MANAGING THE ROAD ENVIRONMENT

The 2002 Transfund/Land Transport Safety Authority Survey

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Managing the Road Environment: The 2002 Transfund/LTSA Survey

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This paper reports on the information gained from a survey of 30 local authorities, 25 of which are predominantly rural in nature, carried out late 2002. Topics covered in the survey included the management of:

- *traffic signs;*
- *vehicle entrances to private property;*
- *stock crossings of roads (at grade and underpasses) including the use of warning devices; and*
- *road surfacings chosen for amenity reasons rather than technical reasons.*

Present practices and problems are assessed and reported. Current best practice is identified from practices reported by local authority staff or observed in the field.

Introduction

This survey arose from two sources:

- Land Transport Safety Authority's wish to survey the present state of traffic signs; and
- Transfund New Zealand's wish to assess how significant some issues noted during recent technical reviews might be in the management of road corridors.

The interests of LTSA and Transfund in the managing of road signs and corridors are complementary. A common pool of information has been derived from the surveys and each organisation is reporting separately its findings based on this knowledge. These reports will be more comprehensive than this paper and should be referred to when issued.

The survey procedure was to work through a previously distributed questionnaire with staff in councils' offices, then to inspect with them specific types of traffic signs along sample lengths of their local roads. Questionnaires covered the management of traffic signs, vehicle entrances to private property, stock crossings, and urban carriageway surfacings. Only traffic signs were inspected in the field and this was limited to regulatory signs, permanent warning signs, chevrons and bridge end markers.

Three pilot visits were carried out in September 2002 and a further 30 councils were visited October – December 2002.

Management Of Traffic Signs

We concluded that most local authorities have a low level of management of traffic signs compared with their management of pavements. We believe political pressure to keep staffing levels low, a hangover from pre-1989 practice when the several regional Automobile Associations installed and maintained traffic signs, and the concentration of asset managers' attention on pavement management, have all contributed to this.

Major findings from the interviews of the survey were that:

- Twenty-three of the thirty authorities (77%) reported no formal policy or no policy at all for providing traffic signs on their network.
- Only 8 authorities (27%) had an inspections-based programme to determine when to replace traffic signs.
- Ten authorities specified Class 1 (commonly called High Intensity Grade) retro-reflective sheeting on all their new signs with a further 8 specifying Class 1 on certain signs and either Class 1A or Class 2 (commonly called Diamond and Engineering Grades) on the others.
- Many inspections of traffic signs are to verify contract payments claims. These won't necessarily identify safety deficiencies in the provision of traffic signs.

Major findings of the field survey of 3920 traffic signs (plus 284 recorded as "Absent") were:

- 57% of signs inspected had some deficiency of configuration, condition, or location.
- 10% of signs in the sample were hidden or partially hidden, mostly by vegetation, from approaching motorists.
- Over 55 % of Stop and Give Way signs in rural areas were smaller than recommended in the Manual of Traffic Signs and Markings (MOTSAM.).
- 60% of signs surveyed in urban areas were closer to the road than the 300 mm recommended in MOTSAM.
- One in eight bridge end markers was too far from the carriageway to properly define the safe traffickable width.
- 23% of all signs were mounted lower than recommended in MOTSAM including 40% of rural permanent warning signs.
- Well over 90% of signs of all retro-reflective classes were still in serviceable condition (subjectively assessed in daylight) after ten years installation.

Cross-tabulating responses from the interviews with findings in the field survey gave the following conclusions:

- Councils with a separate contractor for the provision and maintenance of their traffic signs had significantly better installations than those whose signs were installed and maintained by their network maintenance contractor.
- In general, the inspection procedures being used to check the condition, visibility, maintenance, cleanliness and location of signs are not effective and need to be reviewed.

We identified the following measures as best practice and recommend their adoption by other authorities:

- Record all traffic signs and their characteristics in a database. The Road Assessment and Maintenance Management (RAMM) database is the most readily available and most universally used.
- Require and ensure that traffic signs are marked with the date of erection and record this information in the authority's database.
- Continue regular cyclic inspections regimes (monthly or otherwise) for contractual verification purposes.

- Use people with relevant knowledge and experience to progressively and systematically check all signs conform to the guidelines set out in the Manual of Traffic Signs and Markings (MOTSAM.)
- Use the same people to identify locations where necessary signs are absent (i.e. have never been installed) or are missing.
- Carry out systematic safety audits as an independent review of installations, checking particularly for correctness, coherence and consistency of signs installations.
- Employ contractors that are able to bring relevant specialist expertise to signs maintenance.

Scope for improvement includes:

- Knowledge of correct traffic signs installation practice needs to be fostered on a wider basis than at present.
- Additional to inspections to verify contractual claims, there is a need for inspections by knowledgeable people to verify that guidelines requirements are more adequately met, and to follow-up ensuring remedial work is correctly carried out. Possible means of achieving this include extending:

    (i) advisory work performed by LTSA staff; and/or

    (ii) the system of safety audits that has been built up since 1990 successively by Transit NZ and by Transfund.

Vehicle Entrances

Recent Transfund technical reviews had identified instances where vehicle entrances to private properties had been installed without the knowledge of the road asset management staff of the road controlling authority. This indicated communications between engineering and planning or building inspection staff were not working well enough in those authorities.

Problems that can then arise with vehicle entrances include:

- inadequate sight distances to oncoming traffic,
- entrances that are too narrow to accommodate the vehicles that will be using them,
- steep entrances that may impinge on through carriageways,
- water and loose gravel getting on to carriageways.

There was general agreement among council staff who were interviewed that Resource Consent procedures allow roading asset managers adequate opportunity to identify and forestall any problems new entrances might create. However, where a new vehicle entrance requires a building consent only, relevant Building Consent staff may not always recognise the roading implications of applications and may not consult roading asset managers.

Best practice in this respect reflects the comment or consultation procedures adopted by most authorities for Resource Consent applications. For those councils still experiencing problems, we recommend:

- fostering closer working relationships between building consent and roading asset management staff, and
- having internal consultation procedures for processing Building Consent applications that are similar to the procedures used for Resource Consent applications.

Other elements of best practice found were:

- Follow up procedures also include input by roading asset managers to ensure new and existing entrances are acceptable after installation.
- Remedial work is at the property owners' expense subject to a reimbursable bond being held by the council that is sufficient to cover the cost of remedial work not otherwise completed satisfactorily.

At-grade Stock Crossings

Observations during Transfund technical reviews suggested there were problems with consistency of practice and with farmers' management of warning devices at at-grade stock crossings. Comments from staff interviewed during survey visits suggested liability issues are making the dairy farming industry much more aware of the effect on road users of poorly managed crossings.

Council staff were asked which warning devices they encouraged farmers to use and which ones they thought farmers preferred to use. Some mentioned more than one device in their responses (typically both flashing orange beacons and temporary warning signs) and others had no stated policy or comment. The most commonly used devices, according to staff spoken to, may be summarised:

Councils' Preferences:			**Farmers' Preferences:**		
Order of Preference	Device	Response (%)	**Order of Preference**	Device	Response (%)
1	Temporary warning signs	70	1	Flashing orange beacons	70
2	Flashing orange beacons	57	2	Temporary warning signs	30
3	Permanent warning signs	30	3	Permanent warning signs	10
4	Small orange cones	7	4	Small cones	10
5	High visibility jackets	3	5	Vehicle Hazard Lights	10

We note that the effectiveness of any warning device is degraded quickly if road users see no apparent hazard associated with the warning. The most effective warning device in practice seems to be the flashing orange beacon (whether permanently mounted or vehicle mounted) since it is least likely to be misused. Folding Temporary Warning signs are more liable to misuse, through being left open after stock have finished crossing.

Fewer than half of roading asset managers assessed that farmers were using warning devices acceptably or better. Councils' policies and bylaws on the use of stock crossings cover legal

requirements rather than provide practical guidance to farmers to help them get their crossings operated correctly.

Best practice found among the authorities surveyed included:

- Maintaining a record of at-grade stock crossings and the conditions that pertain to these.
- Having consistent policies for the control of at-grade stock crossings.
- Requiring the use of flashing orange beacons (fixed or vehicle-mounted) in conjunction with folding Temporary Warning signs at all regularly used at-grade dairy stock crossings.
- Requiring the cleaning of stock crossings after each use.
- Educating and assisting farmers to get their installations correctly set up for good management in line with guidelines.

We believe the Road Controlling Authorities' Forum booklet, "Guidelines for Stock Crossings", is the best vehicle available for publicising and for ensuring more consistent practice generally.

Management of Stock Underpasses

Many Councils have thought through the legal and structural implications of permitting farmers to build and operate stock underpasses at public roads and put appropriate policies in place.

The treatment of underpasses for the safety of road users is much less well thought through. We formed an impression that a wish to minimise cost for farmers was a strong influence in the setting of minimum requirements.

There seems little accord on the relationship between minimum acceptable length of underpasses and carriageway width. Minimum acceptable lengths for underpasses, where reported, ranged from 5 metres more than the formation width of the road down to no more than the formation width.

Minimum accepted protection treatments for the void at road level caused by low level approaches to underpasses were:

Minimum Requirement:	Proportion of Respondents with Policies (%)
Wooden rails, no painting requirement	5
White painted sight rails	50
Sight rails plus reflective hazard markers	22
Sight rails plus bridge end markers	22
Total:	100

Our opinion is that underpasses should be protected and marked exactly as any other bridge, with the use of effective guardrails and bridge end markers to indicate the safe traffickable width. If possible, the traffickable width should not be at all constricted. As with at-grade crossings, we recommend the draft "Guidelines for Stock Crossings" as a suitable vehicle for publicising good practice and to help ensure more consistent practice.

Best practice reported by authorities included:

- Legal agreements covering construction, maintenance and removal of structures include for placing an Encumbrance on the titles of relevant land.
- Farmers own and maintain structures to Council inspection and requirements.
- Include stock underpasses in councils' bridge inventories and structural inspections.
- Relate minimum acceptable lengths of underpasses to specific clearances from carriageways.
- Require the same practice for the protection of road users as is applied to new bridges elsewhere on the network.

Urban Amenity Carriageway Surfacings

Transfund was concerned that roading asset managers' judgement may be over-ridden or that managers may be bypassed in Council's decisions on carriageway surfacings for urban traffic management schemes. From our interview surveys we concluded there is no general problem with surfacings having undesirable characteristics such as excessive smoothness being chosen for amenity reasons in urban areas, despite a small number of high profile problems having arisen in the past.

Beyond highlighting the need for "before and after" surveys of road safety changes when urban traffic management schemes are implemented, we have no further comment on best practice on this issue.

Conclusions

The management of traffic signs is clearly the area of major deficiency of those aspects of road corridor management reviewed in this survey. This includes the sign types included in the field survey (Regulatory, Permanent Warning and chevrons) and the reported use of Temporary Warning signs at stock crossings.

Over half of the specific signs installations inspected had deficiencies, indicating that inspection procedures for checking them are not particularly effective. Inspection procedures need to be reviewed generally and the levels of relevant knowledge of staff raised.

Of the range of warning devices available for use when at-grade stock crossings are operating, the flashing orange beacon has highest acceptability with farmers and is most likely to be used as intended. Councils prefer folding Temporary Warning signs, but there is good cause to think these are not as well used in practice. Best practice at such crossings has been achieved by a council that went to a lot of trouble to work with the farming community, providing guidance and advice.

Concerns about procedures for controlling the installation of vehicle entrances to private property and the use of amenity carriageway surfacings were not backed up by the survey findings.

Forward Action

Generally

Take note of the best practice identified in the survey reports and apply this progressively.

Reconsider policy towards the specification and use of warning devices for at-grade stock crossings and of safety measures at hazards associated with stock underpasses.

This Workshop Session

Consider possibilities for improving staff knowledge of correct traffic signs practice.

Discuss means of ensuring traffic signs are:

of the correct configuration,
in the correct location,
effective (including design of the installation and the siting of individual signs).

Discuss additions to the draft RCA Forum "Guidelines for Stock Crossings" that would help improve the standard of management of at-grade stock crossings and would help improve the standard of protection for road users at stock underpasses.

References

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