

Michigan Department of Transportation Roadside Safety Hardware Assessment and Implementation Plan

October 2022

Roles and Responsibilities

The department may modify implementation plans and/or strategies at any time, and at the department's discretion. Exceptions to these procedures and/or requirements must be approved by the department's Engineering Operations Committee (EOC).

Roadside safety hardware assessment will be assigned to different committees and/or work groups based on areas of expertise. The following groups will take the lead in evaluating the device categories noted below. These committees, work groups, and/or categories are subject to change at any time.

- Barrier Advisory Committee (BAC)
 - Guardrail systems
 - Guardrail terminals
 - Permanent concrete barriers
 - Cable barriers and cable terminals
 - Impact attenuators, permanent and temporary (excluding truck-mounted attenuators and trailer-mounted mobile attenuators)
 - Other longitudinal barriers and terminals
 - Temporary barriers (concrete, steel, limited deflection barriers, and portable water-filled barriers; excluding longitudinal channelizing barricades)
- Ad-hoc Group of BAC and Bridge Committee Members
 - Bridge railings
- Bureau of Bridges and Structures (BOBS), Structure Construction Section, Bridge Construction / Modeling Unit
 - Lighting bases
- Transportation Systems Management and Operations (TSMO) Division, Traffic and Safety Section, Traffic Signing Unit
 - Permanent sign supports
 - Other breakaway hardware

The following device categories will be evaluated as part of a separate assessment and implementation plan. Evaluations of these devices will be assigned to the Construction Field Services (CFS) Division, Field Operations Section, Work Zone Management Unit, and the Work Zone Business Team:

- Work zone devices, including longitudinal channelizing barricades and mobile attenuators (i.e., truck-mounted attenuators and trailer-mounted mobile attenuators). This excludes temporary barriers and temporary impact attenuators, which are addressed by BAC.
- Temporary signs and supports
- All other temporary traffic control devices

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Training and staff development will be evaluated and pursued to ensure appropriate competencies and resources are maintained to review and evaluate submittals.

Roadside Safety Hardware Implementation Plan

The following will be applied to each device category and/or subcategory. Different implementation strategies may apply to different device categories and subcategories. This plan is not retroactive, nor does it impact any roadside safety hardware assessment and implementation recommendations made prior to this plan. All submittals as noted herein must be made through the department's New Materials and Qualified Products Evaluation Request process, which can be found at the following link:

[New Materials & Qualified Products Evaluation](#)

1. AASHTO Manual for Assessing Safety Hardware (MASH) 2016 compliant devices may be specified when there are an adequate number of compliant devices, as determined by the department, to meet MDOT's program/operational needs, and beyond any implementation dates established by MDOT.
 - A. Appropriate implementation dates for MASH 2016 compliance will be established by the department for different device categories. Implementation dates may be defined as fixed calendar dates or letting dates and may vary based on device category.
 - B. MDOT may discontinue specifying National Cooperative Highway Research Program (NCHRP) 350 and/or MASH 2009 compliant alternatives, and only specify MASH 2016 compliant devices, when there are at least two MDOT-approved, proprietary options, or one MDOT-approved, non-proprietary option for each device category.
2. MDOT-approved NCHRP 350 or MASH 2009 options may be specified, if available, when there is not an adequate number of MASH 2016 compliant devices to meet MDOT's program/operational needs, as determined by the department.
3. MDOT may consider approving devices based on a combination of one or more of the following options:
 - A. Research, including NCHRP and pooled fund reports, and reports from ISO 17025 accredited crash test facilities.
 - B. Professional opinion letters issued by ISO 17025 accredited crash test facilities.
 - C. Partial crash testing (i.e., less than full suite crash testing) conducted by an ISO 17025 accredited crash test facility of critical test(s) as determined by the crash test facility.
 - D. Crash test results, videos, and test summary sheets that are completed and reported by accredited laboratories.

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- E. Other types of testing and evaluation (pendulum testing, bogie vehicle testing, computer simulation, etc.) performed by an ISO 17025 accredited crash testing facility.
- F. Devices approved by other states.
- G. Engineering judgement.

The evaluation and approval process will be done on an individual device basis, as determined by MDOT. The guidelines described in the *Roadside Safety Hardware Assessment Plan* will serve as guidance in the evaluation process, but the evaluation and approval process, including evaluation and approval criteria, will vary by device as determined by MDOT.

Roadside Safety Hardware Assessment Plan

Assessment Strategies

Different assessment strategies will be applied to proprietary devices (i.e., devices containing components or materials that are protected under intellectual property rights or manufactured by a single company) and non-proprietary devices, and to specific device categories; new and modified. The department may modify the assessment strategy for certain devices as deemed appropriate by the department. All device evaluations will be conducted on a case-by-case basis by MDOT, and all decisions concerning product evaluations will be made at the department's discretion.

Proprietary Devices

New Device Evaluations without Any Product Modifications

The manufacturer must submit the following documentation to MDOT for review.

1. Federal Highway Administration (FHWA) eligibility letter confirming the device is eligible for Federal Aid reimbursement. The FHWA eligibility letter must either specify the device is eligible as a MASH 2016 device, or else one of the following requirements must be satisfied.
 - A. If the FHWA eligibility letter does not explicitly state the version of MASH the product was evaluated under, the device may be considered for approval if a signed professional opinion letter from an ISO 17025 accredited crash testing facility is provided clearly stating the device is MASH 2016 compliant and no further testing is required, or
 - B. If a device was successfully tested or evaluated under MASH 2009 criteria, MDOT may consider approving the device as MASH 2016 compliant without further testing or evaluation if there is supporting documentation (e.g., research and technical reports, a professional opinion letter issued by an accredited testing facility, etc.) indicating that further testing and/or evaluation under MASH 2016 criteria is not necessary. Supporting documentation may also include guidance

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from American Association of State Highway and Transportation Officials (AASHTO), FHWA, and/or other sources, including, but not limited to, clarifications on MASH implementation (e.g., Q&A publications), memoranda/letters, errata, reference guides, and other publications.

2. A signed letter by the manufacturer certifying that no modifications have been made to the device since the device was successfully crash tested and received an FHWA eligibility letter.
3. Product information, specifications, drawings, and installation manuals.
4. Crash test videos and reports. Crash tests must be performed by an ISO 17025 accredited crash test facility.
5. In-service performance evaluations (if available).
6. Any additional information requested by MDOT.

Device Modifications Made During the Course of Crash Testing

Device modifications made during the course of crash testing will only be considered if they were disclosed to FHWA prior to issuance of the FHWA eligibility letter, and if they were documented as described in FHWA's open letter to the roadside safety hardware and design community, dated April 8, 2019. FHWA's roadside hardware policy memoranda, including the April 8, 2019, open letter, are available online at the following link:

https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/policy_memo_guidance.cfm

MDOT reserves the right to review and assess all device changes and/or modifications made during the course of crash testing. Issuance of an FHWA eligibility letter is not a guarantee that MDOT will approve devices with modifications made during the course of crash testing.

Product Modifications Made After Issuance of an FHWA Eligibility Letter

The manufacturer must obtain MDOT approval before furnishing approved devices with modifications. Failure to disclose any device modifications to MDOT may result in revocation of the device's approval status by MDOT, and MDOT may take all necessary measures, as deemed appropriate, to prevent the device from being used on MDOT projects.

If any modifications are made to a device after issuance of an FHWA eligibility letter, the manufacturer must submit a product evaluation request to MDOT, with supporting documentation, requesting approval of the modified product. This applies to all device modifications; significant and non-significant. If available, the manufacturer must provide an updated FHWA letter acknowledging the modified device is eligible for Federal Aid reimbursement. The modified device will be evaluated by MDOT on a case-by-case basis, and approval will be entirely at MDOT's discretion. Unless otherwise specified by MDOT, the following must be provided with the evaluation request:

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1. A signed letter from the manufacturer detailing all modifications made to the device after issuance of the FHWA eligibility letter.
2. Certification documentation:
 - A. A new FHWA eligibility letter confirming the modified device is eligible for Federal aid reimbursement as a MASH 2016 device, or;
 - B. A signed letter from an ISO 17025 accredited crash testing facility certifying that the modified device is MASH 2016 compliant, and no further testing is required.
3. Crash test videos and reports (if conducted). Crash tests must be performed by an ISO 17025 accredited crash test facility.
4. In-service performance evaluations (if available).
5. Analysis from an ISO 17025 accredited crash test facility.
6. Any additional information requested by MDOT.

Approval from MDOT's Engineering Operations Committee (EOC) is required in order to approve a modified proprietary device that does not have an FHWA eligibility letter.

Non-Proprietary Devices

New Device Evaluations and Device Modifications Made After Issuance of an FHWA Eligibility Letter

The department prefers approving devices possessing FHWA eligibility letters specifying the devices are eligible for Federal Aid reimbursement as MASH 2016 devices, or as described below. MDOT may approve non-proprietary devices without FHWA eligibility letters as described below. This applies to both new non-proprietary device evaluations and the evaluation of non-proprietary device modifications. A modified device evaluation will be treated as a new device evaluation by MDOT, regardless of whether the modification is significant or non-significant.

1. If the FHWA eligibility letter does not explicitly state the version of MASH the product was evaluated under, the device may be considered for approval if a signed professional opinion letter from an ISO 17025 accredited crash testing facility is provided clearly stating the device is MASH 2016 compliant and no further testing is required, or
2. If a device was successfully tested or evaluated under MASH 2009 criteria, MDOT may consider approving the device as MASH 2016 compliant without further testing or evaluation if there is supporting documentation (e.g., research and technical reports, a professional opinion letter issued by an accredited testing facility, etc.) indicating that further testing and/or evaluation under MASH 2016 criteria is not necessary. Supporting documentation may also include guidance from AASHTO, FHWA, and/or other sources, including, but not limited to, clarifications on MASH implementation (e.g., Q&A publications), memoranda/letters, errata, reference guides, and other publications.

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The department may also consider approving non-proprietary devices that do not have an FHWA eligibility letter based on one or more of the following.

1. Research, including NCHRP and pooled fund group reports, and reports from ISO 17025 accredited crash test facilities.
2. Professional opinion letters issued by ISO 17025 accredited crash test facilities.
3. Partial crash testing (i.e., less than full suite crash testing) conducted by an ISO 17025 accredited crash test facility of critical test(s) as determined by the crash test facility.
4. Crash test results, videos, and test summary sheets that are completed and reported by accredited laboratories.
5. Other types of testing and evaluation (pendulum testing, bogie vehicle testing, computer simulation, etc.) performed by an ISO 17025 accredited crash testing facility.
6. Devices approved by other states.
7. Engineering judgement.

Approval from MDOT's Engineering Operations Committee (EOC) is required in order to approve a non-proprietary device that does not have an FHWA eligibility letter.

Device Modifications Made During the Course of Crash Testing

For devices with FHWA eligibility letters, device modifications made during the course of crash testing will only be considered if they were disclosed to FHWA prior to issuance of the FHWA eligibility letter, and if they were documented as described in FHWA's open letter to the roadside safety hardware and design community, dated April 8, 2019. FHWA's roadside hardware policy memoranda, including the April 8, 2019, open letter, are available online at the following link.

https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/policy_memo_guidance.cfm

MDOT reserves the right to review and assess all device changes and/or modifications made during the course of crash testing. Issuance of an FHWA eligibility letter is not a guarantee that MDOT will approve devices with modifications made during the course of crash testing.

For devices without FHWA eligibility letters, device modifications made during the course of crash testing will only be considered if they were disclosed to MDOT. Failure to disclose device modifications made during the course of crash testing may result in revocation of the device's approval status by MDOT, and MDOT may take all necessary measures, as deemed appropriate, to prevent the device from being used on MDOT projects.