TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Nebraska Department of Roads

INSTRUCTIONS:
Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # *(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)*	**Transportation Pooled Fund Program - Report Period:**
TPF-5(193) Supplement #107	☐ Quarter 1 (January 1 – March 31) ☑ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ Quarter 4 (October 4 – December 31)

Project Title:		
Top Mounted Socket for Weak Post Bridge Rail		
Name of Project Manager(s):	**Phone Number:**	**E-Mail**
Reid, Faller, Bielenberg, Lechtenberg, Rosenb	402-472-9324	srosenbaugh2@unl.edu
Lead Agency Project ID:	**Other Project ID (i.e., contract #):**	**Project Start Date:**
2611211132001	RPFP-17-AGT-3	10/1/2016
Original Project End Date:	**Current Project End Date:**	**Number of Extensions:**
9/30/2019	9/30/2019	0

Project schedule status:

☐ On schedule ☐ On revised schedule ☑ Ahead of schedule ☐ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
$128,145	$11,172	20%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
	$11,087	

Project Description:

Although most approach guardrail transitions (AGTs) look similar, each AGT has a unique combination of features including rail thickness, post size and spacing, use of a hydraulic curb, and downstream parapet or bridge rail in which it attaches to. However, due to the sensitivity of transition regions, these variables are not interchangeable between AGTs. Thus, each AGT is specific to its own features as well as the bridge railing or parapet to which it is anchored.

Crash testing has illustrated the sensitive nature of these AGT designs with recent failures occurring due to an alteration of an AGT feature (e.g., addition/removal of a curb or changes to the rigid parapet geometry and attachment hardware). The majority of these failures have been the result of excessive vehicle contact on the lower, upstream corner of the rigid parapet. This result indicates that the parapet toe and end geometry may be even more critical than previously believed. Thus, there exists a need to develop a standard concrete parapet end geometry for use with all thrie beam AGTs.

The objective of this research effort is to develop a standardized concrete parapet end section for attachment of various thrie beam AGTs. A prior project (Pooled Fund YR 25 - TPF-5(193): Development of a Standardized Concrete Parapet for AGTs) ultimately resulted in an unsuccessful full-scale crash test. This project is a continuation of that effort and will utilize the knowledge obtained from the previous crash test.

Objectives / Tasks:

1. Redesign of Standardized Parapet
2. CAD Details
3. Construction of Test Article
4. Full-Scale Crash Testing - MASH 3-21
5. Data Analysis

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

System drawings for the redesigned buttress were completed. Additionally, the test article was constructed at the MwRSF proving ground and ready for full-scale crash testing.

Anticipated work next quarter:

The full-scale crash test will be performed according to MASH 3-21 evaluation criteria.
Work will continue on the summary report. A Journal paper will also be written and submitted for consideration at the 2018 Annual Meeting of the Transportation Research Board.

Significant Results:

Following the unsuccessful full-scale crash test, work this quarter consisted of redesigning the geometry of the standardized buttress to improve the safety performance of the system. The size of the lower taper was increase from a 4"12" taper to a 4.5"x18" taper. Also, the height of this lower taper was increased from 11" to 14". these changes were done to reduce wheel snag and loads into the axle of the vehicle. The upper taper was changed from 4"x4" to a 3"x4". this reduction in slope was intended to reduce snag on the vehicle bumper and quarter-panel.

Objectives / Tasks:	% Complete
1. Redesign of Standardized Parapet	100%
2. CAD Details	90%
3. Construction of Test Article	100%
4. Full-Scale Crash Testing - MASH 3-21	0%
5. Data Analysis	0%
6. System Removal	0%
7. Summary Report	0%
8. TF13 Hardware Guide Drawings	0%
9. FHWA Eligibility Letter	NA

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

All costs are currently being charged to the original project (Pooled Fund YR 25 - TPF-5(193): Development of a Standardized Concrete Parapet for AGTs). Once the YR 25 project funds have been exhausted, charges will be made to this YR 27 continuation project.

In a May 2017 memo, the FHWA declared that eligibility letters will now only be granted to systems that have completed the entire suite of tests within the MASH testing matrix. Since the small car test (MASH 3-20) was previously deemed non-critical by MwRSF and the Pooled Fund States, it will not be conducted as part of this project. Thus, the transition buttress will not meet FHWA's new criteria to qualify for a letter, and an application for a letter will not be submitted.

Potential Implementation:

A single design for the concrete parapet end section at the downstream end of AGTs will simplify state design standards. No longer will transitions be associated with only a single concrete parapet shape. All thrie beam transitions will be able to connect to the new parapet. The designer then only needs to transition the parapet to the proper shape and height of the bridge rail.