

**PART B - KEY STEPS IN A ROAD SAFETY AUDIT**

Road safety audit step	Responsibility
1. Determine that an audit is to be undertaken	Project Manager
2. Select a road safety audit team	Project Manager and Road Safety Audit Team Leader
3. Provide information (especially the drawings) about the project to the audit team	Designer (via Project Manager)
4. Hold a commencement meeting – outline the project and discuss the work ahead	Project Manager (plus designer and the Road Safety Audit Team Leader)
5. Assess the project drawings for safety concerns (the “desktop” audit)	The audit team
6. Inspect the site – daytime and night time	The audit team
7. Write the audit report. Send to the Project Manager	The audit team
8. Hold a completion meeting – to discuss the key safety concerns and clarify outstanding matters	Project Manager (plus designer and Road Safety Audit Team Leader)
9. Write a response report, referring to each audit recommendation	Project Manager
10. Follow-up, implement agreed changes	Project Manager



## 1. Deciding that an audit is necessary

The Project Manager will decide if an audit is needed based on the Karnataka road safety audit policy. Generally, the earlier in the planning and design process, the better! Will this road project benefit from an audit? The answer is almost always yes!

In Karnataka, the PWP&IWTD Road Safety Audit Policy (below) details the type of road projects and the stages of audit that are to be undertaken. The Project Manager is responsible for ensuring that the Policy is followed and that all the new road projects in Karnataka are audited at the required stages.

### Statement of Road Safety Audit Policy

Road Safety Audits shall be undertaken throughout the planning, design and construction stages of new road projects in accordance with the process detailed in the PWP&IWTD Road Safety Audit manual (2012).

#### **(a) Purpose of Audits**

Road safety audits are undertaken to identify safety concerns in a new road design so that those who are responsible for delivering the road project can take these safety concerns into account and make the necessary amendments at an early time.

#### **(b) Project Selection**

All road projects in Karnataka shall be road safety audited as shown in the following Table.

AUDIT STAGE	EXPRESSWAYS	NATIONAL HIGHWAYS	STATE HIGHWAYS	COLLECTORS AND LOCAL STREETS
PLANNING	√	√	N/A	N/A
PRELIMINARY	√	√	Optional	N/A
DETAILED	√	√	√	√
ROAD WORKS	√	√	Optional	Optional
PRE-OPENING	√	√	√	Optional
NO. OF AUDITS	5 stages	5 stages	Minimum 2	Minimum 1

**(c) Road Safety Audit Team**

A minimum of two auditors are to be used, each of whom is to be registered in the PWP&IWD database of approved road safety auditors. It is essential that the audit team is highly knowledgeable and skilled in all facets of the work being audited and is independent of the project.

**(d) Road Safety Audit Report**

The output from a road safety audit is a formal road safety audit report. The report shall list the safety concerns identified, together with a brief explanation of each. Reference to current standards and road safety principles and practices shall also be given where applicable. The Senior Road Safety Auditor (the team leader of the audit team) is required to submit the road safety audit report to the Project Manager.

**(e) Response to the Road Safety Audit Report**

The Project Manager will arrange for a response report setting out the proposed course of action to address each safety concern. Changes will then be made as agreed.

## 2. Select a road safety audit team

A road safety audit team leader is appointed by the Project Manager. The team leader should be a registered Senior Road Safety Auditor in the register of auditors maintained by the Road Safety Cell within the PWP&IWT Department of Karnataka.

For Karnataka, a Senior Road Safety Auditor shall:

- Have completed an approved road safety audit training workshop, and
- Have a minimum of 2 years practical experience in a road safety related field, and
- Have previously completed at least 5 road safety audits under the guidance of an experienced Senior Road Safety Auditor

A Road Safety Auditor shall:

- Have completed an approved road safety audit training workshop, and
- Have a minimum of 2 years practical experience in a road safety related field.

The Team Leader is to select one or more auditor(s) to assist him/her with the audit. If you are the Team Leader, there are two key issues you will need to decide:

- How many people do you need for your team?
- What backgrounds should they have?

A team of at least 2 qualified auditors is required for all audits in Karnataka because:

- Two (or more) people can bring different views about safety concerns due to their diversity of backgrounds and experiences.
- Cross fertilization of ideas can result from discussions.
- There are advantages of having more knowledge available.
- Additional people in a team can increase the chance of detecting less obvious safety concerns.

The audit team is to be led by a Senior Road Safety Auditor. All audit team members are to be qualified Road Safety Auditors. Unless it is an exceptionally large project, one other registered auditor will be sufficient to join you in most audits. To decide who that auditor should be, ask four simple questions:

- Is the auditor independent of the project?
- Is the auditor on the Karnataka PWP&IWTD register of auditors?
- Has the auditor the necessary skills for this size and stage of project?
- Is the auditor able to see potential safety concerns from different road users' points of view?

There is no substitute for an experienced road safety audit team that understands the audit process and is able to foresee potential safety concerns at the design stages.

You should be sensitive to the concerns of designers who may feel that they are having their design work 'judged'. Auditors need to be objective in their assessments, yet sensitive to the fact that no one likes criticism. Designers need to welcome audit recommendations as positive inputs to assist their work. They need to look objectively at the audit findings, learn from them and not take the report as any form of personal criticism.

### **3. Obtain all the background information**

A copy of all the drawings and any pertinent reports are to be given to the road safety audit Team Leader to permit a thorough road safety audit to take place. The information required usually includes:

- All drawings of the project at a suitable scale. Hard and soft copies are usually provided.
- A copy of the design report that details the purpose of the project and the key design criteria (such as design speed, and any constraints) adopted.
- A clear statement of the stage of the audit.

## **4. Participate in a commencement meeting**

A commencement meeting provides an opportunity for the audit process to be explained, and for the project manager to explain the proposal in some detail.

This meeting also provides an opportunity for the audit team to request any other information that it feels is necessary. The audit team will not be able to inspect the site under all traffic or weather conditions, so if particular conditions are important (e.g. traffic conditions during market days), the audit team should be advised.

As audits become more common in Karnataka, commencement meetings will become less significant. In time, the Team Leader will be sent the drawings attached to an email and will be requested to offer a timeframe and a cost for undertaking the audit. This is the common way that audits are commenced in those countries that have had many years audit experience.

## **5. Assess the drawings and documents (the desktop audit)**

This step reviews the drawings and any other information that has been provided to the audit team.

This “desktop” audit involves you and the audit team reviewing the drawings and documents in the office before, and again after, carrying out the inspections.

Before inspecting the site, take time to closely examine the drawings. Scribble on the drawings as necessary, and mark all possible safety concerns to be checked on site, making use of the checklists as required. When you are back in the office, use the drawings again to double check for safety concerns now that you know more about the site and its traffic conditions.

## **6. Inspect the site**

The site of the road proposal is to be inspected – by the entire audit team - during day time and again at night time.

The inspection involves taking the drawings of the proposal out to the site and inspecting the site – trying to imagine what the finished road project will look like and how it will operate. During the site inspection, you and your audit team should put yourselves into the shoes of the future road users of that new road project.

While doing this, auditors need to anticipate whether different light (day and night) conditions or weather (such as fog or rain) conditions may create safety concerns on the completed road. Your team is expected to look beyond the limits of the project and to include adjacent sections of road in the audit. Transition zones, where the new road matches into the existing road system can often become locations of increased risk.

Remember that your inspection should be undertaken from the point of view of all the likely road user groups - not just motorists. Karnataka has a wide variety of road users and they have quite different safety needs. Do your best to consider them all in your audits.

### **7. Write the road safety audit report**

Writing the report is the responsibility of the Audit Team Leader. The team members may check the report, and provide comments on it, but in most cases the Team Leader is the one who completes the report.

The ability to write an accurate and technically proficient audit report is a necessary skill for the completion of a quality road safety audit.

Audit reports are concise reports with brief, but technically clear descriptions of each of the safety concerns that have been identified. It is best if the report follows an agreed format; this makes it easier for the team to write and importantly it assists project managers and designers to respond.

Your audit report is to contain:

- A title page – with the name of the road project, its location, the stage of the audit.
- A brief description of the project –what type of road project, why it has been proposed.
- The names of the road safety audit team members.
- Dates of the audit inspection(s), and the weather conditions on-site.
- A table of all the safety concerns found from the desktop audit and from the site inspection, each with a risk rating (see below), together with a recommendation for corrective action for each.
- Digital photographs of important safety issues.
- A statement signed and dated by the Team Leader indicating the team has audited the drawings, inspected the site and identified the road safety concerns noted in the report.
- A list of all drawings, reports and documents reviewed as part of the audit, including drawing numbers and dates.

When writing the audit report, you should:

- Clearly describe each safety concern and its location.
- Avoid being too specific with your recommendations.
- Avoid redesigning – that is for the design team to do.
- Think about high/low cost and short/long term options.
- Be realistic - take into account the level of risk associated with the safety concern and the cost likely to rectify it.
- Be constructive and practical about how the safety concern might be eliminated.

List the safety concerns (and your recommendations for each) either:

- in order from highest risk to lowest risk, or
- in groups of similar concerns (eg cross section matters), or
- by chainage along the project length.

Remind yourself that the audit team guides the Project Team but it is the responsibility of the Project Manager and the designers (not the audit team) to decide what recommendations to adopt.



## Risk assessment

The following tables outline a risk assessment process to assist you to provide an indication of the level of risk for each safety concern.

- Estimate which category in Step 1 and Step 2 the safety concern best fits.
- From those, select the risk category in Step 3.
- The Project Manager may then determine a course of action based on Step 4.

### STEP 1 ESTIMATE THE POSSIBLE CRASH FREQUENCY

Frequency	Definition
Frequent	One or more per month
Probable	One or more per year (but less than one per month)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

### STEP 2 ESTIMATE THE LIKLEY CRASH SEVERITY

Severity	Description	Examples
Catastrophic	Multiple deaths are likely	High speed, multi-vehicle crashes on expressways or highways. A bus collision at high speed with a bridge abutment
Serious	A death and/or serious injuries are likely	High/medium speed vehicle/vehicle collisions or collisions with fixed roadside objects. Pedestrian crashes on highways
Minor	Minor injuries only are likely	Low speed collisions, such as a bicyclist sliding on a sandy road surface, a rear end crash in a slip lane, or a pedestrian hit in a car park
Limited	Trivial injuries or property damage only	Very low speed vehicle collisions. Pedestrian trips on uneven footpath, a car collides with a median island in a car park.

**STEP 3 DETERMINE THE LEVEL OF RISK**

RISK		From Table 1 - Frequency			
		Frequent	Probable	Occasional	Improbable
From Table 2 – Severity	Catastrophic	Intolerable	Intolerable	Intolerable	High
	Serious	Intolerable	Intolerable	High	Medium
	Minor	Intolerable	High	Medium	Low
	Limited	High	Medium	Low	Low

**STEP 4 DETERMINE A COURSE OF ACTION (PROJECT MANAGER)**

RISK	Suggested Treatment Approach
Intolerable	Safety concern “must” be corrected at any cost.
High	Safety concern “should” be corrected (or the risk significantly reduced), even if the cost is high.
Medium	Safety concern “should” be corrected (or the risk significantly reduced), if the treatment cost is moderate, but not high.
Low	Safety concern “should” be corrected (or risk reduced), if a treatment cost is low.

## 8. Participate in a completion meeting

The Project Manager is to arrange a Completion meeting involving:

- The audit Team Leader,
- The Project Manager, and
- The designer.

At this meeting, outline your audit findings and your recommendations. The meeting provides an opportunity for you, the Project Manager and the design team to discuss possible ways to overcome the identified problems. Do not entertain any suggestion to “soften” your audit report.

In time, you will find that completion meetings will become less common in Karnataka. Similar to Commencement meetings, the Completion meeting will eventually give way to a transfer of the audit report via email to the Project Manager.

## 9. Respond to the audit report

The Project Manager is required to respond in writing to each audit recommendation in your report. He/she can either:

- Accept it completely (and develop solutions to overcome or reduce the safety concern); or
- Accept the safety concern but not agree to the recommendation. In these cases he/she will seek alternative ways to resolve the safety concern; or
- Not accept the recommendation.

To provide useful feedback, the Project Manager should send a copy of the response report to the audit Team Leader for information. The audit team should note the response, aware that they should not create an on-going dispute over which recommendations have or have not been accepted.

## Following up and implementing changes

In many audits, particularly while the project is in the early design stage, changes can be made at low cost. But sometimes an audit may reveal a safety concern that causes a difficult decision to be made by the Project Manager. The decision is difficult usually because the cost of remedial action is high.

In these cases a Project Manager may seek low cost (and possibly less effective) countermeasures, or he/she may stage the safety improvements over a long period. Sometimes, a Project Manager may decide not to do anything – and risk the consequences.

Other options available to the Project Manager include seeking an increase in the project budget to allow the desired countermeasures, or shortening the project (say by 10%) and placing the savings into safety improvements. These are all valid decisions. As long as they are committed to writing in the Response Report, that is all that the audit process can ask.