

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

**LONG-TERM BRIDGE PERFORMANCE PROGRAM**

PROGRESS REPORT NO. 20

Report Period: May 1, 2019 – May 31, 2019

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 multiple communication with the FHWA team through emails.

Co-PI: 1 hour

### **2. Develop LTBP Program bridge performance strategic research matrix**

All of the original subtasks of Task 2.3 were 100% complete as of April 2019. In the progress report for the month of April, it was indicated that several functional improvements to the Strategic Research application were needed to deliver a viable long-term solution. In the month of May, these improvements were implemented and the Strategic Research application was delivered via the DockerHub platform.

Subtasks and their percent completion are as follows:

Task 2.3.1 – Develop/finalize pipeline for automated data retrieval and storage (100% Complete):

At this time, this task is complete.

Task 2.3.2 – Create the SRM database schema to store research project data (100% Complete):

At this time, this task is complete.

Task 2.3.3 – Populate SRM database using data retrieval/storage pipeline (100% Complete):

At this time, this task is complete.

Task 2.3.4a – Identify all known current and planned research efforts related to bridge performance research topic areas (100% Complete):

At this time, this task is complete.

Task 2.3.4b – Create frontend interface to visualize and explore the data collected and stored in the SRM database (100% Complete):

At this time, this task is complete.

Staff Engineer: 75 hours

**3. Conduct training for all field personnel on LTBP Protocols**

Nothing was done during this period.

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

Nothing was done during this period.

**5. Legacy Data Mining data extraction**

Nothing was done during this period.

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

Nothing was done during this period.

**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.

During this month, Dr. Babanejad continued worked on enhancing the quality of NDT data and XML files. Details is explained in the Subcontractors progress report. It should be noted that hourly students at Rutgers assisted Mr. Babanejad with this task.

The Bridge Intelligence team worked on generating xml data from the raw impact echo data from the Pilot bridges. Additionally the Bridge Intelligence team transferred almost 1 TB of LTBP data from Dropbox to Google Drive. More detail can be found on the Bridge Intelligence Progress report.

Co-PI: 72 hours

Project Engineer: 20.50 hours

Technician: 60 hours

Project Support: 7 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 FHWA to set up a meeting for the month of June.

### **2. Develop LTBP Program bridge performance strategic research matrix**

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

### **3. Conduct training for all field personnel on LTBP Protocols**

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

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

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

### **5. Legacy Data Mining data extraction**

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

### **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.

**C. Problems/Recommended Solutions**

None.

#### **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)**

<b>Institution</b>	<b>Current Expenditures 5/1/2019 – 5/31/2019</b>	<b>Cumulative Expenditures 10/1/2017 – 5/31/2019</b>
Rutgers, the State University of New Jersey	\$ 11,643.00	\$ 892,185.59
Bridge Intelligence LLC	\$ 9,782.00	\$ 104,686.39
Pennoni Associates	-	\$ 34,206.00
Infratek Solutions	-	\$ 25,244.00
New Jersey Institute of Technology	-	\$ 28,237.18
WJE	\$ 2,665.00	\$ 33,831.00

## **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. 15**

**For the Period from 5/1/2019 through 5/31/2019**

## 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 answered multiple queries from the FHWA team through email.

Number of hours during this period: 1 hour

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

Nothing was done during this period.

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

Nothing was done during this period.

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

Nothing was done during this period.

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

Nothing was done during this period.

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

Nothing was done during this period.

### 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 2019 including updated MS project
- Converted raw impact echo data from LTBP pilot bridges into XML format.
- Manually transferred all LTBP data (800 GB) from Rutgers Dropbox account to Rutgers Google Drive. Previously the Rutgers team had to pay a monthly fee for the Dropbox account but since Rutgers provides free Google Drive, it is not only economical, but it is essential to use this system.

Number of hours during this period: 72 hours

## 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	73	\$ 9,782

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	0	0	0	0	0	72 hrs	97 hrs

## E. Travel

None.

**Progress Report # 3**  
**05/01/2019 - 05/31/2019**  
**Subaward No: 0863**  
**Principal Investigator: Saeed Babanajad**  
**Contract DTFH6117D00001 (T.O. 2 - Task 7)**

June 10, 2019

Franklin Moon, Ph.D  
Center for Advanced Infrastructure and Transportation (CAIT)  
Rutgers, The State University of New Jersey  
100 Brett Road  
Piscataway, NJ 08854-8058  
franklin.moon@rutgers.edu

Re: Progress Report # 3 (05/01/2019 - 05/31/2019)

## A. Accomplishments/Work Performed

During this period, WJE (Dr. Babanajad) performed the necessary steps in order to complete the QA/QC for the NDE data collected through the LTBP Program. He was frequently in contact with Rutgers employees (Dr. Moon, Mr. Mott, Mrs. Gu, Dr. Gucunski, and Mr. Parvardeh) to discuss the details of collected data and any potential troubleshooting. The focus was more on addressing the problematic files. Toward the end, he started collecting some info for a conference call with FHWA.

## B. Work Anticipated During the Next Period

WJE (Dr. Babanajad) will continue the similar activities in order facilitate the progress of project. He would also submit part of the completed data (such as XSD files and Pilot Bridges) to FHWA. Also, he would prepare some slides and checklist for FHWA and present those to the FHWA during a conference call on June 10th. WJE will also work on the creation of FFT spectrum files for IE tests as well as addressing the issues with the problematic results.

## C. Changes /Problems

None.

## D. Participants & Charged Level of Efforts

The table summarizes the participants and charged level of efforts.

**Headquarters & Laboratories**—Northbrook, Illinois

Atlanta | Austin | Boston | Chicago | Cleveland | Dallas | Denver | Detroit | Honolulu | Houston | Indianapolis | Los Angeles | Minneapolis | New Haven  
New York | Philadelphia | Pittsburgh | Portland | Princeton | Raleigh | San Antonio | San Francisco | Seattle | South Florida | Washington, DC

Personnel Name	Role/Contribution	Total Hours	Billed Cost
Saeed Babanajad	Project Manager	20.5	\$154.3/hour

## E. Purchases and Rentals

Per attached, WJE purchased a business GSuite account in order to get access to the data shared by Rutgers University.

## F. Travel

None.

## G. Charges

Institution	Current Expenditures 05/01/2019 – 05/31/2019		Cumulative Expenditures 02/01/2018 – 05/31/2019	
	Labor	Other Costs	Labor	Other Costs
WJE	\$3,198.69	-	\$40,847.89	-

Sincerely,

**WISS, JANNEY, ELSTNER ASSOCIATES, INC.**



Saeed Babanajad  
Associate III