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

LONG-TERM BRIDGE PERFORMANCE PROGRAM

PROGRESS REPORT NO. 8

Report Period: May 1, 2018 – May 31, 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 conversations with FHWA using email and phone call during this month. Moreover, a meeting is scheduled for 6/20th at TFHRC.

Co-PI: 3 hours

2. Develop LTBP Program bridge performance strategic research matrix

Implementation of the proposed strategic research app was initialized in the month of May as part of Task 2.3. Subtasks and their percent completion are as follows:

Task 2.3.1 – Develop/finalize pipeline for automated data retrieval and storage (50% Complete):

Development is complete for automated data extraction of the TRID database. It is anticipated that this task will be completed in the month of June with the development of data extraction scripts for Web of Science.

Task 2.3.2 – Develop the SRM database to store research project data (Not Yet Started):

It is anticipated that this task will be started and completed in the month of June.

Task 2.3.3 – Populate SRM database using data retrieval/storage pipeline (Not Yet Started):

It is anticipated that this task will be started in the month of June and/or at the time of completion for the development of the data retrieval pipeline.

Task 2.3.4a – Identify all known current and planned research efforts related to bridge performance research topic areas (Not Yet Started):

It is anticipated that work on this task will begin in the month of July and continue concurrently with Task 2.3.4b.

Task 2.3.4b – Create frontend interface to visualize and explore the data collected and stored in the SRM database (Not Yet Started):

It is anticipated that work on this task will begin in the month of July and continue concurrently with Task 2.3.4a.

Co-PI: 5.5 hours

Project Engineer: 172.5 hours

Technician: 15.23

Project Support: 5 hours

3. Conduct training for all field personnel on LTBP Protocols

During the month of May, the Rutgers team performed the following tasks:

- Reviewed LTBP data collection protocols relevant for current data collection plan
- Reviewed current training material and coursework. This involved critical review of two full days of training material inclusive of written documents, PowerPoint slides, and previously recorded lectures.
- Held several meetings with team members to plan revision and expansion current draft of protocol training
- Began planning and drafting expansion of protocols training coursework to include a hands-on "workshop" portion. The hands-on portion of the coursework is meant to compliment and reinforce the lecture material. Additionally, it aims to present many of the same problems commonly encountered in the fiend in hopes to provide a robust and diverse training experience that is similar to the expected environment.

Co-PI: 4 hours

Project Engineer: 151.75 hours

Project Support: 9 hours

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

Nothing was done during this period.

5. Legacy Data Mining data extraction

The LDM group accomplished the following tasks for the month of May:

- Finished data extraction for the bridge plans provided (Task is 100% complete).
- Continued to work on creation of the BLOB (Binary Large Object) files from the collected bridge documentation for future implementation into Bridge Portal.
- All Collected data from each individual data input excel sheet has been fully combined into one consolidated “main” input sheet so that it can be uploaded to the Bridge Portal server.

- Quality control and quality assurance was provided for the extracted data by directly reviewing the input data on the final combined excel input sheet as well as reviewing any newly created BLOB files.
- Continued to periodically update and improve the excel input sheet for data extraction to ensure that all data included in the sheet is uniform as well as accurate.
- Miscellaneous updates and fixes to the bridge structure numbers and other fields were made in order to have a smoother upload process of the extracted data to Bridge Portal server.

CO-PI: 22 hours

Project Engineer: 141.25 hours

Staff Engineer: 172.5 hours

Technician: 57 hours

Project Support: 17 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 NBE data to Bridge portal per FHWA request. The detail is in the subcontract section.

Co-PI: 71

Project Support: 18 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 meet with the FHWA team on June 20th.

2. Develop LTBP Program bridge performance strategic research matrix

Task 2.3.2 – Develop the SRM database to store research project data (Not Yet Started):

It is anticipated that this task will be started and completed in the month of June.

Task 2.3.3 – Populate SRM database using data retrieval/storage pipeline (Not Yet Started):

It is anticipated that this task will be started in the month of June and/or at the time of completion for the development of the data retrieval pipeline.

Task 2.3.4a – Identify all known current and planned research efforts related to bridge performance research topic areas (Not Yet Started):

It is anticipated that work on this task will begin in the month of July and continue concurrently with Task 2.3.4b.

Task 2.3.4b – Create frontend interface to visualize and explore the data collected and stored in the SRM database (Not Yet Started):

It is anticipated that work on this task will begin in the month of July and continue concurrently with Task 2.3.4a.

3. Conduct training for all field personnel on LTBP Protocols

The Rutgers team will wait to hear about possible needs for training the HDR team from FHWA.

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

The Rutgers team is still waiting for any possible comment from FHWA. Upon receiving any comment, the Rutgers team will work on providing answers.

5. Legacy Data Mining data extraction

For the following month, the group will continue to work on all of the above items (Creation of BLOB files, performing QA/QC, uploading of extracted data to bridge portal) with more of a focus on reviewing the collected data and uploading of the data 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 is being represented as accurately as possible on the Bridge Portal website.

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 meets 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 5/1/2018 – 5/31/2018	Cumulative Expenditures 10/1/2017 – 5/31/2018
Rutgers, the State University of New Jersey	$ 75,477.00	$ 439,171.84
Bridge Intelligence LLC	$ 13,1715.00	$ 48,821.39
Pennoni Associates	$ 0	$ 33,138.00
Infratek Solutions	$ 0	$ 25,244.00
New Jersey Institute of Technology	$ 1,050.87	$ 6,273.31

H. Subcontractor's Progress Report

Sub-recipient Name: Bridge Intelligence LLC
Subaward No: 00000286
Principal Investigator: Hooman Parvardeh

LTBP TSSC
Federal Contract # DTFH61-17-D00001

PROGRESS REPORT NO. 5
For the Period from 5/1/2018 through 5/31/2018

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 many emails (15+) from FHWA related to the update of LTBP Bridge Portal data.

Number of hours during this period: 3 hours

This task is approximately 40% complete.

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

During this period Mr. Parvardeh worked with Dr. Masceri and Mr. Romano to prepare a working prototype for the visualization of the SRM.

Number of hours during this period: 5.5 hours

This task is approximately 40% complete.

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

During this period, Mr. Parvardeh attended a meeting with Dr. Moon, Dr. Masceri, and Dr. Devitis regarding preparation for the training task. Mr. Parvardeh provided the previously prepared curriculum as well as the recorded data from last contract to the team and reviewed the grid presentation.

Number of hours during this period: 4 hours

This task is approximately 16% complete.

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

Nothing was done during this period.

Number of hours during this period: 0 hours

This task is approximately 80% complete.

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

During this period, Mr. Parvardeh worked on cleaning the extracted data from the LDM team to prepare it for upload to the Bridge Portal. This included numerous interactions and meetings with the LDM data extraction team and multiple revisions to the Excel file.

Number of hours during this period: 22 hours

This task is approximately 70% 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 May including updated MS project
- Discussion regarding Bridge Portal data update with FHWA
- Backed up the Database on LTBP3 before uploading the NBE data
- Performed a code update to the NBE module to make it compatible with the new FHWA NBE model
- Uploaded NBE data from 2015 to Bridge Portal
- Uploaded NBE data from 2016 to Bridge Portal
- Uploaded NBE data from 2017 to Bridge Portal
- Performed QA/QC on the uploaded NBE data
- Prepared the Database for submittal to FHWA
- Prepared the source code for submittal to FHWA
- Prepared instruction for uploading NBI and NBE data to FHWA
- Submitted the Source code, Database and the instruction to FHWA

Number of hours during this period: 71 hours

This task is approximately 45% complete.

BRIDGE INTELLIGENCE

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	105.5	$ 13,715

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
3 hr	5.5 hrs	4	0	22 hrs	0	71 hrs	105.5 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 5/1/2018 through 5/31/2018

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 terms for untreated bridge decks, treated bridge decks, and bridge joints were expanded and refined.

Number of hours during this period:

Technician: 15.2 hrs

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	$69/hour

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

E. Travel

None.