

Traffic Standards and Guidelines
1998 Survey

RSS 7

Temporary Speed Limits



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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 (RCAs) to investigate procedures and programmes for three safety areas - traffic control at road works, temporary speed limits and safety management systems.
- Field surveys were also undertaken at a sample of sites to obtain a “snapshot” of the on-road situation relative to the standards and guidelines, verify responses to the interview, and discuss problems or successes on-site with RCA staff.
- This report details the results of the survey of temporary speed limits. Companion reports detail the results of the other two safety areas.

Results

- Only 66% of RCAs used some form of guideline or specification for setting temporary speed limits.
- 28% of RCAs used only 30 km/h temporary speed limits.
- 41% of RCAs kept no documentation of temporary speed limits.
- Of the sites surveyed with a temporary speed limit, 100% of the sites in an underlying 50 km/h area and 77% of sites in an underlying 100 km/h area were sign posted at 30 km/h.
- The temporary speed limit value was appropriate at 79% of sites surveyed.
- 20% of sites surveyed had no speed limit displayed at the end of the work site.
- At 92% of sites surveyed some speed limit signs were not placed on the left side of the carriageway for either direction of traffic.
- At 12% of sites surveyed with an underlying 100 km/h speed limit a buffer speed limit was present.

Recommendations

All road controlling authorities should:

- Use or specify the use of Appendix B of Transit New Zealand's G1 *Specification for Temporary Traffic Control* to determine appropriate temporary speed limits.
- Use or specify the use of Appendix B of Transit New Zealand's G1 *Specification for Temporary Traffic Control*, and *Working on the Road* to determine the appropriate temporary speed limit sign locations.
- Regularly check to determine whether temporary speed limits remain appropriate to the changing conditions.
- Determine whether there is a need to improve documentation of temporary speed limits in their authority.
- Demand a higher level of expertise and training from contractors and RCA staff involved in the placement of temporary speed limit signs.

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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 (RCAs).

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 Temporary Speed Limits and presents the results.

2. Purpose of the Surveys

The purpose of the survey on temporary speed limits was to:

- review the systems used by road controlling authorities for determining temporary speed limits at road works
- determine what guidelines or specifications are being used to determine the value of temporary speed limits
- review the application of temporary speed limits and their appropriateness
- recommend any justifiable action for implementation of improved standards and policies

3. Methodology

3.1 Sample Selection

A sample of 32 RCAs was chosen for inclusion in the survey. The sample was biased towards authorities not included in the LTSA's surveys the previous year.

3.2 Interview Surveys

Interview surveys were conducted with representatives in each RCA. Questionnaire forms were sent in advance to allow time to research answers if necessary. Questions centred on the documentation, systems and standards employed to ensure appropriate temporary speed limits are installed. The Temporary Speed Limits Questionnaire is attached as Appendix 1.

3.3 Field Surveys

Field surveys were carried out at road works sites within each RCA. The sites were generally located using local knowledge of the RCA staff. Some, however, were located in the process of driving through the authority's area. Of the 104 road works sites surveyed, 61 had a temporary speed limit, and these 61 sites are analysed in this report.

4. Results

4.1 Interview Surveys

4.1.1 Who Determines a Temporary Speed Limit

RCAs were asked who determines (approves) the appropriate temporary speed limits. The responses showed:

- the RCA determined the limits in 10 cases (31%)
- the contractor in 10 cases (31%)
- a consultant engineer in 3 cases (9%)
- no decision was taken in 9 cases (28%) as the limit was always 30 km/h

TNZ G1 suggests that the RCA should authorise temporary speed limits.

4.1.2 Process of Setting a Temporary Speed Limit

RCA's described the processes used in setting temporary speed limits. The processes were:

- contractor proposes and sets in 10 authorities (31%)
- contractor proposes and RCA sets in 6 authorities (19%)
- contractor proposes and consultant sets in 3 authorities (9%)
- contractor and consultant discuss and propose and the RCA sets in 3 authorities (9%)
- consultant proposes and RCA sets in 1 authority (3%)
- always 30 km/h in 9 authorities (28%)

Two of these processes are undesirable arrangements from a road safety perspective, namely where there is always a 30 km/h speed limit, and where the contractor determines and sets the temporary speed limit. Where there is always a 30 km/h speed limit the effect is likely to be a general undermining of the value of a temporary speed limit and, in both processes, there is no checking procedure by the RCA to ensure the speed limit is appropriate.

4.1.3 Guidelines or Specifications used to determine Temporary Speed Limits

The majority of RCA's (21 or 66%) stated that they or their agent used guidelines or specifications to determine temporary speed limits. The remaining 34% used no guidelines or specifications to determine temporary speed limits.

The 21 RCA's using guidelines or specifications were asked to name them. Some RCA's named more than one guideline or specification. There were five guidelines or specifications named. Of the 21 RCA's:

- TNZ G1 was used by 15
- *Working on the Road* was used by 10
- Transit New Zealand's *Code of Practice for Working on High Capacity Highways* was used by 3
- LTSA's Draft Guidelines *Setting Temporary Speed Limits at Road Works* was used by 1
- an internally developed document was used by 1

Of the ten RCA's naming *Working on the Road*, four named no other documents. This is of interest because while this document specifies the required sign locations, it does not allow for the use of temporary speed limits other than 30 km/h. This is because the document was published prior to the 1996 change in the Traffic Regulations.

4.1.4 Key Technical Factors in Determining Temporary Speed Limits

TNZ G1 and the LTSA's Draft Guidelines *Setting Temporary Speed Limits at Road Works* outline the main factors to take into consideration when setting a temporary speed limit as follows:

- loose materials or stones are present on the surface of a repair or reconstruction of a sealed road
- the surface of the road is being sealed or resealed
- visibility restrictions for drivers travelling through the road works site due to dust, construction and/or maintenance equipment and workers working close to or on the trafficable roadway, and abnormal weather conditions
- the alignment, width, and surface condition is reduced below that of adjacent sections of road
- the unobstructed clear width of the carriageway is reduced by the road works
- the safety of road workers and road users could be affected
- emergencies, eg. flooding, slips and the like
- single lane traffic operation
- the safe stopping sight distance is not available for the prevailing operational speed of the road

RCA's were asked what factors they consider when determining temporary speed limits. Most RCA's had a good awareness of the factors involved in determining temporary speed limits and frequently mentioned the above factors. The most commonly cited factors were:

- visibility or sight distance
- type of works
- proximity/safety of road workers
- traffic volume
- surface condition
- encroachment of works into traffic lanes

4.1.5 Documentation of Temporary Speed Limits

4.1.5.1 Documentation Kept

Nineteen RCA's (59%) kept some documentation of the location, time, and value of a temporary speed limit.

The documentation kept was:

- nil in 13 authorities (41%)
- Traffic Management Plans in 10 authorities (31%)
- contract files in 6 authorities (19%)
- application or approval sheets in 2 authorities (6%)
- diaries or TNZ G1 type records in 1 authority (3%)

Many RCAs using Traffic Management Plans (TMP) as the only documentation kept, acknowledged the TMP would not normally include time and location of maintenance contracts. Three authorities noted that they only keep documentation for major construction projects. Two authorities stated that they only keep documentation in special cases, for example where work was substandard, or there had been some criticism of the site.

4.1.5.2 Custodian of Documentation

Of the nineteen RCAs keeping documentation, the custodian of the documentation was the:

- RCA in 15 authorities (79%)
- contractor in 3 authorities (16%)
- consultant in 1 authority (5%)

4.1.5.3 Length of Time Documentation Kept

TNZ G1 suggests documentation should be kept for at least two years. Of the nineteen RCAs keeping documentation, the retention period was:

- greater than two years in 13 authorities (68%)
- no set period in 4 authorities (21%)
- for the contract duration and maintenance period in 2 authorities (11%)

4.1.5.4 Use of Documentation for Prosecution

RCAs were asked whether temporary speed limit documentation had been requested by Police for prosecution purposes. Most said that documentation had not been requested by police. The respondents advised documentation:

- had not been requested of 20 authorities (63%)
- had been requested of 6 authorities (19%)
- may have been requested of 6 authorities (19%) but could not be confirmed

4.1.6 Buffer Speed Limits

A buffer speed limit is a temporary speed limit zone that is intended to be a transition between the a permanent speed limit and a temporary speed limit at a work site. RCAs were asked if they had any policy on buffer speed limits:

- 28 authorities (87%) had no policy
- 4 (13%) had an informal policy
- none had a formal written policy

4.1.7 Maximum Time for Temporary Speed Limits

TNZ G1 and *Setting Temporary Speed Limits at Road Works* state temporary speed limits should apply only while the conditions for it remain, and should be removed immediately when it is no longer required. RCAs were asked if they had any policy on the maximum time a temporary speed limit should remain in place:

- 16 authorities (50%) had an informal policy that signs remained in place only while work was in progress, or safety was compromised, or loose chip was present
- 9 (28%) had no policy
- 5 (16%) had a policy that only applied to reseals
- 2 (6%) had a written policy

4.1.8 Minimum Training and Expertise

The majority of RCAs had no policy on the minimum training or expertise that they expected from their contractors:

- 19 authorities (59%) had no policy
- 5 (16%) considered training in the tender attributes only
- 3 (9%) required a Safety Supervisor on site
- 3 (9%) required formal training for High Capacity Highways contracts
- 2 (6%) specify in the contract documents

4.1.9 Assistance from LTSA or Transfund

The most commonly cited areas in which the RCAs required assistance from the Land Transport Safety Authority or Transfund were producing guidelines (18 or 56%), and carrying out monitoring or audits (7 or 22%).

4.2 Field Surveys

4.2.1 "Signed" Value of Temporary Speed Limits

In April 1996, *Traffic Regulations 1976 Amendment No.28* came into force. This amendment allowed road controlling authorities to set any temporary speed limit lower than the existing underlying speed limit provided it was a multiple of 10 km/h. It also revoked the requirement that provided only for the setting of 30 km/h temporary speed limits. Despite this change, the most common temporary speed limit at the 61 surveyed sites was 30 km/h.

At four sites where a buffer zone was present, the lowest temporary speed limit was recorded.

At 29 sites with an underlying speed limit of 50 km/h (including two sites straddling a 50 and 100 km/h restriction):

- 30 km/h was used at 29 sites (100%)

At 6 sites with an underlying speed limit of 70 km/h (including one site straddling a 70 and 100 km/h restriction):

- 30 km/h was used at 4 sites
- 50 km/h was used at 1 site
- 70 km/h was used in error at 1 site with a 70 km/h underlying speed limit

At 26 sites with an underlying speed limit of 100 km/h:

- 30 km/h was used at 20 sites (77%)
- 50 km/h was used at 6 sites (23%)

These results suggest a reluctance to use temporary speed limits other than 30 km/h. This could be due to unavailability of signs, a lack of knowledge of the regulation allowing alternatives to be used, or over compensating for Health and Safety in Employment Act requirements. The results in section 4.2.4 nevertheless indicate that a high proportion of temporary speed restrictions were appropriate.

4.2.2 Buffer Speed Limits

Buffer speed limits were encountered at three sites with an underlying 100 km/h restriction (12%) and one site with an underlying 70 km/h restriction (17%). Three of the four sites were on State Highways.

4.2.3 Length of Temporary Speed Limits

No guidance is available for determining a minimum or maximum length for a temporary speed limit. However, a minimum length is required in order to be enforceable and to allow motorists the opportunity to comply with the speed limit. A maximum length is also required so that motorists do not become overly frustrated.

During the site surveys it was noted that two temporary speed limits were less than 200 metres in length, and a further 13 were less than 300 metres in length. 12 temporary speed limits were one kilometre or longer, with a maximum length of 3.8 kilometres.

4.2.4 Appropriateness of Temporary Speed Limits

A temporary speed limit must be appropriate to the site conditions and should generally be the maximum that is consistent with the safety of the work, workers and road users. Unnecessarily low temporary speed limits should not be used as the effect is likely to be a general undermining of the value of a temporary speed limit, and the speed limit will gain poor observance from road users.

At each site, the survey personnel used TNZ G1 Appendix B to judge whether the temporary speed limit in place was appropriate for the conditions. The subjective judgements suggest 48 sites (79%) were signed with an appropriate temporary speed limit for the conditions. This figure is surprisingly high given the general feeling amongst practitioners and the general public that temporary speed limits are often too low.

Only one site (2%) was judged to have a temporary speed limit set too high. It was judged that twelve sites (20%) should have had either a higher temporary speed limit, or no temporary speed limit. These figures suggest that on the whole, temporary speed limits are set at about the right level, or slightly lower than is appropriate.

It must however be noted that all surveys were carried out in daylight conditions and work was often in progress. If the surveys were conducted at night it is likely that the figures would differ.

4.2.5 Location of Temporary Speed Limit Signs

4.2.5.1 Layout of Signs

The survey personnel judged whether the layout of the temporary speed limit signs met all of the requirements in *Working on the Road*. *Working on the Road* outlines the requirements for the spacing of signs, the sequence of signs, the sight distance and visibility of signs, and recommends the placement of signs on the left of the road on each entry to and exit from the work site. It was noted whether all, some, or none of these sign location criteria were met. The results were:

- some located correctly at 55 sites (90%)
- all located correctly at 4 sites (7%)
- none located correctly at 2 sites (3%)

The most common fault (56 sites or 92%) was for some of the speed limit signs to be placed on the right side of the carriageway (often those on the exit from the work site), or for exit speed limit signs not to be present at all.

Another common fault (17 out of 26 or 65% of sites with side roads) was that a temporary speed limit was not displayed on some or all side roads.

Faults with the visibility, spacing and sequence of the speed limit signs that were erected were relatively few (8 sites or 13%).

4.2.5.2 Exit Speed Limit Signs

At each site it was noted whether a speed limit was posted at all, some, or none of the exits from the work site, regardless of which side the speed limit sign was on. The results were:

- all posted at 29 sites (48%)
- some posted at 20 sites (33%)
- none posted at 12 sites (20%)

4.2.5.3 Unidirectional Temporary Speed Limits

Temporary speed limits were found to apply to traffic travelling in only one direction at 5 sites or 8% (excluding a site on a one way road and a detour site).

The practice of signing for only one direction of traffic could have ramifications for safety. Specific safety examples could be if loose chip was to migrate into opposing traffic lanes, or if traffic in the opposing lanes was to overtake other traffic at the site.

5. Conclusions

- The proportion of authorities using guidelines or specifications for setting temporary speed limits (66%) requires improvement.
- Surveys confirmed the continued widespread use of 30 km/h temporary speed limits.
- A high proportion (41%) of authorities keep no documentation of temporary speed limits.
- The temporary speed limit value was judged appropriate at a high proportion (79%) of sites surveyed.
- Speed limit signs at work site exits were frequently missing.
- Speed limit signs were often not erected on the left side of the carriageway.

6. Recommendations

All road controlling authorities should:

- Use or specify the use of, TNZ G1 Appendix B to determine appropriate temporary speed limits.
- Use or specify the use of, TNZ G1 Appendix B, and *Working on the Road* to determine the appropriate temporary speed limit sign locations.
- Regularly check to determine whether temporary speed limits remain appropriate to changing conditions.
- Determine whether there is a need to improve documentation of temporary speed limits in their authority.
- Demand a higher level of expertise and training from contractors and RCA staff involved in the placement of temporary speed limit signs

Appendix 1 Questionnaire Form

**Temporary Speed Limits Questionnaire
1998**

Road Controlling Authority

Person(s) Interviewed

Contact Phone No. _____ Date

Interviewer _____

QUESTIONS
1. Who determines the appropriate temporary speed limit to apply at a road works site within your District?
2. Please outline the process in setting a temporary speed limit at a road works site.
3. What guideline or specification do you use when setting temporary speed limits?
4. What are the key technical factors you consider when setting temporary speed limits?
5. What documentation is kept of the location, time and value of a temporary speed limit? <ul style="list-style-type: none"> • Who keeps a copy of this document? • For how long is this the documentation kept? • To your knowledge has it been required by Police in pursuing a prosecution?
6. Do you have a policy on any of the following; <ul style="list-style-type: none"> • The use of Buffer temporary speed limits (eg 70km/h followed by 50 km/h)? • The maximum time that a temporary speed limit should remain in place? • A minimum level of training/expertise for contractors?
7. Can LTSA/Transfund assist the process in any way?

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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.