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# ROAD SAFETY AROUND SCHOOLS

## Audit Checklists

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Prepared for the  
Road Safety Council's

*Road Safety Around Schools Taskforce*



The Taskforce acknowledges the contributions for this project, received from:

Main Roads WA  
Department of Planning and Infrastructure  
Department of Education

**This report is for the Road Safety Around Schools Task Force**

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A. Checklists for 6 stages of Road Safety Audits –

- ❑ Stage 1 Audit: Feasibility stage
- ❑ Stage 2 Audit: Preliminary design stage
- ❑ Stage 3 Audit: Detailed design stage
- ❑ Stage 4 Audit: Pre-opening stage
- ❑ Stage 5 Audit: Roadwork traffic scheme
- ❑ Stage 6 Audit: Existing roads

B. Corrective Action Report

## 1. Introduction

In 1999 the Road Safety Council established the *Road Safety Around Schools Task Force* to examine the issues, develop strategies to improve road safety at schools and to have an on-going role in monitoring safety at these locations.

The Task Force is concerned that road safety does not receive the consideration it requires at a number of stages in the planning, development and operations of schools. While issues about policies that agencies apply in the planning, design and day to day functioning of schools and other particular issues are subject to a separate study and report, ensuring that road safety is tackled in a consistent manner was identified as needing to be addressed. To this end the Task Force believed it appropriate for checklists to be prepared that ensure road safety is and can be addressed systematically in a road safety audit format.

The road safety audit checklists available from Austroads<sup>1</sup> at the time of the Task Force's deliberations were considered inadequate for use at schools. Even though revised checklists subsequently published in the early months of 2002 by Austroads were far more comprehensive than the earlier version, they still relied on auditors having a good understanding of the problems that exist at schools. In the hands of experienced auditors the Austroads checklists would doubtlessly be adequate. However, at a time when road safety audit is growing as a skill it was deemed an advantage for auditors to have more detailed checklists with questions included that are specific to identifying problems at school sites.

## 2. Processes

The processes followed in preparing audit templates/checklists included reviewing Austroads checklists and after consultation with stakeholders, including a raft of additional questions that relate specifically to the major road safety problems that occur at schools. Draft templates were prepared for all stages of road safety audit as specified by Austroads. The draft templates were considered by the Task Force as well as the Road Safety Audit Panel established in Western Australia by the Institute of Public Works Engineering Australia (IPWEA). The panel is comprised of road safety personnel from Local Government, Main Roads WA and the private sector. Two members of the Panel responded, one suggesting that a separate list be prepared as an addendum to Austroads checklists. The other suggested the inclusion of more details in particular areas. As a consequence of the second response, additions were made to the checklists to ensure that the major issues can be addressed. The reason why an addendum is not the preferred option as suggested by one panel member is that there is a tendency for some auditors to only use the addendum in the misbelief that they represent all the issues that need to be reviewed in the audit. While experienced auditors may indeed only use the addendum, it is because they are aware of the other matters contained in the standard checklists.

1. Austroads: Road Safety Audit (second edition 2002)

Austrroads were approached in regard to the matter and the response was "*..on the basis that the source is clearly acknowledged in the material... and that an appropriate explanation is included at the front of the material to make clear the position of these modified checklists in relation to those found as part of AP-G30/02, Austrroads has no objection to what you are proposing.*"

Austrroads wishes to review the final documentation before production and would look to leverage some future benefits from any evaluation or feedback after the checklists have been in use for 12 months.

### **3. Checklists**

A series of checklists/templates have been produced based on stages as recommended by Austrroads. They are appended so that they be applied as a stand-alone document by auditors (notwithstanding that the introduction to the checklists includes a requirement for auditors to refer to other Austrroads documents).

### **4. Corrective Action Report**

Part of the formal Road Safety Audit Process is translating deficiencies in the audited location to a report for the client. This is the Corrective Action Report. It provides a list of prioritised actions recommended from the audit. It also provides a space for response by the asset owner to each of the actions recommended. A suggested layout of a Corrective Action Report is included in the appendices.

### **5. Communication Strategy**

It is important that a communication strategy is developed to ensure that Road Safety Auditors consider the particular problems that relate to school environments.

### **6. Recommendations**

This review of road safety auditing procedure at schools has identified a need for formal audit processes to be adopted by all agencies and authorities responsible for the planning, design and development of new schools as well as the redevelopment of, or assessment of safety concerns at existing schools. A series of Road Safety Audit checklists, based on Austrroads templates, have been developed for these purposes. The following is accordingly recommended:

1. These checklists be used by Road Safety Auditors who are undertaking audits of roads at or adjacent to schools (planned or existing).
2. They should also be forwarded to the Institute of Public Works Engineering (WA Division) and Main Roads WA, recommending that these checklists be used for auditing roads adjacent to schools.
3. Agencies such as the Department of Planning and Infrastructure (DPI) and Education Department adopt road safety auditing in their practices relating to schools. In particular

DPI should require organisations submitting plans for new schools or redeveloping existing schools to support applications with a formal road safety audit.

4. The Education Department should ensure their planning of new schools and redevelopment of existing schools includes formal auditing at all stages of development or redevelopment.

## Appendices

### A. Checklists for 6 stages of Road Safety Audits

- Stage 1 Audit: Feasibility stage
- Stage 2 Audit: Preliminary design stage
- Stage 3 Audit: Detailed design stage
- Stage 4 Audit: Pre-opening stage
- Stage 5 Audit: Roadwork traffic scheme
- Stage 6 Audit: Existing roads

### B. Corrective Action Report

**APPENDIX A.**

**Safety Audit Checklists for Road Safety Around Schools**

## Introduction

This document contains road safety audit checklists for schools. These checklists can be used by Road Safety Auditors in undertaking audits of roads in the vicinity of schools as an option to Austroads' Audit checklists, on which these are based. The approval of Austroads for its checklists found in Austroads publication AP-G30/02 to be used as a basis for these checklists is gratefully acknowledged.

These checklists incorporate six stages similar to AUSTROADS checklists. In using any checklists for auditing purposes practitioners should be familiar with the AUSTROADS *Road Safety Audit* guidelines, which explain many of the general principles of safety audits.

Austroads defines a road safety audit as 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.

A full road safety audit consists of six stages:

- Stage 1 - Feasibility
- Stage 2 – Preliminary Design
- Stage 3 - Detailed Design
- Stage 4 - Pre-opening
- Stage 5 – Roadwork traffic scheme
- Stage 6 - Existing Roads

The reason why these special checklists for school environments have been prepared is that schools have particular road safety problems. For example, pick-up and set-down parking problems exist at most schools during short periods of a day. Depending on the age group, children have different needs for facilities such as shared paths, footpaths and road crossings. It is important that auditors appreciate those problems, many of which are prompted by questions in the checklists. Experienced auditors may not require these special checklists and prefer to use those prepared by AUSTROADS. However, it is important for auditors to know the road safety problems that occur at existing schools to appreciate what features need to be considered in the planning of new schools – where they are located, their design, access, parking and user requirements and the like. Problems are less likely to occur if they are foreseen in the planning stages. For instance should the school be located elsewhere and should they have a different configuration of accesses, parking areas and pathways?

This document covers all stages as they relate to school developments. However, an audit cannot consider the needs of schools to the exclusion of all other developments and road users. This is why the AUSTROADS checklists are particularly important and practitioners require knowledge of processes as detailed by AUSTROADS. The checklists seek responses to more specific questions that are relevant to school environments than are detailed in AUSTROADS checklists.

## Reference Documents

Apart from being familiar with Austroads *Road Safety Audit Guidelines* and knowledge of general road safety and traffic engineering reference documentation, audit personnel should be familiar with Government Acts and Regulations that relate to road safety, (eg Road Traffic Act 1974, Road Traffic Code 2000) and Acts and regulations that govern land use.

## Advice to Safety Audit Personnel

It is essential that personnel leading a road safety audit team have previously acquired experience in auditing. It is of further essential for those undertaking a road safety audit of school sites that they

acquire a knowledge of a range of conditions and operational requirements associated with schools. These conditions and requirements include the following:

- Knowledge of the type of school and its operations including operating hours, age and numbers of students, modes of transport (existing and/or proposed), parking requirements, numbers of teachers. Particular attention needs to be given to pick-up and set-down areas for students, parking for teachers vehicles and bicycles as well as road crossing points and traffic circulation;
- Awareness of children behaviour in relation to roads and traffic;
- Knowledge of any school planning principles
- Knowledge of traffic flow theory
- An understanding of traffic calming principles and operations in regard to affects on road safety, particularly children safety
- A knowledge of traffic control devices including their affect on children safety
- Awareness of any entry/access requirements or permits that may need to be obtained from the relevant authorities

The school location should be examined from a vehicle driver's perspective as well as children and other pedestrians' perspectives particularly in relation to hazards.

### **Corrective Action Report**

Auditors are required to provide a Corrective Action Report (CAR) as part of the Auditor's report. The CAR details, in tabular form, the prioritised actions recommended during the audit. It also provides space for asset owners to comment as to actions proposed. A typical report layout is shown at Appendix B.

### **Feedback Requested**

As mentioned, these checklists are based on those contained in Austroads publication AP-G30/02 with the permission of Austroads. In order that Austroads can evaluate whether their checklists can be improved, feedback from auditors who use these special checklists would be appreciated. Comments should be sent to –

Chairman  
 Road Safety Around Schools Task Force  
 C/o Western Australian Local Government Association  
 15 Altona Street  
 WEST PERTH WA 6005

### Checklist Stage 1: Feasibility stage audit

Issue	Yes	No	Comment
<b>1.1 General topics</b>			
<b>1 Scope of project; function; traffic mix</b>			
What type of school is planned?			
Is the site planned for the school the best available in the development?			
Is the proposed design of the road(s) past the school consistent with the road's function?			
Is the road's function appropriate to front this type of school?			
Will the road adequately cater for the type of traffic: <ul style="list-style-type: none"> <li>- cars?</li> <li>- motorcycles?</li> <li>- pedal cycles?</li> <li>- pedestrians?</li> <li>- heavy vehicles?</li> <li>- buses?</li> </ul>			
Is the expected mix of traffic adequately catered for?			
Will the proposed roads past the school be consistent with adjacent roads, landforms and traffic management?			
<b>2 Type and degree of access to property and developments</b>			
Is the degree of access control along the roads fronting the school consistent with the roads' function?			
Will sight distances be satisfactory – <ul style="list-style-type: none"> <li>- at intersections?</li> <li>- at school and other accesses?</li> </ul>			
Is the design speed (or likely speed of vehicles) compatible with the number and type of intersections and property accesses present?			
<b>3 Major generators of traffic</b>			
Are other major developments (including housing or shopping centres) far enough away so as to not adversely impact on the form of design of the road?			
Have existing or alternative accesses been arranged to ensure existing suburbs/areas/schools are not cut-off from or by the development of the road?			
Are accesses for significant traffic generators including schools, sufficiently far away from intersections for safety?			
Is sight distance to and from school entrances/ accesses adequate?			
Will the scheme (including roads past schools) be consistent with adjacent roads, landforms and traffic management?			

**Checklist Stage 1: Feasibility stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>
<b>4 Staging requirements</b> Will the design (including developments such as schools and/or road(s)) be implemented in one stage only?			
If the design (road or school) is to be implemented in more than one stage, has safety been given a high priority - - in transitions between stages? - in transitions to existing roads?			
Will the staging work avoid problems with safety standards elsewhere during construction?			
<b>5 Future works</b> Will road safety be compromised if there is - future widening? - the addition of a second carriageway? - major geometric changes at intersections - road and/or school extensions			
<b>6 Wider network effects</b> Have any harmful effects of the road/development upon the surrounding road network been identified? Have they been adequately dealt with?			
<b>1.2 Design Issues (general)</b>			
<b>1 Route choice</b> Are all aspects associated with the location of the route and/or its alignment safe?			
If the route follows existing roads what are the effects of this? (comment)			
If the route is in greenfields (undeveloped corridor), is the alignment safe?			
Does the scheme fit in with the physical constraints of the landscape?			
Does the scheme take account of major network considerations?			
<b>2 Impact of continuity with the existing network</b> Are all sections/transitions where the proposed road scheme connects with the existing network free of potential problems?			
<b>3 Broad design standards</b> Have the appropriate design standards been used (having regard to the scope of the project and its function in relation to the traffic mix)?			
Does the geometric plan and profile meet design guidelines?			
Have the appropriate design vehicle and check vehicle been used?			

**Checklist Stage 1: Feasibility stage audit (continued)**

Issue	Yes	No	Comment
Has the appropriate design speed been selected with regard to: <ul style="list-style-type: none"> <li>- horizontal and vertical alignment?</li> <li>- visibility?</li> <li>- merging?</li> <li>- weaving?</li> <li>- decelerating or accelerating traffic at intersections?</li> </ul>			
Is sight distance generally satisfactory: <ul style="list-style-type: none"> <li>- at intersections? (if not, what implications?)</li> <li>- at entry and exit ramps?</li> <li>- at property entrances?</li> <li>- at emergency vehicle access points?</li> </ul>			
Can any sudden change in the speed regime or posted speed limit be safely accommodated? (As may be required at a school)			
Is the designated speed limit, if any, on the proposed road appropriate (including for the intended school precinct)?			
Is the designated or intended speed limit consistent with the design speed?			
<b>5 Design volume and traffic characteristics</b>			
Is the design appropriate with regard to the design volume and traffic characteristics (including the effects of unusual proportions of heavy vehicles, cyclists and pedestrians, or side friction effects)?			
Will the scheme safely cope with unforeseen or large increases in traffic volume?			
Will the scheme safely cope with unforeseen changes in the traffic characteristics?			
<b>1.3 Intersections</b>			
<b>1 Number and type of intersections</b>			
Are all aspects of intersections (for example, spacing, type, layout, etc.) appropriate with respect to: <ul style="list-style-type: none"> <li>- the broad concept of the project,</li> <li>- the function of this road and intersecting roads,</li> <li>- the traffic mix on this road and intersecting roads,</li> <li>- types which are consistent within the scheme, and consistent with adjacent sections?</li> </ul>			
Is the frequency of intersections appropriate (neither too high nor too low: <ul style="list-style-type: none"> <li>- for safe access?</li> <li>- to avoid impacts on the surrounding network?</li> <li>- for emergency vehicle access?</li> </ul>			
Have all physical, visibility or traffic management constraints that would influence the choice or spacing of intersections been considered? (comment needed)			
Has the vertical and/or horizontal alignment been taken into account with regard to the style or spacing of intersections?			
Are all of the proposed intersections necessary or essential?			
Can any unnecessary intersections be removed/can access be achieved more safely by changes on the surrounding road network?			

**Checklist Stage 1: Feasibility stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Will the angle of the intersecting roads and the sight line be adequate for the safety of all road users?			
Is the movement of vulnerable road users safely catered for at all intersections?			
Is the movement of heavy vehicles safely catered for at all intersections?			
<b>1.4 Environmental constraints</b>			
<b>1 Safety aspects</b> Is the surrounding terrain free of physical or vegetation defects that could affect the safety of the scheme? (for example, heavy planting, forestry, deep cuttings, steep or rocky bluffs which constrain the design)?			
Have effects like wind, mist, ice, fog, sun angles at sunrise been given adequate consideration?			
Do the gradients, curves and general design approaches fit in with the likely weather or environmental aspects of the terrain? (for example, fog-prone areas)			
Has safety been considered in the location of environmental features (for example, noise fences)?			
Does the scheme deal adequately with potential animal conflicts? (for example, kangaroos, cattle, etc.)			
Will the scheme perform safely at night when it is wet, or there is fog?			
Are visual distractions (for example, scenic vistas) adequately dealt with (for example, by providing areas for people to stop safely)?			
Has the issue of unstable country been considered (for example, mine subsidence)?			
<b>1.5 Any other matters</b>			
<b>1 Safety aspects not already dealt with</b> Has the possibility of flooding been adequately dealt with?			
Have any railway level crossings been identified and are they treated adequately?			
Have other distractions (for example, low-flying aircraft, advertising, etc.) been adequately dealt with?			
Has the need for laybys or parking (for example school buses, trucks, picnic or rest areas etc) been considered?			
Has the potential of the location to attract roadside stalls been considered?			
Will there be special events? Have any consequent unusual or hazardous conditions been considered?			
Have all classes of pedestrians that could be seriously affected by the proposal been catered for? (for example, school children, elderly etc)?			

**Checklist Stage 1: Feasibility stage audit (continued)**

Issue	Yes	No	Comments
Have any safety or accident problems on the existing network been addressed? (Not carried over to the new scheme.)			
Has the issue of providing lighting for the design been considered?			
Has the need for drivers to stop been considered particularly in regard to picking up and setting down children attending the school?			
Have the issues of pedestrians and cyclist access/routes been considered (e.g. footpaths, shared paths, bicycle paths and crossings)			
Has the issue of pedestrian underpasses been considered?			
Has the issue of off-road parking for staff of the school and any other development along the road section been considered?			
Any other matter which may have a bearing on safety?			

## Checklist Stage 2: Preliminary design stage audit

<b>2.1 General topics</b>			
<b>1 Changes since previous audit</b> Do the conditions for which the scheme was originally designed still apply? (For example, no changes to the surrounding network, area activities or traffic mix.)			
Has the general form of the project design remained unchanged since previous audit (if any)?			
<b>2 Drainage</b> Will the scheme drain adequately?			
Has the possibility of surface flooding been adequately addressed, including overflow from surrounding or intersecting drains and watercourses?			
<b>3 Climatic conditions</b> Has consideration been given to weather records or local experience that may indicate a particular problem? (for example, wind, fog.)			
<b>4 Landscaping</b> If any landscaping proposals are available, are they compatible with safety requirements (for example, sight lines and hazards in clear zones)?			
<b>5 Services</b> Does the design adequately deal with buried and overhead services (especially in regard to overhead clearances, etc)?			
Has the location of fixed objects or furniture associated with services been checked, including the position of poles?			
<b>6 Access to property and developments</b> Can all accesses be used safely? (entry and exit/merging)			
Is the design free of any downstream or upstream effect from points of access, particularly near intersections?			
Have accesses been checked for adequate sight distance, etc.? (particularly to off-road parking)			
<b>7 Adjacent developments</b> Does the design handle accesses to major adjacent generators of traffic and developments safety?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is the driver's perception of the road ahead free of misleading effects of any lighting or traffic signals on an adjacent road?			
<b>8 Emergency vehicles and access</b> Has provision been made for safe access and movements by emergency vehicles?			
Does the design and positioning of medians and vehicle barriers allow emergency vehicles to stop and turn without unnecessarily disrupting traffic?			
<b>9 Future widening and/or realignments</b> If the scheme is only a stage towards a wider or dual carriageway is the design adequate to impart this message to drivers? (Is the reliance on signs minimal/appropriate, rather than excessive?)			
Is the transition between single and dual carriageway (either way) handled safely?			
<b>10 Staging of the scheme</b> If the scheme is to be staged or constructed at different times: - are the construction plans and program arranged to ensure maximum safety? - do the construction plans and program include specific safety measures, signing; adequate transitional geometry; etc. for any temporary arrangements?			
<b>11 Staging of the works</b> If the construction is to be split into several contracts, are they arranged safely?			
<b>12 Maintenance</b> Can maintenance vehicles be safely located?			
<b>2.2 Design issues (general)</b>			
<b>1 Design standards</b> Is the design speed and speed limit appropriate (for example, consider the terrain; function of the road and influence of special needs of schools)?			
Has the appropriate design vehicle and check vehicle been used?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

Issue	Yes	No	Comments
<p><b>2 Typical cross sections</b></p> <p>Are lane widths, shoulders, medians and other cross section features adequate for the function of the road? Is the width of traffic lanes and carriageway suitable in relation to:</p> <ul style="list-style-type: none"> <li>- alignment?</li> <li>- traffic volume?</li> <li>- vehicle dimensions?</li> <li>- the speed environment?</li> <li>- combinations of speed and traffic volume?</li> </ul>			
<p>Are overtaking/climbing lanes provided if needed? Have adequate clear zones been achieved?</p>			
<p><b>3 The effect of cross sectional variation</b></p> <p>Is the design free of undesirable variations in cross section design?</p>			
<p>Are crossfalls safe? (particularly where sections of existing highway have been used or there have been compromise to accommodate accesses, etc.)</p>			
<p>Does the cross section avoid unsafe compromises such as narrowings at bridge approaches or past physical features?</p>			
<p><b>4 Roadway layout</b></p> <p>Are all traffic management features designed to avoid creating unsafe conditions? (particularly associated with the school and access to it)</p>			
<p>Is the layout of road markings and reflective materials able to deal satisfactorily with changes in alignment (particularly where the alignment may be substandard)?</p>			
<p><b>5 Shoulders and edge treatment</b></p> <p>Are the following safety aspects of shoulder provision satisfactory:</p> <ul style="list-style-type: none"> <li>- provision of sealed or unsealed shoulders</li> <li>- width and treatment on embankments</li> <li>- cross fall of shoulders.</li> </ul>			
<p>Are the shoulders likely to be safe if used by slow-moving vehicles or cyclists?</p>			
<p>Are any parking areas safely designed? (both on and off road)</p>			
<p>Are parking areas sufficiently removed from children accesses?</p>			

**Checklist Stage 2: Preliminary design stage audit (continued)**

Issue	Yes	No	Comments
<b>6 Effect of departures from standards or guidelines</b> Any approved departures from standards or guidelines: is safety maintained?			
Any hitherto undetected departures from standards: is safety maintained?			
<b>2.3 Alignment details</b>			
<b>1 Geometry of horizontal and vertical alignment</b> Do the horizontal and vertical design fit together correctly?			
Is the design free of visual cues that would cause a driver to misread the road characteristics (for example, visual illusions, subliminal delineation such as lines of trees, poles, etc.)?			
Does the alignment provide for speed consistency?			
<b>2 Visibility; sight distance</b> Are horizontal and vertical alignments consistent with the visibility requirements?			
Will the design be free of sight line obstructions due to safety fences or barriers? - boundary fences? - street furniture? - parking facilities? - signs? - landscaping? - bridge abutments? - parked vehicles in laybys or at the kerb? - queued traffic?			
Are railway crossings, bridges and other hazards all conspicuous?			
Is the design free of any other local features which may affect visibility?			
<b>3 New/existing road interface</b> Does the interface occur well away from any hazard? (for example, a crest, a bend, a roadside hazard or where poor visibility/distractions may occur.)			
If carriageway standards differ, is the change effected safely?			
Is the transition where the road environment changes (for example, urban to rural; restricted to unrestricted; lit to unlit) done safely?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Has the need for advance warning been considered?			
<b>4 'Readability' of the alignment by drivers</b> Will the general layout, function and broad features be recognised by drivers in sufficient time?			
Will approach speeds be suitable and can drivers correctly track through the scheme?			
<b>2.4 Intersections</b>			
<b>1 Visibility to and visibility at intersections</b> Are horizontal and vertical alignments at the intersection or on the approaches to the intersection consistent with the visibility requirements?			
Will drivers be aware of the presence of the intersection (especially on the minor road approach)?			
Will the design be free of sight line obstructions due to: - safety fences or barriers? - boundary fences? - street furniture? - parking facilities? - signs? - landscaping? - bridge abutments?			
Are railway crossings, bridges and other hazards near intersections conspicuous?			
Will the design be free of any local features that adversely affect visibility?			
Will intersection sight lines be obstructed by permanent or temporary features such as parked vehicles in laybys, or by parked or queued traffic generally?			
<b>2 Layout, including the appropriateness of type</b> Is the type of intersections selected (cross roads, T, roundabout, signalised, etc.) appropriate for the function of the two roads?			
Is the type and layout of intersections adjacent to schools suitable for pedestrians, particularly school children?			
Are the proposed controls (Give Way, Stop, Signals etc) appropriate for the particular intersection?			
Are the junction sizes appropriate for all vehicle movements?			
Are the intersections free of any unusual features that could affect road safety?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are the lane widths and swept paths adequate for all vehicles?			
Is the design free of any upstream or downstream geometric features that could affect safety? (for example, merging of lanes.)			
Are the approach speeds consistent with the intersection design?			
Where a roundabout is proposed: <ul style="list-style-type: none"> <li>- have pedal cycle movements been considered?</li> <li>- have pedestrian movements been considered?</li> <li>- are details regarding the circulating carriageway sufficient?</li> </ul>			
<b>3 Readability by drivers</b> Will the general type, function and broad features be perceived correctly by drivers?			
Are the approach speeds and likely positions of vehicles as they track through the scheme safe?			
Is the design free of sunrise or sunset problems that may create a hazard for motorists?			
<b>2.5 Special road users</b>			
<b>1 Adjacent land</b> Will the scheme be free of adverse effects from adjacent activity and intensity of land use? E.g. schools (If not, what special measures are needed?)			
<b>2 Pedestrians</b> Have pedestrian needs been satisfactorily considered?			
If footpaths are not specifically provided, is the road layout safe for use by pedestrians (particularly at blind corners or on bridges)?			
Are pedestrian subways or footbridges sited to provide maximum use? (i.e. Is the possibility of pedestrians crossing at grade in their vicinity minimised?)			
Are formal pedestrian facilities required for safety at this location? (eg pedestrian crossings, school crossings or pedestrian signals?)			
Where present, are these facilities sited to provide maximum use with safety?			
Are pedestrian refuges/kerb extensions provided where needed?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

Issue	Yes	No	Comments
Has specific consideration been given to provision required for special groups (for example, young, elderly, disabled, deaf or blind)?			
<b>3 Cyclists</b> Have the needs of cyclists been satisfactorily considered especially at intersections?			
Have cycle lanes or shared paths been considered?			
Are all cycleways of standard or adequate design?			
Where a need for shared pedestrian/cycle facilities exists have they been safely treated?			
Where cycleways terminate at intersections or adjacent to the carriageway, has the transition treatment been handled safely?			
Have any needs for special cycle facilities been satisfactorily considered? (for example, bicycle signals.)			
<b>4 Motorcyclists</b> Has the location of devices or objects that might destabilise a motorcycle been avoided on the road surface?			
Will warning or delineation be adequate for motorcyclists?			
Has barrier kerb been avoided in high-speed areas?			
In areas more likely to have motorcycles run off the road is the roadside forgiving or safely shielded?			
<b>5 Equestrians and stock</b> Have the needs of equestrians been considered, including the use of verges or shoulders and rules regarding the use of the carriageway?			
Can underpass facilities be used by equestrians/stock?			
<b>6 Freight</b> Have the needs of truck drivers been considered, including turning radii and lane widths?			
<b>7 Public transport</b> Has public transport including school buses been catered for?			
Have the needs of public transport users been considered?			
Have the manoeuvring needs of public transport vehicles been considered?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are bus stops well positioned for safety?			
<b>8 Road maintenance vehicles</b> Has provision been made for road maintenance vehicles to be used safely at the site?			
<b>2.6 Signs and lighting</b>			
<b>1 Lighting</b> Is this project to be lit? Will safety be maintained if the project is not lit?			
Is the design free of features that make illuminating sections of the road difficult (for example, shadow from trees or overbridges)?			
Has the question of siting of lighting poles been considered as part of the general concept of the scheme?			
Are frangible or slip-base poles to be provided?			
Are any special needs created by ambient lighting?			
Will safety be maintained if special treatments are not provided?			
Have the safety consequences of vehicles striking lighting poles (of any type) been considered?			
<b>2 Signs</b> Are signs appropriate for their location? (including those appropriate to traffic generators such as schools)			
Are signs located where they can be seen and read in adequate time?			
Will signs be readily understood?			
Are signs located so that visibility to and from accesses and intersecting roads is maintained?			
Are signs appropriate to the driver's needs (for example, destination signs, advisory speed signs, warning signs etc.)?			
Have the safety consequences of vehicles striking sign posts been considered?			
Are signs located so that drivers' sight distance is maintained?			
Any signs to be located in the clear zone: are they frangible or adequately shielded by a crash barrier?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

Issue	Yes	No	Comments
<b>3 Marking and delineation</b> Has the appropriate standard of delineation and marking been adopted?			
Are the proposed markings consistent with the works in the adjoining section of the route?			
Are the previous/adjacent markings to be upgraded? If not, will safety be maintained?			
<b>2.7 Traffic management</b>			
<b>1 Traffic flow and access restrictions</b> Can traffic volumes from the proposed scheme be safely accommodated on existing sections of road?			
Have parking provision and parking control been adequately considered? (particularly for school children at schools)			
Can any turn bans be implemented without causing problems at adjacent intersections?			
Has the effect of access to future developments been considered?			
Any traffic diverting to other roads (for example, to avoid a traffic control device): is safety maintained?			
<b>2 Overtaking and merges</b> Are overtaking sight distance and stopping distance adequate?			
Have suitable shoulder widths been provided at lane drop merges?			
Have standard signs and markings been provided for any lane drop?			
Has adequate sight distance been provided to any lane drop?			
Are shoulders wide enough opposite access points and intersections?			
<b>3 Rest areas and stopping zones</b> Are there sufficient roadside stopping areas, rest areas and truck parking areas?			
Are any entries and exits to rest areas or truck parking areas safe?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>4 Construction and operation</b> If the scheme is to be constructed 'under traffic', can this be done so safely?			
Can the scheme be safely constructed?			
Have the maintenance requirements been adequately considered?			
Is safe access to and from the works available?			
<b>2.8 Additional questions to be considered for development proposals</b>			
<b>1 Horizontal alignment</b> Is visibility adequate for drivers and pedestrians at proposed accesses?			
Is adequate turning space provided for the volume and speed of traffic?			
Are curve radii and forward visibility adequate?			
Are sight and stopping distances adequate?			
<b>4 Vertical alignment</b> Are gradients satisfactory?			
Are sight and stopping sight distances adequate?			
<b>3 Parking provision</b> Is on-site parking adequate to avoid on-street parking and associated risks?			
Are parking areas conveniently located?			
Is adequate space provided in parking areas for circulation and intersection sight distance?			
<b>4 Servicing facilities</b> Are off street loading/unloading areas adequate?			
Are turning facilities for large vehicles (including school buses) provided in safe locations?			
Is emergency vehicle access adequate?			
<b>5 Signs and markings</b> Have necessary traffic signs and road markings been provided as part of a development?			

**Checklist Stage 2: Preliminary design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is priority clearly defined at all the intersection points within the car park and access routes?			
Will the signs and markings be clear in all conditions, including day/night, rain, fog, etc.?			
<b>6 Landscaping</b> Does landscaping maintain visibility at intersections, bends, accesses and pedestrian locations?			
Has tree planting been avoided where vehicles are likely to run off the road?			
<b>7 Traffic management</b> Have any adverse area-wide effects been addressed?			
Will the design keep travel speeds at the safe level?			
Are the number and location of accesses appropriate?			
Are the facilities for public transport services safely located?			
Are any bicycle facilities safely located in respect to vehicular movements?			
Are pedestrian facilities adequate and safely located?			
<b>8 Other</b> Has appropriate street lighting been provided?			
Are any roadside hazards appropriately dealt with?			
Has safe pedestrian access to the development been provided?			
<b>2.9 Any other matter</b>			
<b>1 Safety aspects not already covered</b> Will there be special events? Have any consequent unusual or hazardous conditions been considered?			
Is the road able to safely handle oversize vehicles, or large vehicles like trucks, buses, emergency vehicles, road maintenance vehicles?			
If required, can the road be closed for special events in a safe manner?			
If applicable, are special requirements of scenic or tourist routes satisfied?			

### Checklist Stage 3: Detailed design stage audit

Issue	Yes	No	Comments
<b>3.1 General topics</b>			
<b>1 Changes since previous audit</b> Do the conditions for which the scheme was originally designed still apply? (i.e. no significant changes to the surrounding network or area to be served, or traffic mix.)			
Has the design of the project remained unchanged since previous audit (if any)?			
<b>2 Drainage</b> Will the new road drain adequately?			
Are the road grades and crossfalls adequate for satisfactory drainage?			
Are flat spots avoided or adequately dealt with at start/ end of superelevation?			
Has the possibility of surface flooding been adequately addressed, including overflow from surrounding or intersecting drains and water courses?			
Is gully pit spacing adequate to limit flooding?			
Is pit grate design safe for pedal cycles (i.e. gaps not parallel with wheel tracks)?			
Will footpaths drain adequately?			
<b>3 Climatic conditions</b> Has the design taken into account weather records or local experience, which may indicate a particular problem (for example, snow, ice, wind, and fog)?			
<b>4 Landscaping</b> Will drivers be able to see pedestrians (and vice versa) past or over the landscaping?			
Will intersection sight lines be maintained past or over the landscaping?			
Will safety be adequate with seasonal growth (for example, no obscuring of signs, shading or light effects, slippery surface, etc.)?			
Will roadside safety be adequate when trees or planting mature (no roadside hazard)?			
Has 'frangible' vegetation been used in possible run-off road areas?			

**Checklist Stage 3: Detailed design stage audit (continued)**

Issue	Yes	No	Comments
<b>5 Services</b> Does the design adequately deal with buried and overhead services (especially in regard to overhead clearances, etc.)?			
Has the location of fixed objects or furniture associated with services been checked (including any loss of visibility, position of poles, and clearance to overhead wires)?			
<b>6 Access to property and developments</b> Can all accesses be used safely?			
Is the design free of any downstream or upstream effects from accesses, particularly near intersections?			
Do rest areas and truck parking area have adequate sight distance at access points?			
<b>7 Emergencies, breakdowns, emergency and service vehicle access</b> Has provision been made for safe access and movements by emergency vehicles?			
Does the design and positioning of medians and vehicle barriers allow emergency vehicles to stop and turn without unnecessarily disrupting traffic?			
Have broken-down vehicles or stopped emergency vehicles been adequately considered?			
Is provision for emergency telephones satisfactory?			
Are median breaks on divided carriageways safely located (i.e. frequency, visibility)?			
<b>8 Future widening and/or realignments</b> If the scheme is only a stage towards a wider or dual carriageway is the design adequate to impart this message to drivers? (Is the reliance on signs minimal/appropriate, rather than excessive?)			
Is the transition between single and dual carriageway (either way) handled safely?			
<b>9 Staging of the scheme</b> If the scheme is to be staged or constructed at different times: - are the construction plans and program arranged to ensure maximum safety?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
- do the construction plans and program include specific safety measures, signing; adequate transitional geometry; etc. for any temporary arrangements?			
<b>10 Staging of the work</b> If the construction is to be split into several subprojects, is the order safe? (i.e. the stages are not constructed in an order that creates unsafe conditions.)			
<b>11 Adjacent developments</b> Does the design handle accesses to major adjacent generators of traffic and developments safely?			
Is drivers' perception of the road ahead free of misleading effects of any lighting or traffic signals on an adjacent road?			
Has the need for screening against glare from lighting of adjacent property been adequately considered?			
<b>12 Stability of cut and fill</b> Is the stability of batters satisfactory (for example, no potential for loose material to affect road users)?			
<b>13 Skid resistance</b> Has the need for anti-skid surfacing been considered where braking or good road adhesion is most essential (for example, on gradients, curves, approaches to intersections and signals)?			
<b>3.2 Design issues (general)</b>			
<b>1 Geometry of horizontal and vertical alignment</b> Does the horizontal and vertical design fit together correctly?			
Is the vertical alignment consistent and appropriate throughout?			
Is the horizontal alignment consistent throughout?			
Is the alignment consistent with the function of the road"			
Is the design free of misleading visual cues (for example, visual illusions, subliminal delineation like lines of poles)?			

**Checklist Stage 3: Detailed design stage audit (continued)**

Issue	Yes	No	Comments
<b>2 Typical cross sections</b> Are lane widths, shoulders, medians and other cross section features adequate for the function of the road?			
Is the width of traffic lanes and carriageways suitable in relation to: <ul style="list-style-type: none"> <li>- alignment?</li> <li>- traffic volume?</li> <li>- vehicle dimensions?</li> <li>- the speed environment?</li> <li>- combinations of speed and traffic volume?</li> </ul>			
Are the shoulder widths adequate for stationary vehicles and errant vehicles?			
Are median widths adequate for road furniture?			
Is superelevation consistent with the road environment?			
Are the shoulder crossfalls safe for vehicles to traverse?			
Are batter slopes drivable for cars, trucks?			
Are side slopes under structures appropriate?			
Have adequate facilities been provided for pedestrians and cyclists?			
<b>3 Effect of cross sectional variation</b> Is the design free of undesirable variations in cross section design?			
Are crossfalls safe? (particularly where sections of existing highway have been used, there have been compromises to accommodate accesses, at narrowings at bridges, etc.)			
Are any curves with adverse crossfall within appropriate limits?			
Is superelevation provided and sufficient at all locations where required?			
<b>4 Roadway layout</b> Are all traffic management features designed so as to avoid creating unsafe conditions?			
Is the layout of road markings and reflective materials able to deal satisfactorily with changes in alignment? (particularly where the alignment may be substandard.)			
Is there adequate provision for overtaking?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are overtaking lanes provided where required and safely commenced and ended?			
Are overtaking requirements satisfactory?			
Is the design free of sunrise/sunset problems?			
Have public transport and school bus requirements (where necessary) been adequately catered for?			
<b>5 Shoulders and edge treatment</b> Are the following safety aspects of shoulder provision satisfactory? - provision of sealed or unsealed shoulders; - width and treatment on embankments; - crossfall of shoulders.			
Are the shoulders likely to be safe if used by slow-moving vehicles or cyclists?			
<b>6 Effect of departures from standards or guidelines</b> Any approved departures from standards or guidelines: is safety maintained?			
Any hitherto undetected departures from standards: is safety maintained?			
<b>7 Visibility and sight distance</b> Are horizontal and vertical alignments consistent with visibility requirements?			
Has an appropriate design speed been selected for visibility requirements?			
<b>8 Environmental treatments</b> Has safety been considered in the location of environmental features (for example, noise fences)?			
<b>3.3 Alignment details</b>			
<b>1 Visibility; sight distance</b> Are horizontal and vertical alignments consistent with the visibility requirements?			
Is the design free of sight line obstructions due to safety fences or barriers? - boundary fences? - street furniture? - parking facilities?			

**Checklist Stage 3: Detailed design stage audit (continued)**

Issue	Yes	No	Comments
<ul style="list-style-type: none"> <li>- signs?</li> <li>- landscaping?</li> <li>- bridge abutments?</li> <li>- parked vehicles in laybys or at the kerb?</li> <li>- queued traffic?</li> </ul>			
Are railway crossings, bridges and other hazards all conspicuous?			
Is the design free of any other local features which may affect visibility?			
Is the design free of overhead obstructions (for example, road or rail overpasses, sign gantries, overhanging trees) which may limit sight distance at sag curves?			
Has a clear headroom or a high vehicle detour been provided where necessary?			
Is visibility adequate at: <ul style="list-style-type: none"> <li>- any pedestrian, bicycle or cattle crossings?</li> <li>- access roads, driveways, on and off ramps, etc.?</li> </ul>			
Has the minimum sight triangle been provided at: <ul style="list-style-type: none"> <li>- entry and exit ramps?</li> <li>- gore areas?</li> <li>- intersections?</li> <li>- roundabouts?</li> <li>- other conflict points?</li> </ul>			
<b>2 New/existing road interface</b> Have implications for safety at the interface been considered?			
Is the transition from old road to the new scheme satisfactory?			
If the existing road is of a lower standard than the new scheme, is there clear and unambiguous warning of the reduction in standard?			
Have the appropriate provisions for safety been made where sudden changes in speed are required?			
Is access or side friction handled safely?			
Does the interface occur well away from any hazard? (for example, a crest, a bend, a roadside hazard or where poor visibility/distractions may occur.)			
If carriageway standards differ, is the change effected safely			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is the transition where the road environment changes (for example, urban to rural; restricted to unrestricted; lit to unlit) done safely?			
Has the need for advance warning been considered?			
<b>3 'Readability' of the alignment by drivers</b> Will the general layout, function and broad features be recognised by drivers in sufficient time?			
Will approach speeds be suitable and will drivers correctly track through the scheme?			
<b>4 Detail of geometric design</b> Are the design standards appropriate for all the requirements of the scheme?			
Is consistency of general standards and guidelines, such as lane widths and cross falls, maintained?			
<b>5 Treatment at bridges and culverts</b> Is the geometric transition from the standard cross section to that on the bridge handled safely?			
<b>3.4 Intersections</b>			
<b>1 Visibility to and visibility at intersections</b> Are horizontal and vertical alignments at the intersection or on the approaches to the intersection consistent with the visibility requirements?			
Is the standard adopted for provision of visibility appropriate for the speed of traffic and for any unusual traffic mix?			
Will the design be free of sight line obstructions due to safety fences or barriers? - boundary fences? - street furniture? - parking facilities? - signs? - landscaping? - bridge abutments? - parked vehicles in laybys and at the kerb? - queued traffic?			
Are railway crossings, bridges and other hazards all conspicuous?			
Is the design free of any other local features, which may affect visibility?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>2 Layout</b>			
Are intersections and accesses adequate for all vehicular movements?			
Have the appropriate design vehicle and check vehicle been used for turning dimensions?			
Are swept paths accommodated for all likely vehicle types? (Has the appropriate design vehicle been used)?			
Are intersections free of any unusual features which could affect road safety?			
Are pedestrian fences provided where needed? (for example, to guide pedestrians or discourage parking.)			
Has pavement anti-skid treatment been provided where needed?			
Have islands and signs been provided where required?			
Vehicles which may park at or close to the intersection: can they do this safely or does this activity need to be relocated?			
Are safety hazards due to parked vehicles avoided?			
Have pedestrians and cyclist needs been considered?			
<b>3 Readability by drivers</b>			
Will the existence of the intersection and its general layout, function and broad features be perceived correctly and in adequate time?			
Are the approach speeds and likely positions of vehicles tracking through the intersection safe?			
Is the design free of misleading elements?			
Is the design free of sunrise or sunset problems, which may create a hazard for motorists?			
<b>4 Detailed geometric design</b>			
Can the layout safely handle unusual traffic mixes or circumstances?			
Does any median or any island safely account for: <ul style="list-style-type: none"> <li>- vehicle alignments and paths?</li> <li>- future traffic signals?</li> <li>- pedestrian storage space and surface?</li> <li>- turning path clearance?</li> <li>- stopping sight distance to the nose?</li> <li>- mountability by errant vehicles?</li> </ul>			
Is adequate vertical clearance to structures provided (for example power lines, shop awnings)			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>5 Traffic signals</b>			
Is the signal phasing/sequence safe (particularly for school children)?			
Is adequate time provided for traffic movements and pedestrian movements?			
Will the signal lanterns be visible? (for example, not obstructed by trees, poles, signs or large vehicles.)			
Are lanterns for other approach directions adequately shielded from view?			
Are high-intensity signals and/or target boards provided if likely to be affected by sunrise/sunset?			
Does the vertical alignment provide satisfactory stopping sight distance to the intersection or back of queue?			
Are pedestrian facilities provided where they are required?			
Will approaching drivers be able to see pedestrians?			
Are partially or fully controlled turning phases required and provided?			
Are signal posts located where they are not an undue hazard?			
Are road markings for turning traffic satisfactory?			
Have adequate pedestrian phases been provided?			
<b>6 Roundabouts</b>			
Is adequate deflection provided to reduce approach speeds?			
If splitter islands are needed, are they adequate for sight distance, length, pedestrian storage, etc.?			
Is the central island prominent?			
Can the appropriate design vehicle and check vehicle be accommodated?			
Are the central island details satisfactory (delineation, mountability, conspicuousness)?			
Can pedestrians be seen by drivers in sufficient time?			
Can pedestrians determine whether vehicles are turning (no obstructions to sight lines)?			
Are direction markings required in approach lanes?			
Is the lighting adequate?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>7 Other intersections</b> Has the need for kerbed or painted islands and refuges been considered?			
Do intersections have adequate queue length/storage for turning movements (including in the centre of a staggered intersection)?			
<b>3.5 Special road users</b>			
<b>1 Adjacent land</b> Are all accesses to and from adjacent land/properties safe?			
Have the special needs of agriculture and stock movements been considered?			
<b>2 Pedestrians</b> Can pedestrians cross safely at: - intersections? - signalised and/or pedestrian crossings? - refuges? - kerb extensions? - bridges and culverts? - other locations?			
Is each crossing point satisfactory for: - visibility, for each direction? - use by the disabled? - use by the elderly? - use by children/schools?			
Is pedestrian fencing on reservations and medians required and provided for each crossing?			
Is fencing adequate on freeways?			
Are pedestrians deterred from crossing roads at unsafe locations?			
Are pedestrian related signs appropriate and adequate?			
Is width and gradient of pedestrian paths, crossings, etc. satisfactory?			
Is surfacing of pedestrian paths, crossings, etc. satisfactory?			
Have dropped kerbs been provided for each crossing?			
Have channels and gullies been avoided at each crossing?			
Is lighting satisfactory for each crossing?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are crossings sited to provide maximum use?			
Is avoidance of a crossing unlikely (for example, by more direct but less safe alternative)?			
<b>3 Cyclists</b> Have the needs of cyclists been considered: <ul style="list-style-type: none"> <li>- at intersections (particularly roundabouts)?</li> <li>- especially on higher speed roads?</li> <li>- on cycle routes and crossings?</li> <li>- at freeway entry and exit ramps?</li> </ul>			
Are shared cycleway/footway facilities (including subways and bridges) safe and adequately signed?			
<b>4 Motorcyclists</b> Has the location of devices or objects that might destabilise a motorcycle been avoided on the road surface?			
Is the roadside clear of obstructions where motorcyclists may lean into curves?			
Will warning or delineation be adequate for motorcyclists?			
Has barrier kerb been avoided in high-speed areas?			
In areas more likely to have motorcycles run off the road is the roadside forgiving or safely yielded?			
Are all poles, posts and devices necessary? (If so, is shielding an option?)			
Are drainage pits and culverts traversable by motorcycle?			
<b>5 Equestrians and stock</b> Have the needs of equestrians been considered, including the use of verges or shoulders and rules regarding the use of the carriageway?			
Can underpass facilities be used by equestrians/stock?			
<b>6 Freight</b> Have the needs of truck drivers been considered, including turning radii and lane widths?			
Have the needs of freight transport been considered, adequately signed and catered for?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>7 Public transport</b> Have the needs for public transport including school buses been considered, adequately signed and catered for?			
Have the needs of public transport users been considered?			
Have the manoeuvring needs of public transport vehicles been considered?			
Are bus stops well positioned for safety?			
<b>8 Road maintenance vehicles</b> Have the needs of road maintenance vehicles been considered, adequately signed and catered for?			
Can maintenance vehicles be safely located?			
<b>3.6 Lighting, signs and delineation</b>			
<b>1 Lighting</b> Is lighting required and, if so, has it been adequately provided?			
Is the design free of features which interrupt illumination (for example, trees or overbridges)?			
Do any lighting poles present a fixed roadside hazard?			
Are frangible or slip-base poles to be provided?			
Ambient lighting: if it creates special lighting needs, have these been satisfied?			
Is the lighting scheme free of confusing or misleading effects on signals or signs?			
Does the lighting adequately illuminate crossings, nearby paths, refuges, etc.?			
Are all gore areas adequately illuminated?			
Are all merge areas adequately illuminated?			
Is the scheme free of any lighting black patches?			
If there are locations with accident problems that are known to be amenable to treatment with improved lighting, has this lighting been provided?			
<b>2 Signs</b>			
Are signs appropriate for their location?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are signs located where they can be seen and read in adequate time?			
Will signs be readily understood?			
Are signs appropriate to the driver's needs (for example speed limit signs, direction signs, advisory speed signs, etc.)?			
Are signs located so that drivers' sight distance is maintained?			
Are signs located so that visibility is maintained: - to/from accesses and intersecting roads? - to/from pedestrians and important features on the road?			
Have the consequences of vehicles striking signposts been considered?			
Are sign supports out of the clear zone?			
If not, are they: - frangible? - shielded by barriers (for example, guard fence, crash cushions)?			
Has an over-reliance on signs (in lieu of adequate geometric design) been avoided?			
Are signs on the new scheme consistent with those on the adjoining section of road (or will the previous signs need to be upgraded)?			
<b>3 Marking and delineation</b>			
Are markings (lines, arrows, etc.) consistent with standard markings?			
Have any locations where standard markings might be confusing or misread been identified and treated in a way which considers users' likely responses?			
Are barrier lines (no overtaking) provided where required			
Are Raised Retroreflective Pavement Markers (RRPMs) provided where necessary?			
Are curve warning signs, advisory speed plates or chevron alignment markers provided where required?			
Are markings on the new scheme consistent with those on the adjoining section of road (or will the previous markings need to be upgraded)?			
Are diagonal markings or chevrons painted where required?			
Are any other markings required (eg advisory speed limits etc)			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Will markings and delineation be visible at nighttime?			
Will markings and delineation be visible in wet weather?			
Has the need for profiled (audible) line marking been considered?			
Have both high and low-beam cases been considered?			
Are guide posts of the frangible type?			
<b>3.7 Physical objects</b>			
<b>1 Median barriers</b>			
Have median barriers been considered and properly detailed?			
Have all design features that require special attention (for example, end treatments) been considered?			
<b>2 Poles and other obstructions</b>			
Are all poles located well away from moving traffic?			
Have frangible or breakaway poles been included where required?			
Are median widths adequate to accommodate lighting poles or trees?			
Is the position of traffic signal controllers and other service apparatus satisfactory?			
Is the roadside clear of any other obstructions that may create a safety hazard?			
Have all necessary measures been taken to remove, relocate or shield all hazards?			
Can roadside drains and channels be safely traversed by any vehicle that runs off the road?			
<b>3 Crash barriers</b>			
Are crash barriers provided where necessary and properly detailed (for example, at embankments, structures, trees, poles, drainage channels, bridge piers, gore areas)?			
Is the crash barrier safe (i.e. unlikely to create a danger for road users including pedestrians, cyclists, motorcyclists, etc.)?			
Are the end conditions of the crash barrier safe and satisfactory?			

**Checklist Stage 3: Detailed design stage audit (continued)**

Issue	Yes	No	Comments
Is the guard fence designed according to standards for: <ul style="list-style-type: none"> <li>- end treatments?</li> <li>- anchorages?</li> <li>- post spacing?</li> <li>- block outs?</li> <li>- post depth?</li> <li>- rail overlap?</li> <li>- stiffening at rigid obstacles?</li> </ul>			
Is all guard fence necessary (i.e. what it shields is a greater hazard than the fence)?			
Where pedestrians and cyclists travel behind guard fence, is the rear of the fence safe for them?			
<b>4 Bridges, culverts and causeways/floodways</b> Are bridge barriers and culvert end walls safe regarding <ul style="list-style-type: none"> <li>- visibility?</li> <li>- ease of recognition?</li> <li>- proximity to moving traffic?</li> <li>- the possibility of causing injury or damage?</li> <li>- collapsible or frangible ends?</li> <li>- signs and markings?</li> <li>- connection of crash barriers?</li> <li>- roadside hazard protection?</li> </ul>			
Is the bridge railing at the correct level and strong enough?			
Is the shoulder width on the bridge the same as on the adjacent road lengths?			
Is safe provision made for non-vehicular traffic over structures? (for example, pedestrians, pedal cycles, horses/stock, etc).			
Are all culvert end walls (including driveway culverts) drivable or outside the clear zone?			
Have causeways/floodways etc, been given correct signing and adequate sight distance?			
<b>3.8 Additional questions to be considered for development proposals</b>			
<b>1 Horizontal alignment</b> Is visibility adequate for drivers and pedestrians at proposed accesses?			

**Checklist Stage 3: Detailed design stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is adequate turning space provided for the volume and speed of traffic?			
Are curve radii and forward visibility satisfactory?			
Are sight and stopping distances adequate?			
<b>2 Vertical alignment</b>			
Are gradients satisfactory?			
Are sight and stopping distances adequate?			
<b>3 Parking provision</b>			
Is on-site parking adequate to avoid on-street parking and associated risks?			
Are parking areas conveniently located?			
Is adequate space provided in parking areas for circulation and intersection sight distance?			
<b>4 Servicing facilities</b>			
Are off street loading/unloading areas adequate?			
Are turning facilities for large vehicles provided in safe locations?			
Is emergency vehicle access adequate?			
<b>5 Signs and markings</b>			
Have necessary traffic signs and road markings been provided as part of a development?			
Is priority clearly defined at all the intersection points within the car park and access routes?			
Will the signs and markings be clear in all conditions, including day/night, rain, fog, etc.?			
<b>6 Landscaping</b>			
Does landscaping maintain visibility at intersections, bends, accesses and pedestrian locations?			
Has tree planting been avoided where vehicles are likely to run off the road?			
<b>7 Traffic management</b>			
Have any adverse area-wide effects been addressed?			
Will the design keep travel speeds at a safe level?			

**Checklist Stage 3: Detailed design stage audit (continued)**

Issue	Yes	No	Comments
Are the number and location of accesses appropriate?			
Are the facilities for public transport services (including school buses) safely located?			
Are any bicycle facilities safely located in respect of vehicular movements?			
Are pedestrian facilities adequate and safely located?			
<b>8 Other</b> Has appropriate street lighting been provided?			
Are all roadside hazards appropriately dealt with?			
Has safe pedestrian access to the development been Provided?			
<b>3.9 Any other matter</b>			
<b>1 Safety aspects not already covered</b> Will there be special events? Have any consequent Unusual or hazardous conditions been considered?			
Is the road able to safely handle oversize vehicles, or large vehicles like trucks, buses, emergency vehicles, road maintenance vehicles?			
If required, can the road be closed for special events in a safe manner?			
If applicable, are special requirements of scenic or tourist routes satisfied?			

### Checklist Stage 4: Pre-opening stage audit

Issue	Yes	No	Comments
<b>4.1 General topics</b>			
<b>1 Changes since previous audit; translation of design into practice</b> General check: have any matters that have changed since a previous audit been executed safely?			
Has the translation of the design into practice been executed safely?			
<b>2 Drainage</b> Is the drainage of the road and surrounds adequate?			
<b>3 Climatic conditions</b> Are any facilities put in place to counter climatic problems effective?			
<b>4 Landscaping</b> Is the planting and species selection appropriate from a safety point of view?			
Is vegetation/landscaping frangible in locations where vehicles may run off the road?			
Is visibility maintained past or over vegetation/landscaping (particularly for pedestrian safety)? Will this continue to be so once plants grow and mature?			
<b>5 Services</b> Are all boxes, pillars, posts and lighting columns located in safe positions?			
Are they of appropriate materials or design?			
<b>6 Access to property and developments</b> Are all accesses safe for their intended use?			
Are all accesses adequate, particularly in terms of design, location and visibility?			
<b>7 Emergency vehicles and access</b> Are the provisions for emergency vehicle access and stopping safe?			

**Checklist Stage 4: Pre-opening stage audit (continued)**

Issue	Yes	No	Comments
<b>8 Batter treatment</b> Will the batter treatment prevent or limit debris falling on to the carriageway?			
<b>9 Shoulders and edge delineation</b> Are all delineators and reflectors correctly in place?			
<b>10 Signs and markings</b> Are all signs and pavement markings correctly in place? Will they remain visible at all times (day and night)?			
Are new markings consistent with existing markings? (check with adjacent road network)			
Have old signs and road markings been removed?			
Is there any chance of causing confusing?			
<b>11 Surface treatment; skid resistance</b> Are all joints in surfacing free of excessive bleeding or low-skid resistance?			
Have all trafficked areas been checked for similar problems, including loose metal?			
<b>12 Contrast with markings</b> Do the installed road markings have sufficient contrast with the road surface and are they clear of debris?			
<b>13 Roadside hazards</b> Is the scheme free of newly installed or overlooked roadside hazards?			
<b>14 Natural features</b> Is the scheme free of natural features (for example, a bank, rock or major tree) that will be a roadside hazard or an obstruction to visibility?			
<b>15 All road users</b> Is safety adequate for: <ul style="list-style-type: none"> <li>- pedestrian movements? (pedestrians of all ages)</li> <li>- bicycle/non-motorised vehicle movements?</li> <li>- truck and bus movements?</li> <li>- motorcycle movements?</li> <li>- car movements?</li> </ul>			

**Checklist Stage 4: Pre-opening stage audit (continued)**

Issue	Yes	No	Comments
<b>16 Speed zoning</b> Has the appropriate speed zone been selected? Is a special school zone needed?			
<b>4.2 Alignment details</b>			
<b>1 Visibility; Sight Distances</b> Are sight lines free of obstructions?			
<b>2 New/existing road Interface</b> Additional signs and/or markings: have they been considered and provided?			
<b>3 Readability by drivers</b> Is the form and function of the road and its traffic management easily recognised under likely operating conditions? (for example, under heavy traffic, minimal traffic or poor visibility conditions.) Is the transition from old work to new work satisfactory (i.e. no uncertainty or ambiguity at the transition)?			
<b>4 Bridges and culverts</b> Are all markings and signs in place and conspicuous?			
<b>4.3 Intersections</b>			
<b>1 Visibility of intersection</b> Will drivers approaching the intersection be aware of its presence? (especially if required to give way.)			
<b>2 Visibility at intersection</b> Are all visibility displays clear for the different driver eye heights: of cars, trucks, bicycles, motorcycles, vehicles with restricted visibility?			
<b>3 Readability by drivers</b> Is the form and function of the intersection clear to drivers on all approaches? (Check by driving.) Are Give Way or Stop lines visible in time? Are there sufficient visual cues to prevent overshooting into the conflicting traffic?			
<b>4 Traffic signals</b> Is the alignment of lanterns and general correctness of installation satisfactory?			

**Checklist Stage 4: Pre-opening stage audit (continued)**

Issue	Yes	No	Comments
Are all applicable lanterns visible from each approach lane at the appropriate distances?			
Are all traffic signals functioning properly and safely?			
Are all pedestrian signals functioning correctly and safely?			
<b>5 Roundabouts and approach islands</b> Are the roundabout and islands fully visible and recognisable from all approaches?			
Are all signs, markings and lighting correctly in place?			
<b>4.4 Special road users</b>			
<b>1 Adjacent land</b> Is fencing adequate, particularly on roads where pedestrians and animals are not allowed?			
<b>2 Pedestrians</b> Are all pedestrian facilities likely to operate safely regarding: <ul style="list-style-type: none"> <li>- visibility?</li> <li>- signs?</li> <li>- surfacing?</li> <li>- fencing?</li> <li>- the operation of other hardware, including lighting";</li> <li>- wheel chairs and prams?</li> <li>- visually impaired people?</li> </ul>			
<b>3 Cyclists</b> Are all cycleways, lanes, etc. and facilities likely to operate safely regarding: <ul style="list-style-type: none"> <li>- visibility?</li> <li>- signs?</li> <li>- surfacing?</li> <li>- fencing?</li> <li>- the operation of other hardware, including lighting?</li> <li>- crossings of roads and intersections?</li> </ul>			
<b>4 Motorcyclists</b> Has the location of devices or objects that might destabilise a motorcycle been avoided on the road surface			
Is the roadside clear of obstructions where motorcyclist: may lean into curves?			

**Checklist Stage 4: Pre-opening stage audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Will warning or delineation be adequate for motorcyclists?			
Has barrier kerb been avoided in high-speed areas?			
In areas more likely to have motorcycles run off the road is the roadside forgiving or safely shielded?			
Are all poles, posts and devices necessary? (If so, is shielding an option?)			
Are drainage pits and culverts traversable by motorcycle?			
<b>5 Equestrians</b> Are all relevant facilities likely to operate safely regarding: - visibility? - signs? - other special features?			
<b>4.5 Lighting, signs and delineation</b>			
<b>1 Lighting</b> Is all lighting operating and, from a safety point of view, is it effective?			
<b>2 Signs</b> Are the correct signs used and are they correctly placed? (particular attention to school and children signs)			
In daylight and darkness, are signs satisfactory regarding: - conspicuousness? - clarity of message? - readability/legibility at the required distance?			
Is sign retroreflectivity or illumination satisfactory?			
Are any variable message signs operating satisfactorily?			
Are all signs necessary?			
Can all signs be seen (not hidden or camouflaged by their background or adjacent distractions)?			
<b>3 Marking and delineation</b> Is all delineation and road marking placed correctly and fully visible?			
Are RRPMS fully visible with correct spacings, colour, etc.?			
Are all other delineation devices correctly installed (especially location, type and size)?			

**Checklist Stage 4: Pre-opening stage audit (continued)**

Issue	Yes	No	Comments
Are guide post delineators operating adequately at night			
Reflectors on crash barrier: are they the correct type, level and spacing and not misleading in alignment?			
Are all road markings clearly visible at all times to motorists and other road users?			
Is there continuity and uniformity of delineation and markings through the scheme and at transitions?			
<b>4.6 Physical objects</b>			
<b>1 Median barriers</b> Are all necessary median barriers in place and properly signed or delineated?			
Are barriers placed so that they do not restrict visibility or form a roadside hazard?			
<b>2 Poles and other obstructions</b> Are all poles and sign structure bases safely designed and appropriately located?			
Is the scheme free of any other poles or obstructions that may have been missed in other checks?			
Otherwise, are obstructions suitably shielded?			
<b>3 Crash barriers</b> Are all crash barriers in place and safely located (not a hazard in themselves)?			
Is the length of any guard fence adequate?			
Is the guard fence correctly installed, regarding: <ul style="list-style-type: none"> <li>- end treatments?</li> <li>- anchorages?</li> <li>- post spacing?</li> <li>- block outs?</li> <li>- post depth?</li> <li>- rail overlap?</li> <li>- stiffening at rigid obstacles?</li> </ul>			

**Checklist Stage 4: Pre-opening stage audit (continued)**

Issue	Yes	No	Comments
<b>4.7 Operation</b>			
<b>1 Operation</b> Are all operating features working satisfactorily and can access be gained to them safely?			
<b>2 Traffic management</b> Do all traffic management devices function property when observed from a moving vehicle?			
<b>3 Temporary traffic control/management</b> Have all temporary arrangements, signing, etc. been removed and replaced by final arrangements? (for example, signs, signals, lines, construction accesses and temporary barriers.)			
<b>4 Safety matters not already covered</b> Has the scheme been driven and walked to identify any potential problems not already dealt with?			
Have daytime, night-time and busy times for school traffic inspections been conducted, including inspections of all connecting roads?			

### Checklist Stage 5: Roadwork traffic scheme audit

Issue	Yes	No	Comments
<b>5.1 General Items</b>			
<b>1 Alignment</b> Are the road works located safely with respect to horizontal and vertical alignment? If not, does works signing cater for this?			
Are the transitions from the existing road to the road Works, safe and clearly laid out?			
<b>2 Turning radii and tapers</b> Are turning radii and tapers constructed in accordance with guidelines?			
Are the tapers delineated by roadworks cones where necessary?			
Are the width of the lanes satisfactory for the traffic using the works area?			
Are the alignment of kerb, traffic islands and medians satisfactory?			
<b>3 Traffic lane safety and visibility</b> Is the work area clearly defined?			
Are the travel paths for both directions of traffic clearly defined? Is the work area appropriately separated from passing traffic?			
Are centre lines/lane lines/edge lines clear and unambiguous?			
Are sight and stopping distances adequate at works and at intersections and driveways?			
Are bus stops appropriately located with adequate clearance from the traffic lane for safety and visibility?			
Can passengers safely walk to and from bus stops?			
<b>4 Night-time safety</b> Is appropriate street lighting or other delineation provided at the road works to ensure that the site is safe at night? (Night-time inspection essential.)			
Is the works area safe for pedestrians and cyclists at night?			
<b>5 Maintenance</b> Can the road be maintained safely during construction (consider workers and the public)			

**Checklist Stage 5: Roadwork traffic scheme audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is the road surface likely to be free of gravel, mud or other debris?			
<b>6 Access to property</b> Do the roadworks safely accommodate property access including the special needs of any schools?			
<b>7 Safety barriers</b> Are safety barriers used where required to separate works areas from public areas?			
Are safety barriers used where required to shield traffic from other hazards?			
Are the barriers of an approved type for the purpose and located and assembled correctly?			
Are safety barriers erected in a manner that: - does not make them a hazard to traffic? - does not obstruct visibility?			
<b>8 Inspections</b> Has the site been inspected day and night?			
<b>5.2 Traffic management</b>			
<b>1 Traffic controls</b> Are appropriate traffic management controls in place?			
Have the needs of cars, trucks, pedestrians, bicyclists, motorcyclists and bus users been considered?			
Is sight distance to traffic controllers adequate?			
Have parking and clearway matters been considered?			
Have the police and other emergency services been consulted?			
<b>2 Speed management</b> Are speed limit signs required for these works? If so, are they correctly applied?			
Are speed limit signs required to be maintained all day and at night?			
Are motorists informed of the need to slow down through the road works site?			

**Checklist Stage 5: Roadwork traffic scheme audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>3 Work site access</b>			
Are site entrances and exits safely located with adequate sight distance?			
Are traffic merges/exits/entries/turns properly delineated and controlled?			
Are adequate merge lengths provided?			
Are appropriate traffic controls in place where works traffic and public traffic interact?			
<b>5.3 Signs and pavement markings</b>			
<b>1 Signs</b>			
Are all necessary regulatory, warning and direction signs in place?			
Are they correctly placed, clean and conspicuous?			
Do they conform to AS 1724.3-1996 and other guidelines?			
If chevron alignment markers are installed, have the correct types been used?			
Have unnecessary signs been removed when works are not in progress (for example, at night)?			
Are traffic signs correctly located, with adequate lateral and vertical clearance?			
Are signs placed to not restrict sight distance, particularly for turning vehicles?			
<b>2 Day/night sign requirements</b>			
Are the correct signs used for each situation including at night where required, and is each sign necessary?			
<b>3 Traffic control</b>			
Are other traffic control devices according to standards and used correctly?			
Are flagmen or temporary traffic signals provided where required - where, when and how?			
<b>4 Delineation and reflective markers</b>			
Are traffic lanes clearly delineated?			
Have temporary reflective markers been installed?			
Where coloured reflective markers are used, have they been installed correctly?			

**Checklist Stage 5: Roadwork traffic scheme audit (continued)**

Issue	Yes	No	Comments
<b>5 Pavement marking</b> Are all necessary pavement markings installed in accordance with guidelines?			
Are vehicle paths through the works area clear to motorists?			
Are works areas clearly defined and clear of through traffic when flagmen are not used?			
Have any issues of site difficulties for motorcyclists (day or night) been addressed?			
<b>6 Detours</b> Do temporary detours allow heavy vehicles and buses to safely manoeuvre in their designated lane? Are there special needs for schools and are they catered for?			
<b>5.4 Traffic signals</b>			
<b>1 Temporary traffic signals</b> Are the temporary traffic signals clearly visible to approaching motorists?			
Are signs warning of temporary traffic signals adequate?			
Has the need for additional warning signs been considered?			
Will the ends of vehicle queues be visible to motorists so that they may stop safely?			
<b>2 Location</b> Are traffic signals operating correctly? Is the number and location of signal displays adequate?			
<b>3 Visibility</b> Have any visibility problems caused by the rising or setting sun been addressed?			
Do any site works or any construction equipment create visibility problems for traffic signals?			
<b>4 Signal display</b> Are signal displays shielded so they can be seen only by the motorists for whom they are intended?			
<b>5 Traffic movements</b> Are all movements, including pedestrians, catered for by the temporary traffic signals?			

**Checklist Stage 5: Roadwork traffic scheme audit (continued)**

Issue	Yes	No	Comments
<b>5.5 Pedestrians and cyclists</b>			
<b>1 General</b> Have the effects of the works areas on pedestrians and cyclists (particularly near schools) been considered?			
Are appropriate travel paths and crossing points provided for pedestrians and cyclists?			
Are pedestrians and cyclists adequately warned of obstructions and temporary works hazards on their travelled way?			
<b>2 Elderly and disabled access</b> Are there adequate safety access provisions for the elderly, disabled, children, wheel chairs and prams, (for example, holding rails, kerbs and median crossings, ramps)?			
<b>3 Cyclists</b> Is the route available for bicycles continuous and free of squeeze points or gaps?			
<b>5.6 Road pavement</b>			
<b>1 Pavement defects</b> Is the pavement free of defects (for example, excessive roughness or rutting, potholes, loose material, etc.) that could result in safety problems like loss of steering control for: <ul style="list-style-type: none"> <li>- car drivers?</li> <li>- cyclists?</li> <li>- motorcyclists?</li> <li>- heavy vehicle drivers?</li> </ul>			
<b>2 Skid Resistance</b> Does the pavement appear to have adequate skid resistance, especially on steep descents?			
<b>3 Ponding</b> Is the pavement free of areas where ponding or sheet flow of water may cause safety problems?			
<b>4 Signal display</b> Are signal displays shielded so they can be seen only by the motorists for whom they are intended?			

### Checklist Stage 6: Existing roads audit

What type of school is it? (pre-primary, primary, junior high, high school, other)

.....

Issue	Yes	No	Comments
<b>6.1 Road alignment and cross section</b>			
<b>1 Visibility; sight distance</b> Is sight distance to and from school entrances/facilities adequate for the speed of traffic using the route?			
Is adequate sight distance provided for intersections and crossings? (e.g. pedestrian, cyclist, railway.)			
Is adequate sight distance provided at all private driveways and property entrances (including the school)?			
<b>2 Design speed</b> Is the horizontal and vertical alignment suitable for the (85th percentile) traffic speed? If not: - Are warning signs installed? - Are advisory speed signs installed?			
Are the posted advisory speeds for curves appropriate?			
<b>3 Speed limit/speed zoning</b> Is the speed limit compatible with the function, road geometry, land use and sight distance (with particular attention to the desirability or otherwise of special speed limits for the school precinct)?			
<b>4 Overtaking</b> Are safe overtaking opportunities provided?			
<b>5 Readability by drivers</b> Is the road free of elements that may cause confusion? For example: - Is alignment of the roadway clearly defined? - Has disused pavement (if any) been removed or treated? - Have old pavement markings been removed properly? - Do tree lines follow the road alignment? - Does the line of street lights or the poles follow the road alignment?			
Is the road free of misleading curves or combinations of curves?			
<b>6 Widths</b> Are medians and islands of adequate width for the likely users?			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are traffic lanes and carriageway widths adequate for the traffic volume and mix?			
Are bridge widths adequate?			
<b>7 Shoulders</b>			
Are shoulders wide enough to allow drivers to regain control of errant vehicles?			
Are shoulders wide enough for broken-down or emergency vehicles to stop safely?			
Are shoulders sealed?			
Are shoulders traffickable for all vehicles and road users? (I.e. are shoulders in good condition.)			
Is the transition from road to shoulder safe? (no drop-offs.)			
<b>8 Crossfalls</b>			
Is appropriate superelevation provided on curves?			
Is any adverse crossfall safely managed (for cars, trucks, etc.)?			
Do crossfalls (carriageway and shoulder) provide adequate drainage?			
<b>9 Batter slopes</b>			
Are batter slopes traversable by cars and trucks that run off the road?			
<b>10 Drains</b>			
Are roadside drains and culvert end walls traversable?			
<b>6.2 Auxiliary lanes</b>			
<b>1 Tapers</b>			
Are starting and finishing tapers located and aligned correctly?			
Is there sufficient sight distance to the end of the auxiliary lane?			
<b>2 Shoulders</b>			
Are appropriate shoulder widths provided at merges?			
Have shoulder widths been maintained beside the auxiliary lane?			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>3 Signs and markings</b>			
Have all signs been installed in accordance with the appropriate guidelines?			
Are all signs conspicuous and clear?			
Does all linemarking conform to these guidelines?			
Is there advance warning of approaching auxiliary lanes?			
<b>4 Turning traffic</b>			
Have right turns from the through lane been avoided?			
Is there advance warning of turn lanes?			
<b>6.3 Intersections</b>			
<b>1 Location</b>			
Are all intersections located safely with respect to the horizontal and vertical alignment?			
Where intersections occur at the end of high-speed environments (for example, at approaches to towns), are there traffic control devices to alert drivers?			
<b>2 Visibility; sight distance</b>			
Is the presence of each intersection obvious to all road users?			
Is the sight distance appropriate for all movements and all users?			
Is there stopping sight distance to the rear of any queue or slow-moving turning vehicles?			
Has the appropriate sight distance been provided for entering and leaving vehicles?			
<b>3 Controls and delineation</b>			
Are pavement markings and intersection control signs satisfactory?			
Are vehicle paths through intersections delineated satisfactorily?			
Are all lanes properly marked (including any arrows)?			
<b>4 Layout</b>			
Are all conflict points between vehicles safely managed?			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is the intersection layout obvious to all road users?			
Is the alignment of kerbs obvious to all road users?			
Is the alignment of traffic islands obvious & appropriate?			
Is the alignment of medians obvious & appropriate?			
Can all likely vehicle types be accommodated?			
Where cycleways terminate at intersections or adjacent to the carriageway, has the transition treatment been handled safely?			
Are merge tapers long enough?			
Is the intersection free of capacity problems that may produce safety problems?			
<b>5 Miscellaneous</b> Particularly at rural sites, are all intersections free of loose gravel?			
<b>6.4 Signs and lighting</b>			
<b>1 Lighting</b> Is lighting required and, if so, has it been adequately provided?			
Is the road free of features that interrupt illumination (for example, trees or overbridges)?			
Is the road free of lighting poles that are a fixed roadside hazard?			
Are frangible or slip-base poles provided?			
Ambient lighting: if it creates special lighting needs, have these been satisfied?			
Is the lighting scheme free of confusing or misleading effects on signals or signs?			
Is the scheme free of any lighting black patches?			
<b>2 General signs issues</b> Are all necessary regulatory, warning and direction signs in place (particularly relating to children and school safety) ? Are they conspicuous and clear?			
Are the correct signs used for each situation, and is each sign necessary?			
Are all signs effective for all likely conditions (eg, day, night, rain, fog, rising or setting sun, oncoming headlights, poor lighting)?			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
If restrictions apply for any class of vehicle, or times are drivers adequately advised?			
If restrictions apply for any class of vehicle, are drivers advised of alternative routes?			
<b>3 Sign legibility</b> In daylight and darkness, are signs satisfactory regarding visibility? - clarity of message? - readability/legibility at the required distance?			
Is sign retroreflectivity or illumination satisfactory?			
Are signs able to be seen without being hidden by their background or adjacent distractions?			
Is driver confusion due to too many signs avoided?			
<b>4 Sign supports</b> Are sign supports out of the clear zone?			
If not, are they: - frangible? - shielded by barriers (for example, guard fence, crash cushions)?			
<b>6.5 Markings and delineation</b>			
<b>1 General issues</b> Is the line marking and delineation: - appropriate for the function of the road? - consistent along the route? - likely to be effective under all expected conditions? (day, night, wet, dry, fog, rising and setting sun position, oncoming headlights, etc.)			
Is the pavement free of excessive markings? (for example unnecessary turn arrows, unnecessary barrier lines, etc.)			
<b>2 Centrelines, edgelines, lane lines</b> Are centrelines, edgelines lane lines provided? If not do drivers have adequate guidance?			
Are RRPMS required?			
If RRPMS are installed, are they correctly placed, correct colours, in good condition			
Are profiled (audible) edge lines provided where required?			
Is the linemarking in good condition?			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is there sufficient contrast between linemarking and pavement colour?			
<b>3 Guideposts and reflectors</b>			
Are guideposts appropriately installed?			
Are delineators clearly visible?			
Are the correct colours used for the delineators?			
Are the delineators on guard fences, crash barriers and bridge railings consistent with those on guideposts?			
<b>4 Curve warning and delineation</b>			
Are curve warning signs and advisory speed signs installed where required?			
Are advisory speed signs consistent along the route?			
Are the signs correctly located in relation to the curve? (i.e. not too far in advance.)			
Are the signs large enough?			
Are chevron alignment markers (CAMs) installed where required?			
Is the positioning of CAMs satisfactory to provide guidance around the curve?			
Are the CAMs the correct size?			
Are CAMs confined to curves (not used to delineate islands, etc)?			
<b>6.6 Crash barriers and clear zones</b>			
<b>1 Clear zones</b>			
Is the clear zone width traversable (i.e. drivable)?			
Is the clear zone width free of rigid fixtures? (if not, can all of these rigid fixtures be removed or shielded?)			
Are all power poles, trees, etc., at a safe distance from the traffic paths?			
Is the appropriate treatment or protection provided for any objects within the clear zone?			
<b>2 Crash barriers</b>			
Are crash barriers installed where necessary?			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are crash barriers installed at all necessary locations in accordance with the relevant guidelines?			
Are the barrier systems suitable for the purpose?			
Are the crash barriers correctly installed?			
Is the length of crash barrier at each installation adequate?			
Is the guard fence attached correctly to bridge railings?			
Is there sufficient width between the barrier and the edge line to contain a broken-down vehicle?			
<b>3 End treatments</b>			
Are end treatments constructed correctly?			
Is there a safe run-off area behind breakaway terminals?			
<b>6 Fences</b>			
Are pedestrian fences frangible?			
Are vehicles safe from being 'speared' by horizontal fence railings located within the clear zone?			
<b>5 Visibility of barriers and fences</b>			
Is there adequate delineation and visibility of crash barriers and fences at night?			
<b>6.7 Traffic signals</b>			
<b>1 Operations</b>			
Are traffic signals operating correctly?			
Are the numbers, location and type of signal displays appropriate for the traffic mix and traffic environment?			
Where necessary, are there provisions for visually impaired pedestrians (for example, audio-tactile push buttons, tactile markings)?			
Where necessary, are there provisions for elderly or disabled pedestrians (for example, extended green or clearance phase) or children?			
Is the controller located in a safe position? (I.e. where it is unlikely to be hit, but maintenance access is safe.)			
Is the condition (especially skid resistance) of the road surface on the approaches satisfactory?			

**Checklist Stage 6: Existing roads audit (continued)**

Issue	Yes	No	Comments
<b>2 Visibility</b> Are traffic signals clearly visible to approaching motorists?			
Is there adequate stopping sight distance to the ends of possible vehicle queues?			
Have any visibility problems that could be caused by the rising or setting sun been addressed?			
Are signal displays shielded so that only the motorists for whom they are intended can see them?			
Where signal displays are not visible from an adequate distance, are signal warning signs and/or flashing lights installed?			
Where signals are mounted high for visibility over crests, is there adequate stopping sight distance to the ends of traffic queues?			
Is the primary signal free from obstructions on the nearside footway to approaching drivers? (trees, light poles, signs, bus stops, etc.)			
<b>6.8 Pedestrians and cyclists</b>			
<b>1 General issues</b> Are there appropriate travel paths and crossing points for pedestrians and cyclists (particularly children)?			
Is a safety fence installed where necessary to guide pedestrians and cyclists to crossings or overpasses?			
Is a safety barrier installed where necessary to separate vehicle, pedestrian and cyclist flows?			
Are pedestrian and bicycle facilities suitable for night use?			
<b>2 Pedestrians</b> Is there adequate separation distance between vehicular traffic and pedestrians on footways?			
Are there an adequate or appropriate number of pedestrian/children crossings along the route?			
At crossing points is fencing oriented so pedestrians face oncoming traffic?			
Is there adequate provision for the elderly, the disabled, children, wheelchairs and baby carriages (for example, holding rails, kerb and median crossings, ramps)?			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Are adequate hand rails provided where necessary (for example, on bridges, ramps)?			
Is signing about pedestrians near schools adequate and effective? (Includes warning signs and special school zone speed limits)			
Is signing about pedestrians near any hospital adequate and effective?			
Is the distance from the stop line to a crossing facility sufficient for truck drivers to see pedestrians?			
<b>3 Cyclists</b> Is the pavement width adequate for the number of cyclists using the route?			
Are bicycle paths appropriately located and signed?			
Is visibility of cyclists on shared paths adequate at driveways and accesses?			
Is the bicycle route continuous (i.e. free of squeeze points or gaps)?			
Are drainage pit grates 'bicycle safe'?			
<b>4 Public transport</b> Are bus stops safely located with adequate visibility and clearance to the traffic lane?			
Are bus stops in rural areas signposted in advance?			
Are shelters and seats located safely to ensure that sight lines are not impeded? Is clearance to the road adequate?			
Is the height and shape of the kerb at bus stops suitable for pedestrians and bus drivers?			
<b>6.9 Bridges and culverts</b>			
<b>1 Design features</b> Are bridges and culverts the full formation width?			
Are bridge and culvert carriageway widths consistent with approach conditions?			
Is the approach alignment compatible with the 85th percentile travel speed?			
Have warning signs been erected if either of the above two conditions (i.e. width and speed) are not met?			

**Checklist Stage 6: Existing roads audit (continued)**

Issue	Yes	No	Comments
<b>2 Crash barriers</b> Are there suitable traffic barriers on bridges and culverts and their approaches to protect errant vehicles?			
Is the connection between barrier and bridge safe?			
Is the bridge free of kerbing that would reduce the effectiveness of barriers or rails?			
<b>3 Miscellaneous</b> Are pedestrian facilities on the bridge appropriate and safe?			
Is fishing from the bridge prohibited? If not, has provision been made for 'safe' fishing?			
Does delineation continue over the bridge?			
<b>6.10 Pavement</b>			
<b>1 Pavement defects</b> Is the pavement free of defects (for example, excessive roughness or rutting, potholes, loose material, etc.) that could result in safety problems (for example, loss of steering control)?			
Is the condition of the pavement edges satisfactory?			
Is the transition from pavement to shoulder free of dangerous edge drop offs?			
<b>2 Skid resistance</b> Does the pavement appear to have adequate skid resistance, particularly on curves, steep grades and approaches to intersections?			
Has skid resistance testing been carried out where necessary?			
<b>3 Ponding</b> Is the pavement free of areas where ponding or sheet flow of water could contribute to safety problems?			
<b>4 Loose stones/material</b> Is the pavement free of loose stones and other material?			
<b>6.11 Parking</b>			
<b>1 General issues</b> Are the provisions for, or restrictions on, parking satisfactory in relation to safety? Eg pick-up & set-down areas.			

**Checklist Stage 6: Existing roads audit (continued)**

<b>Issue</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
Is the frequency of parking turnover compatible with the safety of the route?			
Is there sufficient parking for delivery vehicles so that safety problems due to double parking do not occur?			
Are there any safety problems caused by vehicles picking up and setting down children? (particular attention is required to potential for off-road pick-up and set-down areas and teacher parking and school bus parking/ stopping)			
Are there problems with off-road parking areas at the school?			
Are parking manoeuvres along the route possible without causing safety problems? (for example, angle parking.)			
Is the sight distance at intersections and along the route, Unaffected by parked vehicles?			
<b>6.12 Provision for heavy vehicles</b>			
<b>1 Design issues</b>			
Are overtaking opportunities available for heavy vehicles Where volumes are high?			
Does the route generally cater for the size of vehicle likely to use it?			
Is there adequate manoeuvring room for large vehicles Along the route, at intersections, roundabouts, etc.?			
Is access to rest areas and truck parking areas adequate for the size of vehicle expected? (Consider acceleration, deceleration, shoulder widths, etc.)			
<b>2 Pavement/shoulder quality</b>			
Are shoulders sealed at bends to provide additional Pavement for long vehicles?			
Is the pavement width adequate for heavy vehicles?			
In general, is the pavement quality sufficient for the safe travel of heavy and oversized vehicles?			
On truck routes, are reflective devices appropriate for Truck drivers' eye heights?			
<b>6.13 Floodways and causeways</b>			
<b>1 Ponding, flooding</b>			
Are all sections of the route free from ponding or flow across the road during wet weather?			

**Checklist Stage 6: Existing roads audit (continued)**

Issue	Yes	No	Comments
If there is ponding or flow across the road during wet weather, is there appropriate signposting?			
Are floodways and causeways correctly signposted?			
<b>2 Safety of devices</b> Are all culverts or drainage structures located outside the clear roadside recovery area?			
If not, are they shielded from the possibility of vehicle collision?			
<b>6.14 Miscellaneous</b>			
<b>1 Landscaping</b> Is landscaping in accordance with guidelines (for example, clearances, sight distance)?			
Will existing clearances and sight distances be maintained following future plant growth?			
Does the landscaping at roundabouts avoid visibility problems?			
<b>2 Temporary works</b> Are all locations free of construction or maintenance equipment that is no longer required?			
Are all locations free of signs or temporary traffic control devices that are no longer required?			
<b>3 Headlight glare</b> Have any problems that could be caused by headlight glare been addressed (for example, a two-way service road close to main traffic lanes, the use of glare fencing or screening)?			
<b>4 Roadside activities</b> Are the road boundaries free of any activities that are likely to distract drivers?			
Are all advertising signs installed so that they do not constitute a hazard?			
<b>5 Errant vehicles</b> Is the roadside furniture on the verges and footways free of damage from errant vehicles that could indicate a possible problem, hazard or conflict at the site?			

**Checklist Stage 6: Existing roads audit (continued)**

Issue	Yes	No	Comments
<p><b>6 Other safety issues</b></p>			
<p>Is the embankment stability safe?</p>			
<p>Is the route free of unsafe overhanging branches?</p>			
<p>Is the route free of visibility obstructions caused by long grass?</p>			
<p>Are any high-wind areas safely dealt with?</p>			
<p>If back-to-back median kerbing is used is it:                      - adequately delineated?                      - obvious where it starts?                      - obvious at intersections?                      - unlikely to be a hazard to pedestrians?</p>			
<p><b>7 Rest areas</b></p>			
<p>Is the location of rest areas and truck parking areas along the route appropriate?</p>			
<p>Is there adequate sight distance to the exit and entry points from rest areas and truck parking areas at all times of the day?</p>			
<p><b>8 Animals</b></p>			
<p>Is the route free from large numbers of animals (for example, cattle, sheep, kangaroos, koalas, wombats, etc.)</p>			
<p>If not, is it protected by animal-proof fencing?</p>			
<p><b>9 Any other matters</b></p>			

**APPENDIX B**

**CORRECTIVE ACTION REPORT**

**STAGE ..... ROAD SAFETY AUDIT - CORRECTIVE ACTION REPORT**

**REPORT FOR:** .....

..... **ROAD**

**TEAM LEADER:** .....

<b>RECOMMENDATIONS</b> <i>(to be read in-conjunction with the audit findings)</i>	<b>ASSET OWNER</b>	<b>AGREE/DISAGREE</b> <i>(with recommendations)</i>	<b>REASON/PROPOSED ACTION &amp; COMMENTS</b>

**ASSET OWNER:** .....

**REPRESENTATIVE NAME/POSITION:** .....

**DATE:** .....

**ASSET OWNER:** .....

**REPRESENTATIVE NAME/POSITION:** .....

**DATE:** .....