

Road Safety Audits—Practice in Australia and New Zealand

**ROAD SAFETY AUDITS
INPUT ROAD SAFETY
ENGINEERING EXPERTISE
INTO DESIGNS FOR ROAD
AND TRAFFIC PROJECTS TO
MAKE THEM SAFER ONCE
THEY ARE BUILT. THIS
FEATURE PROVIDES
BACKGROUND
INFORMATION; REVIEWS
LEVELS OF ADOPTION BY
MAJOR ROAD AUTHORITIES
AND LOCAL GOVERNMENTS
IN AUSTRALIA AND NEW
ZEALAND; DISCUSSES
LEVELS OF EXPERIENCE
AND TRAINING REQUIRED;
AND EXAMINES CURRENT
ISSUES.**

BY ROBERT MORGAN, P.E.

INTRODUCTION

More than 15 years after the concept first was introduced, worldwide interest in road safety audits remains strong. Several papers on road safety audits will be presented August 7–10, 2005 at the ITE 2005 Annual Meeting and Exhibit in Melbourne, Australia.

What are road safety audits and why are they needed? *ITE Journal* readers in many jurisdictions may be familiar with the term, but others may not. According to ITE's *Traffic Safety Toolbox*, no one willfully sets out to design a road or intersection so that it becomes an accident blackspot.¹ All too often, however, a cluster of accidents will begin to occur in a location on a new section of road.

As a profession, transportation engineers have come to understand that this type of accident problem has more to do with inadequate design than poor driving. Admittedly, just prior to an accident, the driver (or pedestrian or rider) has made some kind of error. Road users do not, however, willfully set out to have crashes.

Therefore, given a cluster of accidents, what causes road users to make the same error? Why do they misjudge how to safely negotiate one section of road? They do it because something in the road design prompts them to make inappropriate responses.

Despite the best efforts of designers—all designers have an obvious interest in providing safe roads—either the road is not used as expected or the consequences of that use are different from what the designers expected.

Rather than waiting for the next accident blackspot to appear, it is now appreciated that it is better (less traumatic and cheaper for all concerned) for the problem to be removed from the design before it is built. For this to happen, designs need the specialist input of geometric road designers, traffic engi-

neers and experienced road safety engineers. The mechanism for achieving this is a road safety audit.

BACKGROUND

Road safety audits originated in the United Kingdom in the late 1980s, making use of extensive accident investigation and prevention (AIP) experience in that country and in response to the requirements of successive legislation for highway authorities to take steps to reduce the possibility of accidents on their roads. AIP teams in county councils, initially investigating accident problems on existing roads with great success, began using that experience to assess designs for new road schemes.

Formal processes were developed. In 1990, the Institution of Highways and Transportation published the first *Guidelines for the Safety Audit of Highways*. Six years later, those guidelines were revised.²

The introduction of road safety audits in Australia and New Zealand followed exchanges and visits by road safety engineers between these two countries and the United Kingdom, beginning in 1990. The first road safety audit guidelines were produced in 1993 in New Zealand and in 1994 by Austroads, the association of Australian and New Zealand road transport and traffic authorities.

In response to the significant increase in experience with and understanding of road safety audits in those early years, the Austroads guidelines were completely revised and republished in 2002.³ Unlike in the United Kingdom, road safety audits initially were applied to existing roads as well as to designs for new projects in Australia and New Zealand.

Although audits of existing roads continue in several jurisdictions, it is recognized that the greatest value of the process is the influence on enhancing the safety (and removing potential accident-causing elements) of new designs before they are built.

Several state and territory road authorities, plus Transit New Zealand (and, later, Transfund New Zealand), have issued policy manuals setting out how road safety audits are to be applied. In addition, other guidelines and manuals have been produced, including:

- *Road Environment Safety* (Roads and Traffic Authority, New South Wales, 1996)
- *The Ins and Outs of Roundabouts* (Transfund New Zealand, 2000)
- *Road Safety Audit Procedures for Projects* (Transfund New Zealand, 2004)
- *Stops and Goes of Traffic Signals: A Traffic Auditor's Perspective* (Land Transport New Zealand, 2005)

THE ADOPTION OF ROAD SAFETY AUDITS

Road safety audits are recognized at the government level as a valuable tool in reducing road trauma. Their use is recommended in the national road safety strategies of both Australia and New Zealand. Australian state and territory road safety strategies support their adoption and most state and territory road authorities have a high proportion of their own design projects audited.

Most Australian states have adopted a joint approach to road safety, involving the state road authority, (state) police, state motor vehicle insurance authority, motoring organizations and local government. With this encouragement, numerous local government authorities across Australia have adopted their own road safety strategies and plans. Many of these specifically adopt road safety audits in principle.

In New Zealand, the requirement for undertaking audits applies to all roads (both national and local government), although a project manager may choose not to undertake an audit, in which case the reasons must be stated and a declaration signed.

In Australia, the requirement typically applies only to state road projects or to local government projects that are fully or partly funded under particular state programs. Part of the reason is that local government in Australia tends to be less directed by government above in the areas of roads and traffic than in New



Figure 1. A road safety audit team prepares a report at a recent training workshop in Perth, Australia.

Zealand, although it is not independent to the extent of U.S. local government.

Consequently, the adoption of road safety audits is much more limited in Australian local government, although some individual local authorities are very active in their use of audits of designs and, to a lesser extent, of their existing roads.

For example, in Tasmania, the City of Clarence recently had all its existing roads audited. In western Australia, the creation of a road safety audit panel involving state, local government and consulting practitioners has had a marked, positive effect on the adoption of road safety audits in that state (see Figure 1).

Over the past decade, state road authorities have shifted from requiring that a certain percentage of their design projects be audited to the point where virtually all state road projects now are audited in most states. The more expensive the project, the more audits are undertaken through the development stages of the project.

Audits of land use development projects like shopping centers and residential subdivisions are increasing slowly. In Queensland, for example, audits now are required of major developments adjacent to state roads, to gain state road authority agreement.

ROAD SAFETY AUDITOR REQUIREMENTS

The need for some uniform level of training and experience, in part to protect the integrity of the term "road safety

auditor," was recognized at an early stage. At a summit meeting in 1997, all Australian and New Zealand road authorities and local government engineering interests agreed about training and experience requirements for people who wish to practice as accredited road safety auditors.

In most Australian states, there is a register of people who are accredited as either a senior road safety auditor (able to lead a road safety audit team) or a road safety auditor. An accredited road safety auditor shall:⁴

- Have a minimum of five years of experience in road design, traffic engineering, or a closely related road safety discipline;
- Have successfully completed a training course approved and recognized by the state road authority; and
- Certify that he or she has maintained current knowledge and experience in road safety auditing.

An accredited senior road safety auditor shall:

- Have all the above requirements; and
- Have participated in at least five road safety audits under the guidance of a senior road safety auditor, at least three of which must be feasibility or design stage audits and at least one of which must be a pre-opening or existing road audit.

Road safety engineering is largely an experience-based practice. The more

crash investigations and designs of effective remedial engineering treatments a practitioner undertakes, the better the practitioner is able to apply that experience to the audit of new designs.

Therefore, it can be seen that five years of experience is an absolute minimum for an audit team leader. For large or complex design projects—and especially for audits at the feasibility stage—it is acknowledged that 10 or 20 years of experience is more appropriate.

ROAD SAFETY AUDIT TRAINING

In 2000, Austroads published a syllabus and information guide for a national road safety engineering training course.⁵ The course covers the two parts of road safety engineering: road safety audits and crash investigation. One state has adopted the whole program as a five-day course; other states usually run the two parts as separate courses. The two course texts are the Austroads *Road Safety Audit* guide and the Austroads guide for treatment of crash locations.⁶

Most Australian states and territories have ongoing road safety audit training programs organized through the state road authority, local government engineering (The Institute of Public Works Engineering Australia), or both together. In New Zealand, audit courses are organized by Transit New Zealand as part of a five-day road safety engineering course. Australian audit courses vary, from a minimum of two days' duration to three or five days. The longer courses tend to be conducted once a year. In jurisdictions using a two-day course, they are usually held four times a year.

In the decade since they commenced, training workshops for road safety audits continue to be very popular. The reasons for this include:

- An increasing number of works programs require audits of designs to be included.
- Project managers and designers are attending to better understand how to hire the right auditors for a particular job and how to respond to auditors' reports.
- A common belief (not altogether well founded) that by simply undertaking an audit training course, any

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engineering practitioner is well on the way to becoming a road safety auditor.

- The general increase in awareness of the importance of road safety among practitioners.

All courses involve actual road safety audit practice, including daytime and nighttime inspections. For those who have been unable to maintain their accreditation, New South Wales has introduced a one-day refresher course.

CHECKLISTS

Checklists are used as a prompt to help auditors identify potential safety issues in a design. They are particularly useful for less experienced auditors. The checklists provided with the Austroads audit guide are detailed compared with the checklists developed in the United Kingdom.

There is a risk that inexperienced practitioners (whether auditors or clients) might regard an audit as nothing more than a process of "checking off the checklist." The Austroads guide warns against this and recommends that the checklists not be appended to an audit report, so that the focus is on the safety issues identified and documented in the report.

Nonetheless, checklists are useful. Checklists in the Austroads guide cover each stage of project development (feasibility, preliminary design, detailed design and pre-opening) as well as audits of roadworks traffic management and audits of existing roads. Other checklists also have been developed, including railway level crossings, shared cycle/pedestrian paths and streets around schools (all by Main Roads Western Australia) and audits for motorcycle safety.⁷

STANDARDS OR SAFETY?

A road safety audit is not a check of compliance with standards. It is an assessment of a design's likely level of safety once it is built and operating. In other words, it is a check of its fitness for purpose. This point still is not well understood in many quarters. Checking a design's fitness for purpose requires professional judgment by people with road safety engineering skills; it requires experience. This is a far less comfortable place than the firm and familiar walls provided by standards.

Complying with all the relevant standards—although an important starting point in any design—is no guarantee of safety. Current issues regarding standards and safety include the following:

- Less experienced auditors tend to audit against standards more than experienced auditors.
- When project managers respond to an audit team's report, the response that "it is safe because it meets the standard" continues to be used too often. Consequently, some genuine safety issues are not dealt with effectively.
- Every audit team needs sufficient road safety engineering experience.
- Many more project managers need to undertake road safety audit training to respond to audit teams' reports more effectively.
- There is a risk that, in the hands of inexperienced auditors, computer-based expert systems for auditors will lead to more focus on standards compliance than on risk assessment.

SOME OTHER AUDITING ISSUES

- One positive result of road safety audits is that designers are becoming more aware of safety issues during design. Some use audit checklists to help them with their designs, even before an audit is undertaken.
- Despite the many hundreds of practitioners who have undertaken road safety audit training, experienced and skilled auditors are lacking in most jurisdictions. The challenge will be to encourage upcoming engineers who have an aptitude for this work and to provide them with enough opportunities to gain vital experience.
- Some “design and construct” contracts struggle to deal effectively with road safety issues. If the cost of rectifying design deficiencies rests with the contractor, road safety audit findings sometimes are dismissed.
- The selection of auditors too often continues to be based on price. The inference is that all potential auditors are as good as each other, whereas the most effective audits are those where the audit team’s skills match the needs of the project.
- Many project managers continue to struggle with how to effectively respond to audit findings. Tools like ARRB Group’s Road Safety Risk Manager can help them make decisions based on risk, rather than resorting to standards compliance.
- In Australia, the big area for future uptake of road safety audits is local government. State programs have made some local authorities more aware of the process, but it has yet to be adopted as a routine practice.
- In New Zealand, where local authorities already are obliged to have their road and traffic designs audited, the cost of undertaking audits is an issue for smaller authorities. The experience in Australia is that if several designs can be audited as a package, costs can be reduced.

These and other issues show that challenges still lie ahead for road safety auditing in Australia and New Zealand. The benefits of road safety audits have been well documented.⁸ The biggest challenge is applying

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these benefits effectively to all road and traffic designs as a matter of routine.

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