

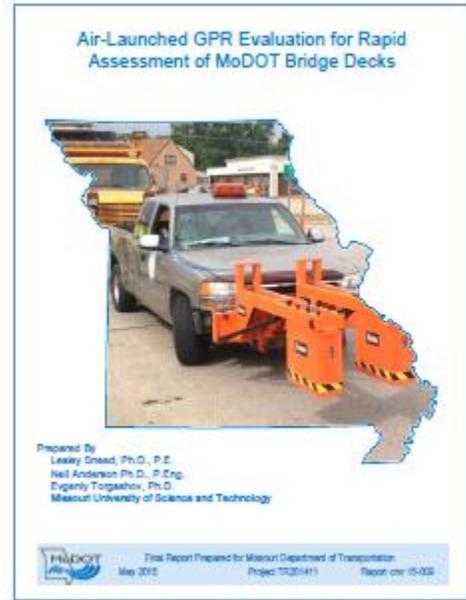
Research Summary

Air-Launched GPR Evaluation for Rapid Assessment of MoDOT Bridge Decks

This study demonstrated the utility of the air-launched ground penetrating radar (GPR) tool in terms of evaluating the condition of MoDOT bridge decks. The objective was to confirm that the air-launched GPR tool can be implemented as a part of a long-term program that enables faster, better, and more cost-effective assessments of MoDOT bridge decks. Ten bridge decks were investigated using an air-launched GPR system.

Four of the bridge decks investigated were previously investigated using a ground-coupled GPR system, and results from those four bridge decks served as ground truth for the air-launched GPR interpretations. Findings show reasonably good spatial correlation between the ground-coupled GPR and air-launched GPR data sets in terms of deteriorated regions and overall percentages of deteriorated regions in terms of bridge deck surface area.

Apparent discrepancies between the air-launched and ground-coupled GPR interpretations can be attributed to several factors, including interpolation between adjacent GPR traverses, differences in signal attenuation due to different antenna frequencies, and differences in signal resolution due to different distance from the antenna to the



embedded reinforcing steel.

It is recommended that reconnaissance-style air-launched GPR data be acquired along 2 to 4 optimally-placed traverses per lane. Increasing the number of traverses and acquiring core control would increase the reliability of the data, but at significantly increased cost, and is not recommended (or necessary) for a reconnaissance-style assessment and programming purposes.

Based on the assessment of the acquired GPR control percentage estimates of the condition of the bridge deck (percentages of surface area designated as “no evidence of deterioration” and “evidence of deterioration”) that is generated, this information can be used by MoDOT for programming purposes.



Findings show a reasonably good correlation between the ground-coupled GPR and air-launched GPR data sets in terms of deteriorated regions and overall percentages of deteriorated regions in terms of bridge deck surface area.

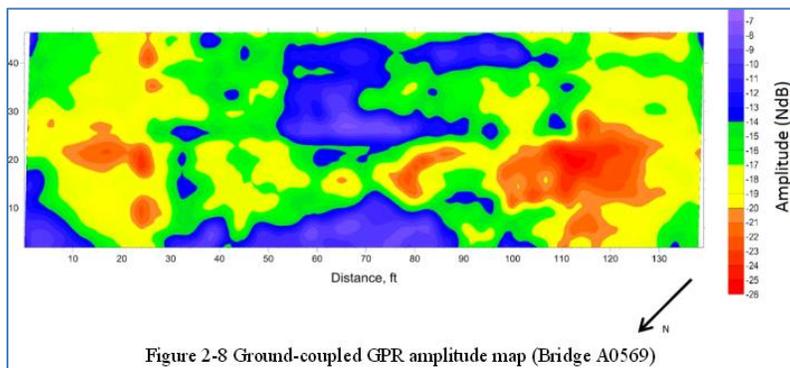


Figure 2-8 Ground-coupled GPR amplitude map (Bridge A0569)

The air-launched GPR tool can be implemented as a part of a long-term program that enables faster, better, and more cost-effective assessments of MoDOT bridge decks.

Project Information

PROJECT NAME: Air-Launched GPR Evaluation for Rapid Assessment of MoDOT Bridge Decks

PROJECT START/END DATE: September 2013–March 2015

PROJECT COST: \$80,000

LEAD CONTRACTOR: Missouri University of Science and Technology

PRINCIPAL INVESTIGATOR: Dr. Lesley Sneed

REPORT NAME: Air-Launched GPR Evaluation for Rapid Assessment of MoDOT Bridge Decks

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