

Federal Contract # DTFH61-17D00001 – Task Order #2

LONG-TERM BRIDGE PERFORMANCE PROGRAM

PROGRESS REPORT NO. 7

Report Period: April 1, 2018 – April 30, 2018

Prepared For:

Federal Highway Administration

Prepared By:



A. Account of work performed in this period

1. Coordination and Meetings Between the Contractor and FHWA LTBP Team

The Rutgers team had a meeting with Dr. Rob Zobel at the 2018 National Bridge Preservation conference in Orlando, FL. on 4/11 and discussed the status of the LTBP program.

Co-PI: 1 hour

2. Develop LTBP Program bridge performance strategic research matrix

April 2018 work consisted of finalizing the proposed framework for the Strategic Research Matrices and preparing and submitting the Task 2.2 report to COR.

Task 2.2.1 - Identification of Review Objectives (100% complete): This subtask was completed in April.

Task 2.2.2 - Development of Strategic Research Matrices Framework (100% complete): The final list of keywords was developed and presented in the Task 2.2 report.

Task 2.2.3 - Development of Review Protocol (100% complete): This subtask was completed in April.

Task 2.2.4 - Development of Initial Visualization Concepts (100% complete): Final mockups for the user interface were developed and presented in the Task 2.2 report.

Co-PI: 2.5 hours

Project Engineer: 197 hours

Staff Engineer: 157.5 hours

Technician: 15.23

Project Support: 17 hours

3. Conduct training for all field personnel on LTBP Protocols

No work was performed for this task.

4. Development of data collection protocols and RABIT-CE operations manual

Task 4.2.1. Instrumentation Protocols – After the submission of review comments to the Pennoni, the Rutgers team continued working on some of the very important protocols (mainly instrumentation design protocols). Meanwhile, the Pennoni team continued working

on the revisions and submitted the completed parts in multiple steps. On April 25, the Rutgers team sent the second drafts of the protocols to the COR. By the end of April 2018, around 90% of the entire task was completed. While waiting to receive COR's comments, the Rutgers team continues working and modifying the protocols.

Task 4.2.2. Legacy Data Mining Protocols – After discussion during the February 23rd meeting at the FHWA- TFHRC office, the Rutgers team focused working on the additional task and analyzed the data extracted from the 1200 bridge documents, which has been completed through the last contract. On April 25, the Rutgers team sent the second drafts of the protocols to the COR. By the end of April 2018, 100% of the entire task (inclusive of the newly added subtask) was completed.

Task 4.2.3. RABIT-CE Operations Manual – During last week of March, the Rutgers team received the review responses from the Infratek. During the month of April, the Rutgers team reviewed and finalized the RABIT-CE operations manual. On April 25, the Rutgers team sent the second drafts of the manual to the COR. By the end of April 2018, around 90% of the entire task was completed. The Rutgers team continues working and modifying the Validation Plan to address the data collection and validation concerns.

Co-PI: 3 hours

Staff Engineer: 157 hours

Project Support: 12 hours

5. Legacy Data Mining data extraction

The Rutgers team accomplished the following during the month of April:

- Data extraction were performed throughout the month for the bridge plans provided. It should be noted that these data extraction being performed by everyone in the LDM group will take up the majority of the groups effort to complete.
- Continued to work on creation of the BLOB (Binary Large Object) files from the collected bridge documentation for future implementation into Bridge Portal. This is where a large portion of the group's efforts currently lay.
- Quality control and quality assurance was provided for the data extraction performed by reviewing the collected data on the data extraction excel input sheets as well as reviewing any newly created BLOB files.
- Continued to periodically work on updating and improving the excel input sheet for data extraction to ensure that all of the data being collected and included in the sheet is uniform as well as accurate. Below are some of the features added to the data extraction sheet.

- Drop down menus for each relevant field in order to limit user input and retain consistency of data.
- Real time statistical measurements of percent data filled to better monitor which fields are missing the most data.
- Collected data from each individual data input excel sheets have begun to be combined into one consolidated “main” input sheet in preparation for data upload to Bridge Portal server.
- Miscellaneous updates/fixes to bridge structure number and other fields that will help prepare for a smoother upload to Bridge Portal server.

CO-PI: 7 hours

Staff Engineer: 157.5 hours

Technician: 57 hours

Project Support: 6 hours

6. Organize, conduct, and participate in LTBP workshops and meetings

No work was performed for this task.

7. Publications, website, communications, and technical assistance

The Rutgers team prepared the electronic version of the monthly progress report and submitted it to FHWA. Moreover, the Rutgers team developed a MS Project file showing the project milestone and submitted it to FHWA.

The Bridge Intelligence team replied to numerous FHWA’s requests regarding Bridge Portal. Moreover, the Bridge Intelligence team worked on uploading NBI and NBE data to Bridge portal per FHWA request. The detail is in the subcontract section.

Co-PI: 64.5

Project Support: 20 hours

B. Work to be accomplished during the next period

1. Coordination and Meetings Between the Contractor and FHWA LTBP Team

The Rutgers team will reach out to the FHWA team to set up a monthly meeting.

2. Develop LTBP Program bridge performance strategic research matrix

The Rutgers team will continue working on the following items:

- 1) Development of the research information database to contain all meta-data for all research activities in the SRMs.
- 2) Further development of the scripts first developed under Task 2.2 to retrieve research data from WoS and TRID.
- 3) Test data retrieval and research data analysis using final keyword list.

3. Conduct training for all field personnel on LTBP Protocols

No work is planned under this task for the next reporting period as of now. However, FHWA might ask the Rutgers team to do a round of training for the HDR team in May.

4. Development of data collection protocols and RABIT-CE operations manual

Task 4.2.1. Instrumentation Protocols – the Rutgers team continues working and modifying the protocols. Upon receiving the comments from COR, the Rutgers team will implement and finalize the protocols for final submission.

Task 4.2.2. Legacy Data Mining Protocols – On April 25, the Rutgers team submitted the protocols to the COR. Upon receiving the comments from COR, Rutgers will implement and finalize the protocols for final submission.

Task 4.2.3. RABIT-CE Operations Manual – the Rutgers team continues working and modifying the manual. Upon receiving the comments from COR, Rutgers will implement and finalize the manual for final submission.

5. Legacy Data Mining data extraction

For the following month, the group will continue to work on all of the above items (finalizing data extraction, creation of BLOB files, performing QA/QC, preparing for extracted data upload) with more of a focus on preparing the extracted data for upload to Bridge Portal servers. The group's efforts will focus on consolidation/review of each individual data extraction sheet as well as creation of the BLOB files. Analysis will continue to be done on the

data collected to ensure it is of the highest quality and the data is being collected as efficiently as possible.

6. Organize, conduct, and participate in LTBP workshops and meetings

No work is planned under this task for the next reporting period.

7. Publications, website, communications, and technical assistance

The Rutgers team will prepare the electronic version of the monthly progress report and will submit it to FHWA. Moreover, the Rutgers team will submit the updated MS Project file to FHWA.

The Rutgers team will work on the tasks related to Bridge Portal as they are requested by FHWA.

C. Problems/Recommended Solutions

The Rutgers team is still waiting to receive comments from the COR for the report submitted for task 4 (protocols). Due to not receiving the comments/feedback from the COR, there will be delays in the delivery of this task.

D. How the results of the work performed supports one or more of the FHWA, DOT and LTBP Goals

The following is a summary of how the work performed on the primary tasks of this task order contribute to meeting the FHWA, DOT, and LTBP program goals.

Task 2 - Develop LTBP Program bridge performance strategic research matrix

Fundamentally, the SRMs aim to link the LTBP program to the larger research community. By placing the LTBP efforts in this larger context, the program will be able to identify potential synergies and collaborative opportunities as well as any overlaps that may exist. This will both increase the cost effectiveness of the program as well as the program's impact on bridge engineering practice through clearly showing how the LTBP program contributes to the overall bridge performance research landscape.

Task 3 - Conduct training for all field personnel on LTBP Protocols

At the heart of the LTBP program's data collection effort is the requirement that data be obtained in a consistent and reliable manner across the breadth of the program. Variations in collection techniques or unreliable practices would pollute the data streams and greatly limit the ability of the program to meet its goal of improving our understanding of long-term bridge performance. Activities under this task aim to ensure that the data collection efforts of the LTBP program are executed by teams with the required expertise to obtain consistent and reliable data.

Task 4 - Development of data collection protocols and RABIT-CE operations manual

Similar to the training work being conducted under Task 3, this task is also involved in ensuring consistent and reliable data collection throughout the program. Specifically, this task will develop additional protocols and operations manuals that specify best-practice approaches for data collection.

Task 5 - Legacy Data Mining data extraction

In addition to ensuring consistent and reliable data collection efforts, the overarching goal of the program is also dependent upon the completeness of the data collection efforts. This task contributes to this through the collection of available legacy data. This data not only provides a means to ensure field data collection efforts are carried out efficiently (i.e. on bridges best suited to meeting the program's goals) but also provides context to the data to help explain observed trends and correlations (and thus further our understanding of long-term bridge performance).

E. Purchases and Rentals

Nothing was purchased during this period.

F. Travel Details for Reporting Period

None.

G. Current and Cumulative Expenditures (cost shown includes benefits and overhead)

Institution	Current Expenditures 4/1/2018 – 4/30/2018	Cumulative Expenditures 10/1/2017 – 4/30/2018
Rutgers, the State University of New Jersey	\$ 74,914.40	\$ 288,780.44
Bridge Intelligence LLC	\$ 10,122.84	\$ 35,106.39
Pennoni Associates	\$ 0	\$ 33,138.00
Infratek Solutions	\$ 0	\$ 25,244.00
New Jersey Institute of Technology	\$ 1,051.02	\$ 5,222.44

H. Subcontractor's Progress Report

Sub-recipient Name: Bridge Intelligence LLC

Subaward No: 00000286

Principal Investigator: Hooman Parvardeh

LTBP TSSC

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PROGRESS REPORT NO. 4

For the Period from 4/1/2018 through 4/30/2018

A. Accomplishments/Work Performed

The following is a complete account of all accomplishments and work performed on each task during this reporting period.

Task 1: (Coordination and Meetings between the Rutgers and FHWA LTBP Team)

During this period, Mr. Parvardeh responded to a few emails related to meetings and coordination.

Number of hours during this period: 1 hour

This task is approximately 30% complete.

Task 2: (Develop LTBP Program Bridge Performance Strategic Research Matrix)

During this period Mr. Parvardeh reviewed the submittal for task 2.2 of the Strategic Research Matrix task.

Number of hours during this period: 2.5 hours

This task is approximately 30% complete.

Task 3: (Conduct Training on Proper Use and Application of LTBP Field Assessment Protocols)

Nothing was done during this period.

Number of hours during this period: 0 hours

This task is approximately 12% complete.

Task 4: (Development and Refinement of Data Collection Protocols)

During this period, Mr. Parvardeh assisted Dr. Babanejad with a few tasks related to Long and Short-Term instrumentation protocols.

Number of hours during this period: 3 hours

This task is approximately 80% complete.

Task 5: (Legacy Data Mining Data Extraction and Upload)

During this period, Mr. Parvardeh met with Mr. Mott on multiple occasions to discuss the progress of the data extraction work. Moreover, Mr. Parvardeh reviewed the output file from the LDM data extraction group.

Number of hours during this period: 7 hours

This task is approximately 40% complete.

Task 6: (Organize, Conduct, and Participate in LTBP Workshops and Meetings)

Nothing was done during this period.

Number of hours during this period: 0 hours

This task is approximately 10% complete.

Task 7: (Publication, Website, Communication, and Technical Assistance)

During this period, the Bridge Intelligence team performed the following tasks:

- Prepared and submitted monthly progress report for April including updated MS project
- Discussion regarding Bridge Portal data update with FHWA
- Provide estimate time and cost for Bridge Portal data update
- Reviewed and modified the LTBP Bridge Portal Journal Paper (work in progress)
- Update the SSL on LTBP3 server
- Update the Operating System, IIS server, and other software on LTBP3 server
- Dealt with Rutgers server policy to bring LTBP3 back online
- Backed up the Bridge Portal Database
- Uploaded the NBI 2017 data on Bridge Portal
- Tested the uploaded NBI data

Number of hours during this period: 64.5 hours

This task is approximately 35% complete.

B. Work Anticipated During the Next Period

For the next period, the Bridge Intelligence team will work with the Rutgers team to satisfy the FHWA requirements.

C. Changes /Problems

None.

D. Participants & charged Level of Efforts

Personnel Name	Role/Contribution	Total Hours	Billed Cost
Hooman Parvardeh	Principal	78	\$ 10,140

Below is a breakdown of level of effort per task:

Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Total
1 hr	2.5 hrs	0	3 hrs	7 hrs	0	64.5 hrs	78 hrs

E. Travel

None.



Sub-recipient Name: New Jersey Institute of Technology

Subaward No: 00000289

Principal Investigator: Matthew J. Bandelt

LTBP TSSC – Task Order 2

Federal Contract # DTFH61-17-D00001

For the Period from 4/1/2018 through 4/30/2018

A. Accomplishments/Work Performed

The following is a complete account of all accomplishments and work performed on each task during this reporting period.

Task 2: LTBP Program Strategic Research Matrices

During this period, the team at NJIT worked on updating the keyword list of the LTBP Program Strategic Research Matrices. The keyword list was updated following the format provided by Dr. Masceri of Rutgers University. NJIT separated and expanded the list to include untreated bridge decks, treated bridge decks, and bridge joints. The keyword list terms were expanded and refined based on input from Rutgers University. Several conference calls were conducted with the Rutgers team to discuss the project

Number of hours during this period: 15.7 (Technician)

Task 3: Training Curriculum

No work was completed on this task during this period.

Number of hours during this period: 0 hours.

Task 4: Development and Refinement of Data Collection Protocols

No work was completed on this task during this period.

Number of hours during this period: 0 hours.

B. Work Anticipated During the Next Period

For the next period, the team at NJIT will continue to assist and work on directed documents as directed by Rutgers and FHWA.



C. Changes /Problems

None.

D. Participants & charged Level of Efforts

Personnel Name	Role/Contribution	Total Hours	Billed Cost
Aaron Strand	Technician	15.2	\$ 1048.8

Task 2	Task 3	Task 4	Total
15.2 hrs	0	0	15.2 hrs

E. Travel

None.