Research Project Quarterly Progress Report

Date: 11/15/2017 **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	25%	$35,235.00	70%	$17,896.00
2. Bridge Rail Full-Scale Testing	$344,162.00	0	$0.00	0	$344,162.00
3. Bridge Rail Reporting	$30,000.00	0	$0.00	0	$30,000.00
4. Bridge Deck Component Testing	$187,956.00	10%	$19,761.00	10%	$168,195.00
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.)

Meetings were held with the sponsors on July 6, August 9, August 22, and September 25 to discuss the progress on the project. Several internal meetings have been held between members of the research team.

The rail section sizes and vertical locations were determined and evaluated using TL-3 and TL-4 loads as per NCHRP Project 22-20. The deck to post offset varied from 4 to 6 in., two dynamic modification factors were included, and the post spacing varied from 6 to 10 ft. Several combinations were determined that met all of the design criteria, and the optimized designs with the lowest weight per foot were determined.

It was agreed upon by the sponsors to design the rail to work with a minimum 17" thick deck or box girder. Several concepts for the post-to-deck connection were brainstormed and submitted to the sponsor for review. Design continued on two primary concepts as recommended by the sponsors. In addition, MwRSF proposed modifications to the box girder to the sponsor and all implemented recommended changes. Drawings of a 42-in. tall box girder with the built-in anchorage hardware were prepared.

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.

Anticipated Work Next Quarter:

The final rail designs will be presented to the sponsor for selection. Further design modification will be completed if necessary.The post-to-rail connection design will be finalized once the post-to-deck offset is finalized (either 4 or 6 in.). The post-to-rail connections as well as rail splices will be designed. The box girder will be ordered. Preparations will be made for the post-to-deck connection bogie tests. Drawings will be prepared for the full-scale crash tests.

Total Percentage of Project Completion:

7%