

MASH Implementation Tracking

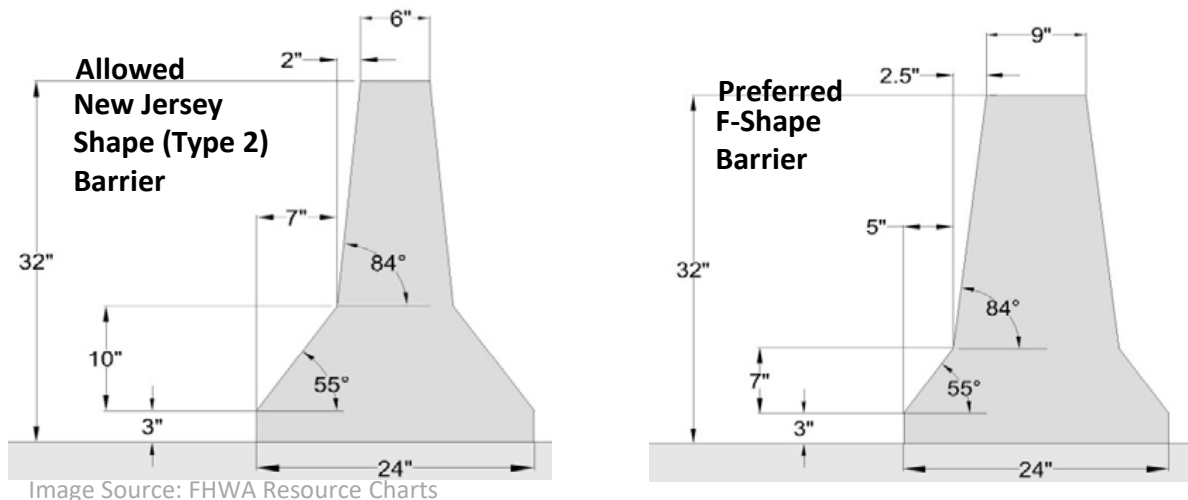
The table below provides an overall summary of past and upcoming changes in support of the implementation of the Manual for Assessing Safety Hardware (MASH). Additional details regarding some of these changes can be found on the back.

Policy Revisions in support of MASH Implementation

Item	Revision	Effective Date
Beam guardrail Type 31 non-flared terminals required to be MASH Compliant	Amendment to the Standard Specifications requires MASH compliance for these proprietary systems	January 2017
(Old) Beam Guardrail Type 1 continued phase-out	July 2017 Design Manual update continues phasing out of Type 1 guardrail. Up to 50 ft. extension of existing runs still allowed. Type 1 design guidance (placement cases, terminal guidance) moves from the Design Manual to website. The mandatory compliance date for this category is January 2018	July 2017
Beam Guardrail Type 31 Transition Section Type 20 removed	Standard Plan C-25.18-05 removed, as there are currently no plans to pursue a MASH compliant version of this system. Use a Type 21 transition instead.	July 2017
Beam guardrail Type 1 non-flared terminals required to be MASH Compliant	The only MASH compliant terminals available are for Type 31 guardrail. Removed the Type 1 non-flared and flared terminal Standard Plans, and removed associated standard bid items. Type 1 guardrail non-flared and flared terminal plans will soon be available for information only in the Plan Sheet Library.	April 2018
Beam guardrail Type 1 eliminated	Extension of existing runs of Type 1 guardrail will no longer be allowed. Type 31 will have to be used instead. All Type 1 guardrail Standard Plans will be eliminated, and un-stamped plans will instead be available on the Plan Sheet Library.	July 2018
F- shape barrier vs. New Jersey shape (Type 2) barrier	Both shapes are still allowed, but the F-shape barrier is now preferred. F-shape barrier is MASH compliant while Type 2 barrier is not.	July 2018
Cable Barrier	New installations will be required to be MASH compliant.	January 2019
Impact Attenuators	New installations will be required to be MASH compliant.	January 2019

Precast Concrete Barrier Type 2 (New Jersey) vs. F-shape

As part of the implementation of MASH-compliant hardware WSDOT is transitioning from using predominantly New Jersey shape barrier (Type 2 barrier) to using F-shape concrete barrier instead. The F-shape barrier is MASH compliant. For new, permanent installations of non-embedded precast concrete barrier, the F-shape barrier is preferred. Installations of new runs of Jersey shape (Type 2) barrier are still allowed and standard plans exist for both New Jersey shape (Type 2) and F-shape barrier.



Guardrail Terminals

New guardrail terminals must be MASH compliant. Currently, the only available MASH compliant non-flared terminals are for Type 31 guardrail (there are no MASH compliant Type 1 guardrail terminals currently available). Therefore, all new terminals (regardless of whether the guardrail run is Type 1 or Type 31) will require a Type 31 non-flared guardrail terminal. Use the "Beam Guardrail Type 31 to Beam Guardrail Type 1 Adaptor" (found in Standard Plan C-25.80) to connect Type 31 guardrail to an existing Type 1 guardrail run. Note, the standard bid item for Type 1 non-flared guardrail terminal has been eliminated.

Impact Attenuators

In Design Manual Chapter 1620 (July 2017 edition) over 30 impact attenuator systems were listed. Only two of the attenuators listed are currently MASH compliant. In anticipation of the major changes that MASH implementation will bring (likely in January 2019), detailed information for impact attenuators has been moved to the [Roadside Safety Design](#) website. This will allow prompt updating of information as more systems are tested and found to be MASH compliant. The detailed Chapter 1620 exhibits (July 2017 DM) showing attenuator system design information have been converted to a new web-based Attenuator Selection Template (documentation tool).

Standard Plans and the Plan Sheet Library

As systems are transitioned over to MASH compliance, non-MASH-compliant systems will be removed from the Standard Plans, and instead be made available as non-stamped plans in the Plan Sheet Library. This transition has affected more than 25 standard plans associated with the Old Type 1 guardrail (including anchors, transitions and placement cases).

MASH Implementation – The Basics

The Manual for Assessment of Safety Hardware (or MASH) provides testing criteria for roadside hardware that updates the previous standard called NCHRP 350. The implementation of MASH will impact stakeholders involved in supplying, specifying, procuring, installing, and maintaining roadside safety hardware.

WSDOT issued [Project Delivery Memo 16-03](#) in November 2016 outlining the overall strategy for MASH implementation and beginning the phasing in of MASH compliant hardware.

MASH implementation does not currently require the replacement of **existing** NCHRP 350 devices, only the elimination of their use for new permanent installations and full replacements, and the phasing out of temporary/WZTC devices as their service lives expire.

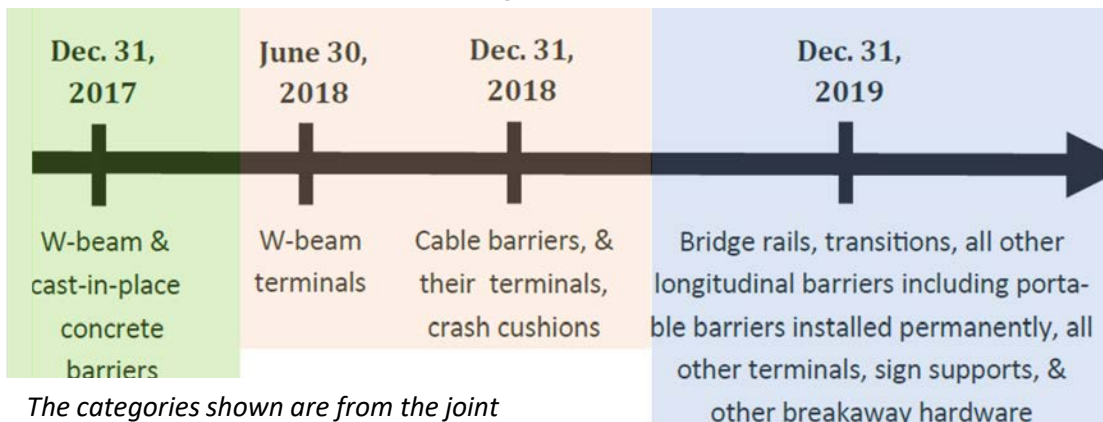
NCHRP 350 devices remain functional and can be left in place through their service lives.



Image Source: Roadside Safety Pooled Fund website

Test of 45” Single Slope Barrier with Acoustic Coating (source Roadside Safety Pooled Fund newsletter. Read more about the pooled fund on the back of this page)

Implementation Categories & Dates



The categories shown are from the joint AASHTO/FHWA implementation agreement. The dates shown are considered by WSDOT to be “no later than” dates. WSDOT will aggressively pursue MASH implementation, and for some categories will require MASH compliancy earlier than the dates shown.

Temporary work zone devices (including portable barriers not installed permanently) manufactured after December 31, 2019

MASH Implementation

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A Collaborative Approach to MASH Implementation

WSDOT has been the lead agency and co-chair of the Roadside Safety Pooled Fund for over 10 years. The pooled fund is a group of states that contribute research dollars and works collaboratively to evaluate the crashworthiness of roadside safety hardware used by the member states. Pooled fund membership has grown to include 20 states and one Canadian province. WSDOT relies heavily on the pooled fund for principles that guide policy and decision making.

Roadside Safety Research for MASH Implementation Pooled Fund Member States

Alaska	Idaho	Oklahoma	W. Virginia
California	Illinois	Oregon	Wisconsin
Colorado	Louisiana	Pennsylvania	Ontario, Canada
Connecticut	Massachusetts	Tennessee	
Delaware	Michigan	Texas	
Florida	Minnesota	Washington	

The Roadside Safety pooled fund maintains a database of MASH-compliant devices, many of which are not included in WSDOT Standard Plans. If you want to find out more about the pooled fund, click on the link below:

[Roadside Safety Pooled Fund](https://www.roadsidepooledfund.org)
(<https://www.roadsidepooledfund.org>)

How will the conversion to MASH compliance be made?

These changes will primarily be made by changing the associated WSDOT Standard Specification to require MASH compliance, or by changing the associated WSDOT Standard Plan to show the MASH compliant system. Once a category of hardware has been converted to requiring MASH compliance, the Standard Plans for any systems that are not MASH compliant will be moved to the [WSDOT - Plan Sheet Library](http://www.wsdot.wa.gov/Design/Standards/PlanSheet) (<http://www.wsdot.wa.gov/Design/Standards/PlanSheet>)

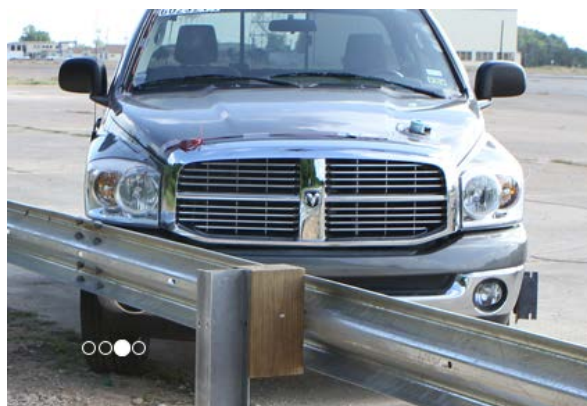


Image Source: Roadside Safety Pooled Fund website

One of the reasons that NCHRP 350 was updated to the Manual for Assessing Safety Hardware (MASH) was that – over time- vehicle characteristics evolve. For instance, full-size trucks grew in size and weight. The full-size truck used in MASH crash testing is considerably larger and heavier than the full-size truck used in NCHRP-350 testing.

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