Roadside Safety Pooled Fund

Research Problem Statement

2019-18-LSRB

Project Title:	MASH TL-2 Evaluation and MASH determination of 8-inch vertical curb with MGS traffic barrier
Project Synopsis:	. Evaluate and potentially crash test a 8-inch tall vertical curb with MGS traffic barrier in accordance with MASH Test Level 2 (TL-2). Perform the necessary steps to certify MASH compliance at TL-2.
Project Goal(s):	A 8-inch vertical curb flush with MGS traffic barrier that is MASH TL-2 compliant.
Project Background:	MDOT has been using curb combination and traffic barrier (attached standard *17_12_21_MD-605.31*) for many years with the face of barrier rail flush with the face of the curb. For design speed equal and less than 45 mph, Type A curb (8-inch) is used (attached standard *MD-602.02*). MDOT also uses traffic barrier with curb and sidewalk, which is basically having the barrier offset from the curb. Due to lack of crash testing for 8-inch curb with barrier aligned up with face of curb, MDOT has difficulty to meet the criteria of MASH 2016. PennDOT also uses 8-inch curb for roadways typically (see attached *PennDOT typical curb detail*). A 4-inch curb is used with traffic barrier (see attached *PennDOT Guide rail with curb detail*). However, 4-inch curb often cannot be used on projects, and then 8-inch curb is allowed with stiffened traffic barrier. For example, 4-inch curb is problematic for drainage, so 8-inch curb is used with drainage inlet (see attached *PennDOT inlet profile detail*).
Proposed Work Plan:	• Build a confidence level (validation) of the simulation model of the of guardrail with a curb by simulating MASH tested designs such the ones conducted at the MwRSF • Evaluate MGS traffic barrier installed along a 8-inch curb using LS-DYNA simulation. The face of the barrier rail should flush with the face of the curb for MASH TL-2. • Evaluate if the barrier be pushed back, how much offset from the face of curb is acceptable. • Identify the most critical successful configuration based on the simulation • Evaluate and perform MASH compliance via crash testing. • Provide final report, including engineering opinion for MASH compliance for crash testing. • Provide engineering opinion on any acceptable variations such as variations of shape of curb, (acceptable offset from curb, etc?). All states may not have the exact same shape of vertical curb, so engineering opinion needs to consider potential MASH compliant variations.

Deliverables:	A report providing details of traffic barrier face flushed with face of 8-inch curb, and variation of barrier offset from curb documentation of the evaluation and crash tests performed, the results of each crash test, and the assessment of the performance according to MASH Test Level 2 (or TL-2) specifications. Engineering opinion for MASH compliance for similar, less critical, designs which were not crash tested.
Urgency and Expected Benefit:	MDOT and PennDOT use 8-inch curb with traffic barrier for low design speed (≤ 45 mph). Testing MGS traffic barrier with 8-inch vertical curb will help MDOT and PennDOT comply with MASH 2016 criteria.
Problem Funding and Research Period:	*Please describe what are the estimated costs and time to complete the project* **-Estimated cost is $142,797** **-Duration is 14 months**
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