# A34 Southbound South Ilsley to Chieveley

Combining powerful carbon reduction solutions in highways maintenance

Heidelberg Materials

# Project overview

Heidelberg Materials partnered with National Highways on the A34 Southbound project in South Ilsley, Oxfordshire, to significantly reduce carbon emissions during highways maintenance. Leveraging local knowledge, we identified the A34 as a prime opportunity to push the boundaries of recycling, carbon reduction, and circular construction methodologies.

The A34 Southbound scheme required extensive resurfacing, and Heidelberg Materials seized this as an opportunity to integrate innovative low-carbon solutions into pavement construction. By meticulously planning the scheme, we sought to showcase the latest advancements in sustainable road construction through the application of a range of technologies which blended recycled materials, warm-mix asphalt, and biogenic asphalt,

**On this project, we achieved**

UK's first scheme blending warm-mix asphalt, biogenic bitumen, and high recycled content on the SRN, proving the potential to combine low-carbon solutions to drive greater $CO_2$ reductions.

# Key highlights

- 50% Recycled Asphalt Pavement (RAP) in the binder course, and 30% RAP in the surface course, reused from the same site, minimizing reliance on virgin materials.
- First use of biogenic asphalt (CarbonLock) with ERA 140 warm-mix asphalt on the UK SRN, contributing to a 20% reduction in $CO_2$ emissions.
- Planings from the A34 were backhauled to our local recycling center and reprocessed for relaying, reducing material transport distances and emissions.
- Warm-mix asphalt applied in compliance with Clause 942 standards, further minimizing the carbon footprint.


**On this project, we achieved**

A fully circular approach to material recycling and minimising vehicle trips.

# Sustainable innovation in action

The crux of this project's innovation lies in the combination of three key levers to reduce emissions in highways maintenance – high RAP content, warm-mix asphalt, and biogenic binder, offering a substantial reduction in $CO_2$.

## Circular solution with high RAP content

The project achieved a circular economy approach by using the planings from the A34 itself. Our technical team leveraged our knowledge of the high 60 PSV aggregate in the existing carriageway surface and designed bespoke asphalt mixes containing 50% RAP in the binder course and 30% RAP in the surface course, enabling a fully closed-loop recycling system.

This minimised carbon emissions by 7kg per tonne of asphalt, while also reducing vehicle trips and virgin material consumption.

## Warm mix asphalt

This project made use of our ERA 140 Warm-mix asphalt product which, by producing the asphalt at a lower temperature, reduces embodied carbon emissions from production by 15% compared to traditionally hot-mixed asphalt.

## Introduction of CarbonLock biogenic asphalt

The A34 project saw the use of CarbonLock bio-asphalt, which incorporates biogenic bitumen derived from renewable sources. This asphalt has the capability to lock in up to 6 tonnes of $CO_2$ per kilometer, offering an additional 20% reduction in $CO_2$ emissions on the scheme. Moreover, biogenic asphalt's durability ensures fewer maintenance interventions, contributing to further whole-life carbon savings.

## Sustainable construction by design

By engaging National Highways in ECI discussions well in advance of the scheme, all options were discussed to maximise efficient outputs and opportunities for the Road User and local economy. By maximising weekend closures the works were delivered across four weekend closures over four months, delivering in excess of 12,000t of material, as opposed to 30 consecutive night shifts, saving significant amounts of carbon emissions by reducing vehicle movements across the network.

# Environmental benefits and outcomes

The combined use of high RAP content and biogenic asphalt significantly reduced carbon emissions both during construction and across the project's lifecycle. Through careful planning and the integration of sustainable practices, Heidelberg Materials delivered the following key benefits:

## Reduced $CO_2$ emissions

The combination of using a highly-recycled solution, incorporating both warm-mix asphalt and CarbonLock biogenic asphalt, resulted in an overall carbon saving of 35% compared to a hot-mix asphalt solution.

## Reduced transport emissions

Material planings were backhauled to one of our local recycling facilities at Sutton Courtney, Oxfordshire, and processed into new asphalt, reducing vehicle trips and reliance on virgin materials.

## Extended pavement lifespan

The high durability of CarbonLock asphalt ensures fewer future maintenance requirements, leading to ongoing carbon reductions throughout the road's lifecycle.

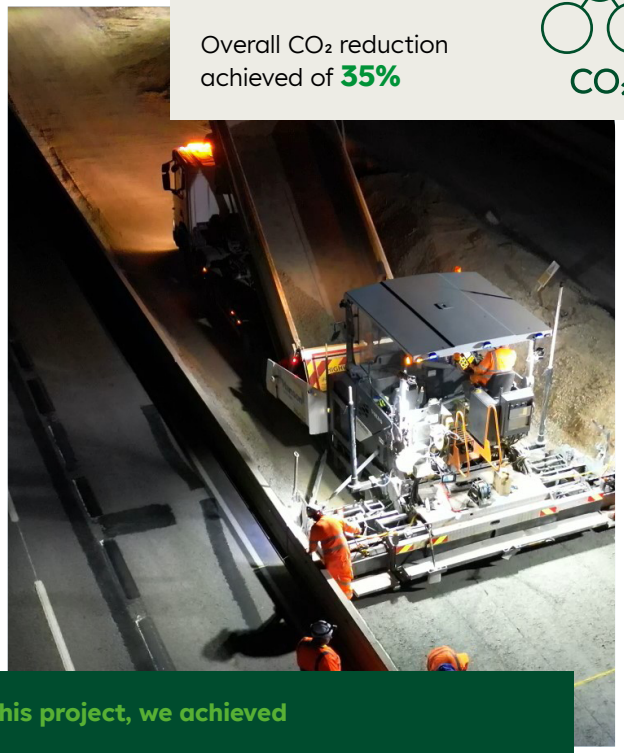
## Lasting impact on the highways sector

This project has set a new standard in sustainable road construction, providing a blueprint for future low-carbon maintenance schemes. Heidelberg Materials' innovative approach – made possible by Atkins and the National Highways SES team who assisted in the design of the solution, and enabled the various departures to be approved – demonstrates that high quantities of recycled planings can be effectively combined with new, durable materials like biogenic asphalt, proving the viability of circular economy solutions in large-scale infrastructure projects.

The success of the A34 Southbound scheme highlights the potential for significant carbon savings within the highways sector and offers a tangible example of how sustainable innovation can align with industry best practices. By reducing emissions at both the manufacturing and operational stages, Heidelberg Materials is helping to accelerate the UK highways sector's journey toward net-zero carbon.

**On this project, we achieved**

Overall $CO_2$ reduction achieved of **35%**



**On this project, we achieved**

A high-durability solution requiring fewer maintenance interventions and lower whole-life carbon emissions.

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national highways