago	51.1
Westland	81.8	Waitaki	51.1
Marlborough	81.7	Tararua	50.0
Waikato	80.2	Queenstown-Lakes	48.9
Waimate	79.3	Selwyn	48.9
Tararua	79.2	TNZ West Coast	45.6
Waitaki	78.7	Westland	44.4
Gore	76.7	Waikato	44.2
Central Hawkes Bay	75.7	Kapiti	41.8
Napier	75.5	Waimate	37.2
Queenstown Lakes	75.5	Gore	37.0
Selwyn	73.2	Stratford	36.8
Grey	72.5	Clutha	36.7
Kapiti	68.1	Grey	36.3
McKenzie	63.6	Marlborough	30.0
Clutha	62.7	Mackenzie	28.6

REGIONAL COMPARISON

Auckland LTSA	85.4	Auckland LTSA	59.2
Wellington LTSA	82.7	Wellington LTSA	54.2
Christchurch LTSA	76.7	Christchurch LTSA	44.3
NEW ZEALAND	81.7	NEW ZEALAND	52.9

TABLE 2: SITE COMPLIANCE

Road Controlling Authority	No of sites surveyed	Sites Fully Complying With			
		Traffic Regulations		TR11 & Signs Manual	
		No. of Sites	Percent	No. of Sites	Percent
Auckland City	10	4	40%	0	0%
Far North District	10	2	20%	0	0%
Franklin District	10	3	30%	0	0%
Rodney District	10	1	10%	0	0%
South Waikato District	10	2	20%	0	0%
TNZ Hamilton	10	1	10%	1	10%
Waikato District	10	1	10%	0	0%
Waipa District	10	2	20%	0	0%
Buller District	7	2	29%	0	0%
Central Otago District	8	1	13%	0	0%
Clutha District	9	0	0%	0	0%
Gore District	9	0	0%	0	0%
Grey District	8	0	0%	0	0%
McKenzie District	2	0	0%	0	0%
Queenstown Lakes District	9	0	0%	0	0%
Selwyn District	8	0	0%	0	0%
TNZ West Coast	6	2	33%	0	0%
Waimate District	8	1	13%	0	0%
Waitaki District	9	1	11%	0	0%
Westland District	2	1	50%	0	0%
Central Hawkes Bay District	9	1	11%	0	0%
Kapiti District	10	0	0%	0	0%
Marlborough District	10	2	20%	0	0%
Napier City	10	1	10%	0	0%
Porirua City	10	3	30%	0	0%
Rangitikei District	10	3	30%	0	0%
Stratford District	7	3	43%	0	0%
Tararua District	10	2	20%	0	0%
Tasman District	7	0	0%	0	0%
TNZ Napier	10	7	70%	0	0%
TNZ Wanganui	10	1	10%	0	0%

REGIONAL COMPARISON

Auckland LTSA	80	16	20%	1	1.3%
Christchurch LTSA	85	8	9%	0	0%
Wellington LTSA	103	23	23%	0	0%
NEW ZEALAND	268	47	18%	1	0.4%

4.2.6 Measurements of Dimensions, Visibility and Condition of Signs, Markings and other Devices Associated with Crossings

Tables A3 to A6 in the Appendix summarise the survey data collected for each RCA. These tables should be used in conjunction with compliance Table A2 to assess areas of deficiency.

5 Discussion

- The compliance surveys show that the statutory requirements of the Traffic Regulations are not being met in all categories. For example while compliance with the dimensions and visibility of pedestrian bar markings was high at around 98% nationally, the average national compliance of all legal requirements measured was 82%. Given that the requirements are mandated and are minimum standards, these figures are low..
- Floodlighting of crossings used at night and attention to skid resistance properties of the pavement on approaches to crossings are not given high priority by RCAs. Both of these issues have the capability of impacting significantly on pedestrian crossing safety.
- Most RCAs know of pedestrian crossings within their jurisdiction that do not meet the warrant for the installation of the crossing, yet only some of these are removed or replaced with alternative pedestrian facilities, such as refuge islands or kerb extensions.

6 Recommendations

- As the standards and guidelines for pedestrian facilities are found in several documents consideration should be given to incorporating TR11 recommendations more fully into the Signs Manual or producing a specific document incorporating all relevant pedestrian issues.
- Non-compliance with legal requirements highlights the need for RCAs to check crossings to ensure their legal obligations are met. The LTSA should produce a summary document identifying RCAs' legal obligations Note: This was done on June 1998 with the production of Traffic Note No 1, June 1998, *Pedestrian crossings - Requirements*
- Clear guidance on floodlighting and improved skid resistance in advance of crossings is desirable. This information should be contained within any new pedestrian crossing guide.

APPENDIX

TABLE A1: CROSSING QUESTIONNAIRE SUMMARY: REGIONAL COMPARISON

				Auckland LTSA	Christchurch LTSA	Wellington LTSA	New Zealand
Crossing Location	Percentage of Sites	Midblock		87%	39%	30%	56%
		Intersection		13%	61%	70%	44%
	Percentage of Sites	2 Lane		NK*	95%	89%	NK
		Multi lane		NK	5%	11%	NK
Percentage of Sites	School		35%	40%	37%	41%	
	Normal		65%	60%	63%	59%	
Warrant	Do you use warrant to justify new crossings? Answer : YES			100%	91%	92%	94%
	Estimate percentage of crossings meeting warrant criteria			89%	32%	80%	62%
	Have you ever removed unwarranted crossings? Answer : YES			50%	50%	64%	55%
Standards	What Standards do you use (Percentage of RCA replies)	Markings	Regs	25%	0%	18%	13%
			TR11	37%	25%	18%	26%
			Signs Manual	75%	92%	100%	90%
			Other	25%	8%	0%	10%
		Signposting	Regs	25%	0%	9%	10%
			TR11	13%	8%	9%	10%
			Signs Manual	63%	92%	100%	87%
		Devices	Regs	13%	0%	9%	6%
			TR11	13%	8%	18%	13%
			Signs Manual	63%	42%	55%	52%
			NZS 6701	0%	8%	18%	10%
		Lighting	Other	13%	8%	9%	10%
			Regs	0%	0%	9%	3%
			TR11	37%	8%	9%	16%
			Signs Manual	25%	8%	18%	16%
NZS 6701	25%		58%	64%	52%		
Other			25%	8%	9%	13%	
Estimate percentage of crossings complying with your standards				82%	74%	85%	80%
Skid Resistance	Do you monitor on approaches to Pedestrian Crossings? Answer : YES			13%	17%	9%	13%
	Program to maintain at appropriate levels on approaches? Answer: YES			13%	8%	0%	6%
Additional Devices (Outside of Regulations)	Do you use additional indicators of crossings eg Fluoro discs? Answer: YES			63%	8%	73%	45%
	Was LTSA approval obtained? Answer: YES			0%	0%	0%	0%
Flood-lighting	Do you floodlight all crossings used at night? Answer: YES			25%	25%	27%	26%
Maintenance	Percentage of RCAs using maintenance cycle versus "fix as detected" inspection	Markings	Cycle	100%	100%	100%	100%
			Inspection	0%	0%	0%	0%
		Signposting	Cycle	57%	45%	64%	55%
			Inspection	43%	55%	36%	45%
		Devices	Cycle	50%	13%	67%	42%
			Inspection	50%	87%	33%	58%
		Lighting	Cycle	67%	10%	90%	53%
			Inspection	33%	90%	10%	47%
	Mean Maintenance cycle (months)		Markings	7.9	10.3	9.3	9.3
			Signposting	1.5	9.8	4.9	5.9
		Devices	1.0	9.0	7.5	6.4	
		Lighting	1.5	6.0	3.1	3.8	

*Auckland City, TNZ Hamilton, Franklin District, unable to supply information

TABLE A2: PEDESTRIAN CROSSING SURVEY COMPLIANCE RESULTS

Percentage complying with Traffic Regulations, TR11 or Signs Manual

Road Controlling Authority	No of sites	Pedestrian Crossing					Diamond		B & W Poles					Signs	
		Visibility		Width		Length	Dist	Vis	Vis.	Distance		Height		Dist.	Visibility
		Regs	TR11	Regs	TR11	TR11	Regs	Regs	TR11	Regs	TR11	Regs	TR11	Manual	Manual
Auckland	10	100	60	100	70	60	75	80	94	85	20	100	75	71	88
Far North	10	95	85	100	60	40	45	75	100	95	10	90	0	81	100
Franklin	10	100	100	100	60	50	50	85	100	100	10	90	10	83	100
Rodney	10	100	65	90	70	90	35	90	100	100	25	100	65	53	77
South Waikato	10	100	95	100	30	40	55	75	90	90	5	90	35	85	85
TNZ Hamilton	10	100	70	100	90	50	35	75	85	95	30	100	50	50	90
Waikato	10	100	85	100	30	40	50	70	75	65	0	95	15	40	70
Waipa	10	100	80	100	0	30	37	84	89	100	28	100	35	33	80
Buller	7	100	100	100	0	5	62	92	100	86	14	100	57	25	100
Central Otago	8	100	87	100	75	13	38	94	75	81	0	81	44	50	100
Clutha	9	78	56	100	44	22	24	88	65	78	5	22	17	25	100
Gore	9	100	81	100	33	11	40	53	71	94	0	78	17	100	100
Grey	8	93	73	100	25	25	23	75	67	71	7	80	20	-	-
McKenzie	2	100	67	100	0	50	25	100	33	50	0	50	0	0	100
Queenstown Lks	9	93	7	100	44	67	29	62	81	87	20	87	47	-	-
Selwyn	8	100	100	100	75	25	25	93	93	75	0	88	6	33	100
TNZ West Coast	6	100	92	100	0	0	67	83	83	90	0	91	18	100	100
Waimate	8	100	93	88	0	13	29	93	87	69	0	88	0	33	100
Waitaki	9	100	93	100	22	11	25	94	65	67	33	89	67	-	-
Westland	2	100	100	100	0	50	50	100	100	75	0	100	0	50	100
Ct Hawkes Bay	9	100	100	89	11	11	63	75	94	75	67	88	63	33	100
Kapiti	10	100	89	100	50	20	35	75	60	40	15	61	0	60	100
Marlborough	10	100	53	100	20	30	21	57	65	100	17	100	11	-	-
Napier	10	100	94	80	10	50	44	50	94	74	26	100	12	50	100
Porirua	10	100	75	100	30	20	50	85	85	95	20	100	70	57	83
Rangitikei	10	100	100	100	30	80	47	100	100	60	35	100	50	44	100
Stratford	7	100	79	100	0	14	77	85	77	64	7	79	0	100	100
Tararua	10	89	74	100	0	10	46	85	74	74	21	79	68	67	100
Tasman	7	100	90	100	57	29	20	88	90	100	39	100	69	38	100
TNZ Napier	10	95	95	100	30	50	89	89	100	94	6	100	84	83	100
TNZ Wanganui	10	100	85	100	30	10	56	94	95	84	11	100	100	85	100

REGIONAL COMPARISON

Auckland LTSA	80	99	81	99	51	50	48	79	92	91	16	96	36	62	86
Christchurch LTSA	85	96	84	99	29	26	35	85	77	79	8	79	28	41	100
Wellington LTSA	103	98	85	97	24	33	51	80	85	77	20	92	42	61	98
NEW ZEALAND	268	98	83	98	34	36	45	81	85	82	15	89	36	58	91

KEY

Regs = Legal requirements in Traffic Regulations 1976

Vis. = Approach visibility of

Manual = Recommended in Manual of Traffic Signs & Markings

TR11 = Recommended in TR11

Dist. = Distance from pedestrian crossing

TABLE A3: MEAN DIMENSIONS

Road Controlling Authority	Mean Dimensions In Metres					
	Xing Width	Distance to Diamond	Visibility of Diamond	Black & White Poles		No Stopping Length
				Distance to	Height of	
Auckland	4.6	48	109	1.2	3.2	53
Far North	3.1	49	80	0.9	2.3	39
Franklin	2.8	45	90	0.6	2.4	32
Rodney	2.9	50	93	0.6	3.2	17
South Waikato	2.6	46	73	0.6	3.0	16
TNZ Hamilton	2.9	47	98	1.1	3.7	47
Waikato	2.8	40	88	1.9	2.5	14
Waipa	2.5	45	95	0.7	3.5	39
Buller	2.4	45	139	0.7	2.8	9
Central Otago	3.1	46	124	0.5	2.7	13
Clutha	2.6	37	128	0.3	1.8	11
Gore	2.7	35	85	0.3	2.3	12
Grey	2.4	43	115	0.6	2.2	12
McKenzie	2.9	45	150	0.3	1.2	5
Queenstown Lakes	2.9	36	83	0.8	2.9	22
Selwyn	4.6	43	134	0.8	2.4	6
TNZ West Coast	2.4	41	121	0.4	2.4	25
Waimate	2.2	45	136	0.9	2.1	15
Waitaki	2.6	40	129	1.2	2.7	10
Westland	2.0	48	150	1.2	2.8	26
Ct Hawkes Bay	2.5	39	106	1.6	2.5	10
Kapiti	3.0	37	76	1.6	1.5	29
Marlborough	2.3	32	46	1.3	2.7	13
Napier	2.6	26	63	1.5	2.4	16
Porirua	2.6	48	94	1.4	2.9	35
Rangitikei	2.6	47	133	1.7	2.7	10
Stratford	2.3	46	67	2.0	1.9	14
Tararua	2.5	50	87	1.5	2.3	14
Tasman	2.7	40	131	1.3	4.6	19
TNZ Napier	2.6	48	129	1.5	2.9	25
TNZ Wanganui	2.9	49	122	1.8	3.2	30
Traffic Regulations	Min 2.0	Min 50	Min 50	Max 2.0	Min 2.0	Min 6

REGIONAL COMPARISON

Auckland LTSA	3.0	46	91	0.9	2.9	32
Christchurch LTSA	3.0	46	136	0.7	2.6	15
Wellington LTSA	2.6	42	95	1.6	2.7	20
NEW ZEALAND	2.8	45	110	1.1	2.7	21

TABLE A4: MEAN LENGTH OF CROSSING BY LAYOUT TYPE

Road Controlling Authority	Mean Length (metres) of Crossing by Layout Type*				Mean Island Width (metres)
	A	B	C	D	Layouts B & D
Auckland	10.3	5.1	-	4.3	1.7
Far North	10.5	5.3	-	-	1.7
Franklin	11.9	5.5	8.5	-	2.0
Rodney	9.3	-	8.2	-	-
South Waikato	13.4	7.7	-	6.2	2.6
TNZ Hamilton	13.5	7.2	9.0	6.4	2.9
Waikato	11.5	5.8	8.3	5.4	3.4
Waipa	11.6	-	-	5.6	2.8
Buller	15.5	-	8.1	-	-
Central Otago	11.7	-	10.0	-	-
Clutha	12.4	-	10.8	-	-
Gore	13.2	-	9.3	-	-
Grey	12.4	9.5	12.0	-	2.3
McKenzie	13.6	-	8.4	-	-
Queenstown Lakes	8.3	-	10.5	6.2	1.2
Selwyn	13.2	6.3	9.7	-	1.1
TNZ West Coast	15.0	7.5	13.6	7.7	1.6
Waimate	13.4	-	11.4	-	-
Waitaki	12.8	11.7	8.3	-	8.0
Westland	-	-	14.7	-	-
Central Hawkes Bay	13.5	5.5	-	-	2.5
Kapiti	14.0	-	11.2	5.6	1.2
Marlborough	12.5	4.5	8.2	5.1	0.9
Napier	13.8	-	8.7	-	-
Porirua	11.9	6.2	-	-	2.3
Rangitikei	10.3	-	8.2	-	-
Stratford	18.9	-	9.7	-	-
Taranua	13.7	-	10.4	-	-
Tasman	12.4	6.2	8.4	-	1.5
TNZ Napier	11.6	-	11.4	-	-
TNZ Wanganui	14.0	6.7	9.7	5.5	1.7
TR11 Recommendations	Max 10.0	Max 5.0	Max 10.0	Max 5.0	Absolute Min 1.4

REGIONAL COMPARISON

Auckland LTSA	11.5	6.1	8.5	5.6	2.4
Christchurch LTSA	12.9	8.8	10.6	7.0	2.8
Wellington LTSA	13.3	5.8	9.5	5.4	1.6
NEW ZEALAND	12.7	6.7	9.9	5.8	2.2

LAYOUT TYPES

- A: Standard crossing with or without centreline (measured from kerb to kerb)
- B: Crossing with solid or flush median (measured from kerb to island for each side of roadway)
- C: Crossing with kerb extensions (measured from kerb extension to kerb extension)
- D: Crossing with kerb extensions and median island (measured from kerb extension to island for each side)

TABLE A5: MEAN APPROACH VISIBILITY OF CROSSING MARKINGS AND POLES

Road Controlling Authority	Mean Approach Visibility (Metres) Of Crossing & Poles By Crossing Layout Type *							
	A		B		C		D	
	B & W Poles	Crossing	B & W Poles	Crossing	B & W Poles	Crossing	B & W Poles	Crossing
Auckland	148	109	167	107	-	-	155	102
Far North	167	106	158	131	-	-	-	-
Franklin	164	141	195	145	138	101	-	-
Rodney	131	105	-	-	146	93	-	-
South Waikato	127	111	200	185	-	-	113	88
TNZ Hamilton	123	63	146	139	168	139	163	138
Waikato	196	151	100	80	136	142	46	74
Waipa	130	102	-	-	-	-	143	126
Buller	142	114	-	-	179	150	-	-
Central Otago	121	110	-	-	148	117	-	-
Clutha	96	82	-	-	200	150	-	-
Gore	139	117	-	-	120	95	-	-
Grey	112	104	0	110	100	100	-	-
McKenzie	0	113	-	-	100	75	-	-
Queenstown Lakes	96	84	-	-	175	125	135	110
Selwyn	200	150	0	-	200	142	-	-
TNZ West Coast	167	150	124	99	200	150	150	150
Waimate	167	133	-	-	150	113	-	-
Waitaki	150	108	73	150	100	150	-	-
Westland	-	-	-	-	150	113	-	-
Ct Hawkes Bay	143	128	200	150	-	-	-	-
Kapiti	75	106	-	-	63	91	108	95
Marlborough	83	93	25	25	65	58	40	40
Napier	175	150	-	-	124	103	-	-
Porirua	150	111	107	97	-	-	-	-
Rangitikei	180	150	-	-	135	125	-	-
Stratford	67	92	-	-	100	100	-	-
Tararua	86	93	-	-	40	68	-	-
Tasman	106	89	115	90	150	113	-	-
TNZ Napier	156	113	-	-	179	150	-	-
TNZ Wanganui	200	150	75	70	162	123	150	113

REGIONAL COMPARISON

Auckland LTSA	148	117	161	131	147	119	124	106
Christchurch LTSA	126	113	49	90	152	123	143	130
Wellington LTSA	129	113	104	86	113	103	99	83
NEW ZEALAND	133	114	112	105	137	115	120	104

LAYOUT TYPES *

A: Standard crossing with or without centreline
 B: Crossing with solid or flush median

C: Crossing with kerb extensions
 D: Crossing with kerb extensions and median island

TABLE A6: CONDITION OF SIGNS, MARKINGS AND OTHER DEVICES

Road Controlling Authority	Average Condition of Signs, Markings & Devices							
	Pedestrian Crossing Sign	Diamond	No Stopping	Centre Line	Crossing	B & W Pole	Belisha Beacon	Fluoro Discs
Auckland	2.8	1.9	2.2	1.9	2.0	2.5	2.8	3.0
Far North	2.2	2.1	2.1	1.7	1.8	1.7	-	3.0
Franklin	2.4	1.8	1.4	1.9	1.8	1.7	1.8	2.6
Rodney	2.2	2.0	2.0	1.9	1.9	2.1	2.0	2.0
South Waikato	1.8	1.8	2.1	2.0	2.0	1.8	2.2	-
TNZ Hamilton	2.2	2.3	2.3	1.9	2.3	2.2	2.1	2.0
Waikato	2.8	2.0	1.9	2.0	2.0	1.7	1.5	-
Waipa	2.5	2.5	2.4	2.7	2.5	2.1	1.7	-
Buller	2.0	2.0	1.7	2.0	1.9	1.9	2.0	-
Central Otago	2.0	2.0	2.0	1.9	1.9	2.0	2.0	-
Clutha	1.8	2.2	2.2	2.2	2.1	1.6	1.7	3.0
Gore	2.0	1.7	2.0	2.1	2.0	2.8	1.5	-
Grey	-	2.0	2.0	2.0	2.0	2.0	2.0	-
McKenzie	2.0	2.0	2.0	2.0	2.0	2.0	-	-
Queenstown Lakes	-	1.9	2.1	1.9	1.9	2.0	1.9	-
Selwyn	2.0	1.8	1.5	2.0	1.8	1.8	2.0	-
TNZ West Coast	2.0	2.0	2.0	2.0	2.0	1.5	1.9	-
Waimate	2.0	2.0	1.9	2.0	1.9	1.7	2.0	-
Waitaki	2.0	2.0	2.0	2.0	2.0	1.6	1.9	-
Westland	2.8	2.0	-	2.0	2.0	1.5	-	-
Ct Hawkes Bay	2.5	2.7	2.9	2.8	2.7	1.7	1.6	-
Kapiti	2.0	2.0	2.0	2.0	2.0	1.9	2.0	-
Marlborough	-	2.0	2.0	2.0	2.0	2.0	2.0	-
Napier	3.0	2.0	1.8	2.3	1.9	2.7	2.5	-
Porirua	2.0	2.0	2.0	2.0	1.9	1.9	1.9	-
Rangitikei	2.0	2.0	2.0	2.0	1.8	2.0	2.0	2.0
Stratford	2.0	2.0	2.0	2.0	2.0	2.0	-	-
Tararua	2.0	2.0	2.0	2.0	2.0	1.7	2.0	-
Tasman	2.0	2.0	2.0	2.0	2.0	2.0	2.0	-
TNZ Napier	2.3	2.1	2.5	2.0	1.9	2.1	1.5	-
TNZ Wanganui	2.0	2.0	2.0	2.0	2.0	1.8	1.8	-

REGIONAL COMPARISON

Auckland LTSA	2.4	2.0	2.1	2.0	2.0	2.0	2.0	-
Christchurch LTSA	2.3	2.1	2.1	2.9	2.1	2.0	2.1	-
Wellington LTSA	2.2	2.1	2.1	2.1	2.0	2.0	1.9	-
NEW ZEALAND	2.3	2.1	2.1	2.4	2.1	2.0	2.0	-

WHERE: 3= Excellent
2= Good
1= Poor

Road Safety Survey Series

RSS 1	Traffic Signal Light Output	1995/96
RSS 2	Street Lighting	1995/96
RSS 3	Treatment of Slip Lanes at Traffic Signals	1995/96
RSS 4	Stop and Give Way controls at Intersections	1996/97
RSS 5	Advisory Speed Signs	1996/97
RSS 6	Pedestrian Crossings	1996/97
RSS 7	Temporary Speed Limits	1998
RSS 8	Traffic Control at Road Works	1998
RSS 9	Safety Management Systems	1998

These reports may be purchased from the Regional Engineer, Land Transport Safety Authority in Auckland (Private Bag 92-515), Wellington (PO Box 27-249) or Christchurch (PO Box 13-364) at a cost of \$10 each including GST.