

# Reducing the highway footprint

ROAD RECYCLING MAKES ENVIRONMENTAL SENSE BUT ADD IN THE CARBON EMISSIONS CALCULATIONS AND IN-SITU RECYCLING HAS A STRONG CASE, ACCORDING TO STABILISED PAVEMENTS' *GERRY HOWE*

**S**ustainability targets are no longer just giving companies ideals in terms of the percentage of recycled material that should be used in their products, but set real figures for reducing emissions. The road surfacing sector is no different and lowering its carbon footprint while improving recycling is becoming a high priority in almost every country, both at local and national level.

"The need to reduce carbon dioxide emissions has become a real driver for the uptake of in-situ road recycling techniques," said Stabilised Pavements director Gerry Howe. "Carrying out the recycling on-site means that there is no haulage of material to and from the site - effectively the road is a linear quarry - so that means significantly less transport is needed and therefore the carbon dioxide levels are lower."

According to Howe, a recent resurfacing project for the East Riding of Yorkshire Council in the UK saved 51 tonnes of carbon dioxide by using in-situ recycling compared to the emissions associated with a conventional resurfacing scheme. Under the project, the company used its in-situ techniques to repair a 2.8km section of the B1228 at Brind.

"The in-situ repair has a 20 year design life and also proved to be far less disruptive to local traffic as it was much faster and considerably cheaper than ex-situ recycling or resurfacing with primary aggregates," said Howe. "Recycling in-situ was considered as the best of the three options as the technique produces a massively lower carbon footprint and contributes to a reduction in energy, fuel and material consumption."

"A large proportion of the 51 tonnes of savings in carbon dioxide emissions between recycling and resurfacing comes from the different methods of producing the base course. During the cold recycling process emissions are reduced as a result.

The council estimates that the in-situ approach saved around £170,000 in costs, as well as removing the need for about 550 20tonne lorry movements and cutting the timescale from 12 weeks to six.

"It is the reduced carbon footprint potential that is helping to convince some authorities that had previously favoured ex-situ techniques to take another look at in-situ methods," said Howe. "In-situ techniques were first used in the UK about 30 years ago, and were widely used elsewhere in Europe before that. Local authorities were initially very receptive to the technology and a number of specialist recycling companies emerged.

"Then some of the larger road contractors started to buy out these smaller specialists and the price started to creep with the need for higher margins. This combined with a few people promoting the greater quality of control led the industry to move more towards ex-situ methods.

"I don't believe that there was ever a problem with the quality of in-situ recycling and we now have a number of projects that have stood the test of time to prove the technique works. In addition, bitumen technology and mix design has further improved in recent years, which with the carbon dioxide emission issues, strengthens the case for in-situ methods."

European in-situ techniques have long used thinner layers than in the UK and Howe believes that this is key to wider use of the method. "Traditionally layers were always thicker in the UK and other countries in Northern Europe to help the surface cope with the wider changes in temperature over the course of the year," said Howe. "But by altering the design of the mix to focus on elastic strength rather than on compressive strength, it is possible to create a thinner recycled layer."

One of the ways in which Stabilised Pavements is working to improve the design has also helped to reduce the embodied carbon dioxide. "Mixing the material to be weaker over a longer period and reducing the thickness means using less cement, which is one of the highest contributors of carbon dioxide to the technique," explained Howe. "We also routinely add pulverised fuel ash - PFA - which is itself a secondary material.

"Despite all the benefits, some authorities are still not making best use of in-situ recycling techniques," said Howe. "But hopefully the need to reduce carbon dioxide emissions will convince them that in-situ methods can not only help them meet sustainability targets but also deliver quality road surfacing too." ■

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*Gerry Howe*

**In-situ recycling reduced carbon emissions by 51 tonnes compared to other techniques on one 2.8km long scheme**

