

Editorial

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Pavements are ground bearing structures, designed, constructed and maintained to carry traffic loading and to provide good ride quality to road users during their design life. Development in innovative materials and pavement construction and maintenance techniques has been a key to improve agency and users' cost and to provide sustainable transport infrastructure.

This themed issue of *Transport* on pavement engineering comprises a briefing note and five papers. They detail practical research, pavement assessment and materials development to help pave the way for future transport infrastructure sustainability. The papers cover the successful introduction and use of French asphalts into UK airfields; pavement surface defects' impact on driver's lane-changing behavior; premature asphalt surface ravelling due to aggregate contamination; steel-fibre-reinforced concrete use for ground slabs; short concrete slab recommendations to improve ride quality; and finally, airfield pavement performance over saline soil.

Bonney *et al.* (2018) describe the successful introduction of French asphalt mixtures as viable alternatives to conventional UK airfield materials. *Bétons bitumineux pour chaussées aéronautiques* (BBA) surfacing and *enrobé à module élevé* (EME2) base were considered. The BBA asphalt surfacing was initially used in the UK in Sumburgh, Tiree, Isle of Man and Jersey island airports, followed by Manchester, London Southend and Birmingham airports. The authors propose a design methodology and highlight the pavement thickness benefits compared with conventional materials for new and rehabilitated airfield flexible pavements. They also assess the use of a stress-absorbing membrane interlayer (Sami) to mitigate the risk of reflective cracking in composite pavements.

Aydin and Topal (2018) describe factors affecting driver's lane-changing behaviour, such as lane configuration, driver characteristics and road surface condition. They use the logit regression model (LRM) to determine driver's lane-changing behaviour, for data collected from two different cities and four different road zones in Turkey. They conclude that pavement surface deformation is the main factor affecting lane-changing behaviour, particularly for passenger cars.

You *et al.* (2018) carried out an investigation to assess possible reasons for premature dense asphalt surface failure. Recently constructed road pavements in China exhibited surface raveling due to poor bond between aggregates and binder. Laboratory testing of core samples revealed compliance with specification and no evidence of design- or construction-related issues. However, X-ray diffraction tests indicated the presence of aggregate contamination with expansive clay such as illite and kaolinite. The authors conclude the main cause of lack of asphalt/aggregate adhesion, which led to premature ravelling failure, is presence of expensive clay. They recommend revising the materials specification to control crushed stone contamination.

Aldossari *et al.* (2018) investigated the effect of steel-fibre and concrete strength on ground slab performance. They carried out laboratory testing on full-scale 100 mm thick 3 m × 3 m precast concrete slabs to determine their load-bearing capacity. They report good agreement between the measured maximum loads/displacements and the theoretical model predictions. They demonstrate that adding 60 kg/m³ of hooked-end steel fibres significantly increases the load-carrying and displacement capacities, changes the mode of failure from brittle to ductile, reduces cracking on the bottom and top surfaces of the slab and allows a significant reduction in slab thickness. However, increasing the steel-fibre-reinforced concrete strength marginally improves the load-bearing capacity post first cracking point.

Pradena and Houben (2018) proposed, constructed and tested small concrete slabs in Chile, to reduce slab curling/warping which lead to high-load-induced stresses and improve ride quality. Pavement profile measurements using walking profile and international roughness index (IRI) were performed at different times of the day over two slab tracks. The results indicate satisfactory performance of the short slab in terms of stability, ride quality and users' experience.

Saline soil which contains a certain amount of soluble salts is widely found in the north-west of China. Pavements

constructed over such soil experience different modes of deterioration due to soil volume change as a result of water, temperature and humidity variations. Zhang *et al.* (2018) investigated the performance and mode of failures of airfield concrete pavements constructed over saline soil. They observed blow-up, faulting, slab cracking and black spots as the main modes of failure, which they attributed to the subgrade, cement-stabilised base and concrete surface being subjected to different levels of sulfate and chloride attack. The authors observed, based on their experiment, an increase in soil salt-heaving pressure with increase in soil dry density, sodium sulfate and water content. The stabilised base compressive strength decreased as the sulfate and chloride salt reached threshold values of 0.3% and 0.2%, respectively. The concrete slab flexural strength and modulus of elasticity are also affected by sulfate content.

Finally, I hope you enjoy reading the interesting technical papers, which cover performance assessment of asphalt and concrete pavement materials, as well as impact of saline subgrade soil on pavement deterioration.

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