TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): New Jersey Department of Transportation

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) Suppl. #88	☑ 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:		
Evaluation of New Jersey TCB Performance under MASH TL-3		
Name of Project Manager(s):	**Phone Number:**	**E-Mail**
Faller, Lechtenberg, Bielenberg, Rosenbaugh,	402-472-9070	kpolivka2@unl.edu
Lead Agency Project ID:	**Other Project ID (i.e., contract #):**	**Project Start Date:**
2611130095001		4/1/2015
Original Project End Date:	**Current Project End Date:**	**Number of Extensions:**
6/30/2016	9/30/2017	1

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
$702,369	$294,009	40%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
	$54,562	

Project Description:

The New Jersey Department of Transportation (NJDOT) currently uses a New Jersey shape temporary concrete barrier (TCB) design with a I-beam connection piece in their work zones and construction areas. The New Jersey Roadway Design Manual provides guidance on allowable barrier deflections for various classes of TCB joint treatments. The guidance provided in the Roadway Design Manual was based on test data from previous testing standard and needs to be updated to be consistent with current testing standards and the vehicle fleet. MASH TL-3 testing of other TCB systems has indicated that dynamic barrier deflections of these types of barriers can increase significantly when compared to deflections based on older crash test data. Thus, a need exists to investigate the performance of the NJDOT TCB design in its various configurations and provide guidance for updating current design guidance for these systems.

The objective of this research effort is to investigate the performance of the NJDOT TCB design in various configurations in order to evaluate the barrier to the MASH TL-3 safety requirements and to develop information on the barrier performance that can be used by the NJDOT to developed updated and improved guidance for the use of the TCB system.

Objectives / Tasks
1. Test no. 1 - Full-scale crash testing (MASH 3-11)
2. Test no. 2 - Full-scale crash testing (MASH 3-11)
3. Test no. 3 - Full-scale crash testing (MASH 3-11)
4. Test no. 4 - Full-scale crash testing (MASH 3-11)
5. Test no. 5 - Full-scale crash testing (MASH 3-11)
6. Test no. 6 - Full-scale crash testing (MASH 3-11)
7. Test no. 7 - Full-scale crash testing (MASH 3-11)
8. Test no. 8 - Full-scale crash testing (MASH 3-11)

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

Internal review of draft report for test no. NJPCB-1 continued.

Draft reports for test nos. NJPCB-2 and NJPCB-3 continued to be written.

Construction of the box-beam stiffened NJDOT PCB system in a free-standing configuration with grouted barrier toes, corresponding to Joint Class B in the NJDOT Roadway Design Manual. this system corresponds to the system specified as test no. 5 in the proposal.

On January 31, the NJDOT PCB in a box-beam stiffened configuration with grouted barrier toes was subjected to AASHTO MASH TL-3 test conditions using a 2270P pickup truck vehicle (test designation 3-11). This system had a 12-ft long, 6-in. x 6-in. x 3/16-in. box beam placed across each joint on the back side of the barriers. The system also had 1-in. diameter steel pins placed in every pin-anchor location in the two end barrier segments. This system configuration corresponds to Joint Class B in the NJDOT Roadway Design Manual. In test no. NJPCB-5, the pickup truck impacted the system at a speed and angle of 62.2 mph and 24.7 degrees, respectively, resulting in an impact severity of 113.4 kip-ft. The system adequately contained and safely redirected the pickup truck. The occupant impact velocities and occupant ridedown accelerations were within the suggested limits provided in MASH. The maximum lateral deflection of the system and working width of the system were approximately 33 in. (which included tipping of the top of the barrier and concrete fracture) and 57 in., respectively. The occupant crush measurements found a maximum of approximately 2 in. of deformation in any of the required locations which does not exceed the limits provided in MASH. Therefore, the test was acceptable according to the safety performance criteria of AASHTO MASH for test designation no. 3-11.

Anticipated work next quarter:

Continuation of internal review of draft report for test no. NJPCB-1.

Continuation of writing draft reports for test nos. NJPCB-2 and NJPCB-3. Potential for internal draft report review to be initiated.

Potentially initiate draft reports for test nos. NJPCB-4 and NJPCB-5.

Procurement of materials for test nos. 6 and 7. Potential for setup system and conduct crash test no. 6. If crash test no. 6 is conducted, documentation of crash test no. 6.

Initiate preparation of CAD details for test nos. 8 and 9.

Initiate LS-DYNA validations with test no. 1.

Significant Results:

None

Objectives / Tasks	% Complete
1. Test no. 1 - Full-scale crash testing (MASH 3-11) - NJPCB-3	100%
1a. Test no. 1 Report - NJPCB-3	70%
2. Test no. 2 - Full-scale crash testing (MASH 3-11) - NJPCB-4	100%
2a. Test no. 2 Report - NJPCB-4	0%
3. Test no. 3 - Full-scale crash testing (MASH 3-11) - NJPCB-1	100%
3a. Test no. 3 Report - NJPBC-1	85%
4. Test no. 4 - Full-scale crash testing (MASH 3-11) - NJPCB-2	100%
4a. Test no. 3 Report - NJPBC-2	70%
5. Test no. 5 - Full-scale crash testing (MASH 3-11) - NJPCB-5	100%
5a. Test no. 5 Report - NJPCB-5	0%
6. Test no. 6 - Full-scale crash testing (MASH 3-11)	10%
7. Test no. 7 - Full-scale crash testing (MASH 3-11)	10%
8. Test no. 8 - Full-scale crash testing (MASH 3-11)	
9. Test no. 9 - Full-scale crash testing (MASH 3-11)	
10. LS-DYNA simulation test no. 1	
11. LS-DYNA simulation test no. 5	
12. LS-DYNA simulation reduced system lengths	
13. Written report documenting design, testing, and conclusions	

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).

In August 2015, MwRSF received authorization to begin work on the project. However, the NJDOT provided $219,500 of project funding initially. In October 2015, NJDOT anticipates providing additional funds to reach $350,000 in total funding. In the fall of 2016, NJDOT anticipates providing the remainder of the funds to reach the $702,369 total project budget. Therefore, the project plan was adjusted to accommodate the staged funding and delayed authorization to proceed.

Note: additional funds to reach the initial $350,000 have not been received as of April 30, 2016. Therefore, the project only has enough funds to conduct 3 tests at this time.

A no-cost extension will be requested to continue the project since funding has been delayed.

The additional funds to reach the $702,369 total project budget was received in September 2016. Therefore, the project plan may be shifted 6 months to account for the delay in funding.

Potential Implementation:

Investigation and evaluation of the proposed NJDOT TCB configurations would provide for MASH TL-3 acceptance of the current NJDOT barrier standard. In addition, the testing and proposed simulation analysis would provide improved data for NJDOT design guidance and standards.