AASHTO Manual for Assessing Safety Hardware (MASH)

Dick Albin
FHWA Resource Center
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Manual for Assessing Safety Hardware (MASH)

• What is MASH
• MASH Implementation Agreement
• Eligibility Letters
  – What are they?
  – FAQ’s
• Status – What hardware has been tested
Crash Testing has been used as a tool for evaluating roadside hardware since the 1930’s.
Evolution of Crash Test Procedures

1962

1974

1980

1993

2009

2016
• Update of the evaluation procedures in NCHRP 350
• Published as AASHTO document in 2009
• 2\textsuperscript{nd} Edition published in 2016
• MASH is NOT an FHWA document
• FHWA forwards questions on interpretation to AASHTO
What is MASH?

- Specifies tests for roadside hardware devices
- Includes 6 unique Test Levels for longitudinal barriers
- Test matrices for crash cushions, supports and work zone devices
- Worst Practical Conditions
Test Vehicle Changes

- One of the most noticeable changes from NCHRP 350 to MASH
One of the biggest changes in the 2nd edition is for testing of cable barrier.
• Agencies are **urged to establish a process to replace** existing highway safety hardware that has not been successfully tested to NCHRP Report 350 or later criteria.

• Agencies are **encouraged to upgrade existing highway safety hardware** to comply with the 2016 edition of MASH either when it becomes damaged beyond repair, or when an individual agency's policies require an upgrade to the safety hardware.
For contracts on the National Highway System with a letting date after the dates below, only safety hardware evaluated using the 2016 edition of MASH criteria will be allowed for new permanent installations and full replacements:

- W-beam barrier and cast-in-place concrete barrier: **December 31, 2017**
- W-beam terminals: **June 30, 2018**
- Cable barrier, cable barrier terminals, and crash cushions: **December 31, 2018**
- Bridge rails, transitions, all other longitudinal barriers (including portable barriers installed permanently), all other terminals, sign supports, and all other breakaway hardware: **December 31, 2019**
Countermeasures that Reduce Crash Severity

Hardware, such as barriers, sign supports, and work zone devices are commonly used to reduce the potential severity of crashes on the roadside. Crash testing is used to evaluate the crashworthiness of these devices.

The American Association of State Highway Transportation Officials (AASHTO) provides guidance related to the design and installation specifications of roadside hardware and safety hardware. Federal Highway Administration (FHWA) Office of Safety reviews crash-tested hardware to determine if it is eligible for Federal Funding.
FHWA Role – What is an Eligibility Letter?

• Service to the FHWA Division Offices and States since the 1980’s
• Review of crash tests and evaluations
• If device meets crash test criteria, FHWA issues letter indicating that it is eligible for FHWA reimbursement
• Effective December 31, 2015 FHWA no longer accepts requests for modifications to NCHRP 350 hardware.
• 2 reviews are ongoing by the GAO and Volpe that may recommend changes to this process.
• Q1: Does all roadside safety hardware need a FHWA Eligibility Letter in order to be eligible for reimbursement on projects on the NHS?

• A1. No. Eligibility Letters are provided as a service to the States and are not a requirement for roadside safety hardware to be eligible for reimbursement.

• Q2: If a State does not request an FHWA Eligibility Letter for a safety hardware device, what documentation can a Division Office rely on that the device is eligible for Federal-aid reimbursement?

• A2: When approving the State's standard plans or qualified products lists (QPLs), the Division Office may rely on a certification from the State DOT indicating that the hardware satisfies MASH or NCHRP 350 criteria. The State DOT should keep on file documentation supporting this certification.

Eligibility Letter Status - Barriers

Letters Issued as of 2/22/2017
• W-beam Guardrail – 18 Devices
• Guardrail Transitions – 9 Devices
• Cable Barrier – 5 Devices (MASH 2009)
• Concrete Barrier – 3 Devices
• Bridge Rail – 8 Devices
• Portable Barriers – 18 Devices
• Other – 6 devices

Note- There has been additional testing conducted (NCHRP projects) but Eligibility letters have not been requested
Eligibility Letter Status – Terminals and Crash Cushions

Letters Issued as of 2/22/2017

• W-Beam terminals – 3 devices
• Crash Cushions – 2 devices
Eligibility Letter status – Breakaway Supports

Letters Issued as of 2/22/2017
• Dual post support – 3 devices
• Luminaire Supports - 0

Note:
• MASH now requires testing with the PU truck that was not required under NCHRP 350
• There has been additional testing conducted (NCHRP projects) but Eligibility letters have not been requested
Eligibility Letter status – Work Zone Devices

Letters Issued as of 2/22/2017
• Portable Sign Stands – 4 devices
• Barricades – 6 devices
• Longitudinal Channelizers – 8 devices
• Delineators – 7 devices
• Other – 2 devices

Note – MASH now requires testing with the PU truck that was not required under NCHRP 350
Questions?

Dick Albin
FHWA Resource Center
303-550-8804
dick.albin@dot.gov