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| **Roadside Safety Pooled Fund Program** **Research Problem Statement** | State:  Texas A&M Transportation Institute (TTI-76) |
| Title:  MASH TL3 T-Intersection (Short Radius) System Design Variations | |
| Problem Statement:  When a road intersects a highway with restrictive features, such as bridge rail or culvert, it is difficult to fit the proper guardrail length along the primary roadway. Site constraints, such as private driveways and county roads may intersect the primary road and not allow the placement of a properly designed guardrail. In these cases, the alternatives are to shorten the guardrail length, provide a curved guardrail design, or relocate the site constraint.  Although numerous tests have been conducted for different short radius guardrail designs, none of them passed National Cooperative Highway Research Program (NCHRP) Report 350 TL-3 requirements nor the updated to the Manual for Assessing Safety Hardware (MASH) standards.  Recently, TTI researcher modeled and simulated an optimized short radius design for TxDOT. Subsequently, TTI crash tested this system successfully to MASH 3-33, 3-32 and 3-31 test conditions. These tests condition include some of the most elusive to pass TL3 neither under NCHRP 350 nor MASH. This innovative design utilizes an energy dispassion component plus a cable anchor that provide tension capacity to the main driveway rail section from an anchor BCT post on the secondary road portion of the system. This new ideas made the system very effective in capturing the vehicles while in short distance while using less components than what had been previously tested. | |
| Objectives of the Study:  Extend this TxDOT innovative design to incorporate conditions commonly found in the pooled fund state site. Some of these conditions would be modification of private driveway section to incorporate a secondary roadway section with terminal. Another example will be the modification of the design to implement skewed intersection profiles. Others will be studied once the project scope is initiated with the pool fund states DOT’s. | |
| Expected Benefits:  Current short radius designs are not TL3 crashworthy and it is not known how they will perform once crash tested.  TL-3 crashworthy Short Radius design has been elusive for many years. There has been neither NCHRP 350 nor MASH complaint Short Radius designs. This new design has very low footprint and was successful in capturing both test vehicles at the nose. Also, the placement of inertial dissipation next to the rail allows for earlier grade change for the ground behind the short radius as may be a much needed feature in many site conditions. | |
| Description of the Proposed Feature to be Tested: *(Be as detailed as possible. Include drawings and/or plans, if available.)*  This phase will consists of extensive simulations of several design condition s   * TTI researchers will review with Pooled Fund states DOT most common site conditions as update them as listed from previous study. * The current model will be caliberated with the existing tests if needed * TTI researchers will use the current finite element model to evaluate the selection design modifications. * Once these modification simulations are conducted, a priority list of designs that may be need further testing and ones that may be approved based on simulations | |
| Estimated Cost *(of the feature per linear foot installed):* | Total Estimated Cost of Crash Test:  $ 90,000 |
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