

Abstract

# Assessment of Pavement Structural Conditions Using Ground Penetrating Radar <sup>†</sup>

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**Abstract:** Ground-penetrating radar (GPR) technology has been widely applied in ground subsurface investigations. The major development of GPR for pavement assessment originated in the early 1980s and since has become a well-established investigation technique for pavements. Analysis of GPR data provides much richer information on layer depths of pavement structure, material conditions, moisture content, voids, and locations of reinforcement and other features. Being able to accurately and reliably assess the underlying conditions of pavements is essential to fully understand both functional and structural deficiencies or failures of pavements and associated causality. This improved understanding will lead to the most cost-effective maintenance and rehabilitation treatments and considerable savings in maintenance and rehabilitation expenditure. The overall goal of this research is to extend the GPR technology in combination with modern data analytics to provide improved pavement investigation capabilities. As a result, new methodologies and analytical procedures were developed to acquire and analyze field GPR data, and infer subgrade density, which is critical for diagnosis of pavement failure and underlying causality [1, 2]. Based on the outcomes of the research, the potential pavement foundation issues of critical state highways in Georgia, USA are presented.

**Keywords:** Ground penetrating radar (GPR); pavement structure; electromagnetic mixing theory; subgrade soil density;

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