



↑ Operatives work beside a paver receiving rejuvenated material from a conveyor attached to a Wirtgen machine directly in front

Cold recycling first for North East

First use of a pioneering in situ cold recycling road renewal method on the A1 in Northumberland has the potential to challenge hot mix highways maintenance. Jackie Whitelaw reports.



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Graeme Watt

October will see the latest outing on the English strategic road network for a road refurbishment technique that is new to the UK but may become standard practice nationwide.

The cold recycling system employed by contractor A-one+ in Highways England's Area 14 in the North East could be described as an example of genuine innovation in UK road maintenance. It is one of the early successful outputs from Highways England's challenge to contractors to find £1.2Bn of savings to set against the £15Bn currently being spent on its network.

Cold repave is a form of road rehabilitation which simultaneously removes the old road material, regrades the retained asphalt

product and treats it with new emulsion. Material is placed in to a tracked paving machine which lays it to the correct line and level.

This is all done at bitumen emulsion temperatures of 25 to 30°C compared to the traditional new material delivered at 130°C, making it safer to work with and helping reduce fumes and emissions. The process is popular in the US, Europe and China – but the contractor says that the work carried out in the North East is the first of its kind in Britain.

An initial trial of the technique on 8.4km of lane carriageway on the A1 Felton Bypass in June led to 11,000t of recycling being completed in 10 working days, compared to an average of 350t per 10 hour shift using conventional methods.

Other results beyond a 70% increase in daily outputs included 40% cost savings and a 33% reduction in carbon emissions. There was also a 75% reduction in quarried stone, a 66% reduction in waste taken to landfill (100% if you count using old surface material for new farm tracks alongside the trace of the projects) and 70% fewer lorry movements.

First formal use of in situ cold recycling (see box, page 16) took place in August on 1.5km of road at Brownieside, also on the Northumberland A1. This month the technique will also be used on the A66M. The projects so far have recycled the carriageways to depths of 160mm but the process can go to 200mm.

It was Highways England's '1000t challenge' to its contractors to find ways of carrying out 1000t of resurfacing in a single shift that encouraged A-one+ to rethink traditional practice. Now with the early trials complete the firm is aiming to achieve 2000t of renewal in a 10 hour shift.

"We hit the 1000t target by stretching what we do conventionally," says A-one+ Area 14 asset manager Graeme Watt. "But we needed a lot more resource – more people, more trucks and the pace of work was not safe or sustainable for our operatives."

"By 'throwing the kitchen sink at it' we did provide efficiency in terms of the amount of carriageway resurfaced but only saved less than £100,000 on a £1.6M scheme. Clearly we had to think completely >

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> differently and look at how to reduce the use of imported aggregates and hot mix as well as a way to increase productivity.”

The answer came with the help of planing contractor Lane Rental Services, whose boss Mike Reay came forward with the idea of a technique used in Europe that could be employed on the English strategic road network – cold recycling.

“We went to see Wirtgen cold recycling in use in France and then discussed the next moves with Highways England, saying we would pursue the technique if it could provide the Departures from Standard that would allow us to use it,” Graeme Watt says.

These came swiftly in the course of just 10 months. “From October 2015 to February this year we had a number of meetings with Highways England’s technical specialists along with Lane Rental Services, Paving Testing Services and Wirtgen to develop and agree the departures,” he adds.

There was also a visit to Orlando in the US to see the technique in action and understand the contracting issues which gave everyone the confidence to go ahead. Then the planning contractor put in an order for the Wirtgen equipment which was delivered to the UK in June for the first trial.

This was where the investment demonstrated its value. Under the watchful eyes of Highways England, A-one+ and Wirtgen experts from Germany and the US, including European head of recycling Walter



↑ Engineers check road depth

Gruber, the CR3200 machine successfully resurfaced 4.2km of dual carriageway over 10 shifts. Costs were cut from £2.24M to £1.2M.

“And we got a depth of repair that would never normally have made it into the budget,” Graeme Watt says.

According to Lane Rental Services managing director Mike Reay “the old road becomes new road in one pass of interlinked equipment.”

Completion of the renewal is followed by application of a new thin surface course.

One lesson from the trial for the follow up Brownieside scheme was to spray the surface with cement before the machine passed to help absorption of water to aid compaction. “When we saw the

technique in the US they didn’t need the cement but they were operating in 30°C heat which is not so common in Northumberland. We need a bit of help here to drive the water out,” Graeme Watt says.

The technique is gaining a degree of favour within Highways England, he believes. Highways England project manager for the Brownieside job Steve Bishop is an enthusiast.

“There are lots of benefits to using this new way of working,” he says. “It means we can resurface larger areas of road, there are fewer construction vehicle trips and the road surface is designed to last for at least 10 years.

“The means that we shouldn’t need to go back to carry out further repairs any time soon meaning less disruption for drivers.”

↓ Milled material is deposited into the paver



New machine makes easy work of road renewal

Cold recycling carried out in Northumberland makes use of a £1.7M Wirtgen CR3200 road recycler.

The process of renewal involves stripping off the top course material first. Then the paver slowly drives forward, milling the rest of the old surfacing out and stripping it down to its constituent parts of hardened bitumen and aggregate.

This produces a predetermined material grading. As the material passes under the milling drum it is mixed with bitumen emulsion and a small amount of water to aid compaction. The newly graded and mixed material passes up the conveyor and into the traditional paving machine that follows behind to be laid like traditional hot mix material, but cold.

A-one+ is planning to use cold recycling for all

its Highways England work and is going on tour to explain the technique to other contractors.

Other clients are also very interested, particularly county councils which can see the potential for major savings. Many have tried cold foam mix recycling in the past but that still involves removing all the material from site and bringing it back again. Work such as this, the contractor says, has never before been done in situ.

“The best way for us to achieve the efficiencies Highways England requires is to use this technique,” Area 14 asset manager Graeme Watt says. “It is currently difficult to see how this is not the future of sustainable road maintenance on the Highways England network and beyond.”

