Suitability of Intelligent Compaction for Relatively Smaller-Scale Projects in Vermont

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Problem Statement

Intelligent Compaction (IC) is an innovative technology (Figure 1) that has the potential to overcome some of the issues associated with conventional compaction techniques. However, more information on the use of IC is needed to gain confidence and experience in the technology and to develop robust QA/QC specifications in Vermont projects.
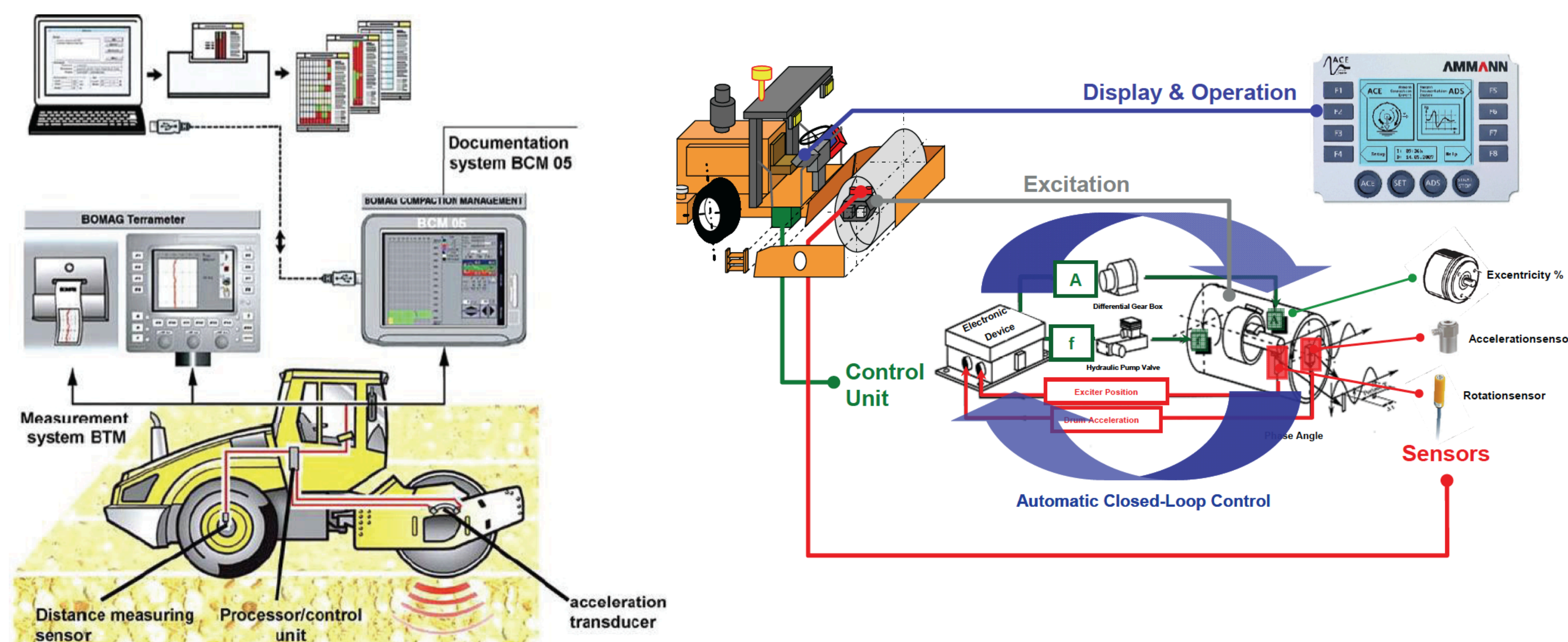

Figure 1. Schematic of IC components/interactions (source: Bomag, Ammann)

Background

The use of IC rollers (1) increases the compaction uniformity; (2) provides a system wide stiffness-based inspection practice; (3) allows for real-time monitoring, identification of weak areas, and making informed decisions on proper course of action during compaction (Mooney et al., 2010).
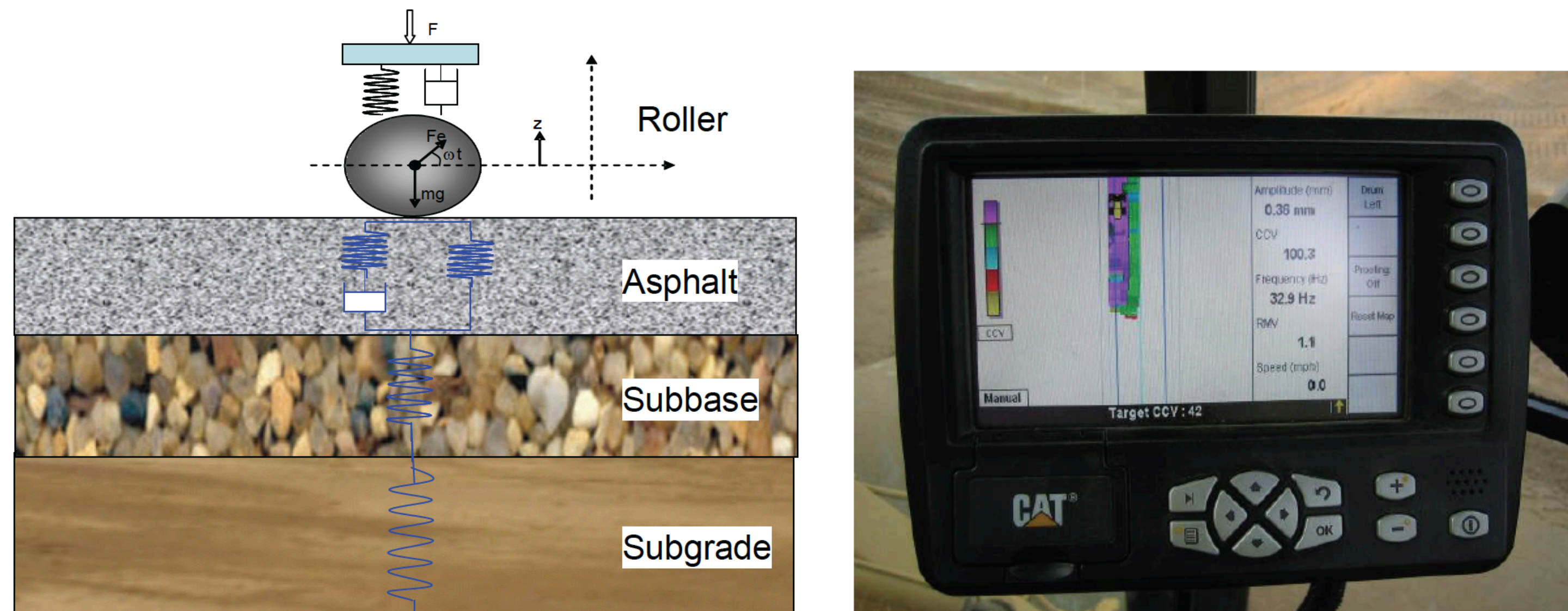

Figure 2. Roller-pavement Interaction; on-board display unit (Chang et al., 2011)

Results

The main project objective was to review the literature on IC. Generally, spot-test measurements correlate better with IC roller measurements in soils compared to in asphalt (Chang et al., 2011). IC-measured stiffness correlates weakly with spot-test measurements for layered soil profiles compared to homogeneous soils (Mooney et al., 2010).
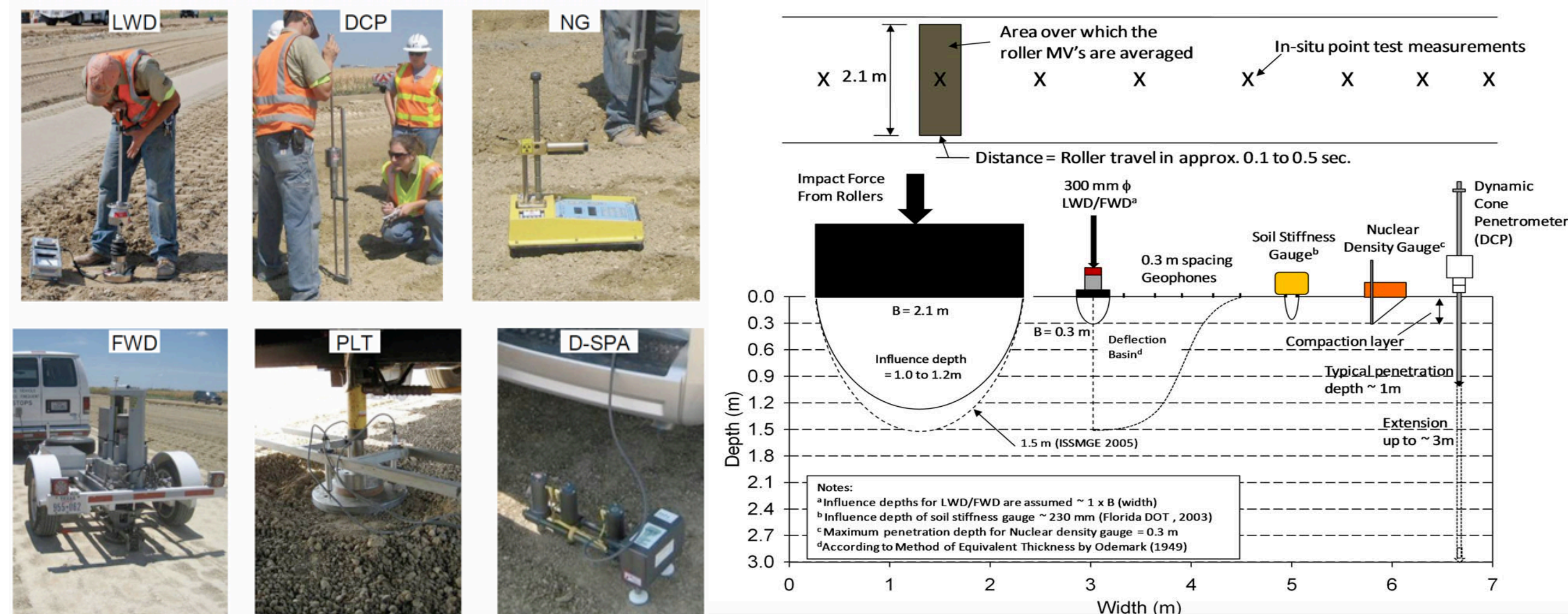

Figure 3. IC and spot test measurements/influence depth (Chang et al., 2011; Mooney et al., 2010)

Conclusions and Recommendations

The next step is to implement IC technology in some of the pavement construction projects in Vermont, collect data, and develop IC guidelines and robust QA/QC specifications for future IC implementation in Vermont.

Acknowledgments

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References

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