

“This trial sets a blueprint for low carbon delivery on the strategic road network and the exacting requirements of decarbonising every element of highways maintenance. It demonstrates how shorter, more focused use of road networks can improve efficiency, boost productivity and minimise nighttime closures, reducing disruption for road users.”

Brian Kent, national technical director A&A at Tarmac

# Solutions

## Sustainable Construction

### *UK's lowest carbon resurfacing scheme*

A cutting-edge trial on the A64 has delivered the UK's lowest carbon resurfacing scheme on the strategic road network without using carbon offsetting. Tarmac and National Highways, together with supply chain partners, successfully reduced carbon emissions on the project by 75% compared to a traditional maintenance project of a similar scale, with more than 260 tonnes of carbon savings delivered.

The trial – the first of its kind on the strategic network – was delivered on a 1.5 mile section of the A64 eastbound carriageway at junction 44 near Bramham in North Yorkshire. Over a seven-day period the team, including HW Martin, Premier Roadmarkings, Kier and Mway Comms, combined an extensive range of innovative low carbon materials, paving technology and plant equipment to deliver the significant carbon savings.

Overall, 41.3% of the project's carbon reduction total was delivered using low carbon raw materials, 14.7% from the transport of materials and the paving process, including the use of electric plant equipment, and 44% from employing sustainable manufacturing techniques.

A warm mix asphalt was used together with a pioneering 'carbon sink' bio-component binder from Shell, which locks carbon into the road to prevent it being released into the atmosphere. The lower layer of the pavement used 40% recycled asphalt planings (RAP) with a further 20% in the surface course to help reduce the need for primary materials.

A number of zero emissions plant vehicles and prototypes were used including electric and hybrid road rollers and an electric bond coat sprayer, minimising noise and further reducing tailpipe emissions as well as CO<sub>2</sub>. Tarmac's Cross Green asphalt plant in Leeds, which manufactured many of



the materials used on the project, was powered by a combination of biofuel and clean electricity.

Other construction methods adopted on the scheme delivered significant benefits including enhanced pavement life and a smooth, high-performance surface. This was achieved through continuous paving using an 'echelon' paving method, where asphalt is laid across the entire road surface rather than in lanes, to remove the joints between them.

Eliminating joints reduces water infiltration into the road surface, which results in a more durable road that is expected to last more than 20% longer than those constructed with conventional surfacing methods. It also requires less maintenance, reducing operational carbon in the longer

term. In addition, the increased smoothness of the surface improves ride quality which reduces fuel consumption, therefore lowering associated emissions and particulates from vehicles.

In addition, a small 150m section was implemented with all of the above technologies, a standard penetration binder and a small percentage of negative carbon aggregate, facilitating the landmark achievement of the UK's first net zero pavement.

The sharing of vital learnings and expertise from this project will help the supply chain collectively adopt new approaches and tackle the sector-wide challenge of decarbonisation.