

Developing a Safety Management System for Road Authorities

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Biography

Bill recently rejoined the New Zealand Land Transport Safety Authority (LTSA) as Manager for the Safety Management Systems (SMS) project that is part of the New Zealand Governments Road Safety 2010 Strategy. This follows 18 years with the Christchurch City Council. His roles with the City included 5 years in Transportation Planning, a Local Government Study Award investigation of the road safety benefits of Local Area Traffic Management in the UK and a period as Area Traffic Engineer. Since 1998 he led the road safety functions of the Council as their Transportation Safety Engineer. In 2001 Bill received the 3M New Zealand Traffic Engineer of the Year Award for innovation in traffic engineering.

Abstract

As part of the development of a New Zealand Road Safety 2010 Strategy strong community support was evident for a structured approach to address road engineering safety issues. The method of achieving this was seen as through the adoption of SMS.

This paper describes what a SMS is, what are its benefits and what it should contain. The model used to implement “best practice” SMS within New Zealand (NZ) Road Controlling Authorities (RCAs) is also presented. This paper is intended to showcase and create discussion on the innovations in road safety engineering that have come out of a SMS development project involving NZ RCAs. This project is a key component of the NZ Road Safety 2010 Strategy. The project envisages all RCAs within NZ will operate a SMS by 2007.

1. INTRODUCTION

Despite the significant road safety benefits which can be delivered by properly targeted road engineering interventions, RCAs have no clearly expressed duty in NZ law to consider and implement measures to address road safety risk. In other countries road authorities have been taken to court for failing to take reasonable measures to ensure a safe road environment. To date this has not been the case in NZ, where accountability for safety performance of the local road network is weak.

An extensive consultative exercise was undertaken during the development of a NZ Road Safety 2010 Strategy (MoT October 2000). The consultation identified broad agreement on the development of a systematic road safety engineering management model as the best means of achieving safer road infrastructure. Analysis by the LTSA (LTSA 1998) during the development of the proposed national road safety strategy provided further support for this approach. The consultation findings (LTSA 2002) indicated that the community wished to see improvements in the safety of the road environment, and that RCAs supported the development of a structured approach to this through SMS.

In the early stages of discussion it was envisaged that the development and use of SMS by RCAs would be made a requirement via legislation. However, late in 2002 a decision was made that the use of SMS by RCAs would be purely voluntary (LTSA September 2002). To achieve

the willing compliance from RCAs a well-funded project team was established within the LTSA in December 2002.

2. SAFETY MANAGEMENT SYSTEMS

2.1 What is a Safety Management System?

It is the fundamental means of achieving the vision of a greater degree of consistency in how the national road environment appears to road users. A SMS:

- is a widely supported method of managing the road network to improve safety
- documents road safety strategies, policies, standards, procedures, staff expertise, management and audit systems of RCAs
- should be an integral part of the overall management system for the road network.
- ensures that RCAs decisions about construction, maintenance and management of the road networks lead to the achievement of clear safety targets

2.2 What are the benefits of a Safety Management System?

It is generally recognised that there will be safety advantages from using a systematic approach to the management of safety on the road network. The following are benefits that a SMS is expected to provide to a RCA and to road users:

- it ensures safety is considered in decisions about construction, maintenance and management of the road network
- assists in the achievement of targets and goals identified in the national and local road safety strategies
- ensures implementation of road management procedures will be consistent and efficient
- risk is managed and documented providing protection in the event of litigation
- road safety knowledge and expertise needs are documented and managed
- provides clear guidance for all staff and can be used for training of new employees
- development, review and auditing of the road network is undertaken in systematic way
- better safety for ALL road users

2.3 What does a Safety Management System contain?

- The strategic **direction** of the RCA including a vision and plans to achieve it. The RCAs partnerships used to deliver safer roads are also identified.
- The road safety engineering 'toolbox' of **delivery** including crash reduction studies, safety audits, data collection, adopted standards and guidelines. These are generally related to the RCAs road hierarchy, staff structure, roles and technical expertise requirements and are usually presented in tabular form.
- The management **control** systems and responsibilities for the SMS including road safety engineering processes that will be used.
- **Review/audit** regimes to ensure best practices are in place, are followed and being delivered for the road users.

This is illustrated in the following diagram:

Safety Management System Structure

RCA's Road Safety Strategy

Reference to or inclusion of current Safety Strategy and Action Plan.

Policies, Standards, Procedures and Guidelines

Reference to or inclusion of current Policies, Standards, Procedures Guidelines and for all safety related roading functions

Expertise, Qualifications, Experience

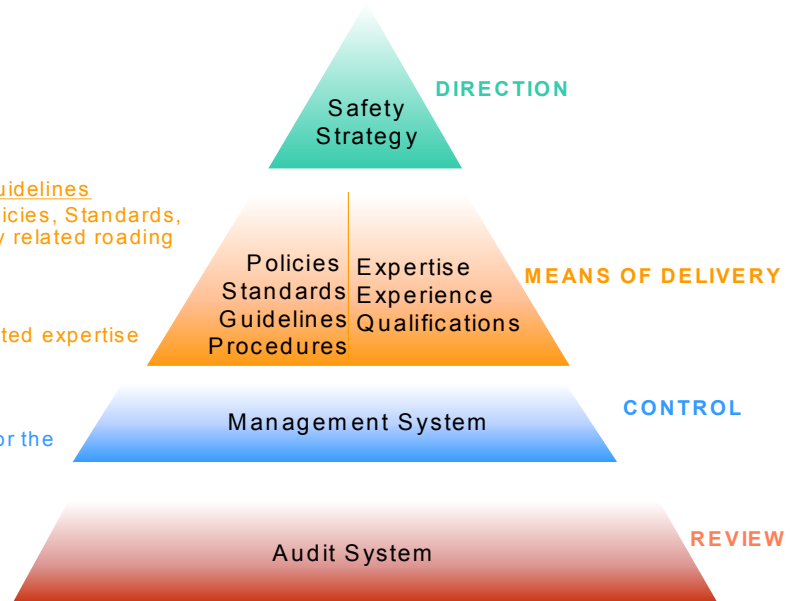
RCA's staff structure, roles, and associated expertise requirements

Management System

Processes used and Responsibilities for the Safety Strategy and SMS

Audit Regime

Performance Targets, Monitoring Audit and review processes



3. THE SMS DEVELOPMENT PROJECT

The NZ Government First Steps Programme (LTSA September 2002) provided funding to the LTSA for 17 projects in support of the Road Safety 2010 Strategy. In the engineering area a key component was the encouragement of RCAs to adopt SMS. Following the appointment of a project manager in December 2002 a project was established with the purpose *'to ensure RCAs decisions about construction, maintenance and management of the road networks lead to the achievement of clear safety targets'*. A plan to achieve the objective focused on five activity areas (Greenwood B January 2003). The five activity areas of the project are Marketing, Guidelines, Demonstration, Expertise Development and Evaluation.

3.1 Marketing

RCAs were encouraged to be involved in the project at presentations to various forums of road engineering professionals, transport planners and RCA decision-makers. A "Traveling Road Show" visiting the 4 main NZ population centers was especially effective in detailing the significance of road safety engineering and especially SMS in the government's proposed Road Safety 2010 Strategy and the NZ Transport Strategy (MoT December 2002).

3.2 Guidelines

RCAs were encouraged and assisted in the development of their SMS by two sets of guidelines.

1. *Interim guidelines for developing a safety management system (LTSA February 2003)*
2. *Trial issue Guidelines for developing a **safety management system** for road controlling authorities (LTSA May 2003)*

Both guidelines were produced under very short time constraints of 6 weeks from concept to published document. The “interim” guidelines used material from many previous research papers (Appleton I (2000), Cleal PM & Edgar JP (2001) and Cleal Peter & Croft Peter (2002) and the “trial issue” document utilised examples from existing RCA SMS (Transit NZ et al).

Following evaluation and subsequent amendment the document will be available for use by the remaining RCAs in New Zealand. It is planned to have all NZ RCAs operating a SMS by 2007.

3.3 Demonstration

Initially 22 RCA's participated with the LTSA in a voluntary SMS demonstration project. These RCA's acted as trials for further refinement of the voluntary approach sought by the NZ government.

The experiences of all the participants, including engineers from the RCA, Consultant, and LTSA, were recently reported to a review workshop. The experience gained will continue to be used to assist the other RCAs within NZ develop their SMS. The level of interest from RCAs within NZ suggests that more than two thirds of the 74 RCAs in NZ will have a SMS in place by mid 2004.

3.4 Expertise Development

By facilitating RCAs participation in the project gaps in expertise in the road engineering profession are being identified/confirmed. Documentation of the gaps is currently occurring along with identifying methods to address these gaps.

3.5 Evaluation

Audit/Review of the SMSs developed within the project and assessment of progress towards implementing a consistent safety management approach across the NZ road network will commence in early 2004. This evaluation will provide the basis for considering improvements to the SMS approach. Feedback workshops are also proposed to bring together personnel involved in SMS projects including RCA engineers, consultants and LTSA support staff. The results of these workshops will be reported to various conferences to encourage further participation by RCAs.

Specifically, the project has to date:

- Marketed the benefits of SMS to RCA's decision-makers.
- Developed SMS Guidelines to assist RCA's to develop their SMS.
- Fully supported 22 RCA's in the development of their SMS as a demonstration project.
- Identified safety standards and guidelines for road design and management for inclusion in RCA's own SMS.
- Conducted technical workshops with industry to develop and promote elements of the SMS.
- Outlined a model Road Safety Strategy for RCA's to use if required in the development of their strategy.
- Provided assistance to all RCA's wishing to develop their SMS.
- Identified the development of 'best practice' road safety engineering and management and disseminated the findings to NZ RCAs.

The project is now moving its main focus to evaluation of the SMS and safety engineering expertise development.

Specifically current project activities are focused on:

- Specifying general criteria for safety engineering expertise in SMS development and management and the training needed to reach this level of expertise.
- Conducting technical workshops with industry to develop and promote elements of the SMS.
- Outlining appropriate management and evaluation regimes for SMSs. Training needs will also be identified in this area.
- Developing procedures for understanding how the various components of SMS result in safety performance on the road network.

4. ROAD NETWORK PERFORMANCE MEASUREMENT

One other Road Safety 2010 Strategy project that is very closely aligned with and forms the future measurement basis for the SMS project is the Road Network Performance Project (LTSA October 2002).

Key components of this project include:

- Developing an agreed national functional classification system as the basis for managing the safety of the road network.
- Specifying a network safety performance evaluation process to quantify the benefits of the SMS approach to road safety.
- Survey and assessment of the existing network with regard to design standards and traffic management practice.
- Developing procedures for monitoring the safety performance of the road network
- Encouraging the adoption of best practice and consistently applied standards for each category of road hierarchy so we have a “no surprises” road user environment.

5. CONCLUSIONS

The SMS project is one of the key components of the New Zealand Road Safety 2010 Strategy. The potential contribution of the road-engineering sector to achieving safety benefits has been given greater emphasis in this national road safety strategy. For this contribution to be achieved and the benefits realised nation-wide it is important that road safety engineering expertise is applied as widely and as systematically as possible among the authorities responsible for road management. The principles and accepted best practice in road safety engineering also need to be implemented and managed within a systematic framework with clear safety goals. The paper describes the development of best practice in SMS and its implementation in many NZ RCAs.

The SMS developed, as a result of this project will be the chief mechanisms for delivering the expected safety returns from the road-engineering sector. There is a need to be able to quantify these gains. Like Safety Audit was in the past, SMS is currently an act of faith based on sound road safety engineering judgement. There is still development to be undertaken in terms of agreeing appropriate road safety standards, linked to a functional road classification system. Developing performance measures to quantify the expected road safety benefits should then be possible. The Road Network Performance Project is addressing this need.

It is anticipated that experienced gain from both these projects will assist the international consideration of SMS as a key road safety engineering innovation.

References

- MoT (October 2000) Road Safety Strategy 2010 consultation document
- LTSA (1998) Working Papers 2 The Safety Directions Development Programme
- LTSA (2002) Road Safety Strategy Consultation Report
- LTSA (September 2002) Road Safety Package – first steps towards 2010
- Greenwood, B (January 2003) "Safety Management Systems Project Plan Report to LTSA
- LTSA (February 2003) "Interim Guidelines for Developing a Safety Management System."
- LTSA (May 2003.). "Guidelines for developing a Safety Management System for Road Controlling Authorities."
- MoT (December 2003) Ministry of Transport New Zealand Transport Strategy
- Appleton, I (2000) "Safety Management Systems", Proceedings, Engineering for Road Safety Symposium, Rotorua
- Cleal, PM and Edgar, JP. (2001)"Safety Management Systems for Road Controlling Authorities", Proceedings, 20th ARRB Transport Conference, Melbourne
- Croft Peter and Cleal Peter (2002) "Road Safety Engineering: from principles to practice", Proceedings AITPM Conference
- Transit NZ et al, Transit NZ, Hamilton City Council, Rotorua District Council & Clutha District Council Safety Management Systems
- Hurunui District Council Road Safety Strategy 1999
- LTSA (October 2002) Road Network Performance Project Plan

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Keywords

Systematic Road Safety Engineering Management