TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Date: _June 30, 2022_

Lead Agency (FHWA or State DOT): _____Indiana DOT_____

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)* ***TPF 5-436***	**Transportation Pooled Fund Program - Report Period:** ☐Quarter 1 (January 1 – March 31) XQuarter 2 (April 1 – June 30) ☐Quarter 3 (July 1 – September 30) ☐Quarter 4 (October 1 – December 31)

Project Title: **Development of Criteria to Assess the Effects of Pack-out Corrosion in Built-up Steel Members**		
Name of Project Manager(s): **Tommy E. Nantung**	**Phone Number:** **(765) 463-1521 ext. 248**	**E-Mail** tnantung@indot.in.gov
Lead Agency Project ID:	**Other Project ID (i.e., contract #):**	**Project Start Date:** 9/1/2019
Original Project End Date: **8/31/2022**	**Current Project End Date:** **8/31/2022**	**Number of Extensions:** None

Project schedule status:

X 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**
$560,000	**$360,858**	**62%**

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$47,966	**8.6%**	**63.9%**

**This total budget is based on funds that are shown as "committed" on the TPF website. However, it has been reduced at this time (4/22) since all commitments have not been realized to date.

Project Description:
This study proposes to:

1) To develop AASHTO ready specifications for the evaluation of the effects of pack-out corrosion in built-up steel tension, compression, and flexural members.
2) Provide guidance on the need for repairs and corrosion rates that can be expected in various environments in order to assist owners in programming when repairs may need to be made.
3) Identify the most effective methods of repairs and provide suggesting verbiage that could be used when preparing special provisions for repairs.
4) Develop several case-study examples, including calculations that will be used for training users on the methodologies to be developed. It is anticipated that the research team will host a number of webinars or on-site training sessions to ensure technology transfer and implementation.

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

- Continue to calibrate FEA models of compression flanges and axial members using the large-and small-scale test date. These data will be used along with the data from the compression flange girder tests to begin to develop strategies to evaluate the effects of pack-out on the capacity of compression members. FEA parametric studies are underway for these compression members.
- Began fatigue testing the large-scale girders (see Figure 1). There are two girders being tested at the same time as shown in Figure 1. The testing began later than anticipated due to equipment issues. The tests are being run at low stress ranges (7 ksi) to obtain data at stress range levels representative of in-service bridges. Hence, they will take a very long time to complete. There are 4 girders in total that will be fatigue tested. A photograph of a typical specimen is shown in Figure 1.
- Continued calibrating FEA models based on the experimental data.

Anticipated work next quarter:

- Continue with the finite element studies and based on the results of the prototype test, develop the detailed experimental program for compression flanges;
- Continue analytical and experimental studies on tension flanges with pack-out corrosion.
- Continue fatigue testing of corroded girders.
- Obtain additional members with pack-out corrosions. **If a state has such members available or coming out of service in the near future, the RT requests that they contact Robert Connor to discuss the potential for obtaining the members for the research.**
- Schedule an on-site project meeting with partners in the month of October.

Significant Results:

1. None to date

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).

The project will require a 12-18 month no cost extension. While the "official project start date on the TPF website was effectively September 2019, commitments did not arrive until spring of 2020. This was documented in the earlier QPRs from 2019 and 2020. COVID 19 then shut the university down in Spring of 2020 and no work could be performed and no students were hired out of caution. In order to perform all of the long-life fatigue and strength testing, finish all FEA studies, compile all project results, etc. a no-cost extension will be requested. An email request for this extension will be sent out to partners in August.

Potential Implementation:
None to date

Figure 1 – Photographs of fatigue testing set-up of large-scale girders with real pack-out corrosion.