Bi-Monthly Progress Report:
Project Number and Title: 1.8: Enhancing Intelligent Compaction with Passive Wireless Sensors
Research Area: Thrust # 1, Monitoring and Assessment for Enhanced Life
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Reporting Period: *06.01.2019 to 07.31.2019*
**Date:** *July 30, 2019*

Overview:

During the past two months we continued to perform field tests and collect data in an Intelligent Compaction (IC) project currently underway in Route 117 in Vermont. Also, we met with the VTrans team (Josh Hulett and Mark Woolaver) at the project's construction office in July and discussed:

- design of future field tests for potential IC improvement utilizing Intelligent Compaction Measurement Value (ICMV) as a function of vibration amplitude and frequency in the control system, followed by adjusting these parameters to optimize the compaction process along with designing a filter to improve consistency of ICMVs in order to minimize compaction variance;
- (ii) potential challenges for implementation of the passive wireless sensors; and
- (iii) IC testing plan in August.

With regards to implementing passive sensors in the field tests, we worked with a sensor manufacturing vendor (Phase IV Engineering Inc.) to explore viable options for design and ruggedization of the pressure sensors to survive the extreme pressure and temperature during compaction process.
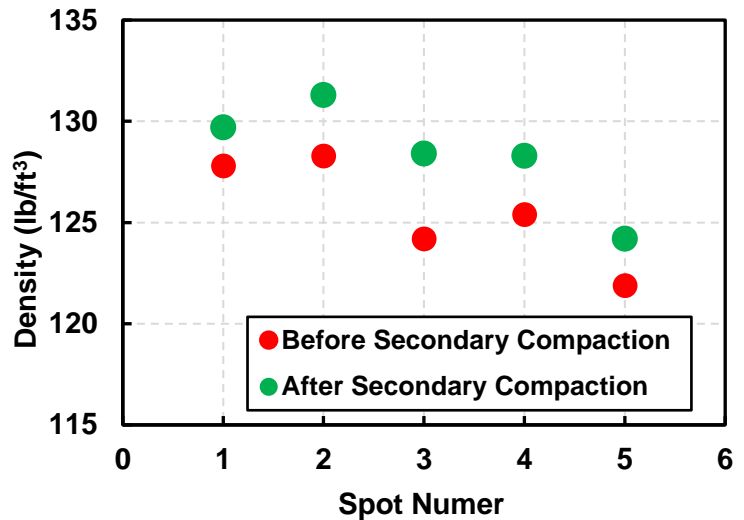
(a)   (b)

Figure 1: IC compaction in the field, (b) Density values before and after using IC roller feedback data in a field test

Planned Activities:
Perform new IC field tests aiming at IC performance improvement and continue exploring viable options for implementation of passive sensors in IC compaction.