Case Study

Effectiveness of Asphalt Materials Used on the Strategic Road Network (SRN)

Year: 2013-2014
Location: UK
Client: Highways England, Eurobitume UK

Summary

TRL undertook three research tasks on behalf of the Collaborative Research Programme funded by the Highways Agency, Mineral Products Association and the Refined Bitumen Association. Three groups of technologies were explored that had the potential to improve the efficiency of use of asphalt on the Strategic Road Network:

- Lower-temperature Asphalts
- RFID tags
- Joint Repair Systems
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The Challenge

Lower-temperature asphalts (LTA) typically offer appreciable carbon savings when compared to conventional asphalt alternatives. Historically, these materials had limited uptake on the UK network, despite being used extensively in the United States. The challenge was to successfully demonstrate use of an LTA on the high speed network, evaluate the benefits, mitigate any shortcomings and encourage uptake in the most effective way, based on the findings of the research and lessons learnt from successful implementation in other countries.

Radio Frequency IDentification (RFID) tags potentially offer the ability to store and link information about construction materials in situ in the road pavement. Having the ability to recall exact information about each material laid when evaluating performance at a later date offers great potential to enhance the durability and recyclability of materials over time.

The aim of this task was to trial use of RFID tags on the network and recall information using a suitable detector fitted to survey vehicles that were already in use.

Excessive fretting within the proximity of longitudinal joints is commonly observed in thin surface asphalt courses, despite the remainder of the course remaining serviceable. The challenge was to find a technology that could repair joints, thereby enhancing the longevity of the surface and avoiding the need for its premature replacement in entirety.

All three tasks required TRL to work closely with the asphalt sector, and within the Highways Agency’s specifications, to implement the trial solutions and determine viable pathways to implementation.

Our Approach

The Collaborative Research Programme was managed by TRL. Our experts led the technical input into all three tasks and our strong sector presence facilitated the collaboration with industry. Our presence on international committees and working groups gave the necessary scope for knowledge to be gathered from asphalt specialists worldwide, in order to provide state-of-the-art solutions to our clients.
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The specialist monitoring and imaging equipment we provided was essential for conducting the research.

The Results

The demonstration of lower-temperature asphalt on the Strategic Road Network was a success. Our close monitoring of the procedures involved, in relation to the quality standards that needed to be met, allowed some clear messages to be drawn to facilitate greater and more successful take-up of LTAs in the future, giving industry the potential to further reduce its carbon emissions.

The pilot trial involving the addition of RFIDs into asphalt mixtures and their ability to be detected in situ in the road pavement demonstrated their potential, yielding possibilities for more informed asset management in the future.

Exploratory research into crack repair techniques determined the most appropriate technology to be trialled on the network and outlined appropriate test conditions in which to undertake a trial.

DATA:
- TRL has a 60-strong team of experienced pavement specialists with expertise in design, products and durability.