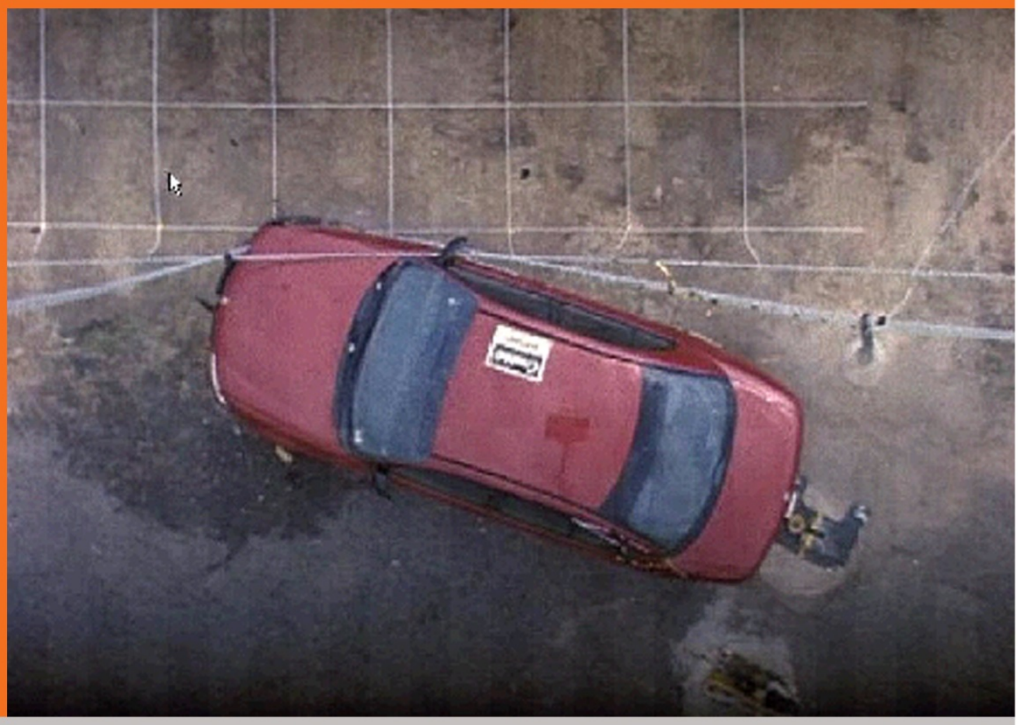
Austroads








Austroads Safety Barrier Assessment

Submission Information Document

Version 3:0

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Contents

1. About this Document

Many fatalities and serious injuries that occur on roads are as a result of errant vehicles crashing into roadside objects or into vehicles travelling in opposing lanes. A response to errant vehicle management is to promote a more forgiving, and therefore safer, roadside environment. Such a roadside may include the use of road safety barriers and road safety devices. This document describes the procedure used in the assessment of road safety barriers and devices by the Austroads Safety Barrier Assessment Panel (the Panel).

1.1 Definitions

The Panel: a multi Road Agency panel that assesses safety barrier products proposed for deployment in Australia and New Zealand. The Panel operates under the patronage of Austroads.

Secretariat: administrator of the assessment procedure.

Proponent: the company with the legal rights to request an assessment of a safety barrier system or device.

Owner: the company with the legal rights to manufacture the road safety barrier system or device. This may be different to the Proponent.

Distributor: the company with the rights to market and distribute a safety barrier system or device. The Distributor may be different in different jurisdictions.

Permanent – a road safety barrier that is installed permanently and is not considered to be of a temporary nature (refer temporary).

Temporary – a road safety barrier that is installed in association with adjacent ongoing and continuous works, short-term emergencies or similar situations. This type of safety barrier must be removed upon completion of the works or emergency.

Road safety barrier systems – products covered by AS/NZS 3845.1:2015

Road safety devices – products covered by AS/NZS 3845.2:2017

1.2 Reference documents

The Assessment Procedure refers to the following documents:

- Standards Australia (2015), *AS/NZS 3845.1:2015 Road Safety Barrier Systems*
- Standards Australia (2017), *AS/NZS 3845.2:2017 Road Safety Devices*
- Austroads (2010), Guide to Road Design Part 6: Roadside Design, Safety and Barriers
- American Association of State Highway and Transportation Officials, Manual for Assessing Safety Hardware (MASH)
- Transportation Research Board (1993), *NCHRP Report 350 - Recommended Procedures for the Safety Performance Evaluation of Highway Features*
- European Committee for Standardization (1998 - 2010), *EN 1317 Road Restraint Systems - Part 1 to Part 6*

2. Austroads Safety Barrier Assessment Panel

The Panel implements the Duty of Care requirement for Australian/New Zealand Road Agencies to assess the crashworthiness and suitability of road safety barriers, systems and devices for deployment on roads under their care and control; providing Agencies with recommendations on product acceptance. The existence of the Panel avoids the need for products to undergo full assessment by individual jurisdictions.

By submitting a product for assessment, the Proponent certifies that they have the legal right and authority to provide the information and agrees that all information may be used by Road Agencies for their business activities. Product information and design parameters for recommended products may be published for public information.

The Panel may re-assess a product and withdraw or modify acceptance recommendations and technical conditions for use at any time.

The strength of the Panel assessment process is the rigour of systematic joint decisions. For this reason, out-of-session decisions affecting safety barrier systems and road safety devices recommendations will not be made between Panel meetings.

The Panel provides recommendations to the participating Road Agencies.

2.1 Participating Road Agencies

The following Road Agencies or their successors participate in the Panel assessment:

- Australian Capital Territory (Territory and Municipal Services Directorate).
- New South Wales (Roads and Maritime Services).
- New Zealand (Transport Agency).
- Northern Territory (Department of Infrastructure, Planning and Logistics)
- Queensland (Department of Transport and Main Roads).
- South Australia (Department of Planning, Transport and Infrastructure).
- Tasmania (Department of State Growth).
- Victoria (Roads Corporation Victoria - VicRoads).
- Western Australia (Main Roads Western Australia).

2.2 Fees

Individual Road Agencies fund their involvement in the assessment process and **do not** require applicants to pay a fee for assessment. This preserves the ability of the Panel to impartially assess safety barrier systems and road safety devices and provide recommendations for acceptance or non-acceptance of products.

2.3 Secretariat

Secretariat contact details:

Austroads Safety Barrier Assessment Panel
PO Box 3035
PARRAMATTA NSW 2124

asbap.secretariat@austroads.com.au

Further information can be found at: www.austroads.com.au

2.4 Meeting Schedule

Panel meetings are scheduled quarterly. Meeting dates are published on the Austroads website www.austroads.com.au

2.5 Objectives

The objectives of the Panel are to:

- Provide the best outcomes for community as well as customers and stakeholders.
- Support the achievement of Towards Zero (Safe System).
- Harmonisation of products across Australia and New Zealand which are available to individual road agencies recognising individual nature and local autonomy.
- Challenge and question the information provided to the Panel.
- Oversee the implementation and continued operation of safety barrier system installation accreditation processes.
- Minimise “red tape” for proponents.
- Consider whole of life and operational practices associated with road safety barrier systems and road safety devices.
- Recognise the importance of the Safe System principles in the performance of road safety barrier systems and road safety devices.

2.6 Individual Road Agency Acceptance

The Panel’s recommendation is provided to individual jurisdictions for their determination.

Constitutional arrangements mean that each participating Road Agency is responsible for the management of safety barrier systems and road safety devices within its jurisdiction. Road Agencies may issue separate acceptance and conditions documents that will apply in individual jurisdictions based on the Austroads technical conditions determined by the Panel. Such acceptance may contain conditions for use applicable to the individual jurisdictions.

2.7 Confidentiality

Notes and minutes of the Austroads Safety Barrier Assessment Panel are confidential and shall not be distributed to any party other than the Road Agency Panel representatives and the Austroads Board, unless otherwise authorised under relevant jurisdictional freedom of information legislation or legal subpoena.

To preserve the independence of the Panel and to ensure that all determinations are made based only on submission content, Proponents are not permitted to address Panel meetings.

2.8 Safety in Design

Products must be designed, so far as reasonably practicable, to mitigate risks to the health and safety of persons who construct, maintain or demolish the product.

Compliance shall meet the requirements of the harmonised Work Health and Safety Acts as defined in the Safe Work Australia Safe Design of Structures Code of Practice.

Products that do not demonstrate safety in design will not be accepted, regardless of performance.

3. Assessment Process

3.1 Documentation Pre-assessment

Upon receipt of a submission, the Secretariat will ensure that the submission contains all of the required documentation. Incomplete submissions will not proceed to Technical Pre-assessment.

3.2 Technical Pre-Assessment

Products are assigned to a Panel member/s to undertake an initial technical pre-assessment based on the pre-assessment checklist (Appendix A). Please note that the pre-assessment checklist is not the only pre-assessment tool used by the Panel to assess a product. Following technical pre-assessment submissions progress to a full technical and risk assessment.

3.3 Technical and Risk Assessment

(AS/NZS 3845.1:2015 - Clause 4.6 and AS/NZS 3845.2:2017 – Clause 4.6 and AS/NZS ISO 31000)

The risk assessment is undertaken by the Panel to determine the risk to road users and stakeholders. The risk assessment is based on Australian/New Zealand Standard 3845 Road Safety Barrier Systems and Devices Part 1 and Part 2, which provides a framework for evaluating safety barrier products.

The assessment of safety barrier system and device attributes may affect the acceptance and technical conditions for use. The evaluation includes consideration of the following:

- Documentation and training material provided for installation, maintenance and repair
- Full-scale crash testing
- Justification for waiving required tests
- Ability to withstand a second impact
- The devices ability to reduce the severity of injuries to vulnerable road users
- Component durability
- Work health and safety during installation and maintenance
- Ease with which maintenance can be undertaken including the requirement to use specialised tools and the expected time to replace damaged components following impact
- Installation on a range of foundations

Crash test performance alone is not sufficient justification for acceptance of a product.

3.4 Assessment Outcomes and Feedback

Based on the documentation, the Panel assesses the submission based on the following:

- Evaluation of risk associated with operational performance and safety of road safety barriers and road safety devices, as well as compliance with crash test procedures.
- Ensuring that safety barriers and road safety devices installed on Australian/New Zealand roads under the care and control of individual Road Agencies support road safety objectives and minimise risk to errant vehicle occupants, other road users, including vulnerable road users (e.g. motorcyclists, cyclists, pedestrians) and road workers.
- Providing guidance on Technical Conditions for Use.

Based on the assessment, the Panel assigns one of the following recommendations:

- **Recommended for Acceptance:** The product is recommended as suitable for use.
- **NOT Recommended for Acceptance:** The product is not recommended as suitable for use.
- **Phase Out:** Existing installations can remain in service until the end of service life, no new installations permitted after a specified date.
- **Legacy:** Existing installations can remain in service until the end of service life. No new installations permitted.

Assessment outcome letters will be provided to Proponents. Letters for products 'not recommended for acceptance' will outline the reasons for the Panel's determination.

3.5 Technical Conditions for Use

All products 'recommended for acceptance' will have Technical Conditions for Use determined by the Panel. Recommendations for acceptance are issued without an expiry date, however the Panel may re-assess a product, withdraw or modify Technical Conditions for Use at any time.

Use of products 'recommended for acceptance' in individual jurisdictions is subject to receipt of Road Agency specific acceptance and conditions.

4. Submission Requirements

All documentation must be developed in line with AS/NZS 3845 Part 1 and Part 2, as appropriate.

If a product has several variants, documentation submitted must be clear and provide data to enable each variant to be considered separately and be supported by crash testing. This may require separate submissions for each variant.

4.1 Submission Documentation

(AS/NZS 3845.1:2015 Clause 2.2 and AS/NZS 3845.2:2017 – Clause 2.2)

The following documentation must be included in the submission:

- Cover Letter
- Submission Template
- Crash Test videos/reports/photos
- Product Manual(s) - covering Design/Installation/Maintenance/Inspection/Repair
- Product photographs
- Product drawings
- Connections – drawings and Proponent letters

Failure to provide the required documentation will result in the submission not progressing to technical and risk assessment.

It is recognised that further product information is required under AS/NZS 3845 Parts 1 and 2 and Proponents must certify that the product meets all of the requirements of AS/NZS 3845 Parts 1 or 2, as applicable.

4.2 Format of Information

Submissions are to be in electronic format on a USB drive. The data on the USB drive must be organised into folders as follows:

- Submission (including cover letter and Submission Template)
- Product Manual(s)
- Product Drawings
- Product Photographs
- Crash Testing (including photos, videos and reports). Each crash test should have a separate folder
- Connections – drawings and Proponent letters

Note: *Email size limits prevent the electronic transfer of crash test videos.*

4.3 Delivery of Submissions

Submissions must be **posted** to the Secretariat:

Austroads Safety Barrier Assessment Panel
PO Box 3035
Parramatta NSW 2124

4.4 Crash Tests

(AS/NZS 3845.1:2015 – Clauses 2.3 and 4.3 and AS/NZS 3845.2:2017 – Clauses 2.3 and 4.3)

From 23 April, 2018, crash testing procedures for road safety barrier systems and road safety devices shall be in accordance with AS/NZS 3845 Part 1 or AS/NZS 3845 Part 2. Where a product has not been tested in accordance with MASH guidelines, Proponents must provide MASH equivalency and justification.

Full-scale and complete crash testing is required as it provides valuable data on likely performance. All components of the submitted product shall be in-place during crash testing. Where full-scale and complete crash testing is not undertaken, full and comprehensive engineering justification must be provided in the Submission Template for the Panel to undertake the assessment. The Panel reserves the right not to accept non-tested justification and strongly advises Proponents to undertake the complete suite of tests required by the Standard.

Proponents are required to satisfy the Panel that the testing laboratory is accredited by a signatory of The International Laboratory Accreditation Cooperation (ILAC), in order to be considered for acceptance for use on Australian/New Zealand roads under the care and control of individual Road Agencies.

The following must be provided:

- Complete crash test reports in .PDF format (summary sheets are not sufficient)
- Crash test videos in .AVI format
- Crash test photographs in .JPG format

Interpolated or interpreted data is **NOT** accepted or assessed by the Panel.

All systems must rely on testing and analysis of their own or licenced products where variations are submitted for assessment.

4.5 Product Manuals

(AS/NZS 3845.1:2015 – Section 2 and AS/NZS 3845:2:2017 – Section 2)

Technical Conditions for Use will take precedence over any instructions in Product Manuals.

Product manuals must include a date and/or version number. Product manuals submitted by Proponents at the time of product submission form an integral part of the assessment process and the date and version of the Product Manual is recorded on the Technical Conditions for Use documents.

Product manuals must contain information that is required to safety install, operate, maintain and remove the road safety barrier or device on a ‘whole of life’ basis.

Product Manuals must also reflect the crash tested article and the supporting documentation. Products will not be ‘recommended for acceptance’ where the Product Manual includes elements not covered by crash testing or justification. Where design information is provided, it must be clearly identified as being ‘normal design advice’ or ‘extended design advice’.

> ***Note:*** *Products Manuals have been observed to contain information about configurations that have not necessarily been assessed or accepted by the Panel.*

If Product manuals are updated or altered, it is the responsibility of the Proponent to advise the Panel and submit the updated Manual with justification for any changes that differ to the product approval and published Technical Conditions of Use. Failure to submit updated Product manuals may result in product recommendation for acceptance being withdrawn.

4.6 Attachments (including Gawk Screens)

(AS/NZS 3845.1:2015 – Clause 2.5.5 and AS/NZS 3845.2:2017 – Clause 2.5.4)

In accordance with the requirements of Australian/New Zealand Standard AS/NZS 3845, "*There shall be no attachment to a road safety barrier system unless it can be shown by crash testing or by assessment as a modification (refer to Clause 4.4) that it is suitable."*

4.7 Traceability

(AS/NZS 3845.1:2015 - Clause 3.2.8 and AS/NZS 3845.2:2017 – Clause 3.2.8)

Traceability must be outlined in the product manual or submission documentation.

4.8 Foundation pavement conditions

(AS/NZS 3845.1:2015 – Clause 2.5.4 and AS/NZS 3845.2:2017 – Clause 2.5.3)

Accepted foundation pavement conditions will be based on crash testing. Where testing is not carried out or supported, relevant areas of the foundation pavement conditions table in the submission template must be left blank.

4.9 AS/NZS 3845 – Part 1 Products

4.9.1 Longitudinal Barriers

(AS/NZS 3845.1:2015 – Section 5, 6, 7 and 8)

The Panel considers separately the longitudinal component of a safety barrier and the terminal. Therefore, it is necessary to provide separate submissions for the longitudinal barrier and the terminal.

Longitudinal barriers must be fitted with crash tested and accepted terminals. Applicants submitting safety barriers MUST also submit details on the attachment of terminals to the barrier. The proposed terminal and the interface connection must be crash tested. Proponents would not be expected to provide crash testing for all possible connections however, justification for like product connection is required.

If attachment to approved Proprietary products is sought, a letter from the terminal product Proponent is required along with interface connection drawings.

Where a submission seeks to vary <u>temporary</u> product conditions to allow the product to be used in a permanent installation, the submission must clearly address issues relating to the use of the product in these situations including, but not limited to; changes to joints, changes to footings, ongoing maintenance and operational issues, etc.

Where a submission seeks to vary <u>permanent</u> product conditions to allow the product to be use in a temporary installation, the submission must clearly identify issues relating to the use of the product in these situations including, but not limited to; ongoing maintenance and operational issues (including part replacement), treatment of panel gaps and other catch points, etc.

The Technical Conditions for Use document will publish the minimum redirective length of the barrier as defined by the tested article.

4.9.2 Terminals, Crash Cushions, Gates

(AS/NZS 3845.1:2015 – Section 9, 10 and 12)

Terminals, Crash Cushions and Gates are not considered to have an acceptance to be used with any or all accepted longitudinal barriers. A request must be made for connection to a longitudinal safety barrier. The barrier proposed and the interface connection must be crash tested. Proponents would not be expected to provide crash testing for all possible connections however, justification for like product connection is required.

If attachment to approved Proprietary products is sought, a letter from the Barrier Proponent is required along with interface connection drawings.

If attachment to Public Domain products is sought, drawings outlining the interface connection are required.

4.10 AS/NZS 3845 – Part 2 Products

(AS/NZS 3845.2:2017)

The Panel requires submission information in accordance with AS/NZS 3845.2:2017.

Part 2 products include, but is not limited to:

- Longitudinal Channelling Devices
- Truck and Trailer Mounted Attenuators
- Rear Underrun Protection Devices
- Permanent Bollards
- Sign Support Structures and Poles

Note: *Connection of devices to vehicles must be independently certified as being structurally adequate for the vehicle to which the device is being attached and in line with current standards and regulations and be provided with submissions.*

The Panel or member road agencies do not certify such connections and any acceptance or approval by the Panel or its member road agencies shall not be taken or purported to provide such certification.

Any liability for such connections shall remain with the system owner/proponent.

APPENDIX A

Pre-Assessment Checklist
Observations
Product identification and classification
Variants, modified configuration, modified components
Distributor identified, right to use product verified
Commentary on product operation
Crash Testing
Crash tests (to include detail of the tested configuration, including site conditions)
Commentary on crash test - longitudinal (Record dynamic deflection, working width, ASI and THIV)
Commentary on crash test - end on (Record dynamic deflection, working width, ASI and THIV)
Commentary on crash test - interface (critical impact point, connection between terminal and barrier). Record dynamic deflection, working width, ASI and THIV)
Modification or substitution of components from the crash tested article including rationale to justify such modification
Repeatability of testing
Non-standard full scale tests (R&D pendulum tests)
Computer simulations
Waived tests
Reverse direction impacts
Parameters (design and usage guide)
Speed limit
Tested containment
Adopted dynamic deflection
Working width (for TL4 & TL5 systems)
Point-of-Need / hazard free area behind terminal
Development length (length of barrier required to weigh down the end of an unrestrained barrier so it performs from the Point-of-Need)
Minimum length including development length (relationship to tested length)
Terminals (defined, connection performance verified, suitability)
Area required to open the gate
Estimated time for opening the gate
Width of opening provided by the gate
System characteristics and limitations
Range of horizontal and vertical radii suitable for the system
Cross falls that the system can be installed on
Proximity to hinge point
Transition to public domain systems
Expected design life of the system and components
System's ability for modification on structure
System documentation
Documentation to include installation tolerances
Bill of materials to be available
Documentation to include: 1. Load to which posts can be tested 2. Load to be exerted on anchors to confirm adequacy
Documentation to include permissible attachments (e.g. delineators)
System to have name and manufacture date clearly embossed
Documentation to include process of dismantling, disposal and/or recycling
Foundation support required for system to operate to be documented including ground conditions that are not appropriate (specify approved foundations)
Documentation shall include periodic maintenance requirements and post crash repair. For WRSB also to include how to maintain tension

Movement and deflection during impact
Is the road safety barrier or device likely to have unfavourable outcomes if crash test targets are exceeded (e.g. vehicle occupant limits, system breach, etc)?
Are impacting errant vehicles likely to exhibit vaulting, spinning, rollover, snagging or rebound and in doing so affect the occupants of a closely following vehicle?
Are impacting errant vehicles likely to exhibit vaulting, spinning, rollover, snagging, rebound, breaching or encroaching behind the barrier / terminal and in doing so affect the occupants of a vehicle in the opposite direction?
Are impacting errant vehicles likely to exhibit vaulting, spinning, rollover, snagging, rebound, breaching or encroaching behind the barrier / terminal and in doing so affect a pedestrian/road worker?
Is the road safety barrier or device likely to have a compromised performance on a slope (e.g. side slope, embankments, longitudinal slope)?
Is the road safety barrier or device expected to withstand a second impact before being repaired?
Can the road safety barrier or device reduce the severity of injury to vulnerable road users (e.g. motorcyclists)
Impact hazard generation
Is the road safety barrier or device likely to have hazards before the impact (e.g. sharp components, zones for pedal clash)?
Is the road safety barrier or device likely to have sharp or spearing elements that have the potential to cause injury after an impact?
Is the road safety barrier or device likely to obstruct a lane after an impact (e.g. including generated debris)?
Operation
Is the road safety barrier or device likely to be complex or difficult to install, maintain, repair and/or dismantle?
Are the minor variations in the installation likely to compromise performance of the road safety barrier or device?
Is the road safety barrier or device likely to generate problems with interfaces or connections to other road safety barriers (e.g. bridge decks)?
Is the road safety barrier or device likely to generate problems with interfaces with utility services (e.g. clash)?
Does the road safety barrier or device have adequate provision for delineation?
Does the road safety barrier or device have adequate traceability?
Does the road safety barrier or device have provision for emergency access?
Materials
Are the materials likely to be susceptible to deterioration or failure (e.g. durability of components)?
Does the road safety barrier or device present any issues with substitution of materials?
Is the environment likely to affect the road safety barrier or device performance (fire, flooding, snow, etc)?
Does the road safety barrier or device allow reusability of components?
Environment
Is the road safety barrier or device environmentally friendly (.e.g. do the components used have a larger environmental ‘foot print’ than those in other systems. Can the road safety barrier or device be disposed of without affecting the environment significantly)?