

# Data correlation of non-destructive testing methods to assess asphalt pavement thickness

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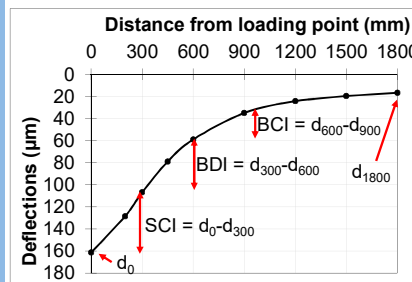
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## Introduction

**Layers thicknesses** are among the major contributors to the overall pavement response and performance in the framework of **pavement structural assessment**. Inaccuracies in thickness assessment might result in erroneous response analysis and life expectancy estimation with a detrimental financial impact during maintenance planning.

*This research reports a data-correlation approach incorporating multi-source information from deflection-based and electromagnetic-based Non-Destructive Testing (NDT) methods for the assessment of roadway pavements.*

## Preliminary finding



Curve fitting → nonlinear relationship

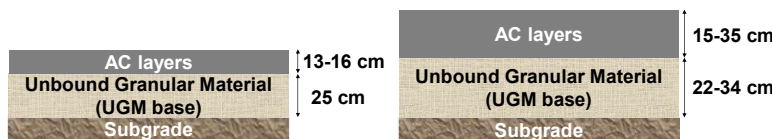
$$h_{AC} = f(SCI; BDI)$$

- Developed from GPR data
- Calibrated and validated with either GPR- or core-based thicknesses
- Need for statistical data treatment

## Objectives and Methodology

**Focus:** Investigation of the correlation between Long-Term Pavement Performance (LTPP) data collected on asphalt pavements with the Falling Weight Deflectometer (FWD) and the Ground Penetrating Radar (GPR) techniques.

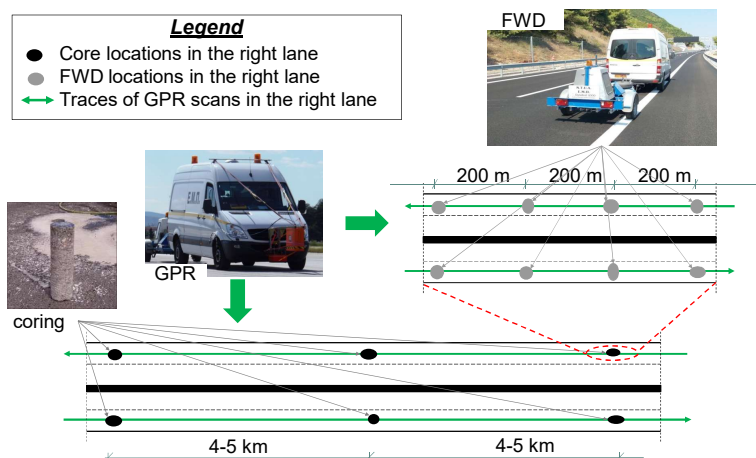
**Goal:** Estimation of the thickness of the Asphalt Concrete (AC) layer directly from FWD deflection parameters.



Cross-sections of the investigated LTPP sites

### Legend

- Core locations in the right lane
- FWD locations in the right lane
- Traces of GPR scans in the right lane



Overview of the experiment

## Remarks

1. GPR is an uncontested method for measuring pavement layer thickness, but not able to depict structural issues as FWD method does.
2. The developed approach suggests a good potential to produce AC thickness directly from FWD-deflection data sources.
3. This approach deals mainly with pavement performance assessment at a network level basis, where highway agencies need to get "quick answers" about the pavements' condition by reduced measuring effort.
4. Small-scale projects (using commonly FWD and cores) can also gain from the suggested procedure, since the procurement and the transportation logistics of multiple and expensive measuring equipment at these cases is rather unaffordable.

### Related research:

Plati, C., Loizos, A. & Gkyrtis, K. (2020). Integration of non-destructive testing methods to assess asphalt pavement thickness, Journal: NDT & E International. DOI: <https://doi.org/10.1016/j.ndteint.2020.102292>

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