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## **SPECIAL ATTENTION**

### **ROADSIDE SAFETY HARDWARE WORTHINESS COMPLIANCE WITH NCHRP REPORT 350 AND MASH**

The American Association of State Highway and Transportation Officials (AASHTO) has most recently published the Manual for Assessing Safety Hardware (MASH), 2016 edition. The main objective of MASH is to present uniform guidelines for the crash testing of both permanent and temporary highway safety hardware and evaluation criteria to assess test results. The need for updated crash criteria was based primarily on the changes to the vehicle fleet since the publication of National Cooperative Highway Research Program (NCHRP) Report 350. Highway safety hardware includes, but is not limited to, longitudinal barriers, crash cushions, attenuators, end terminals, breakaway supports, and work zone hardware/devices.

**IMPORTANT:** AASHTO & FHWA formed a joint Implementation Agreement (dated January 7, 2016) for MASH to set dates for states to come into compliance with MASH standards for various categories of roadside safety hardware. This agreement states full compliance to MASH for all permanent hardware by January 1, 2020.

Temporary work zone devices manufactured after December 31, 2019 must be MASH 2016 compliant. However, NCHRP-350 and MASH 2009 compliant devices manufactured prior to January 1, 2020 can be used throughout their normal service life. Service life for portable concrete barrier has been defined in the *Notice to Contractors*. Service life for temporary impact attenuation devices has been defined in their item specifications. All other devices meeting NCHRP-350 or MASH 2009 compliance, and manufactured prior to January 1, 2020, such as temporary barricades, can be used until December 31, 2025.

### **WORK ZONE TRAFFIC CONTROL DEVICES:**

The following is a summary of work zone traffic control devices categories, and their crash testing acceptance requirements, titled "Recommended Procedures for the Safety Performance Evaluation of Highway Features," testing and evaluation criteria as implemented by the AASHTO-FHWA Agreement (350 Agreement) dated July 1, 1998. These categories and associated requirements also apply to newly designed or revised devices that would now fall under MASH testing criteria.

**Category I:** Small, lightweight devices that are known to be crash-worthy from crash testing or years of demonstrable safe operational performance. These include plastic or rubber cones, tubular markers, flexible delineators, and plastic drums with no lights, batteries, signs, etc. added. For devices to be included in this category, there must be virtually no potential that they will penetrate windshields, cause tire damage, or have a significant effect on the control or trajectory of an impacting vehicle. These devices will be allowed based upon developer's self-certification, as long as there are no attachments to the device.

**Category II:** Devices that are not expected to produce significant vehicular velocity change, but may be otherwise hazardous. All or parts of the devices may be substantial enough to penetrate a windshield or injure a worker or they may cause instability when driven over or become lodged under a vehicle. The total mass of a Category II device must be less than 45 kg. Examples of this category are barricades, portable sign supports, intrusion detectors and alarms and drums, vertical panels, or cones with lights.

**Category III:** Devices expected to cause significant velocity change or other potentially harmful reactions in impacting vehicles and Category II devices with a mass greater than 45 kg. Examples of this category are Truck-mounted attenuators (TMA), portable crash cushions, and portable concrete barrier (requires appropriate sized pin and loop or better connection).

**Category IV:** Examples of this category are portable, usually trailer mounted devices such as area light supports, flashing arrow panels/arrows displays, temporary traffic signals, and changeable message signs. However, these types of devices combined with TMA are considered Category III devices.

All categories of project work zone traffic control devices in use shall conform to the testing and evaluation criteria as outlined above. Devices not conforming to the criteria shall be replaced with conforming devices at no expense to the Department.