


Memorandum

Appendix 11-06

Subject: **INFORMATION:** AASHTO/FHWA
Joint Implementation Agreement for
Manual for Assessing Safety Hardware
(MASH)

Date: JAN - 7 2016

From: 
Thomas Everett
Director, Office of Program
Administration

In Reply Refer To:
HSST

Michael S. Griffith 
Director, Office of Safety Technologies

To: Division Administrators
Directors of Field Services
Federal Lands Highway Division Directors

Purpose

The purpose of this memorandum is to share information regarding the American Association of State Highway and Transportation Officials (AASHTO)/FHWA Joint Implementation Agreement for the AASHTO Manual for Assessing Safety Hardware (MASH). Recently, the agreement was successfully balloted by AASHTO's Standing Committee on Highways and approved by FHWA.

Information

On November 12th, 2015, FHWA issued a memorandum (http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/policy_memo/memo111215/) indicating that all modifications to NCHRP 350-tested devices will require testing under MASH in order to receive a Federal-aid eligibility letter from FHWA. In addition, a Federal Register Notice (<https://www.federalregister.gov/articles/2015/11/13/2015-28753/manual-for-assessing-safety-hardware-mash-transition>) was also issued regarding this action. This action provided a significant step forward to the implementation of MASH.

Through the AASHTO/FHWA partnership, the agreement was executed to define actions needed for full implementation of MASH over the course of several years. Per the agreement, the implementation of the forthcoming edition (anticipated Spring 2016) of the AASHTO Manual for Assessing Safety Hardware (MASH) will be as follows:

- The AASHTO Technical Committee on Roadside Safety will continue to be responsible for developing and maintaining the evaluation criteria as adopted by

AASHTO. FHWA will continue its role in issuing letters of eligibility of roadside safety hardware for federal-aid reimbursement.

- 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:
 - December 31, 2017: w-beam barriers and cast-in-place concrete barriers
 - June 30, 2018: w-beam terminals
 - December 31, 2018: cable barriers, cable barrier terminals, and crash cushions
 - December 31, 2019: bridge rails, transitions, all other longitudinal barriers (including portable barriers installed permanently), all other terminals, sign supports, and all other breakaway hardware
- Temporary work zone devices, including portable barriers, manufactured after December 31, 2019, must have been successfully tested to the 2016 edition of MASH. Such devices manufactured on or before this date, and successfully tested to NCHRP Report 350 or the 2009 edition of MASH, may continue to be used throughout their normal service lives.
- Regarding the federal-aid eligibility of highway safety hardware, after December 31, 2016:
 - FHWA will no longer issue eligibility letters for highway safety hardware that has not been successfully crash tested to the 2016 edition of MASH.
 - Modifications of eligible highway safety hardware must utilize criteria in the 2016 edition of MASH for re-evaluation and/or retesting.
 - Non-significant modifications of eligible hardware that have a positive or inconsequential effect on safety performance may continue to be evaluated using finite element analysis.

Division Offices should discuss the MASH implementation agreement with state transportation agency partners and monitor the actions taken and progress towards the dates established in the agreement.

If you have any questions or comments, please contact Brian Fouch in the Office of Safety at (202) 366-0744.



U.S. Department
of Transportation
**Federal Highway
Administration**

New Hampshire Division

March 6, 2020

53 Pleasant Street, Suite 2200
Concord, NH 03301
(603) 228-0417

In Reply Refer To:
HDA-NH

Ms. Victoria F. Sheehan
Commissioner
New Hampshire Department of Transportation
7 Hazen Drive
Concord, NH 03302-0483

Attn: Mr. Peter Stamnas,

**Subject: Revised Process for Determination of Roadside Safety Hardware
Crashworthiness, date 2/27/2020**

Dear Commissioner Sheehan:

FHWA is in receipt of your submission for review and consideration of the revisions to NHDOT Revised Process for Determination of Roadside Safety Hardware Crashworthiness, date 2/27/2020. Thank you for your effort on making these amendments and coordinating with FHWA.

We have reviewed the submitted NHDOT Revised Process for Determination of Roadside Safety Hardware Crashworthiness, date 2/27/2020, document and the Division concurs with the NHDOT newly revised process for determining the crashworthiness of all roadside safety hardware installed on the NHS.

Again, thank you for the great effort on these amendments. Please feel free to contact me at 603-410-4852 or Michelle.Marshall@dot.gov with any questions or comments.

Sincerely,

Michelle Marshall
Safety and Area Engineer

MM

CC: K. Cota, J. Marshall, K. Mudgett NHDOT
Y. Volcy, FHWA
File Subject #150.400



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



Victoria F. Sheehan
Commissioner

William Cass, P.E.
Assistant Commissioner

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**Revised - Process for Determination of
Roadside Safety Hardware Crashworthiness**

February 27, 2020

Michelle Marshall
Safety and Area Engineer
Federal Highway Administration, NH Division
53 Pleasant St, Suite 2200
Concord, NH 03301

Dear Ms. Marshall,

Please find attached NHDOT's **revised** outlined process for determining crashworthiness of roadside safety hardware on the National Highway System (NHS). The attached revises the original process outline sent to your division office in June 2018.

It remains the goal of NHDOT to utilize roadside safety hardware that meets national crash test criteria. During our search for a new state standard for portable concrete barrier it became evident that there are many MASH compliant barrier options, some of which contractors have already purchased and put into use. We feel that this revised process best addresses future use of temporary work zone devices that are MASH compliant.

In the attached document, we separate the requirements for new hardware into two categories, permanent and temporary. We have identified that the need for detailed review of maintenance, installation, and in most cases regional climate, is not the same for temporary installations as it is for permanent installations of hardware. Proof of MASH testing compliance at an approved laboratory will need to be submitted for approval of temporary hardware. Temporary hardware would not require a federal letter of compliance, or require to be "Department Approved" hardware. Temporary hardware will still be reviewed for approval for use on a project by project basis. Regional climate impact on the hardware can be best assessed by project Construction personnel.

Thank you for the original guidance for determining this process. I trust the attached meets FHWA's expectations of an acceptable process, please let me know if otherwise.

Sincerely,

Peter Stamnas
Director of Project Development

Attachment
KOM

cc: J. Marshall/K. Cota

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NHDOT Process for Determination of Roadside Safety Hardware Crashworthiness

February 27, 2020

New Permanent Roadside Safety Hardware

To determine crashworthiness of new permanent systems, NHDOT shall:

- Confirm the existence of a federal eligibility letter relative to AASHTO MASH criteria.
- Confirm that the crash testing was conducted by an ISO 17025 accredited laboratory
- Seek out manufacturer's data for installation, maintenance, and crash testing and determine if the system meets the NHDOT's needs, considering, at a minimum :
 - Climate effects on the system performance, longevity, etc.
 - Complication of installation requirements
 - maintenance needs
 - overall crash performance
- Documentation would be required, with signature of chief engineer, similar to controlling criteria design exception process.

Modifications to existing successfully MASH tested permanent roadside safety hardware

Proprietary Devices –

- Originally having a federal eligibility letter relative to AASHTO MASH criteria
- Confirmation that the crash testing was conducted by an ISO 17025 accredited laboratory
- Engineering analysis conducted by an ISO 17025 accredited laboratory that determines the modification does not affect the crashworthiness of the roadway safety hardware based on previous testing.
- Internal review to determine that the modification will still meet the NHDOT's need for a system using the same criteria as for a new system.
- Documentation would be required, with signature of chief engineer, similar to controlling criteria design exception process.

Generic Devices –

- An engineering analysis shall be conducted by NHDOT, or group approved by NHDOT. The other group could be another state or pooled fund, but NHDOT would need to review their report and videos.
- Crash testing may be warranted based on the results of the analysis.
- Documentation would be required, with signature of chief engineer, similar to controlling criteria design exception process.

NHDOT Process for Determination of Roadside Safety Hardware Crashworthiness

Assurance of Proper Installation of Proprietary System, Through Contractor and Maintenance Forces

- Ensure proper installation through:
 - Required training of installer by manufacturer
 - Contractor completion of checklist (sign off), including:
 - Date
 - Location (Coordinates)
 - Type
- Encourage proper maintenance by providing manufacturer installation guides to maintenance forces.

Assessment of In-Service Performance

- NHDOT may perform periodic crash data assessments
 - Priority to examine new products over established products, 3-5 years after first installed
 - Sources that are most likely to contain relevant data for use:
 - Crashes occurring during construction of a project. (Those who understand the hardware are quite often witnesses to the event.)
 - Accident reports that come via re-imburement sought through Bureau of Finance – where guardrail is impacted during a crash. (These are usually more detailed than typical police reports)
 - Other state's crash data, if available and detailed enough.
 - NHDOT will make determination from this review, whether the system is still meeting our expectations.

Exceptions to MASH Approved Hardware Requirement

There may be circumstances where requiring hardware that meets AASHTO MASH test criteria is very difficult. Approval for exceptions would be required, with signature of chief engineer.

Temporary Use Safety Hardware

To determine crashworthiness of temporary (construction workzone) systems, contractors shall:

Either,

- Use a pre-approved permanent hardware system being utilized for temporary use, that NHDOT approved via the system above (New Roadside Permanent Safety Hardware),

Or,

NHDOT Process for Determination of Roadside Safety Hardware Crashworthiness

- Use a pre-approved system that NHDOT approved by:
 - Confirmation that the system has passed MASH testing
 - Confirmation that the tests took place at an ISO 17025 accredited laboratory
 - Determining from manufacturer's data for crash testing, that the system meets the NHDOT's needs for overall crash performance.

Or,

- Supply proof of successful MASH testing of a product for approval by the engineer. This method shall be outlined for contractors in item specifications and elsewhere within the Proposal.
 - For example: NHDOT will have a preferred and approved standard portable concrete barrier, but will allow use of other MASH systems, with approval, on a project by project basis.
 - Engineer will determine if the system meets the project's needs, considering:
 - Climate effects on the system performance, longevity, etc.
 - Overall crash performance

Drafted By: K. Mudgett

Noted By: J. Marshall, K. Cota, C. Spetelunas

Attachments: Cover Letter