PROGNOSTISERING AV SPÅRTILLVÄXT - ASFALTBELÄGGNINGAR

Implementation of viscoelastic rutting performance model

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Funded by VINNOVA, STA, SBUF, Nynas, Volvo Technology, DRF

Project leader: Safwat Said (VTI) Project participants: VTI, KTH, Nynas, Skanska, Peab, NCC, Volvo, DRF

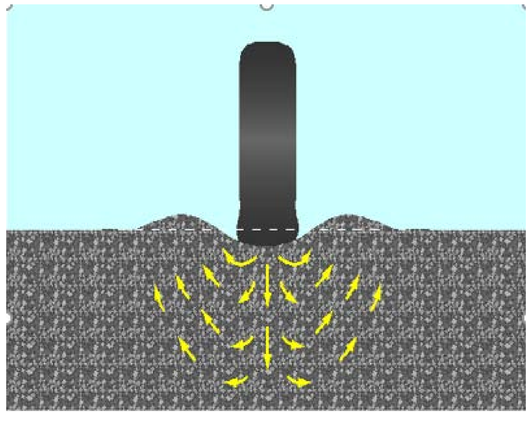
MOTIVATION

Analytical tool is needed to quantify the influence of:

- Asphalts viscoelastic parameters
- Axle loads and configurations
- Traffic parameters (speed, density, lateral wander)

on ***asphalt layer rutting performance.***

The goal is the implementation and demonstration of viscoelastic rutting deterioration model, PEDRO, to provide the industry with a tool suitable to be used in PMS systems for better planning of maintenance needs.

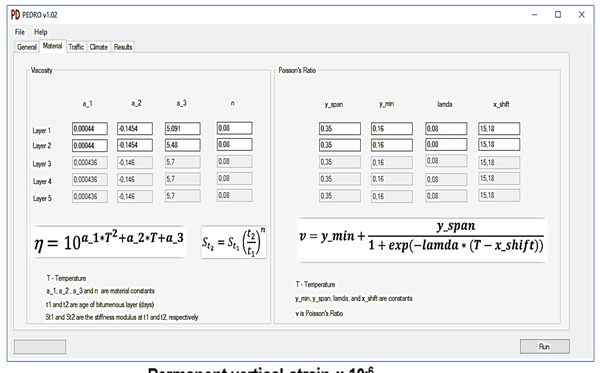


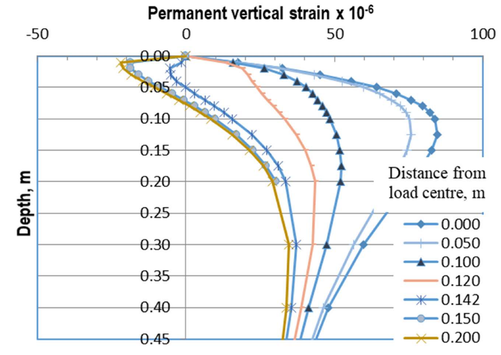
MODEL

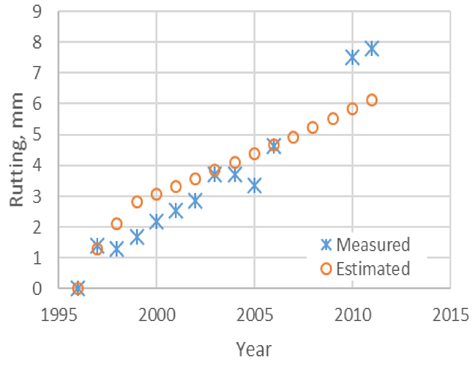
The model is based on measured viscoelastic parameters of asphalt mixture (sweep shear test)

Two components, representing the primary and secondary phases to distinctly predict the effect of densification and shear flow.

Input parameters: the viscosity of the asphalt mixture, hourly traffic volume, traffic loads, speed and lateral wander, hourly climate data, and the thickness of the bituminous layers.



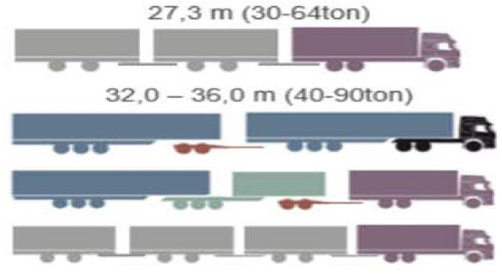




EXPECTED PROJECT OUTCOMES

- Analytical tool for flexible pavements rutting performance prediction implemented and available for industrial use.
- Mechanics-based decision support tool for pavement construction and maintenance relating the expected rutting performance to both structural and material properties.
- The model can be used to quantify the effect of traffic and vehicle parameters (axle configurations, tire type and inflation pressure, etc.) on the pavement damage induced:

In particular, new tire types and truck designs:



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