Research Project Quarterly Progress Report

Date: 1/31/2017 **Project Number:** TPF-5(193) Suppl#116

Project Title: Illinois DOT and Ohio DOT MASH TL-4 Steel Tube Bridge Rail and Guardrail Transition

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Project Start Date: 5/4/2017 **Project Completion Date:** 9/30/2019

Report Period: **Due Date:**

- ☐ Quarter 1 (July 1 – September 30) ---------- October 31
- ☒ Quarter 2 (October 1 – December 31)---------- January 31
- ☐ Quarter 3 (January 1 – March 31) ---------- April 30
- ☐ Quarter 4 (April 1 – June 30)---------- July 31

Project Schedule Status:

- ☒ **On Schedule**
- ☐ **On Approved Revised Schedule**
- ☐ **Ahead of Schedule**
- ☐ **Behind Schedule**

Progress:

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. Bridge Rail Planning, Literature Review, Design	$53,131.00	28%	$17,396.00	98%	$500.00
2. Bridge Rail Full-Scale Testing	$344,162.00	2%	$3,500.00	2%	$340,662.00
3. Bridge Rail Reporting	$30,000.00	5%	$2,000.00	5%	$28,000.00
4. Bridge Deck Component Testing	$187,956.00	20%	$43,763.00	25%	$139,259.00
5. Transition Planning	$13,859.00	0	$0.00	0	$13,859.00
6. Transition Analysis and Design	$67,261.00	0	$0.00	0	$67,261.00
7. Transition Full-Scale Testing	$200,482.00	0	$0.00	0	$200,482.00
8. Transition Reporting	$30,000.00	0	$0.00	0	$30,000.00
9.					

Progress and Accomplishments this Quarter:

(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)

A meeting was held with the sponsors on December 19 to discuss the progress on the project. Several internal meetings have been held between members of the research team, and several discussions were held via email with the sponsors.

The sponsors selected an 8-ft post spacing and selected a 6-in. offset from the face of the post to the edge, and 6-in. deep rail sections on the face of the post to maximize usable deck area. A dynamic modification factor of 1.5 was selected for the design of the rail. The face of the top rail will be set back from the face of the lower two rails by 1 in. The final recommended rail sections to be used are: a top rail HSS12x4x1/4 with two lower rails HSS8x6x1/4. The tube rails will be spliced every two spans with the splices aligned vertically in all 3 rails.

Two post-to-deck spacer blocks (longitudinal tubes and built-up welded spacer) and two post options (welded or non-welded) were presented to the sponsors. These were designed to carry the TL-4 impact force without any permanent deformation to the spacer or the deck. The weight and number of components and bolts to install for estimated for each concept. Both preferred the concept with two longitudinal tubes and a welded post. Ohio DOT inquired about adding vertical tolerance at the deck edge. Illinois DOT also liked the double angle attached with vertical tolerance added into the post web. The concepts for testing and the final designs have not been finalized.

A 42-in. tall box girder with the built-in anchorage hardware was ordered for component testing anticipated to be conducted next quarter. Writing continued on the summary report.

Circumstances Affecting Project, Scope, or Budget:

(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)

The original gantt chart in the proposal had the project starting in April 2017. Due to the time it took to get the contract in place (May 4, 2017), the project timeline will be shifted by approximately 1 month. Along with the initial delay, design and optimization of the connections and rails has taken longer than expected. Thus, component and full-scale crash tests have not begun as early as anticipated and will be delayed a few months from the gantt chart. Every effort will be made to get the project completed by its original end date (September 30, 2019). There will be no changes to the budget. *Note the expenses last quarter (July 1-Sept 30, 2017) were incorrect.

Anticipated Work Next Quarter:

The connections between the post and rail as well as the rail splices will be designed. More discussion and meetings will be held with the sponsors to incorportate their preferred connections, spacer block, and horizontal and vertical tolerances. Preparations will be made for the post-to-deck connection bogie tests. Drawings will be prepared for the full-scale crash tests. Writing will continue on the summary report.

Total Percentage of Project Completion:

12%