

Roadside Safety Hardware Assessment

Design Manual
Chapter 8
Roadside Safety
Originally Issued: 07-23-19

The Department strives to use roadside safety hardware that meets or exceeds currently adopted testing standards. The Department's approach to hardware is (by priority):

1. Use MASH compliant products.
2. If no MASH compliant products are available or have Department approval for use, use NCHRP Report 350 compliant products. A list of NCHRP Report 350 compliant products is available on [FHWA's website](#).
3. If no products are available that have been tested to MASH or NCHRP Report 350 testing standards, the Department will work with one or both pooled fund groups (currently the Iowa DOT belongs to two pooled funds: Midwest Roadside Safety Facility (MwRSF) and Texas A&M Transportation Institute (TTI)) to either:
 - Choose the best product for the constraints of a project, or
 - Initiate research to develop a compliant product.

The choice of a product to meet the constraints of a project will be based on a combination of:

- In house engineering judgement;
- Research (NCHRP or pooled fund studies) conducted through ISO 17025 accredited crash test facilities showing a device meets AASHTO MASH 2016;
- Review by an ISO 17025 accredited crash test facility (both MwRSF and TTI are ISO 17025 accredited crash test facilities);
- Critical Test Matrix by an ISO 17025 accredited crash test facility and at least one physical crash test (includes final report);
- Crash test results, videos, and test summary sheets that are completed and reported by accredited laboratories according to AASHTO MASH 2016; and/or
- Safety Hardware used by other states. This involves gathering documentation from other states for the systems.

The Methods Section in the Design Bureau will evaluate roadside safety hardware for use on the Interstate and Primary systems.

Non-Proprietary Roadside Safety Hardware

These typically are products developed through the efforts of a pooled fund and are not patented.

New Products

1. The Methods Section reviews the following:
 - Research and development (if system is developed at MwRSF or TTI), or product information and specifications, and installation manual if the system is developed at another facility.
 - Crash test videos and reports. Crash tests must be performed by an ISO 17025 accredited crash test facility. All applicable crash tests for the product as defined in MASH 2016 must be performed.
 - In-service performance evaluations (if available). If data is not available at the time of review, the product may be reviewed again when data is available. Crash tests will not need to be rerun for the product to be reevaluated.
2. The Methods Section reviews the product information and specifications for appropriate use of the product, and for potential compatibility conflicts with existing systems. The installation

manual is reviewed for potential installation difficulties, such as special equipment or tools required that maintenance crews may not have readily available. Crash test videos are reviewed for behaviors not mentioned in crash test reports, such as barrier rail buckling and potentially intruding into the passenger compartment. A life cycle cost analysis may also be considered. The Methods Section then decides if the product is approved for use in Iowa and documents the decision.

3. If the product is approved, it is listed in the Material Approved Products List ([MAPLE](#)). Installation manuals and crash test documentation will be available in MAPLE.

Changes or Modifications to Products

1. The Methods Section reviews the following:
 - Reason for, and explanation of, the change or modification.
 - Research and development (if system is developed at MwRSF or TTI), or product information and specifications, and installation manual if the product is developed at another facility.
 - Crash test videos and reports. Crash tests must be performed by an ISO 17025 accredited crash test facility. All applicable crash tests for the product as defined in MASH 2016 must be performed.
 - In-service performance evaluations (if available). If data is not available at the time of review, the product may be reviewed again when data is available. Crash tests will not need to be rerun for the product to be reevaluated.
2. The Methods Section reviews the product information to determine how the change or modification affects appropriate use of the product, and compatibility with existing systems. The installation manual is reviewed for potential installation difficulties as a result of the modification, such as special equipment or tools required that maintenance crews may not have readily available. Crash test videos are reviewed for behaviors not mentioned in crash test reports, such as barrier rail buckling and potentially intruding into the passenger compartment. If a life cycle cost analysis was performed for the product when new, it may be redone. The Methods Section then decides if the product is approved for use in Iowa and documents the decision.
3. If the product is not approved, it will be removed from the Material Approved Products List ([MAPLE](#)). If the product is approved, it remains in the Material Approved Products List ([MAPLE](#)). If the installation manual is revised, it will be made available in MAPLE. Crash test documentation will also be available in MAPLE.

Proprietary Roadside Safety Hardware

These are patented products.

New Products

1. A manufacturer submits the following to the Department:
 - Product information and specifications, and installation manual.
 - Crash test videos and reports. Crash tests must be performed by an ISO 17025 accredited crash test facility. All applicable crash tests for the product as defined in MASH 2016 must be performed.
 - In-service performance evaluations (if available). If data is not available at the time of review, the product may be reviewed again when data is available. Crash tests will not need to be rerun for the product to be reevaluated.
2. The information is sent to Methods Section for further review.
3. The Methods Section reviews the product information and specifications for appropriate use of the product, and for potential compatibility conflicts with existing systems. The installation manual is reviewed for potential installation difficulties, such as special equipment or tools required that maintenance crews may not have readily available. Crash test videos are reviewed for behaviors not mentioned in crash test reports, such as barrier rail buckling and potentially intruding into the passenger compartment. A life cycle cost analysis may also be

considered. The Methods Section then decides if the product is approved for use in Iowa and documents the decision.

4. After review, the Methods Section issues a letter to the manufacturer stating whether the product is approved for use in Iowa. If the product is not approved, the letter will explain why. If the product is approved, it is listed in the Material Approved Products List ([MAPLE](#)). The approval letter will contain a note informing the manufacturer of the need to notify the Department of any changes or modifications to the system. Installation manuals and crash test documentation will be available in MAPLE.

Changes or Modifications to Products

1. A manufacturer notifies the Department of a change or modification and submits the following to the Methods Section :
 - Reason for, and explanation of, the change or modification.
 - Revised product information and specifications, and installation manual.
 - Crash test videos and reports. Crash tests must be performed by an ISO 17025 accredited crash test facility. All applicable crash tests for the product as defined in MASH 2016 must be performed.
 - In-service performance evaluations (if available). If data is not available at the time of review, the product may be reviewed again when data is available. Crash tests will not need to be rerun for the product to be reevaluated.
2. The Methods Section reviews product information to determine how the change or modification affects appropriate use of the product, and compatibility with existing systems. The installation manual is reviewed for potential installation difficulties as a result of the modification, such as special equipment or tools required that maintenance crews may not have readily available. Crash test videos are reviewed for behaviors not mentioned in crash test reports, such as barrier rail buckling and potentially intruding into the passenger compartment. If a life cycle cost analysis was performed for the product when new, it may be redone. The Methods Section then decides if the product is approved for use in Iowa and documents the decision.
3. After review, the Methods Section issues a letter to the manufacturer stating whether the product remains approved for use in Iowa. If the product is not approved, the letter will explain why, and the product will be removed from Material Approved Products List ([MAPLE](#)). If the product remains approved, it remains in the Material Approved Products List ([MAPLE](#)). If the installation manual is revised, it will be made available in MAPLE. Crash test documentation will also be available in MAPLE.

Chronology of Changes to Design Manual Section:

008A-005 Roadside Safety Hardware Assessment

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