Trial of additives derived from waste plastic in highways surfacing, Penrith and Nenthead, Cumbria

Project case study

Product

Hanson asphalt containing Shell Bitumen LT R and Shell Cariphalte AgeSafe

Volume

450 tonnes of asphalt containing Shell Bitumen LT R; 340 tonnes containing Shell's Cariphalte AgeSafe bitumen; and 300 tonnes of standard product

Client

Cumbria County Council

Overview

Hanson worked closely with Cumbria Council and Shell Bitumen to trial the use of additives derived from waste plastics in highways surfacing to reduce environmental impact and improve durability.

Project description

Cumbria County Council is investigating the sustainability and suitability of using additives derived from waste plastics as part of a highways surfacing programme and part of the ADEPT (Association of Directors of Environment, Economy, Planning & Transport) SMART Places Live Labs programme.

Cumbria's project is aimed at reducing the carbon footprint of highways schemes and providing a more resilient road network. It is one of eight local authorities across the country to be selected as part of the Live Labs programme, a £22.9 million initiative funded by the Department for Transport (DfT) to carry out real world tests using new highways technology and methods on local roads to create value and reduce waste.

Hanson has been working with Cumbria County Council on the Live Labs project for around two years. As part of the project, Hanson is trialling Shell Bitumen LT R, which uses a chemically modified waste plastic to make it compatible with bitumen, without compromising performance. As well as developing a beneficial use for plastic at the end of its life, Bitumen LT R is designed to work at production and laying temperatures up to 30°C lower than conventional asphalt, helping to lower carbon emissions through reduced energy use during asphalt production. It is also able to be recycled back into new asphalt at the end of its life.

In addition, Hanson is also trialling Shell's Cariphalte AgeSafe bitumen, which incorporates an additive designed to improve the longer-term performance of asphalt mixtures by slowing the ageing processes of the binder to prolong the lifetime of the road.

The trials are taking place over three sites in Cumbria – two in Penrith and one at Nenthead in the North Pennines →

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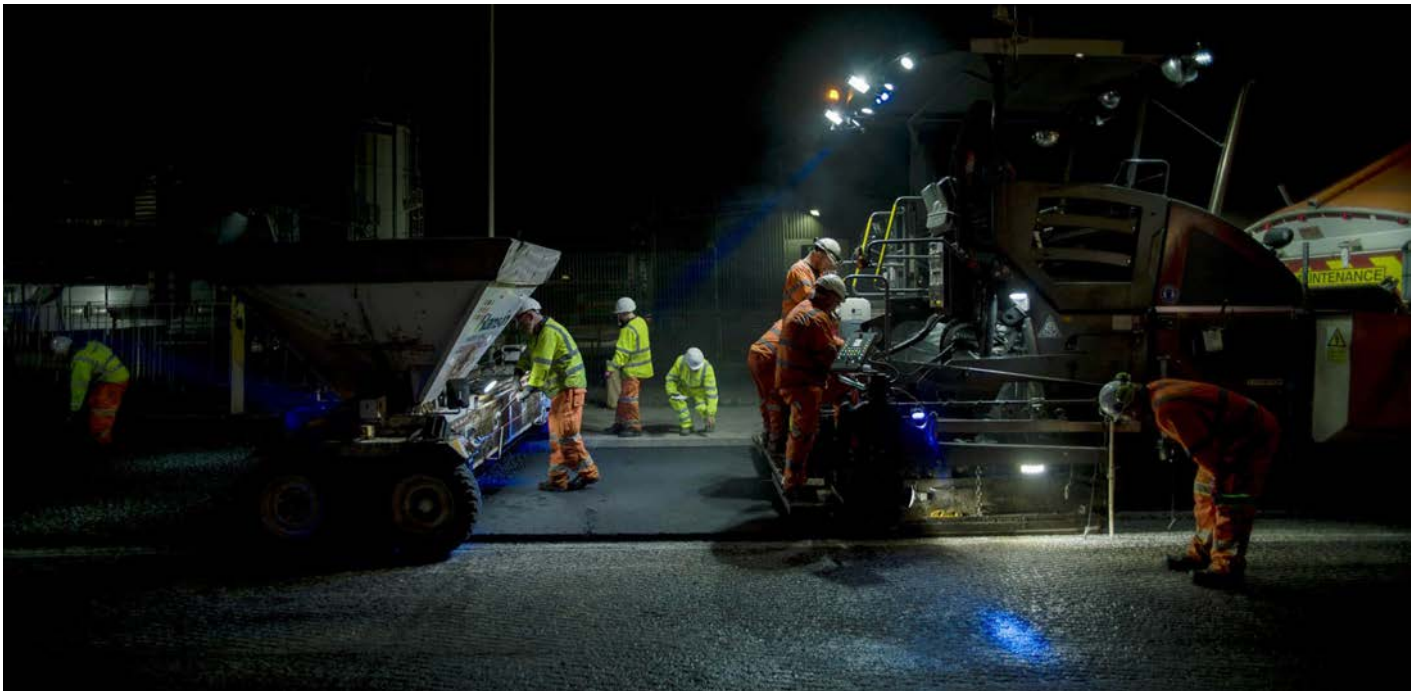
Carbon reduction



– as well as Hanson's office in Penrith, where future coring and testing can be undertaken at regular intervals over the coming years to determine the reduction in ageing of the asphalts. The diverse trial settings will provide comprehensive performance results.

The three asphalt mixtures were produced at Hanson's Shap asphalt plant in Penrith. In total, 450 tonnes of Shell Bitumen LT R and 340 tonnes of Shell Cariphalte AgeSafe was laid along with 300 tonnes of standard product as a control. Cllr Keith Little, Cumbria County Council Cabinet member for Highways and Transport, said: "The highways industry does have a significant environmental impact in terms of carbon footprint and it's important we seek new and innovative ways to mitigate this impact. Using waste plastic in the road surface is something that we're very keen to support. Cumbria County Council is pioneering the use of waste plastic material in our highways and we're delighted to be the first in Europe to trial Shell Bitumen LT R through the ADEPT Live Labs programme.

"I look forward to seeing the results of this trial taking place here in Cumbria on the A689 at Nenthead."