

Traffic Standards and Guidelines
1998 Survey

RSS 8

Traffic Control at Roadworks



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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

- Interview surveys were conducted in April / May 1998 at a sample of 32 road controlling authorities to investigate procedures and programmes for three safety areas - traffic control at road works, temporary speed limits and safety management systems.
- This report details the results of the survey of traffic control at road works. Companion reports detail the results of the other two safety areas.

Discussion

The questionnaire survey indicated that road controlling authorities use a wide variety of techniques to ensure traffic safety at road works sites. Larger authorities tend to have more sophisticated management systems in place while smaller authorities may rely more on personal contacts. The use of a traffic management plan in contract documents is widespread and increasing but is still not in universal use.

The safety performance and motivation of contractors was reported to be extremely variable. Training alone was not seen as the key but could play an important role in providing both the skills and the motivation for contractors to do a better job.

The Traffic control issues identified by road controlling authority engineers often related to the inappropriate use of signs. Signs left out too long; speed limits not fitting the conditions at the time; and using incorrect, damaged or old signs were common issues.

The field surveys demonstrated significant gaps in the on-street performance of contractors. Field surveys encompassing 104 road works sites throughout New Zealand failed to find a single site fully complying with the current guidelines. While many of the faults found were not dangerous the message being given to motorists was inconsistent and would have contributed to the low regard taken by some motorists for road works signs.

Recommendations

- Road Controlling Authorities should require any work on or over a public road they control to comply with a traffic management plan acceptable to the authority. Ensuring compliance with the plan would also involve the authority in an audit regime.

- New guidelines for traffic control at road works should be produced which;
 - encompass both traffic safety and occupational safety and health,
 - expand on the advice given in *Working on the Road: A Handbook for Temporary Traffic Control and Safety at Roadworks Sites*, Transit NZ and make it more relevant for use in maintenance contracts and for low volume roads,
 - recognise the special needs of pedestrians and cyclists.

Note: A joint committee convened by Transit New Zealand and involving Land Transport Safety Authority, Police, and Industry representatives are currently producing a new guideline on traffic control at roadworks which will accommodate many of the issues raised in this report.

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1. Introduction

In April / May-1998 the Regional Offices of the Land Transport Safety Authority (LTSA) conducted surveys of three standards and guidelines in 32 road controlling authorities.

The standards and guidelines surveyed were:

- Traffic Control at Road Works: *Working on the Road: A Handbook for Temporary Traffic Control and Safety at Roadwork Sites* ['Working on the Road'] TNZ 1993, and *Specification for Temporary Traffic Control* TNZ G1: May 1996, ['TNZ G1']
- Temporary Speed Limits: *Setting temporary Speed limits at Road Works*, LTSA Draft Guidelines March 1996
- Safety Management Systems:

This report describes the procedures for the survey of Traffic Control at Road Works and presents the results.

2. Purpose of the Surveys

The purpose of the survey on traffic control at road works was to:

- review the systems used by road controlling authorities for managing traffic control at road works;
- determine what standards and guidelines are being used to manage traffic control at road works.
- Review the overall performance of traffic control at road works in New Zealand against *Working on the Road* and *TNZ G1*
- recommend any justifiable action for implementation of improved standards and policies.

3. Methodology

3.1 Sample Selection

A sample of 32 road controlling authorities was chosen for inclusion in the survey. The sample was biased towards authorities not included in the LTSA's surveys the previous year and those with higher social costs from crashes at road works. (An accident study¹ indicated that road works accidents were over-represented on State Highways, at night, and in the single vehicle loss control categories.)

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 documentation, systems and standards employed to ensure contractors provided an adequate level of traffic control at road works.

See Appendix 3 for the questionnaire form.

3.3 Field Surveys

Field surveys were carried out with representatives of each authority where there were some road works under way at the time of the survey (27 of 32 authorities).

The field surveys looked at the traffic signs and controls being used at road works sites and compared these with the recommendations of *Working on the Road* and *TNZ G1*. A pilot technique² was used which placed a numerical "Site Danger Rating" on each road works site depending on its compliance with the guidelines. (see Appendix 4)

4. Results

4.1 Interview Surveys

4.1.1 Who is responsible for road works contracts

There was no one model followed by all road controlling authorities. In general the larger authorities had a senior council engineer (often the Asset Manager) as the engineer responsible for the contract. In many authorities consultants took a major role in approving and managing contracts.

4.1.2 Role of the Traffic Management Plan

- 70% of authorities required a traffic management plan to be specified for every road works contract.
- 10% of authorities required a traffic management plan for the majority but not all of their road works contracts. Often the maintenance contract or contracts let by other council departments were not yet included.
- 20% of authorities do not use traffic management plans and instead rely on general instructions for example to follow *Working on the Road*

4.1.3 Guidelines used

All authorities in some way used either *Working on the Road* or *TNZ G1*.

- 83% used *TNZ G1* although 13% of these stated they only used it for contracts on or near to State Highways.
- 73% used *Working on the Road*
- 40% used one or both of the above guidelines in addition to a locally developed standard.

Other guidelines used included the authority's health and safety plan and *Code of Practice for Working on High Capacity Highways*, Transit NZ, Auckland

4.1.4 Controls on others working in or over the road

- 77% of authorities used a permit system to control street openings which included either a traffic management plan or some general provision for traffic management at the site
- 23% of authorities did not use any permit system and relied solely on provisions of the *Health and Safety in Employment Act 1992*, general specifications and or spot surveys.

Most authorities recognised, and were concerned that, some operators slipped through the net. These were typically emergency operations, tree felling, and private operators.

4.1.5 Is the Traffic Management Plan being enforced?

The enforcement of the traffic management provisions of contracts were in general handled by the contract supervisor. This sometimes meant that contracts let by external agencies (eg utility companies) did not come under the same level of scrutiny as contracts let by the road controlling authority.

- 27% of authorities had provisions in the contract for financial penalties to be placed on the contractor if the traffic control did not match the requirement of the traffic management plan
- 87% of authorities had systems in place for regular or random field inspections with the ability to close down the site if the traffic control was seriously deficient. The quality of traffic control in the past would also be a factor in awarding new contracts to that contractor.
- 13% relied on the Police, the public or the good judgement of the contractors to ensure that traffic control was adequate.

4.1.6 Satisfaction with the delivery in traffic control

Training: The majority of authorities (63%) thought the training received by their contractors was adequate but there was a wide range in the responses. Some were clearly dissatisfied. Typical comments received include

- “it’s variable but improving”
- “new and smaller operators are less focussed on safety”
- “commitment by the contractor is seen as more important than formal training”

Delivery: Most (73%) authorities felt that contractors generally did deliver according to the traffic management plan but again the response was variable. Typical comments include;

- “it depends entirely on who is holding the stop/go paddle at the time”
- “need to continually keep reminding contractors of the safety requirements”

4.1.7 Opinion on weaknesses in traffic control

In total 94 separate comments were made on weaknesses in current traffic control at road works. These cover a wide range of topics and have been listed fully in Appendix 1 and summarised below.

- *Signing General:* The most common comments were on the practice of leaving the signs out when they were no longer required. It was thought that this dropped the credibility of road works signing nationally.
- *Speed Limits and Speed Control:* Common comments concerned the inappropriate use of speed limits and the lack of any positive speed control (eg. cones) being employed to slow vehicles down.
- *Manuals:* Comments identified gaps in the current manuals and guidelines and in particular suggested that any new standards include more guidance for dealing with low volume roads.
- *Special Situations:* Comment was made that in urban areas not enough care was taken catering for pedestrian and cyclist traffic.

4.1.8 Assistance from LTSA or Transfund

In total 66 separate comments were made on the assistance that LTSA or Transfund could provide to improve the performance of the industry. These have been listed fully in Appendix 2 and are summarised below.

- Produce improved manuals and guidelines – 26 responses
- Improve legislation / policies or enforcement – 15 responses
- Conduct surveys or audits – 8 responses
- Provide or assist with training of contractors – 5 responses

- Educate contractors and the public – 6 responses
- Provide publicity on the Road Works signing – 6 responses

4.2 Field Surveys

A field survey using the sheet shown in Appendix 4 was carried out at 104 sites involving 27 separate roading authorities where road works were ongoing. The deficiencies in signing, delineation or protection were noted at each site and a summary is shown in Table 1.

- In 77% of all sites visited there was at least one sign missing.
- In 26% of sites an incorrect sign was used, in 2 cases dangerously.
- At 9% of sites the sign quality was considered unacceptable.
- The cone taper was too abrupt (or non existent) in 27% of sites.

TABLE 1 LIST OF DEFICIENCIES FOUND AT ROAD WORKS SITES

Deficiency	Number	% of Sites with this deficiency
Signs:		
Some signs omitted	80	77%
Wrong sign used (not dangerously)	25	24%
Sign warning distance deficient	20	19%
Sign visibility distance deficient	17	16%
Sign spacing deficient	17	16%
Some intersections not signed	14	13%
Sign quality unacceptable	9	9%
Intersections not signed	4	4%
Permanent signs not covered	4	4%
Sign sequence wrong	3	3%
Signs not legal	3	3%
Wrong sign used dangerously	2	2%
TW30 missing for Stop/Go	2	2%
TW24 used in 2 lane, 2 way road	1	1%
Cones and Delineation:		
Cone taper deficiencies	28	27%
Cone spacing deficiency	19	18%
Flashing lights not used*	13	12%
Some flashing lights not working*	8	8%
Protection:		
Traffic protection inadequate	21	20%
Working outside safety space	21	20%
Ped/Cyclist protection inadequate	14	13%
Worker protection inadequate	7	7%
Safety vests not used	4	4%

* As the surveys were made in daylight the effectiveness of flashing lights could not be accurately assessed

Each site was rated for risk using the "Site Danger Factor" method shown in Appendix 4 and the individual ratings found are shown in Table 2 below. It should be noted, however, that the method is still being refined and shouldn't be used as a comparison between authorities.

TABLE 2 THE "SITE DANGER FACTOR" OF EACH ROAD WORKS SITE IN THE FIELD SURVEY.

Road Controlling Authority	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9
Ashburton	185	35	185	75	25	6500			
Banks Peninsula	2100	125	400						
Carterton									
Christchurch City	1250	1750	300	300	1000	4700			
Clutha	625	875	1250	625	100				
Hastings City	1500	125	100						
Hauraki	950	500	125	2500					
Horowhenua	60	150	135						
Kaikoura									
Kaipara	940								
Manukau City	1350	4000	1050	1140					
Opotiki									
Otorohanga	1500	1250	750	375	725				
Ruapehu	150								
Selwyn	225	200	1500						
Southland	200	300	150						
Sth Taranaki	900	70							
Sth Wairarapa									
Thames Coromandel	2000	4200	60	250					
Timaru District	4600	2500	50	75	2300	10			
TNZ Auckland	200	150	50	200	200				
TNZ Dunedin	3500	250	25	1350	1900	60	50		
TNZ Hamilton	175	25	100	125	500	150	25	250	625
TNZ Wellington									
Upper Hutt	750	500	75						
Waimakariri	3000	85							
Waimate	900	100							
Wairoa	625	85							
Waitaki	1500	75	50	625					
Waitomo	100	25	125	100	25				
Wanganui	50	1100							
Whakatane	975	2775	5	25					

Note: The "Site Danger Factor" method is still being refined and while the ratings obtained from the survey are broadly indicative of performance they do not yet give a reliable comparison of safety performance between authorities.

- The values obtained for the "Site Danger Factor" varied from 5 (the best) to 6,500 (worst) with an average of 820.
- In general sites with values over 2,000 had deficiencies which would require immediate attention. 13% of sites were in this category.
- Sites with serious deficiencies were usually followed up by the local engineer either during or at the conclusion of the survey.

5. Discussion

The questionnaire survey indicated that road controlling authorities use a wide variety of techniques to ensure traffic safety at road works sites. Larger authorities tend to have more sophisticated management systems in place while smaller authorities may rely more on personal contacts. The use of a traffic management plan in contract documents is widespread and increasing but is still not in universal use.

The safety performance and motivation of contractors was reported to be extremely variable. Training alone was not seen as the key but could play an important role in providing both the skills and the motivation for contractors to do a better job.

The traffic control issues identified by road controlling authority engineers often related to the inappropriate use of signs. Signs left out too long; speed limits not fitting the conditions at the time; and using incorrect, damaged or old signs were common issues.

The field surveys demonstrated significant gaps in the on-street performance of contractors. Field surveys encompassing 104 road works sites throughout New Zealand failed to find a single site fully complying with the current guidelines. While many of the faults found were not dangerous the message being given to motorists was inconsistent and would have contributed to the low regard taken by some motorists for road works signs.

6. Recommendations

- R C As should require any work on or over a public road they control to comply with a traffic management plan acceptable to the authority. Ensuring compliance with the plan would also involve the authority in an audit regime.
- New guidelines for traffic control at road works should be produced which;
 - encompass both traffic safety and occupational safety and health,
 - expand on the advice given in *Working on the Road* and make it more relevant for use in maintenance contracts and for low volume roads,
 - recognise the special needs of pedestrians and cyclists.

Note: A joint committee convened by Transit New Zealand and involving Land Transport Safety Authority, Police, and Industry representatives are currently producing a new guideline on traffic control at roadworks which will accommodate many of the issues raised in this report.

7. References

1. Harold Sigthorsson (1998) - "*Traffic Safety at Road Works in New Zealand*", LTSA internal report, unpublished.
2. Mike Gray & David Parkes (1997) "*Transfund NZ Pilot Survey Safety Audit of Roads Works Sites*" Report No. RA 9615625

Appendix 1: Listing of responses to Question 7: What in your view are the greatest weaknesses in traffic control at road works?

Signing General:

- Signs up longer than necessary.
- Signs left out when no longer required.
- Everyone just does the signing. Anyone can hire or buy a sign and erect it without the Council knowing. People think they own the road and can do whatever they like with it.
- Poor quality of signs.
- Contractors need a huge number of signs for their contracts especially reseals and maintenance. Large cost and difficult to control.
- Instability of signs under strong wind loadings and vulnerability to theft.
- Lack of flagman on occasions.
- Signs not being replaced after being blown down or hit by vehicles. Needs national guidelines for equipment such as sign stands and weights, etc .
- Traffic control may be unnecessary at low traffic volumes. Can lead to neglect and lack of respect for the signs.
- Speed limits and signs on the main road can look strange when the works are in the side road.
- When the work site changes, contractors do not always amend the sign layout.
- Back of the signs should be white so that they can be seen especially when placed in the middle of the road.
- Signs can be located so that they are a traffic obstruction and this should be prevented.
- Covering of advisory speed signs within the work site is not recommended
- Emergency work (eg burst water main) may use the incorrect signs for the type of job.
- Damaged and old signs
- Signs left out too long (eg after reseal)
- Signage, distance
- Condition of signs - signs are not maintained. Engineering grade is not good at night and we should move to Class 1 as a minimum.
- Lack of delineation through the work site at major works which leads to confusion of the motorist. Lack of site protection in amongst the machinery.
- The length of time that hazard signs remain in place. They shouldn't be up too long. Some drop outs could have netting around for up to a year
- In general, signs being left out when they are not needed, and the standard Stop / Go signs are too small.
- Side road traffic control.
- End of works indicators.
- Signs left out when not required
- Quality of some signs (not always looked after)
- Sign spacing
- Poor stop/go operation
- Leaving road works signs out when no work is actually being done.
- Visibility of signs and placement i.e. placement around bends
- Sun strike problems
- Leaving signs up when not needed
- Misuse of signs (eg. leaving signs too long)
- Inconsistency from site to site. There should be no surprises on the road.
- Keeping signage appropriate to the job ie not enough signs versus too many.
- Some contractors signs and delineation cones, etc are not kept in good condition or replaced when damaged.
- Public attitudes to road works and their signs is poor. This could be improved with greater consistency of signing.
- Too many signs at a site can cause a traffic obstruction in themselves.
- Use of RG-17 on mowers is confusing. Some drivers think it means to pass now regardless of traffic conditions.
- The TW-1 should only be used when there are workers on the site.

Speed Restrictions and Speed Control:

- Speed restriction signs are used when not needed or left out when the condition of the road does not warrant it.
- Too much bureaucracy involved in setting speed limits.
- Need to slow traffic in advance of the site.
- Contractors use of temporary speed limits.
- Contractors do not use enough positive traffic control.
- Unrealistic temporary speed limits
- inappropriate speeds
- Buffer zones are not good

- Positive traffic control – must have this if speed reduction greater than 50 km/h.
- Leaving temporary speed limit signs out when work is finished for the day, or when the job is completed. In these situations, signs lose their impact. People slow down more for cones than for the temporary speed signs.

Manuals:

- Events such as parades are not included in the procedures.
- Needs national guidelines for equipment such as sign stands and weights, etc .
- WOTR Handbook needs to be rewritten particularly addressing urban cross roads and roads with low traffic volumes.
- Need a more appropriate standard for traffic control at low volumes than G1.
- Guidelines for the use of temporary traffic signals are needed.
- Some standard for the bases of signs needs to be developed – one contractor uses old truck wheels for their sign supports.
- The new Transfund Specification has a number of impractical aspects regarding staff numbers and safety requirements - especially relating to smaller jobs like pothole repair.
- No Code of Practice. Working on the Road is not comprehensive enough, and doesn't emphasise responsibilities. There are big gaps between WOTR, G1 and HCH. Small contractors in particular need lots of guidance.
- G1 needs to be more comprehensive.

System Issues:

- Contractors trying to use a generic TMP instead of considering each site individually.
- Problems are encountered where no TMP is required.
- "Clear" have been flexible in their work practices. This may be because they are a new company and do not have the baggage associated with having operated under a different environment before the new OSH Act.
- Contractors staff do not take safety seriously enough. Sometimes the Company embraces safety but the staff do not buy into the culture.
- Contractors and/or their staff do not understand their responsibilities under the OSH Act.
- Incidents on the site are not reported to the client consistently.
- Lack of consistency between sites.
- Unattended sites not inspected frequently enough.
- Coordination of the process of creating policy for setting up the site.
- Smaller contractors are not as good as larger ones at preparing traffic management plans.
- Failure to follow the TMP is the major fall down particularly in the area of monitoring after setup though setup can also be a problem.
- Need to apply common sense to actual situation beyond Working on the Road handbook.
- Getting contractors to accept the responsibility all the time.
- Getting resources within Council to check / monitor situation. Needs a full-time person to check / monitor road works.
- Bitumen contractors seem to be the worst offenders.
- Site inspections of traffic control are not always followed up
- Contractors let themselves down.
- Maintenance contracts, ie seals/patches, have a problem with being mobile over large areas.
- Lack of commitment by contractors staff as opposed to the overall commitment of the contractor. This applies to the larger firms as I believe there is a lack of commitment by the smaller firms.
- Contractors tend to cut corners so that they can cut costs eg sign and cone quality. Profit margins dictate what level of safety is applied to the job, and cutting corners is the nature of the business.
- Most contractors tend to have only one set of signs- this is an educational matter.
- Widespread industry non-compliance with TM Plans due to cost cutting.
- The greatest weakness is the inability to enforce and adequately police traffic controlled road works. The majority of drivers see traffic control as an inconvenience and readily ignore instructions.
- Human factors
- Probably a lack of traffic control resources (eg. working people)
- Traffic controlling persons do not have control over the public.

Special Situations:

- Scaffolders and crane operators working over footpaths only and not providing for pedestrians.
- Contractors may put sufficient control out for traffic but not consider other road users such as pedestrians and cyclists.
- Nighttime lighting of the site is important and needs more attention.
- Traffic lanes are often not set up properly through the site.
- Not enough contractors provide for pedestrians and cyclists in urban areas.
- Short term fixed sites such as patching are difficult to control.
- Pedestrians and other non-motorised road users are generally poorly catered for.
- On local roads where traffic volumes are low field staff don't believe control is necessary.
- Remote rural sites where field staff don't believe control is necessary

Appendix 2: Listing of responses to Question 8: Can the Land Transport Safety Authority or Transfund help the process in any way?

Manuals and Guidelines

- Prepare a user friendly generic traffic management plan that all contractors can understand and use.
- Define good practice, encourage and support the setting up of better systems.
- Provide a standard package of guidelines for setting up Safety Management Systems.
- Revise G1 to require safety staff on site at all times.
- Include event management in the guidelines.
- Provide uniform national guidelines/standards for contractors.
- Create a generic Traffic Management Plan that is more user friendly than the example in G1.
- Rewrite the WOTR handbook.
- Provide a pared down version of G1 for use on low volume roads that has been assessed and accepted nationally.
- Create guidelines appropriate for the needs of low traffic volume roads ie less than 50 vehicles per day.
- Specify the appropriate level of signing for smaller contracts.
- Update the Standard.
- Documentation – below Transits G1 to cover all situations with signage and control appropriate to the level of highway.
- Guidelines on reflectivity.
- Greater consideration for the rural environment in a guideline for road works. Environment could be based on traffic volumes. It should be recognised that some rural places have no exit roads that do not justify full Working on the Road control.
- More common sense is needed in guidelines.
- Guidance on what standard is required for low volume roads (i.e. is full WOTR required for a low volume no exit road).
- *555 need more guidance for who to report faults to after hours
- They could liaise more closely with OSH to determine OSH's level of involvement in the safety of road works sites, and communicate this to the industry.
- Yes. They should take responsibility for producing a Code of Practice. Should also be more pro-active in auditing road works sites and initiate training programmes. Utility companies in particular are hard to control
- Don't want rigid guidelines, but guidelines that allow judgements to be made on site. RCAs and contractors should be able to use their discretion. Being too pedantic slows the job too much.
- WOTR should allow grading of a quiet road for greater than 2km.
- ODC do not want to scare away minor contractors with a requirement for G/1 to be followed and a Traffic Management Plan to be provided.
- Cost of full range of signs is prohibitive.
- Some one needs to take over G1 and develop a true national standard
- Develop generic TMP and traffic management specifications for specific types of road works .

Legislate / Policies / Controls / Enforcement:

- Lobby for legislation for Road Controlling Authorities to be able to control utilities and require them to meet their fair costs for traffic disruption
- Need a policy addressing the use of rumble strips and vibrational lines at road works. John Edgar mentioned one was coming at the last liaison group meeting.
- The current TNZ management structure doesn't seem to work as efficiently as it used to in controlling road works.
- We have little control over the minor works and emergency works by utility companies There seems to be a imbalance of power here.
- Some surveyors appear to do what they like –(rules to control).
- Transfund requirement to have a person both ends of the road when investigating cracking etc is just not practical in most instances.
- Transfund should set the funding system to exclude those with poor training / safety record.
- Ensuring by training standards or rules that a uniform standard is maintained, this also requires cooperation

and commitment of principals, consultants and contractors.

- Improved enforcement, both of contractors (to make certain that they're toeing the line) and of road users eg speed through the site. Police, LTSA and OSH could all be involved in this.
- Stop/Go paddle has no legal standing. LTSA need to change the regulations to cover this.
- Yes, pass legislation giving contractors/supervisors reporting rights for traffic control infringements and some confidence that prosecution will follow.
- Allow police to operate speed cameras in major road work sites
- Enforcement
- In rural areas, the contractor calls the police if they are having problems with the way the public are using the road works site and the police will enforce the site. This has proved to be successful
- Try to reduce the cost of road safety equipment, especially for small sub contractors

Educate:

- Educate contractors and the public.
- Educate contractors of the legal issues in traffic control and their obligations under OSH.
- Educate the public in how to drive through road works sites.
- Encourage regular radio reports listing current road work sites.
- Can instigate driver education programmes. For instance most road users don't know what the roadworks man sign really means- that someone is actually working at the site. Some drivers may need to be re-educated.

Survey / Audit:

- LTSA and Transfund could carry out spot checks without informing the TLA that they are coming.
- Publish the results of the surveys undertaken.
- Independent audits of sites would be a definite advantage and TNZ could supply a list of contracts such that they could be audited.
- Results and recommendations from surveys are helpful. The type and the format of the "RTS" series guidelines are useful
- Audits are useful. Feedback is always welcome – timeliness is important for this. This can help measure performance.
- By providing bench marking between TLA's (would help to focus districts awareness of this issue)
- Regular site visits/audits and provide feedback
- The surveys being undertaken by the LTSA are useful in that they make the RCA think about what is happening on the roads.

Train:

- Provide training for writing a good TMP.
- Run annual workshops for engineers and contractors.
- Provide a standard course for road works contractors so that they can be accredited. Transfund should provide this accreditation. Courses should be amended through the country to account for local practices.
- Provide training to contractors in developing/preparing traffic management plans.
- Promote common sense at worker level.
- Training programmes are too expensive eg. Taranaki Polytechnic course is \$400. There used to be a local government programme.

Publicise:

- LTSA needs to keep the issues in front of Contractors Federation and contractors – road safety issues - results of this survey.
- The LTSA could help with on going publicity and training, the guy on the job is the one who training should be aimed at.
- Public education of road work signs
- Advertising
- National campaign
- Advertising to public the need to take notice of the road works sites.

Appendix 3: Questionnaire Form

**Traffic Control at Road Works
Questionnaire, 1998**

Road Controlling Authority _____

Person(s) Interviewed _____

Contact Phone No. _____ **Date** _____

Interviewer _____

QUESTIONS
1. Who, within your authority or as your agent, is responsible for road works contracts and other contracts within the road reserve?
2. Does every road work contract specify a Traffic Management Plan?
3. What guideline / specification do the Traffic Management Plans in your district use?
4. How do you control contracts let by utility companies and others working in the roadway?
5. What provisions are made by your authority to ensure that traffic management is delivered according to the Traffic Management Plan?
6. Are you satisfied that contractors on your roads; <ul style="list-style-type: none"> • have had the necessary training in traffic control and • do deliver traffic management according to their Traffic Management Plan?
7. What in your view are the greatest weaknesses in Traffic Control at Road Works either in your area or generally?
8. Can the Land Transport Safety Authority or Transfund help the process in any way?

Appendix 4 Field Survey and Site Danger Factor calculation form.

SITE DANGER ESTIMATION FORMULA	
SITE PROTECTION FACTORS = P	SITE COMPLEXITY FACTORS = C
50= All signs missing <input type="checkbox"/>	1= SIMPLE No intersections
	2 lane-2 way, 1 way
10= Deficiencies in:	50km/hr
Sign visibility distance <input type="checkbox"/>	Low volume traffic
Sign warning distance <input type="checkbox"/>	
Sign spacing <input type="checkbox"/>	5= MODERATE Intersections/roundabouts
Cone taper <input type="checkbox"/>	2 lane-2 way, 1 way
Cone spacings <input type="checkbox"/>	50/70km/hr
Traffic protection inadequate <input type="checkbox"/>	Medium volume traffic
Pedestrian/cyclist protection inadequate <input type="checkbox"/>	
Worker protection inadequate <input type="checkbox"/>	10= COMPLEX Intersections/roundabouts
Wrong sign used dangerously <input type="checkbox"/>	2 lane-2 way or multi lane
Working outside safety space-(workers/equip) <input type="checkbox"/>	80/100km/hr
Safety vests not used/ineffective <input type="checkbox"/>	High volume traffic
No intersections signed <input type="checkbox"/>	
TW-30 missing for stop/go control <input type="checkbox"/>	
TW-24 used in 2 lane, 2 way road <input type="checkbox"/>	TRAFFIC EFFECT FACTORS = T
Flashing lights not used/ineffective <input type="checkbox"/>	1= Works not in carriageway
Signs not safely visible at night <input type="checkbox"/>	5= Traffic staying in own lane
5= Some signs omitted <input type="checkbox"/>	10= Traffic moving from own lane - signed
Some intersections not signed <input type="checkbox"/>	20= 1 Lane created - no signs
Wrong signs used - not dangerous <input type="checkbox"/>	1 Lane, 2 way traffic created with no TW-27
Sign sequence wrong <input type="checkbox"/>	sign combined with RG-19 and RG-20
Signs not legal <input type="checkbox"/>	No temporary lanes
Sign quality unacceptable <input type="checkbox"/>	No traffic controller
Permanent signs not covered <input type="checkbox"/>	
Some flashing lights not used/working <input type="checkbox"/>	
2= Some signs wrong:	
Size <input type="checkbox"/>	
Height <input type="checkbox"/>	
Grade <input type="checkbox"/>	
Sign quality marginal <input type="checkbox"/>	
ADD MULTIPLE DEFICIENCIES FOR P	
KEY	
ADD ALL SITE PROTECTION FACTORS FOR VALUE:	= P
SELECT SITE COMPLEXITY FACTOR FROM PARAMETERS LISTED	
SELECT TRAFFIC EFFECT FACTOR FROM CONTROL METHOD OBSERVED	
MULTIPLY P X C x T = SITE DANGER FACTOR	
SITE DANGER FACTOR =	

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.