# TRANSPORTATION POOLED FUND PROGRAM
# QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): ____IOWA 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 #**<br>*TPF-5(300)* | **Transportation Pooled Fund Program - Report Period:**<br>Quarter 1 (January 1 – March 31, 2015)<br>Quarter 2 (April 1 – June 30, 2015)<br>Quarter 3 (July 1 – September 30, 2015)<br>X Quarter 4 (October 1 – December 31, 2015) |
|---|---|

| **Project Title:**<br>Performance and Load Response of Rigid Pavement Systems | | |
|---|---|---|
| **Project Manager:**<br>Brian Worrel | **Phone:**<br>239-1471 | **E-mail:**<br>brian.worrel@dot.iowa.gov |
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| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):**<br>Addendum 504 | **Project Start Date:**<br>5/29/14 |
|---|---|---|
| **Original Project End Date:**<br>5/31/2017 | **Current Project End Date:**<br>**5/31/2019** | **Number of Extensions: PFS** |

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 | Total Percentage of Work Completed |
|---|---|---|
| $1,520,000.00 | $296,970.68 | 32% |

***Quarterly*** Project Statistics:

| Total Project Expenses This Quarter | Total Amount of Funds Expended This Quarter | Percentage of Work Completed This Quarter |
|---|---|---|
| $45,258.55 | $45,258.55 | 5% |

**Project Description:**

The modern approach to highway design is embodied in the Mechanistic-Empirical Pavement Design Guide (MEPDG), which incorporates models embedded in dedicated software, such as AASHTOWare Pavement ME Design, to predict pavement performance in greater detail than before. Full implementation of the MEPDG by state departments of transportation requires customizing or calibrating the software to state and local conditions, which in turn requires collecting data on climate, material properties, load response, and pavement performance.

The MEPDG software uses these data inputs to more accurately simulate the load response of pavements and long-term pavement performance. Local calibration of the software involves comparing long-term performance simulation results to actual performance data at local sites if possible or from matching pavements in the LTPP database. New York is one of the states that have previously instrumented test pavement sections to acquire local data to improve calibration of the MEPDG software. The installed sensors are still functioning to an extent that permits collection of additional useful data. This project has these objectives:

- Collecting load response and performance data and environmental monitoring at selected test pavements in New York for four years.
- Installing new instrumented sections as needed for a better understanding of rigid pavement response, including monitoring for the duration of the project.
- Determining the impact of a base on long-term performance of rigid pavement utilizing the data acquired in fulfilling the first two objectives and other nationally available data on the topic.

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

NYSDOT priority task list:

- Task 1. Develop relationships between PCC slab thickness and pavement performance
- Task 2. FWD Analysis Procedures

Work for the NYSDOT is progressing on several points.

1. The interim report for Task 2 is being finalized. Additional information is being added to the report and the report will be sent for review when it is completed.
2. Data for the MEPDG catalog is being generated in response to the comments provided by the liaison. Tables are being constructed for the various parameters, including: PCC pavement thickness, Truck ESALs, IRI, faulting, and cracking.

The state has been divided into four sections based on weather conditions, as shown in Figure 1. Therefore, there will be only four weather stations needed, one for each section, located in Buffalo; Massena; Elmira/Corning; and Farmingdale. Weather stations in these 4 weather sectons give similar results, based on all runs for 5000 psi subgrade and 30 year design life.

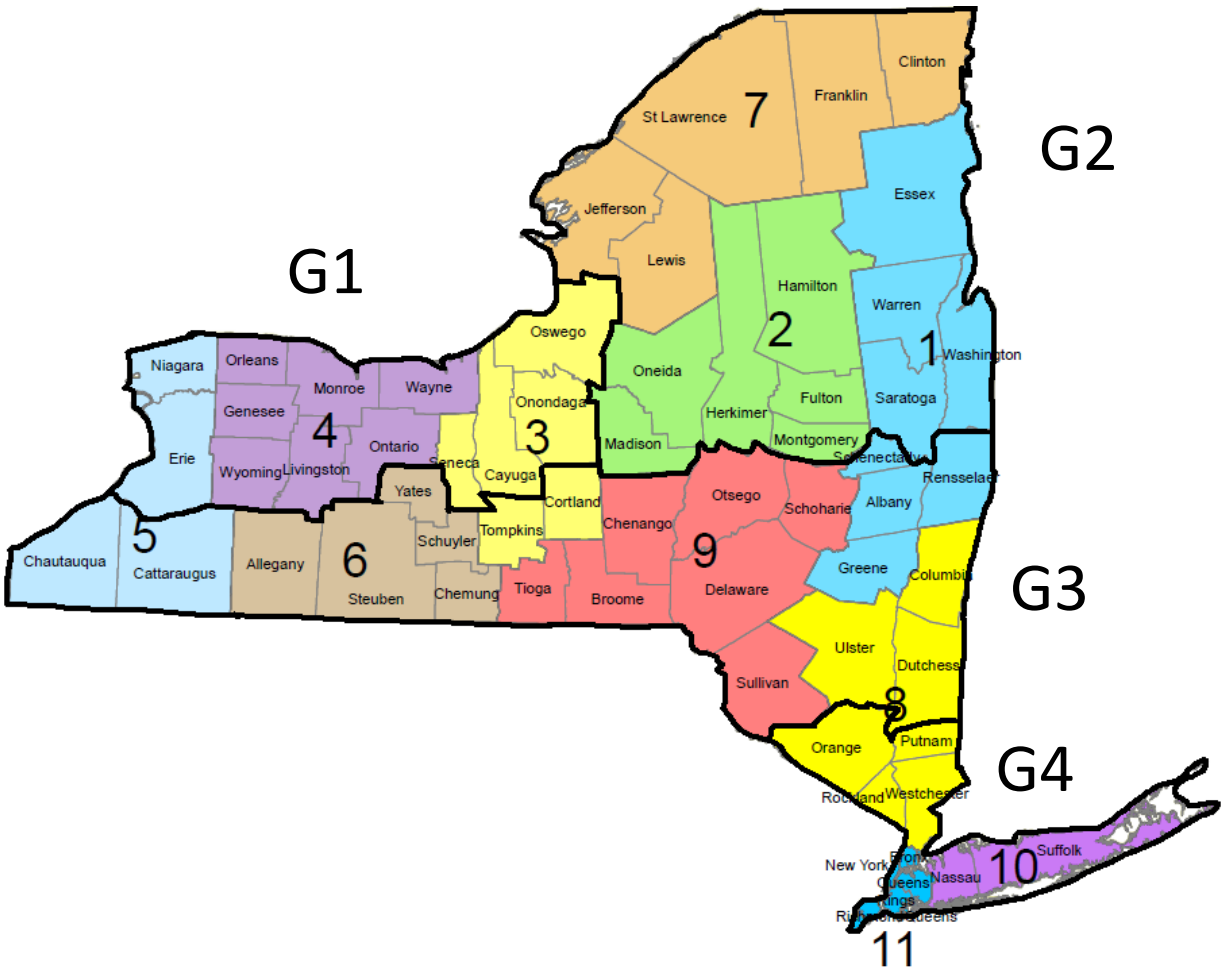


*Figure 1. Weather Regions G1, G2, G3, and G4 outlined in black on a map of NYSDOT Regions.*

For each of these four weather sections, the software has been run for various subgrade moduli. However, because the subgrade modulus is incorporated into the k value, there is only a slight variation in pavement thickness computed as a result. A new version (2.2) of the software was received and has been installed. There are some minor issues with the program that we are working to resolve. Once this has been done and the data analyzed and reviewed for Task 1 and a draft report will be sent.

3. On November 5th, ORITE personnel visited the Rt9A site and met with NYDOT personnel and contractor to discuss the logistics of moving the wires from the existing pull box to the permanent location in the newly installed cabinet and inspect the sensor wires. The condition and operation of the sensors were last checked in 2008. The wires as shown in Figure 2 were found to be in fair condition, with some mud and other debris from rain and construction. Figure 3 shows a view from the location of the new box to the location of the wires. Figures 4 and 5 show the new box. Measurements indicated that the wires will need to be extended approximately 200 ft and threaded through the conduit to the new box. A solar charging panel will also be installed at the box location and sensors will be connected to a data acquisition system installed in the box. Based on the observed conditions at the site, the research team is

finalizing the supplies needed. This work will be planned as soon as the wires and other components are received. The onsite work will be performed in January 2016.

*Figure 2 Sensor wires in pull box*


*Figure 3 Street view from location of new Box towards current sensor wire location*

*Figure 4 Newly-installed instrumentation box (center, in front of white car)*

*Figure 5 The new instrumentation box*

**Anticipated work next quarter:**

- Continue creating design tables for NYSDOT regions
- Install new cabinet on the RT9A project site when requested.
- Discussions are continuing on selection of a site for instrumented pre-cast slabs.

NYSDOT priority task list:

- Task 1. Develop relationships between PCC slab thickness and pavement performance: has been nearly completed waiting on feedback from NYSDOT, then a short report will be prepared on the findings
- Task 2. FWD Analysis Procedures for overlay design will continue. Software used by ODOT has been adapted for use by the NYSDOT. The procedure to collect FWD data and run the program is being written.

**Significant Results:**

**Circumstance affecting project or budget (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 newest version of the AASHTO Pavement-ME software, Version 2.2, has been received and installed. The earlier results generated with Version 2.1 of the software need to be validated using the new version as the calibration coefficients have been changed.