

Austrorods Experience with Road Safety Audits

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Abstract:

Austrroads published its world famous Road Safety Audit Guide in 1994. Since then it has been at the forefront of the development and promotion of road safety audit world-wide. In this paper the author discusses some of the Austrroads activities.

- *In May 1998 Austrroads hosted the first International Road Safety Audit Forum. It became known as IRSAF. That Forum prepared a 10-point communiqué, which is given in full in this paper.*
- *In July 2001, the Austrroads hosted a Road Safety Audit Summit for the road authorities in Australia and New Zealand. The outcome of that Summit is described in this paper.*
- *Revision of its 1994 guideline – Austrroads published the second edition in 2002*
- *Evaluation of the safety benefits of road safety audit – the research demonstrates that road safety audit is highly cost-effective*
- *Development of a methodology for assigning a risk factor to audit recommendations – the methodology is called the “Road Safety Risk Manager” and it is proving to have a much wider application than just road safety audit.*
- *Development of an “expert system” to help the audit process*
- *Development of a National Road Safety Engineering Training Course, which has a Road Safety Audit component.*

These are described in detail. While a brief introduction to road safety audit is provided, this paper does not describe road safety audit in detail. Readers should refer to the second edition of the Austrroads Road Safety Audit Guide for a comprehensive description of the audit process.

Introduction

What is Austrroads?

Austrroads is the association of Australian and New Zealand road transport and traffic authorities whose purpose is to contribute to the achievement of improved transport outcomes. A profile of Austrroads is provided at the end of this paper.

What is Road Safety Audit?

Road Safety Audit had its origins in the United Kingdom in the 1980s, following the development of Accident Investigation and Prevention (AIP) techniques and 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, from initially investigating problems on existing roads with great success, turned their attention to preventing accidents on new road schemes. Formal processes were developed and in 1990 the Institution of Highways and Transportation published its Guidelines for the Safety Audit of Highways. Those guidelines have since been revised.¹

Keen interest in road safety audit in New Zealand and Australia through the 1990s has now been followed by interest in parts of Europe, North America, Asia and South Africa.

Definition

A road safety audit is a formal examination of a future road or traffic project or an existing road, in which an independent, qualified team reports on the project's crash potential and safety performance ².

Road safety audit has the greatest potential for improving safety and is most cost-effective when it is applied to a road or traffic design before the project is built. It can be conducted on any design proposal that involves changes to the ways road users will interact, either with each other or with their physical environment.

It is a formal process using a defined procedure. To be effective it must be conducted by people who have appropriate experience and training, and who are independent.

Road safety audit needs to be a routine and common practice, in the same way as independent structural checking or benchmarking is a routine and common practice.

When a road safety audit is conducted, the designer of the new project remains responsible for the design. He or she, as a matter of good practice and as part of a quality management approach should make regular, informal checks of the physical safety of a design as it progresses. Road safety audits do not alter the need for this "safety first" amongst designers. The road safety audit process provides, at regular intervals, for an independent assessment to be made by a team specifically skilled in the areas of accident prevention and road safety engineering. That assessment and its recommendations are then considered by the client and/or the designer.

The remainder of this paper describes the Austroads activities and research projects on Road Safety Audit.

International Road Safety Audit Forum (IRSAF)

An International Road Safety Audit Forum was held in Melbourne on 11-12 May 1998 ², to facilitate discussion on a wide range of key issues in road safety audit. The Forum, convened by Austroads, attracted 180 road safety professionals from 14 countries who adopted the following policy position on the road safety audit process.

Reducing road trauma

Practitioners managing the road network are concerned to ensure that accidents and casualties are contained as the network develops. Proven techniques and standards which guide road design and traffic management are therefore applied. Road safety auditing is one basic technique used in this approach.

Specialist safety checks

Road safety audit is a process for examining any road or traffic project using an independent, qualified and experienced team which reports formally on the safety issues of that project. Road safety audit involves a specialist review of relevant designs or the existing road network against safety principles. It is more than a compliance check against standards.

Prevention is better than cure

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A vital design tool

Road safety audit is a vital tool in road safety engineering. It is a proactive approach that needs to be part of the design process from start to finish, the earlier the better. It is complementary to other reactive initiatives such as accident investigation and blackspot review programs.

Benefits are substantial

Road safety audit is a low cost and effective tool which brings savings in project costs, and reductions in accidents and casualties. It results ultimately in improved design standards and management practices, ensuring a higher level of safety in the road environment.

Commitment breeds success

The success of road safety audit depends on a strong commitment to the process from leaders and decision-makers in road authorities. It must be part of corporate policy, integrated within quality management systems and include set procedures for dealing with audit findings.

Training and experience are essential

Road safety engineering practitioners must be trained in the road safety audit process, and a register of qualified auditors established. Qualifications must include relevant technical expertise, training, experience, and currency in road safety audit practice.

Spreading the word

The value of road safety auditing must be actively promoted throughout the road design, traffic management and road safety disciplines, to encourage its adoption by national and local road authorities worldwide. Common guidelines on road safety engineering principles and safety audit will assist in implementing the process.

Improvements are needed

Road safety audit continues to evolve. Monitoring and evaluation of the process and its findings must continue so that road safety engineering practice can be further improved. Research into the processes, methods and effectiveness of road safety audits must be encouraged and supported.

Learning from each other

Road safety audit can help to reduce the increasing road toll in developing countries. An international network of road safety engineering practitioners will help to disseminate information on the safety audit process and findings, and to promote the value of this in road safety management.

The Forum endorsed the position expressed in the above statements, as the basis for promoting and advancing road safety audit worldwide as an essential element in road safety management.

AUSTROADS Road Safety Audit Summit 2001

At the February 2001 Austroads Road Safety Engineering Reference Group meeting, it was agreed to pursue a second national forum to discuss developments in road safety audit in Australia and New Zealand.

The Summit was held in Brisbane (Queensland Main Roads), on 12th – 13th July 2001.

Issues discussed included:

- * international developments;
- * training procedures;
- * registration / accreditation systems;
- * agency policies and procedures; and
- * the future of road safety audit in Australasia and its use by other road authorities.

The Summit concluded that Road Safety Audit is a valuable tool in the overall management of the road system, through the identification and treatment of hazards in road projects and the existing road network.

Delegates at the Summit urged that Austroads continue to support the widespread use of road safety audit by State and Local Government road authorities, and that the matters raised during the Summit be addressed by Austroads in its member agencies.

International developments

The Summit agreed that there is a need to promote Road Safety Audit internationally, and that Austroads has a role in the promotion / coordination of the second International Road Safety Audit Forum, otherwise known as IRSAF2. However, this should not be at the expense of other Austroads projects. IRSAF2 should be pursued through partnerships with PIARC, Global Road Safety Partnership, or aid agencies.

Revision of Austroads guide

The Summit noted the imminent reprint of the revised Austroads Road Safety Audit Guidelines and agreed that the document should be widely promoted.

With regard to the use of the term “audit” in relation to Stage 5 (Existing Road) investigations, the Summit agreed that the Guide should reflect the use (in practice) of both “audit” and “review” terms, and the following amendments were supported in principle.

- The road safety audit process can be applied to the existing road network - either in a route specific manner (which yields detailed safety issues) or in a network wide manner (which yields more general safety issues).
- The audit process when applied to existing roads is sometimes given a different name to emphasise the difference between design stage audits such as a review or assessment (eg road network review or road safety assessment). The critical issue is that an independent assessment is made against objective criteria.
- Throughout this guide the term road safety review is used but readers are advised that other terms are equally applicable.

Other issues resolved included the need to promote difference between an audit of an existing road and a maintenance review.

The Summit agreed that the audit / review of existing roads must be undertaken in the context of the road safety audit model, with a particular emphasis for:

- * The accreditation of those undertaking the audit / review;
- * The independence of those undertaking the audit / review;
- * The audit / review should be a formal process and documented accordingly.

Policies

The Summit noted that most Australian States and New Zealand have established policies and procedures for the implementation of road safety audits. The development of policies by other jurisdictions (including local Government) should be encouraged. The development of Road Safety Audit policies should link with other Road Safety Strategies / Action Plans that may exist.

Registration / accreditation

The Summit agreed that Road Safety Auditors should be registered on a State by State basis, and that the actual arrangements for each register can be managed within each jurisdiction.

It was agreed that the register should reflect the auditors accreditation as an auditor, based on the core requirements established at the 1997 Summit, and jurisdictions were encouraged to implement systems to maintain an accurate register of auditors,

Similarly, the registers should identify senior auditors, based on the requirements previously established.

The Summit did not support the development of competency based standards at this time. Notwithstanding, the models being developed and implemented in Western Australian and New South Wales were noted with interest. This matter should be kept under review, and the Summit recognised that, in the future, a more comprehensive and self funding registration system may be needed.

Importantly, the Summit emphasised that road safety audit registers must identify individuals that have been accredited, and not organisations that they represent.

Training

The Summit agreed that the minimum core components of training were still appropriate, and that each jurisdiction is complying with the requirements.

The Summit reaffirmed that the purpose of the training courses are awareness of the road safety audit process, and that the courses are only part of the overall accreditation process.

Other associated training should be encouraged by the jurisdictions and Austroads including:

- * Road Safety Engineering
- * Blackspot investigations
- * Road side hazards and the use of crash barrier
- * Road work sites
- * Risk assessment / management
- * The preparation of response action reports.

Learning from experience

The Summit agreed that Austroads should encourage the development and implementation of procedures suitable for each jurisdiction that ensure that outcomes of audits are addressed.

The Summit recommended that Austroads consider research to examine the outcomes of road safety audit and identify implications for road engineering standards and guidelines.

It was also agreed that authorities should be aware of matters which need to be addressed as indicated by road safety audit activities for referral to Austroads RS Program Manager for referral to relevant Reference Groups for action

Local government involvement

The Summit noted, with some disappointment, the apparent low take-up of road safety audit principles within Local Government.

The Summit recommended that Austroads should consider undertaking research to determine Local Government needs for Road Safety Audit and barriers to take-up. This could involve an extensive questionnaire / survey of local government throughout Australia.

Austroads should continue to promote the benefits of Road Safety Audit through Local Government.

Austroads should encourage the development of Local Government Road Safety Audit policies (similar to Western Australia).

Associated developments

The Summit concluded that Austroads should widely promote the outcomes of current research into the benefits associated with road safety audits.

Austroads should encourage conduct of road safety audits on land use development plans eg Local Government Authorities could require as part of development application.

Further consideration is required into the management of road safety audits as part of design-construct contracts.

The full report of the Summit is available on the Austroads Website www.austroads.com.au

Road Safety Audit Guide (2nd Edition)

Austroads works towards uniformity of practice in respect of design, construction, maintenance and user aspects of the Australasian road system and, with this in view, publishes guides and general procedures.

These guidelines for road safety auditing draw together current practices in Australia, New Zealand and elsewhere. They provide practitioners and decision makers in State highway authorities, local government authorities and consulting practices with ways of formally addressing road safety issues.

This second edition of the Austroads guidelines³ reflects the knowledge and experience gained around the world since the first edition was published in 1994, including much of the material shared at the Austroads International Road Safety Audit Forum held in Melbourne in May 1998.

The significant changes incorporated into this edition include:

- The audit of designs is the main focus of this guide, although the audit of existing roads is covered.
- Numbering of the stages of audit has been removed, as agreed at the May 1998 forum.

- Audit of roadwork traffic schemes and audit for particular road user groups has been added.
- Audit of land use development has been expanded.
- There is specific advice about ‘following up’, after the audit report is received.
- Relationship between audit, accident investigation and maintenance is explicitly addressed.
- There is advice on getting audits started in an organisation.
- Alternative report formats are described in the case studies.
- Auditor experience requirements have been expanded.
- There is now a quantitative information on costs and benefits.
- Advice is included on how to frame recommendations and how to frame responses.
- When ranking audit recommendations, the terms ‘for Immediate Attention’ has been altered to ‘Urgent’.
- The term ‘Design Draft’ (the old stage 2) has been changed to ‘Preliminary Design’.

These guidelines are intended to provide principles and advice on good practice. They are to be used with discretion and judgement and to be complemented by experience. The rigorous application of the checklists is no substitute for experience or the committed application of accident prevention principles.

The Austroads Road Safety Audit (Report AP-G30/02) is available from:

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Evaluation of the proposed actions emanating from road safety audits

The Road Safety Audit process is designed to pro-actively improve road safety through formal independent review of designs and inspections of new and existing roads and traffic operation plans.

In recent years, road authorities in Australia and New Zealand have recognised the potential of Road Safety Audit as a means of preventing crashes or reducing their severity, and have embraced the process as an effective road safety tool.

As Road Safety Audit has developed in Australasia and overseas over the past decade, the process has been subject to monitoring and review. However, there has been no evaluation of the expected safety benefits of Road Safety Audit in Australasia. As safety practitioners seek to minimise road trauma, it is important to know what ‘value for money’ Road Safety Audit can deliver.

In order to identify and measure the benefits achieved by Road Safety Audit in Australia, Austroads commissioned ARRB Transport Research to undertake a major investigation to determine the economic value of Road Safety Audit. The key tasks of the study were:

- to review recent international literature;
- to develop an appropriate methodology enabling the benefits of Road Safety Audit to be estimated; and
- to apply this methodology to a variety of detailed design stage audits and existing road audits.

Literature review findings

In general, the literature suggests the Road Safety Audit process is cost effective. While a number of reports quote various qualitative benefits of Road Safety Audit such as safer roads, better design practice and reduced whole of life project costs, only four studies were identified where the economic benefits of Road Safety Audit have been quantified.

- Surrey County Council in the UK ⁴ undertook a study of 19 audited and 19 non-audited traffic schemes. Comparisons were made between the casualty crash reductions achieved as a result of the projects. For sites with audited schemes, the average number of casualties dropped 1.25 per year (from 2.08 to 0.83) while the change in casualty crashes at the unaudited sites dropped by only 0.26 per year (from 2.60 to 2.34).
- The UK Highways Administration commissioned a study ⁵ of 22 trunk road projects audited at the design stage. The project considered the cost of implementing the audit recommendations after construction was complete as opposed to addressing them at the design stage. The average saving from implementing changes at design stage was £11,373.
- In Denmark, a study was undertaken on 13 projects utilising crash prediction methods to estimate expected crash rates had road safety audit recommendations not been implemented at the design stage. The results of the analysis demonstrated a first year rate of return of 146% ⁶
- A study in Jordan ⁷ focussed on investigating newly constructed sites with demonstrated crash problems. The study considered the potential benefits had the sites been audited, assuming the audit would have identified the underlying safety problem and the changes made at the design stage. Based on these assumptions the first year rate of return of conducting design stage audits was estimated to be 120%.

Methodology for estimating the benefits of road safety audit

The approach taken to evaluate Road Safety Audit has focussed on quantifying the benefits and costs of the proposed actions that have emanated from deficiencies identified through the audit process.

Following assessment of the various options available, the development of a method based on the use of the Austroads *Road Safety Risk Manager* developed by ARRB Transport Research was progressed. The *Road Safety Risk Manager* allows an assessment of the risk of a wide range of hazards and their associated treatments to provide a measure of the risk reduction potential of particular actions.

To enable an evaluation of the economic benefits of Road Safety Audit a method to equate risk reduction to monetary benefits was required. This was achieved through consideration of a sample of projects from the 1995/96 Transport Accident Commission (TAC) Blackspot Program in Victoria.

The analysis involved using the *Road Safety Risk Manager*, to calculate the expected risk reduction for each blackspot project. Actual before and after crash statistics were then evaluated to determine the actual crash savings that occurred as a result of the treatment. Reduction in risk was then equated to the actual project benefits realised to give the benefit in crash savings per unit of risk reduction.

The outcome of the analysis was an equivalent valuation of \$20 in safety benefits for each unit of risk reduction achieved.

Benefits of road safety audits

In evaluating the proposed actions emanating from road safety audits a significant level of estimation has been required to predict the crash savings accrued. Individual audits also vary considerably in the number and crash cost reduction potential of the issues that are identified. As a result, the valuation of benefits identified in this project should be considered indicative and not definitive. A sensitivity analysis of key assumptions has been undertaken and the results reported.

In considering the proposed actions only the safety related benefits have been quantified. The study has not included an analysis of the wider economic implications of the proposed actions. When developing a works program based on audit findings an asset owner should ensure actions taken work in synergy with other transport objectives, and where required undertake a full economic evaluation of proposed treatments.

The evaluation of recommendations emanating from **design stage audits** resulted in the following findings:

- Of the nine design stage audits assessed, the benefit cost ratio (BCR) of implementing the recommendations from individual audits ranged from 3:1 to 242:1.
- Individual recommendations within the design audits exhibited BCRs between 0.06:1 and 2,600:1.
- Over 90% of all implemented recommendations had BCRs > 1.0.
- Approximately 75% of all implemented recommendations had BCRs > 10.
- The majority of design audit findings required only very low-cost responses (65% of recommendations had a cost < \$1,000). Of these low-cost responses 85% had BCRs > 10.

The evaluation of the proposed actions emanating from **existing road audits** resulted in the following findings:

- The analysis of a range of existing road safety audits indicated BCRs between 2.4:1 and 84:1, when considering the value of completing the proposed actions identified in response to the audit findings.
- The BCRs of individual proposed actions within the existing road audits ranged between 0.003:1 and 460:1.
- Over 78% of all proposed actions had BCRs > 1.0.
- Approximately 47% of all proposed actions had BCRs > 5.0.
- Over 50% of all proposed actions had a cost < \$5,000. 87% of these actions had BCRs > 1.

The completion of design and existing road safety audits will also result in many qualitative benefits. In addition to the safety related benefits of pro-actively identifying and treating specific hazards at the design stage, or on the existing road network, the asset owner should also consider the other benefits of the audit process, including:

- identification of improved design, construction and maintenance standards that influence safety performance on an ongoing basis;
- the role the audit plays in improving the general road safety awareness of operational staff; and
- the role the audit plays in providing the designer/asset owner with confidence in the safety performance of the proposed project or road network.

An important element of the audit process is the recognition that an audit with no deficiencies identified will still retain significant value in providing assurance of safety. As with all audit processes an audit with no deficiencies identified is a positive and desirable outcome.

Recommendations

While the study was restricted to a finite number of audits, a variety of deficiencies and associated treatments emanating from road safety audits was assessed. The findings confirm the current belief that the audit process is a valuable and beneficial process in maximising the safety of the road network and minimising road trauma.

Key recommendations from this study are:

- The road safety audit process should be supported and progressed. In addition to the qualitative benefits that can be realised, the return on investment of implementing Road Safety Audit is high.
- The focus of asset owners should be on identifying the audit recommendations that are most likely to return high value and investing funds in the appropriate treatments. Budgetary constraints may not allow all recommendations to be treated, however this study has highlighted that with a targeted approach to addressing audit findings the reduction in road trauma can be maximised.
- The road safety audit process as it relates to the design stages of a proposed project should be encouraged and implemented for all projects. Regardless of the planned project cost, the audit process has the potential to identify deficiencies and associated treatments with a significantly high return on investment. This is equally possible for minor and major projects.
- Documentation of the responses to audit findings should be made high priority by all asset owners. Development of tools that facilitate the traceability of audit findings, assessment of audit findings and corrective actions undertaken should be further investigated.

Reduction in road trauma is a key challenge facing society. Whether through a reduction in exposure, removal or reduction of the mechanisms that lead to a crash, or through treatments that reduce the severity of crashes, road safety audits are a valuable tool available to road safety professionals.

Road safety risk manager

Managing road safety risk is now, more than ever, a critical function of road asset owners. The ARRB Transport Research and Austroads developed *Road Safety Risk Manager* will provide authorities with a powerful tool to manage, prioritise and track the status of road safety issues on their networks.

Road safety practitioners have expressed a need to have more confidence in prioritising road safety engineering treatments. These treatments can be generated through standard road safety programs, black-spot assessments, community initiation, road safety audits at the design stage or for reviews on existing road sections.

The *Road Safety Risk Manager* process has been developed to provide road safety professionals with a tool to proactively assess road safety hazards and treatments for the purpose of prioritising actions. The tool adopts a risk management approach, with the ultimate aim of maximising the risk reduction on the road network for a given budget. The primary outcome of the research is the *Road Safety Risk Manager* software.

In 1998 AUSTRROADS commissioned ARRB Transport Research to develop a procedure to

rank the recommendations emanating from the road safety audit of existing roads. Based on the findings of this project the risk management approach to prioritising road safety treatments was developed.

The process is based on the measurement of risk as a function of exposure, likelihood and severity, and provides users with the ability to analyse the hazard risk and the treatment risk reduction for 57 different types of deficiencies, across a variety of different road types and severity outcomes. Following inclusion of treatment costs, the derived risk-cost ratio forms the basis of prioritising the proposed works. During initial testing it became evident that the process could be applied to all road safety treatments and not just those emanating from road safety audits.

To facilitate a trial of the process a spreadsheet based prototype was developed and provided to Australian and New Zealand road authorities. This early version of the software provided a quick and simple means of applying the methodology to a particular road safety hazard or treatment.

This version was trialed for a period of 18 months to ensure the risk based approach was appropriate for the issues being considered. Feedback from these trials was incorporated into the methodology and the comments on the prototype software used to form the basis of the functional specification for the *Road Safety Risk Manager* software.

The current software provides a user friendly computer based system that can be used by auditors, investigators, project managers and asset owners. After appropriate training and site information, the tool allows the assessment of individual hazards and treatments in under 10 minutes. With reporting and budget analysis tools the software can meet the specific needs of risk identification, risk management and the development of remedial treatment programs.

Exporting and importing functions also allow the development of local area programs at the regional level, which can be easily incorporated into a state-wide or federal program such as the 'black-spot' initiatives. This allows the comparison and prioritisation of actions in a consistent manner across the program, providing a targeted approach to funding those engineering treatments most likely to maximise the reduction in road trauma.

The *Road Safety Risk Manager* represents a new and innovative approach to prioritising a wide range of road safety treatments. As road safety practitioners gain a better understanding of the road safety problem from a risk perspective, the models and methods within the *Road Safety Risk Manager* can be constantly improved over time.

For further information on the *Road Safety Risk Manager* contact ARRB Transport Research at rsm@arrb.com.au

Road safety audit expert system

The specifications for the computer based "expert" system, the Australian Road Safety Audit Advisory System, were completed in January 1999 by ARRB Transport Research. This was an Austroads' project to develop a nationwide version of the NSWEASy Audit⁸.

ARRB Transport Research, for Austroads is currently taking these specifications and creating an operational program for all practitioners in Australia and New Zealand. It has been dubbed SAFAR, the Safety Advisor For Auditing Roads.

This computer program allows the user to move through the requirements of the Austroads' road safety audit process. The program prompts the user with questions. At each question, the user can indicate either, yes - a safety issue related to the question has been identified, no - there is

not a safety issue present, or that the question is not applicable.

Where safety issues exist, the user can then enter more detail about the problem. Once the requirements of the audit have been addressed, the user can print out a report either indicating the answer to all the questions, or a summary report of the questions and comments where safety issues have been identified.

The program will also contain guidelines from each road authority. For each question, the relevant section of the guidelines will be available to the user to determine whether an element of road design meets the recommended requirements. Each state authority will have access to their own and Austroads guides, but with other state guidelines also available, comparisons of guidelines will also be possible.

SAFAR will be a powerful tool for all road safety auditors. With all Austroads checklist questions available, and the connection to relevant guidelines, auditors can ensure that every audit completed is thorough and complete.

Training

Austroads has published a report titled ‘National Road Safety Engineering Training Course’⁹. It contains a Syllabus and background information for Course Notes and Presenters.

The purpose of the document is to set out a framework for a road safety engineering training course, which may be consistently applied nationally, with opportunities to be adapted and applied internationally.

Purpose of the training course

The purpose of the training course is to provide engineers and other professionals with training, which they may combine with relevant road safety engineering experience, so that they may become more effective in road safety engineering. In doing so, these engineers may develop as accident investigation engineers and/or road safety auditors.

The course will provide road designers and project managers with an understanding of safe road design, the treatment of crash locations and the road safety audit of road and traffic designs.

It is expected that this course will only be available through appropriately skilled training establishments. It is expected that, after the workshop, participants will be able to:

- Appreciate the role of engineering in road safety
- Assist with accident investigations
- Assist with road safety audits
- Understand some of the technical issues involved in good road safety engineering practice.

Timetable structure

The course is based on a five day workshop style of format, with three days generally available for accident investigation and reduction (otherwise known as the treatment of crash locations) and two days generally available for road safety audit training.

Availability of training courses

Several training courses for road safety audit are available in Australasia, most of which reflect the road safety audit content of the Austroads syllabus. Courses are presented in most Australian States, based on an agreed core content, and range from 2 days to a week in duration. In most instances, the courses are presented under the joint auspices of the State road agencies

and professional or practitioner institutions.

For example: in 2002 Vicroads (the state road controlling authority in Victoria) has a programme of three training courses. The next one is in October, 2002. The Workshop Manager is John Coles – contact jecoles@bigpond.com.

In Western Australia the Institute of Public Works Engineers of Australia (IPWEA) run a 3 day Road Safety Audit Training Course each year. The next one is in August 2002. Contact Brian Kidd email brian.kidd@mainroads.wa.gov.au. At the last course in Bunbury a delegation of 20 engineers from Thailand attended.

In New Zealand, there is the long-established annual Road Safety Engineering Workshop, which reflects the content and format of the Austroads course, and is supported by the national road and transport agencies. The contact for course details is Stuart Fraser email stuart.fraser@transit.govt.nz

The Austroads National Road Safety Engineering Training Course (Report AP-R171/00) is available from:

ARRB Transport Research Ltd, Australia
Book Sales,
Tel: +61 3 9881 1547
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