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# Field skid resistance and macrotexture performance: from early life to long-term relationship

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Driving safety has been connected with pavement skid resistance and this is the reason why pavement maintenance is mainly triggered by functional characteristics as skid resistance. Macrotexture is another functional characteristic being also one of the main contributors to skid resistance. So far, many laboratory studies have been conducted trying to find a relationship between them, but their findings cannot be extrapolated in the field. As in field, skid resistance faces many challenges due to its multi-parametric nature. As such, research efforts have been devoted to deal with challenges of field data interpretation with respect in skid resistance and macrotexture evolution over time. The former characteristic encompasses two distinct variations, namely seasonal variation within a year and yearly variation during an asphalt pavement's service life.

First, this study aims to present the seasonal variation effect on skid resistance within the years of the investigation. An overview of field data under the effect of seasonal variation is presented and it is spotted out that seasonal variation is quite significant and can severely skew skid resistance data if not compensated for. In addition, based on the field data it becomes obvious that seasonal variation effect gradually becomes less pronounced as skid resistance level reaches a low value. Second, this study aims to present and analyze the yearly deterioration of skid resistance and macrotexture by utilizing field data from open-graded pavements of highways. Yearly deterioration is investigated mainly focusing on the cumulative traffic effect that passes over the pavement sections, for over a decade.

It seems that cumulative traffic leads to a diverse skid resistance and macrotexture trend. However, the findings of this research provide evidence that cumulative traffic, albeit being critical for skid resistance and macrotexture relationship, is not the only determinant factor. As pavement sections with low traffic volume but different climatic conditions have proved to present a diverse change too, in skid resistance and macrotexture levels over the years. Also, another point to highlight is that many variations continually occur in the field, affecting the way that macrotexture influences skid resistance levels; hence, it becomes infeasible to use macrotexture measurements for developing easy and safe models in order to limit skid resistance measurements, considering the variances amongst the devices.

All in all, field skid resistance and macrotexture measurements should be included in the pavement monitoring program and are proved to be important beyond the modeling approaches which seem to be insufficient for long-term field studies. Thus, pavement engineers could analyze and react based on the collected data and limitations of the utilized monitoring devices.

Keywords: skid resistance; macrotexture; pavement monitoring; long-term performance; GripTester; Laser Profiler; British Pendulum; Sand Patch