

# Frequently Asked Questions – Adoption of MASH road safety barrier systems and devices

The Manual for Assessing Safety Hardware (MASH) supersedes the previously accepted National Cooperative Highway Research Project Report 350 (NCHRP350) for the purposes of testing and evaluating road safety barrier systems.

In 2018, Austroads Board accepted MASH as the new testing standard and TMR established MASH as the default standard from 1 January 2022.

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## Why is TMR adopting MASH tested road safety systems and devices?

In 2009, the US Manual for Assessing Safety Hardware (MASH) was published, superseding the NCHRP350 for the purposes of testing and evaluating new safety hardware on the US highways network. Subsequently, in April 2018, the Austroads Board accepted the Australasian Safety Barrier Assessment Panel's recommendation to transition to MASH tested products progressively.

When compared with the NCHRP350 guideline, the most significant point of difference with the MASH guidelines is that they have been developed with special considerations for larger vehicles (which have an increased mass and changed centre of gravity). This guideline increases the minimum crash-test performance and capacity to safely contain and redirect those vehicles.

This change aligns Queensland with other Australian states and territories by working towards compliance with MASH standard and the latest changes to AS/NZS 3845.

This update is another step towards a national approach making it easier for industry to conduct business and making our roads safer.

## What are the changes that I need to be aware of?

On 1 January 2022, TMR removed all proprietary non-MASH tested products from the *Accepted Road Safety Barrier Systems and Devices* document, meaning:

- Current permanent proprietary non-MASH systems and devices became 'Legacy' items and:
  - should be replaced with new MASH compliant systems when they reach the end of their service life or are significantly damaged.
  - can be repaired, where justified, based on remaining service life.
- Projects that include the installation of new barrier and have already commenced or passed the Development Phase<sup>i</sup>, can continue to use non-MASH products.
- All other new projects will be required to install MASH compliant products.

- Temporary roadside barrier systems and devices manufactured:
  - prior to 1 January 2022 can continue to be used until the end of their service life.
  - after 1 January 2022 shall meet MASH guidelines.

In addition to this, due to the higher restraining capacity requirement, there is a potential increase to deflection and working width compared to non-MASH products. This means an additional formation width may be required for MASH tested barriers depending on site conditions.

Projects that have commenced Concept Phase (Options Analysis or Business Case) after 1 January 2022 will need to consider this requirement and may need to include a slight increase in width to accommodate MASH tested proprietary barriers.

### **Do these changes also apply to Truck Mounted Attenuators?**

Yes, as with Temporary Roadside Barrier Systems, Truck mounted attenuators will be required to meet to MASH guidelines if they are manufactured after the 1 January 2022 or be replaced at the end of their service life if manufactured prior to this date.

### **Do TMR's Regions and Districts have flexibility in deciding what barriers system to use on their network?**

Yes, Regions and Districts will continue to have the flexibility to decide what level and type of barrier system replacement is appropriate for their network (based on the technical requirements and compliance in TMR's *Road Planning and Design Manual* and *MRTS14*).

Advice on compatibility of retrofitting barrier products is also provided in the *Accepted Road Safety Barrier Systems and Devices* document.

### **Are non-MASH tested barriers more expensive?**

The overall supply and installation cost of MASH products is expected to be the same if not lower than our legacy products.

However, as MASH tested barriers may provide an increase in deflection, additional formation width may be required which could increase some project costs. After 1 January 2022 new projects will need to consider this potential slight increase to width requirements during the Concept Phase (Options Analysis or Business Case).

### **Are Public Domain concrete road safety barriers still allowed?**

As no MASH-tested permanent or temporary single slope concrete barrier proprietary system has been submitted to TMR for inclusion at this stage, Public Domain concrete road safety barriers will continue to be supported for new projects and installations.

When and if a MASH proprietary single slope concrete system is accepted and this advice is updated TMR will advise affected stakeholders and update the *Accepted Road Safety Barrier Systems and Devices* document.

### **Will existing non-MASH tested road safety barriers need to be upgraded to MASH tested barriers?**

If the installed road safety barrier system is still functioning as designed and meets NCHRP 350 standards it will not require replacement with a new MASH tested product. However, if the system has been significantly damaged where repairs or replacements cannot be reasonably or readily undertaken, then a new MASH barrier may be required.

Please refer to the '*Decision tree - Adoption of MASH road safety barrier systems and devices*' for further guidance in determining when new MASH-tested products should be considered for your project.

### **What do you mean by 'significantly damaged' and 'reasonably and readily undertaken'?**

As, local conditions and circumstances are different throughout the state, there is no TMR standard definition for these terms. However, each Region or District has the flexibility to define what constitutes 'significantly damaged' and "reasonably and readily undertaken" depending on the circumstance.

**Technical Note 147 Recommended Interim Treatment for Crash-Damaged Public Domain Steel Beam Guardrail Infrastructure** – Provides some definitions for crash-damaged public domain steel beam guardrail infrastructure.

TMR **Accepted Road Safety Barrier Systems and Devices** document – Provides information about the compatibility of end treatments for the replacement of significantly damaged Public Domain end treatments. Replacement with proprietary end treatments should be investigated prior to replacing like-for-like.

For proprietary non-MASH tested products, please refer to the relevant product manual or the product Supplier for guidance on required maintenance actions appropriate to the barrier condition/damage.

### **What if the non-MASH barrier system on my network requires repair and the components are no longer available?**

As road agencies transition to MASH it is acknowledged that over time the ability to repair non-MASH barrier systems may become difficult depending on the compatible components. There are several components that are used in MASH tested barriers which are the same as NCHRP 350 barriers (such as w-beam rails).

The good news is MASH tested components may be used to assist in repairing damaged sections, where applicable.

There are a number of suppliers listed by TMR for supply of public domain steel barriers components in QLD. Please refer to TMR's current [Standing Offer Arrangement](#) (SOA) and [Registered Suppliers List](#) on TMR website to find suppliers for the maintenance and repair of non-MASH barriers.

### **Where can I go for more information?**

If you have further questions or would like to comment on this FAQ, please email Road Design Unit at [Standards\\_Research\\_and\\_Training@tmr.qld.gov.au](mailto:Standards_Research_and_Training@tmr.qld.gov.au)

The '*Decision tree - Adoption of MASH road safety barrier systems and devices*' document was created to support Districts and Regions in determining when a new MASH tested products should be considered.

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<sup>1</sup> As referred to in TMR's OnQ Project Management Framework. All efforts to incorporate MASH tested road safety barrier systems and devices should be made in detailed design. However, if the detailed design of a project has progressed where design with MASH tested barriers and devices will result in significant project variations (cost and time), use of Public Domain products is accepted.