Incorporating Safety in Maintenance Need Forecasting

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Traditional pavement deterioration models used for predicting how pavement condition varies over time in response to climate and traffic, such as incorporated in the World Bank's "The Highway Design and Maintenance Standards Model (HDM)," have been derived from data pertaining to road lengths 300 m or greater as this is representative of a typical pavement treatment length. In contrast, modelling of skid resistance and macrotexture is driven by the need to determine to within a year when the surfacing of a short section of road between 10 m and 100 m length breaches specified threshold values. In other words, for skid resistance and macrotexture modelling, emphasis is on predicting "end of life" rather than "whole of life." This is made more difficult by the fact that, on average, no more than 3.5% by length per year of New Zealand's state highway network has either skid resistance or macrotexture that is equal to or below the threshold value.

Therefore, the amount of relevant data available to develop and validate skid resistance and macrotexture "end-of-life" models is miniscule compared to "whole-of-life" pavement condition models.
Furthermore, in order to be of use for budget forecasting purposes and for identifying where asset preservation and safety related works overlap, the prediction of threshold breaches needed to be as accurate as possible, with the number of "false" positives kept to a minimum. As a consequence, the skid resistance and macrotexture models need to offer the best compromise between length of state highway network where the threshold value is breached (the quantity of safety works required), and the individual road sections requiring treatment. This requirement guided the way the modelling was approached.

The resulting models for predicting skid resistance and macrotexture will be presented, along with their validation.