Queensland Guide to Road Safety

Part 6: Road Safety Audit (2022)

November 2022



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Feedback

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About this document

Austroads' *Guide to Road Safety* Part 6: *Road Safety Audit* provides practical guidance on the procurement, management and implementation of road safety audits. It has been established within the current operating environment for auditing, setting a series of key principles which establish good practice to shape a local road safety audit strategy / policy.

How to use this document

The Department of Transport and Main Roads has agreed to adopt the standards published in Austroads Guides as part of national harmonisation. The department seeks to avoid duplicating information addressed in national guidance and has developed documents instead that provide Queensland specific advice while following the structure established in Austroads Guides.

Queensland specific advice includes practices which vary from national practice because of local environmental conditions (such as geography, soil types, climate); different funding practices; local research; local legislation requirements; and to expand instruction on particular issues.

As such, this Part of the *Queensland Guide to Road Safety* (QGRS) takes precedence over the <u>Austroads Guide to Road Safety</u> Part 6: Road Safety Audit except where the Austroads Guide is accepted without changes.

This Part is designed to be read and applied together with Austroads *Guide to Road Safety* Part 6: *Road Safety Audit*. Readers must have access to the Austroads *Guide* to understand its application in Queensland.

This document:

- sets out how the Austroads *Guide to Road Safety* Part 6: *Road Safety Audit* applies in Queensland
- has precedence over the Austroads *Guide to Road Safety* Part 6: *Road Safety Audit* when applied in Queensland, and
- has the same section numbering and headings as the Austroads *Guide to Road Safety* Part 6: *Road Safety Audit*.

The following table summarises the relationship between the Austroads *Guide to Road Safety* Part 6: *Road Safety Audit* and this document:

Applicability	Meaning
Accepted	The Austroads Guide section is accepted.
Accepted, with amendments	Part or all of the Austroads <i>Guide</i> section has been accepted with additions, deletions or differences.
New	There is no equivalent section in the Austroads Guide.
Not accepted	The Austroads <i>Guide</i> section is not accepted and does not apply in Queensland.

A summary of the documents relevant to road safety in Queensland, and their links, is provided following:



Definitions

The following general amended definitions apply when reading the Queensland *Guide to Road Safety* Part 6: *Road Safety Audit*.

Reference to	Means
AGRS Part 6	Austroads <i>Guide to Road Safety</i> Part 6: <i>Road Safety Audit</i> , as amended by this document; for example, a reference to AGRS Part 6 means the reader must refer to the Austroads <i>Guide to Road Safety</i> Part 6: <i>Road Safety Audit</i> , and the <i>Queensland Guide to Road Safety</i> Part 6: <i>Road Safety Audit</i> (QGRS Part 6).
	Throughout AGRS Part 6, references are made to other Parts of the AGRS (for example, when reading AGRS Part 6, the reader may be referred to AGRS Part 3 for further information.)
	In such cases, the reader must refer to the equivalent Part within the <i>Queensland Guide to Road Safety</i> first. Check the applicability of the equivalent QGRS Part before referring to the referenced AGRS Part.
	Similarly, references may be made to other Austroads Guides (for example, when reading AGRS Part 6, the reader may be referred to the <i>Guide to Traffic Management</i> Part 3: <i>Transport studies and analysis methods</i>).
	In such cases, the reader must refer to the equivalent Queensland Guide first, where such exist. Check the applicability of the equivalent Queensland Guide before referring to the referenced Austroads Guide Part.
AGRS	Austroads Guide to Road Safety
AS 1742	Australian Standard AS 1742 Manual of Uniform Traffic Control Devices

Reference to	Means
NRSS	National Road Safety Strategy
NRSAP	National Road Safety Action Plan
QGRS	Queensland Guide to Road Safety
QRSS	Queensland Road Safety Strategy
QRSAP	Queensland Road Safety Action Plan
QRSTUV	Queensland Road Safety Technical User Volumes
TMR RSP	Queensland Department of Transport and Main Roads Road Safety Policy
TORUM Act 1995	Transport Operations (Road Use Management) Act 1995 (Qld)
TRUM	Volume 2 of the <u>Traffic and Road Use Management manual</u> preceded this Part of the Queensland Guide to Road Safety and was withdrawn on publication of the corresponding QGRS Part.

References

QGTM section	Reference
All	www.legislation.qld.gov.au

Relationship table

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1.	Introductio	on			
	1.1	Road Safety Auditing and its Contribution	Accepted	Safer Roads	
	1.2	Previous Austroads Guides	Accepted	Safer Roads	
	1.3	Development of This Guide	Accepted	Safer Roads	
	1.4	Guide Structure	Accepted	Safer Roads	
	1.5	Who Should Use This Guide and How Should They Use It?	Accepted	Safer Roads	
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	2.1	Introduction	Accepted with amendments	Safer Roads	
	2.2	Why Designing to Standards and Guidelines does not Guarantee Safety	Accepted	Safer Roads	
	2.3	What are the Attributes of the Safest Roads?	Accepted	Safer Roads	
	2.4	Legal Considerations	Accepted	Safer Roads	
	2.5	Closing Summary of the Key Benefits of RSA	Accepted	Safer Roads	
3.	RSA Withi Framewor	n a Road Safety Management k			
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	3.3	Verification of Designs	Accepted	Safer Roads	
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	4.2	The Two Guiding Concepts	Accepted	Safer Roads	
	4.3	The Three Themes within the Operating Environment	Accepted	Safer Roads	
	4.3.1	Theme 1 – Raising Competency and Improving Outputs	Accepted	Safer Roads	
	4.3.2	Theme 2 – Audit Coverage	Accepted	Safer Roads	
	4.3.3	Theme 3 – Staying Relevant and Future Proofing	Accepted with amendments	Safer Roads	

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	5.2	Applying Safe System Principles in the RSA Process	Accepted	Safer Roads	
	5.3	Identifying Risk Mitigation Measures Under the Safe System	Accepted with amendments	Safer Roads	
	5.4	Safe System Assessments (SSA)	Accepted	Safer Roads	
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	6.3	What Can be Audited and When Should Audits be Undertaken?	Accepted	Safer Roads	
	6.4	Developing an Audit Schedule – New/Modified Road Infrastructure	Accepted	Safer Roads	
	6.5	Developing an Audit Schedule – Existing Roads	Accepted	Safer Roads	
7.	Types of F	RSA	Accepted	Safer Roads	
	7.1	Feasibility (Strategic/Concept)	Accepted	Safer Roads	
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	7.3	Detailed Design	Accepted	Safer Roads	
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	7.7.2	Thematic (Road User Specific) Audits	Accepted	Safer Roads	
	7.7.3	Road Safety Checks and Asset Management Inspections	Accepted	Safer Roads	
	7.7.4	Traffic Management	Accepted with amendments	Safer Roads	
	7.7.5	Road Related Areas	Accepted	Safer Roads	
	7.7.6	Emerging Technology	Accepted	Safer Roads	
	7.7.7	Maintainability Assessment	Accepted	Safer Roads	
8.	The RSA F	Process			
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	8.2	Client and Audit Teams	Accepted	Safer Roads	

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Departmental contacts:

• Safer Roads: Safer Roads Infrastructure, Engineering and Technology, Transport and Main Roads email <u>SaferRoads@tmr.qld.gov.au</u>.

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2 The Key Features of RSA

2.1 Introduction

Difference

In Table 2.1, replace the first dot point related to Who undertakes an audit? with:

An audit team – defined as preferably two to four auditors, with the skills relevant to the audit. An audit may be able to be undertaken by larger groups, or if undertaken by someone who has all the required skill sets, a single road safety auditor.

4 The Operating Environment

4.3 The Three Themes within the Operating Environment

4.3.3 Theme 3 – Staying Relevant and Future Proofing

Difference

Replace 'Draft National Road Safety Strategy 2021–2030' with <u>'Australian National Road Safety</u> <u>Strategy 2021-2030'</u>.

5 RSA within the Safe System

5.1 Introduction

Difference

Replace Figure 5.1 with:

Figure 5.1 – Safe System model



Source: Adapted from Queensland's Road Safety Strategy 2022-2031

5.3 Identifying Risk Mitigation Measures Under the Safe System

Deletion

Delete last sentence.

Difference

This process is mandatory in Queensland.

7 Types of RSA

7.7 Other Considerations

7.7.4 Traffic Management

Addition

Someone on the audit team will need to have a suitable level of knowledge / capability to assess the traffic management components. A Traffic Management Design qualification would be a minimum for this person, though the auditor does not necessarily need to hold this qualification themselves.

8 The RSA Process

8.2 Client and Audit Teams

8.2.1 Client Team

<u>Deletion</u>

Delete:

The pertinent road agency or road operator is the client for audits of existing roads.

9 Commissioning Phase

9.5 Auditor Competency

Difference

Replace 'Austroads Guide to Road Safety Part 8: Treatment of Crash Locations' with 'Austroads Guide to Road Safety Part 2: Safe Roads.'

11 Completion and Implementation Phases

11.6 Retention of Records

Difference

Replace 'documentarian' with 'documentation'.

Appendix H Prompt Lists

H.8 Steep Routes Prompt List

H.8.1 Introduction

<u>New</u>

The purpose of this section is to provide guidance and a checklist for conducting road safety audits of steep routes.

Roads with long steep grades and very steep grades are potentially hazardous for drivers. The hazard potential is greatly increased if the standard of design, construction or maintenance of the road is too low or inappropriate for the type of road environment.

The following checklist may be used when conducting a road safety audit of potentially hazardous steep routes.

H.8.2 Steep routes safety audit

<u>New</u>

In conjunction with the checklist, the following issues should be considered when conducting a safety audit of a steep route.

H.8.3 Road geometry

<u>New</u>

Horizontal and vertical geometry

Factors such as speed difference between successive curves and combinations of horizontal and vertical geometry should be considered.

Cross section elements

Lane and shoulder widths and superelevation should be appropriate for the traffic volumes and dimensions of vehicles using the road. In assessing superelevation, two aspects need to be considered – the minimum superelevation required for faster-moving light vehicles and the maximum superelevation allowable for slow-moving vehicles with shifting loads or high centres of gravity.

Sight distance

In assessing appropriate sight distance, consideration should be given to such factors as the likelihood of large speed differentials and the longer stopping distance required on steep downgrades.

Intersection design

Intersections and property accesses on steep routes can be hazardous due to restricted visibility, longer stopping distances and adverse superelevation while turning. Locations and layouts need to be carefully considered. Additional warning signs may be warranted.

H.8.4 Safety barriers and clear zones

<u>New</u>

The potential for vehicles to leave the roadway on steep grades increases when variations in the operating speeds of horizontal curves also occur. The problem can be compounded if drivers adopt inappropriate speeds or if the drivers are distracted by the scenic nature of the country in which steep grades are often located.

Existing safety barriers must be checked for appropriateness of location and also for effectiveness of operation, for example, correct design, including offset, height, strength and end terminal treatment.

H.8.5 Safety ramps / exits

<u>New</u>

Runaway vehicles are a particular problem on steep grades. If there are no natural escape routes that could be used by an out-of-control vehicle, consideration should be given to whether safety ramps are required. The locations of existing and proposed safety ramps must be carefully considered; for example, ramps may not be appropriate following a sharp curve which a runaway vehicle would not be able to negotiate and a runaway vehicle should not be required to cross the path of oncoming traffic to enter a safety ramp. As well as being accessible, the ramps must be effective in operation – that is, they must be capable of bringing a runaway vehicle to a stop.

H.8.6 Vehicle check areas

<u>New</u>

Vehicle check areas are desirable to help promote vehicle safety awareness among drivers. Two types of vehicle check areas should be provided on steep routes whenever possible:

- brake check areas prior to steep descents, and
- brake rest areas or brake cooling areas on the descents.

Desirably, sufficient areas should be available to store several semi-trailers, depending on the traffic volumes. Existing areas should be checked for appropriateness of location and for effectiveness of operation.

H.8.7 Signing and delineation

<u>New</u>

Long steep grades and very steep grades require special signing considerations. Drivers must be adequately informed of the presence and nature of the steep grade that they are approaching. Where necessary, drivers should be advised of alternative routes. In extreme circumstances, it may be necessary to prohibit the entry of certain classes of vehicles.

The provision of steep grade warning signs does not remove the need for other warning signs and devices that may be warranted because of other characteristics of the road.

The location, condition and effectiveness of all existing signing and delineation should be checked for all likely operating conditions, for example, day, night, rain and fog. The need for additional signing and delineation should also be considered.

H.8.8 Pavement and shoulders

New

The crash potential on a steep route can be increased if the pavement surface does not have an adequate skid resistance. Where necessary, skid resistance testing should be carried out to assess the adequacy of the surface.

Particular attention should be paid to locating pot holes and sections of road with edge drop-off as these have the potential to be particularly hazardous on steep routes. The implications of losing vehicle control due to these conditions must be considered.

Shoulders provide a recovery area for errant drivers, and act as emergency stopping areas. The shoulders need to be trafficable in all weather conditions.

The potential for sheet flow of water along or across the pavement surface requires particular consideration on steep grades.

H.8.9 Prompt List for Steep Routes

<u>New</u>

Table H.8.9 provides a prompt list for steep routes.

Table H.8.9 – Prompt List for Steep Routes

Issue	Yes	No	Comment		
Road geometry					
Are the combinations of horizontal and vertical alignments considered safe?			Click or tap here to enter text.		
Are sight distance requirements satisfied?			Click or tap here to enter text.		
Are lane and shoulder widths appropriate for the volume and type of traffic?			Click or tap here to enter text.		
Is the superelevation appropriate for all classes and likely speeds of vehicles?			Click or tap here to enter text.		
Is adverse superelevation appropriate where used?			Click or tap here to enter text.		
Are the intersections adequate for the type of traffic and volume?			Click or tap here to enter text.		
Safety barriers and clear zone					
Are existing guardrails adequate (for example, type, height, post spacing, end treatments and so on)?			Click or tap here to enter text.		
Are all hazardous roadside objects within the clear zone shielded?			Click or tap here to enter text.		
Can the required clear zone widths be provided by removing obstacles or flattening embankment slopes?			Click or tap here to enter text.		
Is the clear zone trafficable in all weather conditions?			Click or tap here to enter text.		
Safety ramps / exits					
Are existing safety ramps and emergency exits in appropriate locations and effective in operation?			Click or tap here to enter text.		
Are there sufficient safety ramps or emergency exits?			Click or tap here to enter text.		
Are there any suitable locations for addition safety ramps or emergency exits?			Click or tap here to enter text.		
Vehicle check areas					
Are existing brake check areas and brake cooling areas in appropriate locations and of adequate size?			Click or tap here to enter text.		
Are there sufficient brake check areas or brake cooling areas?			Click or tap here to enter text.		

Issue	Yes	No	Comment		
Are there any suitable locations for additional brake check areas or brake cooling areas?			Click or tap here to enter text.		
Signing and delineation					
Are speed limits compatible with the road geometry and sight distance?			Click or tap here to enter text.		
Where intersections are poorly located, are appropriate warning and guide signs erected?			Click or tap here to enter text.		
Do the direction signs adequately cater for the drivers directional needs on the route?			Click or tap here to enter text.		
Where necessary, are curves clearly delineated with chevron alignment markers?			Click or tap here to enter text.		
Are all signs clearly visible (that is, not obstructed by vegetation, and so on)?			Click or tap here to enter text.		
Are guide posts correctly positioned and spaced?			Click or tap here to enter text.		
Are all guide posts clearly visible?			Click or tap here to enter text.		
Are all necessary pavement markings present and in satisfactory condition (for example, centrelines, edge lines, continuity lines, pavement arrows, and so on)?			Click or tap here to enter text.		
Are locations defined by reflective raised pavement markers or delineators where necessary?			Click or tap here to enter text.		
Are delineation and signing adequate and effective in all conditions (day / night, wet / dry, fog / mist, and so on)?			Click or tap here to enter text.		
Have the requirements of the steep grades signing set out in the Queensland <u>Manual of</u> <u>Uniform Traffic Control Devices</u> (Queensland MUTCD) been applied where appropriate?			Click or tap here to enter text.		
Are drivers advised of alternate routes if necessary?			Click or tap here to enter text.		
Pavement and shoulders	•	· · · · · · · · · · · · · · · · · · ·			
Is the pavement in good condition (for example, roughness, rutting, potholes and so on)?			Click or tap here to enter text.		
Does the pavement appear to have adequate skid resistance with no sections that require testing?			Click or tap here to enter text.		
Is the drainage of water from the pavement satisfactory (that is, there is no evidence of ponding)?			Click or tap here to enter text.		
Is shoulder in good condition (for example, edge drop, edge wear and so on)?			Click or tap here to enter text.		
Are the shoulders trafficable in wet conditions?			Click or tap here to enter text.		

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