

## SCDOT MASH-2016 Transition Plan

January 2020

### 1.0 Introduction

The development of this implementation plan is in response to the AASHTO/FHWA Joint Implementation Agreement for the 2016 Manual for Assessing Safety Hardware (MASH). Additional information regarding the agreement and background on the need for a transition to MASH compliant roadside hardware is available at the following link:

[http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road hardware/docs/memo\\_joint\\_implementation\\_agmt.pdf](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road硬件/docs/memo_joint_implementation_agmt.pdf).

This Transition Plan sets forth the steps necessary for the South Carolina Department of Transportation (SCDOT) to implement the requirements of the Joint Implementation Agreement. SCDOT will utilize our in-house resources in conjunction with our membership in the Midwest States Pooled Fund Program to develop standard drawings, specifications, qualified product lists, design criteria, and other guidance to support the implementation.

This Transition Plan places emphasis on achieving MASH-2016 compliance with new permanent installations and full replacements. SCDOT will continue to utilize safety hardware that was tested prior to MASH-2016 as discussed in this transition plan and within the references identified in Section 2.0.

### 2.0 References

- Engineering Directive Number 42
- Maintenance Directives Related to Permanent Traffic Barriers
- SCDOT Guardrail, Cable Barrier, and Crash Attenuator Inspection and Repair Guidelines, Latest Edition
- SCDOT Standard Drawings, Latest Edition
- SCDOT Standard Specifications, Latest Edition
- SCDOT Qualified Products List 49 (QPL49) Permanent Traffic Barriers, Latest Edition
- SCDOT Approved Products List (APL) for Traffic Control Devices in Work Zones, Latest Edition
- SCDOT Preconstruction Design Memorandums 2 and 14
- FHWA/SCDOT Memorandum of Agreement for Federal-Aid Preventive Maintenance Projects

### 3.0 Definitions

**MASH** –Devices that have passed MASH testing.

**PREMASH** –Generic term referring to all devices that have not successfully passed MASH testing. SCDOT will continue to utilize these devices as specified within the references in Section 2.0.

**Safety Hardware Component [Component]** – Generic terminology used to describe the individual parts that make up a safety hardware device. For example, rails, posts, offset blocks, bolts, cable, impact heads, and cartridges.

**Safety Hardware Device [Device]** - Generic terminology used to describe the individual installed sections (leading end treatment, longitudinal barrier, trailing end treatment) that make up a **safety hardware system**.

**Safety Hardware System [System]** – A combination of multiple safety hardware devices and related elements that are designed to function together in order to accomplish a desired level of protection. This is commonly referred to as a “run”, i.e., a run of guardrail.

See SCDOT Standard Drawings for additional definitions.

#### **4.0 Implementation Guidance for Semi-Rigid Barrier**

The following information provides guidance for where MASH and PREMASH Semi-Rigid Guardrail can be used for new installations and maintenance.

SCDOT will identify devices acceptable for new installations and maintenance as either MASH or PREMASH on QPL49 and APL for Traffic Control Devices in Work Zones. Additional guidance on the use of permanent MASH and PREMASH semi-rigid barriers can be found in Preconstruction Design Memorandum 14.

**DO NOT MIX** MASH devices with PREMASH devices within the same system.

#### **4.1 MASH Installations & MASH Guardrail Maintenance for Semi-Rigid Barrier**

Install MASH devices to form new complete MASH systems:

- In new installation Guardrail Alignments when all devices in the system are MASH compliant
- In installations previously considered “relocations” when the entire system is moved or reconstructed
- In full system repair/replacement (when site conditions accommodate MASH devices)
- In repairs to damage within existing MASH systems

SCDOT will identify additional MASH devices in the Standard Drawings as they become available.

Utilize a PREMASH system for new installations that are unable to accommodate MASH compliant systems. **DO NOT MIX** MASH devices with PREMASH devices within the same system.

#### **4.2 PREMASH Installations & PREMASH Guardrail Maintenance for Semi-Rigid Barrier**

Install PREMASH devices when attaching to existing PREMASH installations:

- As repairs to damaged or missing devices
- As extensions to length of need of existing installations
- As approaches to retained bridge railings that do not accommodate MASH devices
- As new installations when one or more devices within the system are not available as MASH compliant devices.

The vast majority of PREMASH installations will be for maintenance of existing guardrail infrastructure; however, some new installations may still occur until a full complement of MASH compliant devices are qualified. SCDOT will identify additional MASH devices in the Standard Drawings as they become available.

For any new installations that require a device or connection that is not MASH compliant, use PREMASH devices for the installation. As MASH devices become more readily available, new installations of PREMASH systems will decrease.

Prior to July 2018 letting, all existing SCDOT guardrail installations are PREMASH. Maintenance of these systems will continue to conform to PREMASH devices to prevent mixing of devices from different compliance requirements.

#### **5.0 Implementation Guidance for Crash Cushions**

SCDOT will identify qualified crash cushion devices for new permanent installation and maintenance as either MASH or PREMASH on SCDOT QPL49. Additional guidance for application of new and maintained permanent crash cushions can be found in Preconstruction Design Memorandum 2 as well as page 1 of QPL49.

SCDOT will identify approved work zone devices on SCDOT APL for Traffic Control Devices in Work Zones.

#### **6.0 Implementation Guidance for Rigid Barrier**

SCDOT Standard Drawings for rigid barrier are MASH compliant. All new permanent installations will be MASH compliant. Repairs will be in accordance to the current system that was damaged.

#### **7.0 Implementation Guidance for Flexible Barrier**

SCDOT currently utilizes generic, low tension cable barrier. SCDOT is working with the Midwest States Pooled Fund to evaluate flexible barrier options. SCDOT will re-evaluate MASH implementation when a generic, low tension MASH compliant flexible barrier becomes available.

#### **8.0 Implementation Guidance for Bridge Rails**

SCDOT will utilize SCDOT bridge standards in effect at the time of the Preliminary Bridge Plan approval. MASH bridge railing drawings and design memo are available as of January 1, 2020. These drawings were reviewed for MASH Equivalency by the Midwest Roadside Safety Facility.

#### **9.0 Implementation Guidance for Other Safety Hardware Devices**

Utilize SCDOT standards to implement hardware when generic items have achieved compliance with MASH.

#### **10.0 Implementation Guidance for Temporary Work Zone Devices**

For **Temporary Work Zone Devices**, all hardware manufactured on or after January 1, 2020, must have achieved compliance with MASH. Hardware that does not comply with MASH but that is included on the APL and manufactured before this date may be used for its normal service life, provided it meets the requirements of SCDOT Standard Specifications. If MASH compliant options are not available for certain categories, then PREMASH options may be used.