Impact of MASH on Roadside Safety Hardware Manufacturers

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History of Crash Test Procedures

Vehicle Weight Trends

MASH establishes testing and assessment guidelines for:

- Longitudinal Barriers
  - Flexible & Semi-Rigid
  - Rigid
  - Barrier Transition
- Crash Cushions
  - Redirective (gating/non-gating)
  - Non-Redirective (gating)
- End Terminals
  - Guardrails
  - Median barriers
- Work Zone Attenuation & Channelizers
  - Truck-Mounted Attenuators (TMAs)
  - Longitudinal Channelizing Devices (LCD)
- Support Structures
  - Break-away luminaires and signs
  - Utility Poles
  - Work Zone Traffic Control Devices

Transition to MASH
Published 2009/2016

- Next step in advancement & evolution of roadside safety testing & evaluation
- Supersedes NCHRP Report 350
- Addresses changes in vehicle fleet
- Marks first time AASHTO has officially published crash testing procedures.
- Updated in 2016

MASH ‘16 Updates:

Major Changes:
• Crash testing criteria for Cable Barriers on slopes...
• Redirective Gating Test 37 CIP Impact @ 25° changed to small size vehicle

Minor Technical Changes:
• Soil strength testing
• Improved documentation of vehicle damage
• Longer tractor-trailer lengths

Impact of MASH on Roadside Safety Hardware Manufacturers

Since January 1, 2011, all new roadside safety hardware for which a Federal-aid reimbursement eligibility letter is sought must be tested to MASH criteria

• First to develop a MASH Qualified End Terminal and Crash Cushion Product
• By the end of 2015 had 9 MASH Qualified Products, well ahead of any mandates
• Proactive not Reactive...

FHWA Open Letter

May 26, 2017

1. Federal-Aid Eligibility Letters are provide as “a service” not required for reimbursement
2. All roadside devices must complete the full suite of (MASH) tests
3. FHWA will not longer provide Letters for modifications to MASH crash tested devices
4. FHWA will address initial “entry” of device, but final decisions on selection and modifications will be at State/Local level...

*See FHWA link: Roadside Hardware Policy Memoranda and Guidance

Policy Resolution PR-2-16

Title: Role of FHWA in MASH Implementation and Crash Test Reviews

WHEREAS, The sunset dates for NCHRP 350 hardware were jointly developed between AASHTO and FHWA, and with significant outreach to additional stakeholders, including private industry and academia; and
WHEREAS, These dates were established with the assumption, as stated in the implementation agreement, that FHWA “will continue its role in issuing letters of eligibility of highway safety hardware for federal-aid reimbursement” and
WHEREAS, FHWA’s continued technical support is critical to the success of the roadside safety community in meeting the sunset dates delineated in the joint agreement and
WHEREAS, Without technical support being provided to those developing roadside hardware, including an approved test matrix that, if passed by a device, will lead to a positive eligibility determination, manufacturers and laboratories have slowed or stopped their development and testing to MASH standards; and
WHEREAS, At least most states do not have the technical expertise needed to conduct reviews of crash tests to determine appropriate use of roadside hardware, and the AASHTO Technical Committee on Roadside Safety does not have the time, expertise, nor jurisdiction to determine eligibility for use on the NHS; and
WHEREAS, Due to the lack of resources and technical expertise that has traditionally been provided by FHWA to manufacturers, laboratories, and state practitioners, AASHTO is not confident that appropriate MASH-approved hardware will be available by the sunset dates agreed to in the joint agreement.

NOW, THEREFORE, BE IT RESOLVED, AASHTO requests that FHWA reaffirm its role, as agreed to in the joint implementation agreement, of providing objective technical expertise and resourcestotheroadsafety community and issuing eligibility determinations for safety hardware on the NHS.
1. State Agency Review and Assessment: DOT’s implement their own procedures for accepting devices.
2. Multi-Agency Review and Assessment: Pooled Fund projects (MGS, TTi) Regional Coordination
3. AASHTO’s NTPEP
6. Manufacturer-Based Certification, Installation & Maintenance

April 9, 2018 - FHWA Memo: Evaluating a State DOT’s Process to Determine RSH Crashworthiness on NHS

"Exceptions and clarifications to the AASHTO/FHWA MASH Implementation Agreement"

- **06/30/18 – W-Beam End Terminals**
  This sunset date now only covers tangent terminals. Other applications, such as double-sided or median terminals, flared terminals...are included in the Dec. 31, 2019
- **12/31/18 – Cable Barriers, cable terminals & Crash Cushions**
  This sunset date now only covers crash cushions. Cable barriers, cable barrier terminals are now included in the Dec. 31, 2019
- **12/31/18 – Cable Barriers, cable terminals & CC (10-20-18)**
  For contracts on the NHS with a letting date after Dec. 31, 2018, State (DOTs) may request a substitution to specify a NCHRP 350 compliant crash cushion when an equivalent MASH 16 compliant crash cushion doesn’t exist....

Uncertainty impacts...

- **R&D Cost:** Full test matrix required for every version increases cost and results in less innovation and fewer products available
- **Ongoing Enhancements:** Modifications that have, in the past been based on engineering analysis, must run full matrix. Testing vs. Field results...
- **Approval Process & Technical Support:** Moving from a single approval authority to potentially 50 state approvals, and crashworthy determination. Objective expertise/support to Mfg.’s & States
Uncertainty impacts...

**Production**

- **Cost and time** to convert plant equipment, material and resources to produce a new MASH device
- **Plants need to maintain parts inventory** for NCHRP 350 while trying to anticipate MASH production
- **Creates longer lead times to deliver**, creating scheduling delays which in turn delays Maintenance & New Projects
- **Impacts on plant staffing** until volume is more certain

Uncertainty impacts...

**Legal Costs**

- **Impact of the Trinity lawsuit on the industry** both Federal and State Agencies & Mfg.'s can’t be understated
- **The need to pause development due to these uncertainties in the industry was necessary**
- **We have resumed development, moving forward, but cautiously**

**Current MASH-16 Crash Cushions**

**Current MASH-16 TMAs**

**Current MASH-16 End Terminals**

**23 CFR Parts 630 and 635. Construction and Maintenance—Promoting Innovation in Use of Patented and Proprietary Products**

DEPARTMENT OF TRANSPORTATION Federal Highway Administration  
**ACTION:** Notice of proposed rulemaking (NPRM); request for comments:  
**SUMMARY:** This rulemaking would provide greater flexibility to States to use proprietary or patented materials in Federal-aid projects. FHWA proposes to amend and replace the requirements relating to patented and proprietary product approvals with a more flexible general requirement that enhances fairness, open competition, and transparency in the product selection process...thereby encouraging further innovation in the development of new highway transportation technology and methods, as well as potentially reducing costs
Thank You—Questions?

Takeaways...

- Impact of THP lawsuit on the industry regulatory agencies & Mfg.’s can’t be understated
- The need to pause due to uncertainties in the industry created delays, but was necessary
- We have committed capital investment in our plants and resumed testing with intention to have multiple MASH devices within each of our core product lines