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 #105	☐ 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:		
MGS with Curb and an Omitted Post		
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:**
2611211134001	RPFP-17-MGS-1	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
$164,855	$43,956	70%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
	$31,148	

Project Description:

Curbs located along roadways can adversely affect the interaction of errant vehicles with roadside barriers. Although the two are commonly used in combination, when curbs are placed near guardrail systems, the propensity for vehicle underride, override, and instability increases. The MGS with a curb offset 6 in. from the front face of the guardrail was successfully crash tested to NCHRP Report No. 350 TL-3 requirements. However, the MGS with curb has not yet been evaluated to MASH TL-3.

In addition, roadside obstructions may frequently occur that prevent proper post placement within a run of guardrail. To avoid small obstructions, a single post may be left out of system creating a single enlarged span length of 12.5 feet. The MGS with an omitted post was crash tested to MASH test no. 3-11 and adequately redirected the 2270P pickup truck. However, the introduction of a curb below to the elongated span of an omitted post length may lead to vehicle capture and/or stability issues. omitted posts has never been crash tested to the safety performance criteria of MASH.

Thus, the objective of this research is to evaluate the performance of the MGS with a single omitted post installed with the face of the rail offset 6-in. from the face of the 6-in. tall AASHTO Type B curb. The evaluation of the barrier system behind curb will be undertaken according to the MASH TL-3 safety criteria through two full-scale crash tests with both the 1100C and 2270P vehicles.

Objectives / Tasks:

1. Determination of CIPs
2. CAD Details
3. Construction of test article
4. Full-Scale Testing - MASH 3-10
5. Full-Scale Testing - MASH 3-11
6. Data Analysis
7. System Removal

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

Full-scale crash test, test no. MGSCO-1, was conducted on the MGS with an omitted post placed 6" behind a 6" curb. The test was conducted in accordance with MASH test 3-10 with the 1100C small car. During impact, the W-beam rail was torn at the splice located within the elongated span length created by the omitted post. As a result, the vehicle was not captured, but instead penetrated through the barrier system.

Anticipated work next quarter:

Full-scale testing will commence on the system. The MASH 3-10 test will be conducted first, and if successful, a second test will be conducted on the system according to MASH 3-11.

Significant Results:

BARRIER VII analyses were utilized to determine the CIPs for MASH TL-3 impacts on the MGS placed 6" behind a 6" curb and with an omitted post. The CIP for the 1100C was determined to be 122" upstream of the first post downstream of the elongated span, while the CIP for the 2270P was determined to be 131" upstream of the first post downstream of the elongated span.

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Objectives / Tasks:	% Complete
1. Determination of CIPs	100%
2. CAD Details	100%
3. Construction of test article	100%
4. Full-Scale Testing - MASH 3-10	100%
5. Full-Scale Testing - MASH 3-11	NA
6. Data Analysis	90%
7. System Removal	50%
8. Summary Report	0%
9. TF13 Hardware Guide Drawings	NA
10. 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).

Due to the failure of test MGSCO-1, the second budgeted crash test (MASH 3-11 with the 2270P) will not be conducted as part of this project. Also, hardware guide drawings and an FHWA eligibility letter will not be completed as part of this project. As a result, a significant portion of the project funds will remain upon the completion of this project. These funds will need to be reallocated according to the desires of the Pooled Fund Sponsors.

Potential Implementation:

First, the successful testing and evaluation of the MGS guardrail with an omitted post utilized with a 6-in. tall Type B curb would provide the state DOTs with a MASH-tested option for guardrail treatment of curbed roadsides (no need to include omitted post if not necessary). Second, successful evaluation of the MGS guardrail with curb and omitted post will allow state DOTs to eliminate one post to avoid an obstruction in a guardrail run installed adjacent to curbs and ensures that its safety performance remains adequate with respect to the current vehicle fleet.