**Problem Title**:

Impact on pavement network condition when converting an agency’s data collection process from manual or semi-automated, to fully automated methods.

**Background:**

Many Departments of Transportation (DOT) have in recent years transitioned to fully automated pavement condition data collection technologies. However, DOT’s often do not change their protocol for capturing and storing the data due to fears that historical information may be lost or for other reasons. However, agencies may be missing out on significant capability and detail in the data that could be used to drive more effective pavement management decisions.

For most DOT’s, pavement condition data was originally collected using manual, windshield surveys. For the agencies that were employing distress-based measurements, the protocols used were likely developed in-house, and were focused on making the job of the surveyors as easy as possible in an effort to ensure data could be collected safely while also being able to collect relatively quality data. This often leads to the older protocol not being well defined or suited to automated data collection, making it harder for data collection vendors to meet the data requests of the agency.

As industry rises to the challenge, quite often they are caught between trying to meet the agency request and struggling to get the tools to achieve the agency’s data goals. In the absence of a standard national protocol for all agencies to follow for pavement data collection, more research needs to be done to develop processes and technology to make automated data collection more adaptable.

**Research Objectives:**

1. Determine the state of the practice in data collection protocols among State DOTs.
2. Determine the technical capabilities, both equipment and processing algorithms, of data collection vendors to convert raw measurements to agency protocol.
3. Determine what distress definitions that agencies are using that are especially difficult to adapt to automated data collection.
4. Determine what distress definitions that agencies are using that are easier and more consistently provide high quality results.
5. Create a process or tool that an agency can adopt that provides a more adaptable crossover from raw measurements to an agency’s specific protocol.
6. From this study, make recommendations toward a national standard for automated data collection protocols.

**Potential Benefits:**

The following are the potential benefits of this study:

1. Agencies can expect higher quality, more repeatable and accurate data coming from the data collection vendor.
2. Agencies can change vendors without having to worry about the data quality changing.
3. Data collection costs may decrease since processing could require less calibration.
4. Vendors will have less risk in their projects due to concerns of meeting an agency’s specific protocol.

**Relationship to Existing Body of Knowledge:**

A number of studies exist that discuss the transition from manual to automated data collection methods. Some highlight specific agency experiencesi, while others focus on developing transitional protocols to align manual to automated methodsii. This research study will focus more deeply on adaptability of technology and data processing algorithms across agency protocols while maintaining the quality and integrity of the data output.

**Tasks:**

The research will include the following tasks:

1. Conduct a literature review of state of the practice in State DOT data collection protocols. Determine which have not modified their protocols as a result of a change in data collection processes.
2. Conduct a literature review to determine the technical capabilities, both equipment and processing algorithms, of data collection vendors to convert raw measurements to agency protocol.
3. Develop an adaptable process or analysis tool that can convert raw automated data collection measurements effectively regardless of the protocol adopted by the agency.
4. Demonstrate the results of the study using available data sets and compare across separate data protocols the ability to convert the data to actionable pavement management data.
5. Develop a set of standard agency protocols that can be recommended to agencies when adopting automated data collection methods based on how easily adaptable they may be.
6. Identify Future Research Needs.

**Sponsoring Committee:** AFD20, Pavement Monitoring and Evaluation

**Co-Sponsoring Committees:** AFD10, Pavement Management Systems

**Funding:** $200,000-$250,000

**Research Period:** 12-18 Months

i Sivaneswaran, N., Pierce, L.M., and Mahoney, J.P. (2004), “Transition from Manual to Automated Pavement Condition Surveys: Washington State’s Experience”, 6th International Conference on Managing Pavements, Brisbane, Queensland, Australia.

ii Chan, S., Cui, S., Lee, S. (2016), “Transition from Manual to Automated Pavement Distress Data Collection and Performance Modelling in the Pavement Management System”, Conference of the Transportation Association of Canada, Toronto, ON.