Roadside Safety Pooled Fund

Research Problem Statement

2024-01-LCB

Project Title:	MASH TL-3 compliance of tall precast F-shape concrete median barrier -pinned to asphalt.
Project Synopsis:	Evaluate MASH TL-3 compliance of tall F-shape precast concrete median barrier. To use in temporary work zone conditions with little to no deflection, it should be evaluated pinned (vertically) to asphalt (with no barrier embedment). This could also be used as permanent conditions, if embedment is not desirable. Both 42” and 50” tall barriers should be evaluated. Crash test would probably only be required for one height and the other height could likely get a Professional Engineering Opinion for MASH compliance. Using PennDOT’s pin and loop connection would allow similar production for precast industry.
Project Goal(s):	Determine MASH TL-3 compliance of tall precast F-shape concrete median barrier pinned to asphalt.
Project Background:	MASH compliant precast concrete median barriers used in work zones are mostly 32” high and very few are 42”. For permanent installations, PennDOT has a MASH compliant 50” tall F-shape median barrier that is embedded 4” in the pavement. The PennDOT’s precast MASH barriers are connected with a pin and loop.
Proposed Work Plan:	1.) Task 1 – Engineering & Simulation Develop barrier design concept, perform finite element simulation analysis for both 42-inc and 52-inch barrier design. Perform impact simulations with MASH 3-10 and 3-11 test conditions. Determine critical design for crash testing. Also determine critical impact point for crash testing. Develop reinforcement design for both barrier heights. Task 2 – Construction & Crash Testing (MASH 3-10 & 3-11) 2.) Task 3 - Reporting
Deliverables:	A report describing the results of the study and the MASH TL-3 compliance determination.
Urgency and Expected Benefit:	Work zones on freeways frequently involve high traffic volumes with high number of trucks and SUV’s. The work zone median is often only the width of the barrier with opposing traffic on each side. Headlights from these vehicles can be blinding and cause safety concerns. Currently there are no 50” tall MASH temporary concrete median barriers. When the current NCHRP 350 temporary tall (52” w/o embedment) median barrier sunsets in 2026 in PA, there will not be any available. This barrier could also be used in permanent conditions, if embedment is not desirable.
Problem Funding and Research Period:	**Total Estimated Cost = $325,966**
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