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| **Roadside Safety Pooled Fund Program** **Research Problem Statement** | State:  WA-83 |
| Title:  Barrier gap limit for unrestrained concrete barriers connected using thire-beam guardrail cover | |
| Problem Statement:  In some field applications, two unrestrained concrete barriers are placed adjacent to each other with some gap in between (see typical layout attached). A thrie beam cover is used on the field and traffic sides of the barrier to connect the two unrestrained barrier systems. It is currently not known how this connection will perform under MASH test level 3 (TL3) testing criteria, and what length of gap can be allowed for acceptable performance. Evaluation of this connection type is needed using parametric simulation analysis followed by full-scale crash testing to determine the acceptable barrier gap.  WSDOT typically uses this connection with its NJ profile barrier with a pin-and-loop connection. This barrier profile can be considered as the most critical case compared to the F-shape or single-slope barrier profiles. Gap limits and connection details determined for the WSDOT’s NJ profile barrier are thus expected to be applicable for other states designs of unrestrained concrete barriers. | |
| Objectives of the Study:  Determine maximum allowed gap between two unrestrained, NJ profile, pin-and-loop concrete barriers that are connected using thrie beam covers. The design should meet MASH test level 3 testing criteria. | |
| Expected Benefits:  Successful design will allow connecting free-standing concrete barriers that have a gap in between. This task will determine the maximum allowable gap that can be used while meeting MASH performance criteria. | |
| Description of the Proposed Feature to be Tested: *(Be as detailed as possible. Include drawings and/or plans, if available.)*  A concept of the connection as currently used is attached.   * It is expected that two crash tests will be needed for successful evaluation of the connection as per MASH. One crash test will be needed to evaluate performance with a small passenger car (MASH Test 3-10). Another test will be needed to evaluate performance using a pickup truck (MASH Test 3-11). * Finite element analyses will be needed to evaluate the design and determine the maximum allowable gap. FE analyses will also be needed to determine the critical impact points for both small car and pickup tests * WSDOT will provide free-standing NJ barrier segments for testing. TTI should budget for shipping cost. | |
| Estimated Cost *(of the feature per linear foot installed):* | Total Estimated Cost of Crash Test:  Total = 113,000  FEA = 30,000  Small car & pickup tests = 80,000  Barrier Shipping = 3,000 |
| Contact Person: | Telephone: |



