LECTURE A8 – ROAD SAFETY AUDITS

CONTENTS

Introduction

The Elements of a Road Safety Audit

The Need for Road Safery Audits

The Phasing of Road Safety Audits

The Road Safety Audit Methodology

The Checklist

Some Practical Hints on Conducting a Site Inspection

INTRODUCTION

This section deals with the requirements for Road Safety Audits as contained in the South African Road Safety Audit Manual (SARSAM), May 2012, published by the Road Traffic Management Corporation. Furthermore, before safety audits are undertaken there must be budget provision to implement the recommendations as they are now compulsory for all road authorities.

Audits need to be undertaken in respect of roads planned or that are already built. In the latter case, the process leads to the instigation of some or other remedial action on the basis of a report compiled by the audit team.

INTRODUCTION

The road safety audit applies practical safety experience to the project to ensure that:

- Unsafe features are not introduced; and
- Safety features are built in

The objectives of road safety audits are to:

1. Ensure high levels of safety on new road projects
2. Reduce the whole life costs of projects
3. Minimise accident risk on the adjoining network
4. Promote the safety of all road users
5. Promote road safety engineering

THE ELEMENTS OF A ROAD SAFETY AUDIT

A road safety audit is defined as a **formal examination** of an existing or future road project in which an **independent qualified examining team** reports on the project's crash potential and safety performance. It takes technical skills, mixes these with sound judgement and considers the safety of all road users and generates a written report.

The highlighted words in the definition demand further consideration.

THE ELEMENTS OF A ROAD SAFETY AUDIT

(a) Formal examination implies that the audit is not a rough and ready check. It follows a set procedure discussed further below.

(b) In the same way that a writer cannot effectively edit his or her own work, the audit must be carried out by a team that is independent of the design team. It is important that "fresh eyes" view each project.

(c) The examination team has to have appropriate experience and training. The reason for this is that the audit is not simply a design check against current design standards and procedures. If it were, anybody armed with the latest design manual would be able to carry out the audit. The team must have knowledge and experience beyond that reflected by current manuals.

THE ELEMENTS OF A ROAD SAFETY AUDIT

This last requirement is confirmed by the SARSAM that states that the members of the audit team must have:

i) expert knowledge in road safety engineering with at least three years of experience;

ii) at least conducted at least five road safety audits under a Lead Road Safety Auditor

iii) conducted at least one road safety audit annually

A problem in South Africa is that accident investigations and road safety audits are still in their infancy with regards to the procedures set out in the SARSAM, particularly with regards to Lead Road Safety Auditors.

THE ELEMENTS OF A ROAD SAFETY AUDIT

In consequence, relatively few persons in South Africa ever get involved in road safety audits and the possibility of others ever gaining experience in road safety audits is restricted.

The road safety audit must report only on the accident potential and safety performance of the project. No other norms and criteria such as economic or social benefits are applicable, and comment may not be made on the desirability of the project on the basis of such considerations.

THE NEED FOR ROAD SAFETY AUDITS

To repeat: It is not the function of a road safety audit to check a project against compliance to standards. If a road has a high crash potential, this can be attributed to one of only two things, being:

1. Insufficient attention being given to traffic safety during the design process; and

2. The use of design standards or combinations of standards that are inadequate and unsafe.

Many engineers firmly believe that complying with standards result in designs that are safe. Prof Ezra Hauer points out that safety is not an absolute.

THE NEED FOR ROAD SAFETY AUDITS

If it were an absolute, this would imply that it is not possible to ever have a crash or even a slight mishap on the road. A road can always be made more or less safe than it currently is; it cannot be made safe.

Some reasons why “standards do not necessarily equal safety” include

Standards often reflect what is considered economically justifiable at the time they were established – they reflect value judgements that can, and often do, change with time

Standards reflect what we currently know and, as we learn more, standards can lag behind

THE NEED FOR ROAD SAFETY AUDITS

Standards are developed for a variety of reasons that may have little to do with safety, e.g. cost or capacity

Standards usually cover simple or common situations and not all situations

A designer may inadvertently use an inappropriate or an outdated standard

Individual road elements, designed to standard may be quite safe in isolation but, when combined with other standard elements, may lead to a significant number of users making errors

Standards are often minima or maxima. Combining a series of limiting values leave no room for error

THE PHASING OF ROAD SAFETY AUDITS

Audits are ideally undertaken during the design phase. Five stages of the design process are identified as being times when audits should be carried out. A sixth stage relates to existing roads. Most road safety audits currently being carried out in South Africa concern existing roads. This is not unlike closing the stable door after the horse has bolted. These stages are:

Stage 1 - Feasibility (Planning, Route Determination - call it what you will)

Stage 2 - Layout. (Horizontal alignment, vertical alignment, intersections etc)

THE PHASING OF ROAD SAFETY AUDITS

Stage 3 - Detailed design. Road signs and markings, drainage details, lighting, clearance to roadside obstacles etc. This Stage is normally immediately prior to the preparation of contract documentation and drawings.

Stage 4 – Road Construction. During this stage only those aspects applicable to construction activities are checked. These include temporary facilities provided during the construction phase as well as the utilisation of permanent facilities.

Stage 5 - Pre-opening. Immediately before the road is opened to traffic. By this time mistakes are already set in concrete but, at least, they have as yet to kill someone

THE PHASING OF ROAD SAFETY AUDITS

Stage 6 - Existing roads

The whole thrust of the road safety audit is that prevention is better than cure. Furthermore, it is easier and cheaper to rectify a mistake while it is still on paper than when it is represented by several cubic metres of 25 MPa concrete.

When applied to an existing road, the audit process is sometimes given a different name to emphasise its difference from the design stage audits. Terms such as “road network review” and “road safety assessment” are used. The term “road safety review” is used in the Austroads Manual.

THE PHASING OF ROAD SAFETY AUDITS

In South Africa, there is also a differentiation between "road safety assessments" and "road safety audits". A road safety assessment is aimed at the entire road network under the jurisdiction of the authority initiating it and is intended to determine which road segments and intersections take the highest priority for the implementation of audits.

On existing roads, therefore, a road safety audit would often be initiated on the basis of the findings of a road safety assessment.

THE ROAD SAFETY AUDIT METHODOLOGY

As pointed out earlier, there is a significant difference between identification of red spots and road safety audits. Red spot identification is concerned with historical absences of safety whereas audits look to potential or future absences of safety.

The SARSAM confirms that the auditors are not tasked to develop or plan remedial measures after completion of the audit. They make findings based on their audit and it is up to the designer to consider these findings and to take appropriate action.

THE ROAD SAFETY AUDIT METHODOLOGY

This could include changes to the design or just leaving it as it is. In either case it is imperative that the designer formally document his reasoning for whatever decisions he makes regarding the responses to the audit findings.

Once an audit team has been selected and appointed, the steps to be followed are:

Commencement meeting where the audit team meets the designer team. If the design team is not the road authority, the road authority should also be present

THE ROAD SAFETY AUDIT METHODOLOGY

Background information is provided, normally at this meeting, by the design team to the audit team in addition to the drawings appropriate to the stage in design at which the audit is being undertaken. Background information may include locality sketches, detail survey plans design standards, traffic counts or projections and anything considered relevant

Assessment of information provided enables the audit team to familiarise itself with the project and also to check the information for completeness. Further information may be required, and this would be compiled by the design team rather than the audit team

THE ROAD SAFETY AUDIT METHODOLOGY

The site inspection is an essential step in the audit process. In the case of an existing road, it should be visited during day and night time and also during peak and off-peak periods.

The designer should seek opportunities to introduce passing lanes on two –lane roads, particularly where the terrain limits sight distance. This site inspection should take all possible users of the facility into account including public transport, heavy vehicles, pedestrians, and disabled persons.

THE ROAD SAFETY AUDIT METHODOLOGY

The audit report contains the findings of the audit team and lists all deficiencies identified. It is not obligatory to do so but the report may include recommendations regarding possible remedial measures for the consideration of the design team. It is to be noted that these recommendations are not enforceable and the decision to accept them or not is exclusively that of the design team with whom the final responsibility for the design rests. It is important also to note that the audit report is a FINAL report. At most, expansions in support of clarity may be requested.

A completion meeting is held with the purpose of presenting the findings of the audit team.

THE CHECKLIST

Having pointed out that the audit is a formal process with set procedures, to be undertaken by an independent, experienced audit team, and that the process is not a check against a specific set of standards, it follows that that the use of a checklist is not the process to be followed by the audit team.

For the designer however, a checklist becomes a very useful tool to at least jog the memory as to what features or design aspects need to be considered with respect to road safety during the design process. In the pages that follow, a checklist has graciously been made available by Dr S C van As for inclusion in these course notes.

SOME PRACTICAL HINTS ON CONDUCTING A SITE INSPECTION

The process described below has been developed based on experience and a number of site investigations.

Diagrammatic layout maps are used for making notes as the inspection progresses. When detail design drawings are available, the maps can be developed from these drawings. The following information should be shown on the maps:

Road and street names, including those of intersecting roads

Road reserve boundaries

SOME PRACTICAL HINTS ON CONDUCTING A SITE INSPECTION

Road and lane layout of road links, intersections including the angle of intersection of the intersecting roads, accesses and pedestrian crossings

The start and end of horizontal and vertical curves

Pedestrian sidewalks and lanes, including cycle lanes

Developments adjacent to the road; and

Kilometre markings along the road

No additional information should be shown on the maps leaving them as clear as possible for notations during the inspection. The maps should preferably be produced on A4 sheets but nothing larger than A3 sheets should be used.