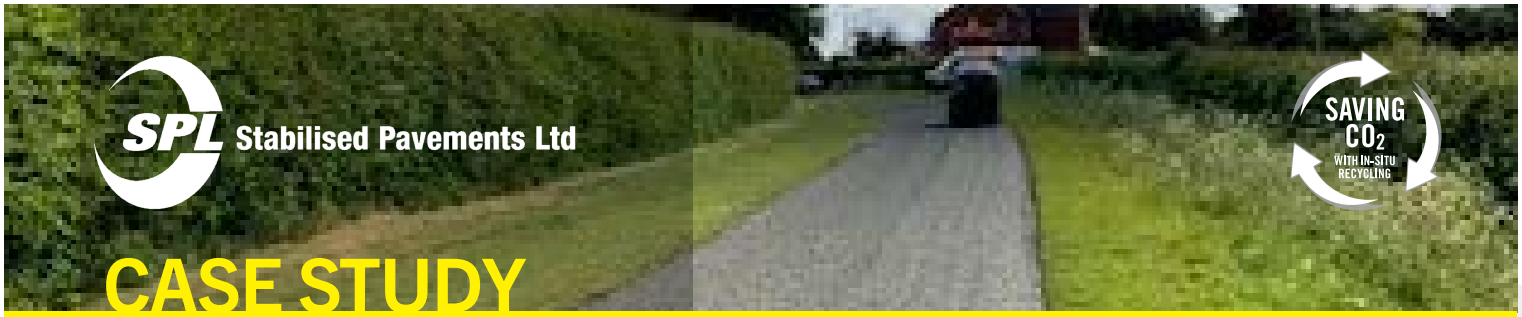
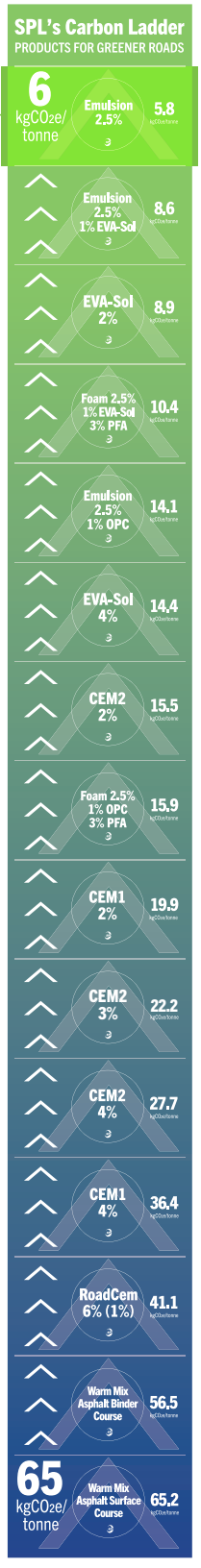


Stabilised Pavements Ltd

SAVING CO_2 WITH IN-SITU RECYCLING

CASE STUDY

Sustainable In-situ Carriageway Maintenance



1. PROJECT OVERVIEW

SCHEME	High Lane, Scrivlesby, Lincolnshire
CLIENT	Lincolnshire County Council (Lincolnshire COUNTY COUNCIL Working for a better future)
CONTRACTOR	Balfour Beatty
DATE OF WORKS	May 2025
TREATMENT AREA	5,962 m^2
IN-SITU PROCESS	In-situ Retread 125 with Emulsion
RECYCLED DEPTH	125mm
PAVEMENT TREATMENT	Recycled Materials
CO_2e SAVING	98.4 Tonnes

HISTORICAL CONTEXT:

Lincolnshire's road network has roots in Roman and medieval infrastructure, originally developed to support trade, military movement, and agricultural expansion. These roads have long served as vital arteries for economic development and regional connectivity. The High Lane project continues with this legacy by integrating modern sustainability practices into the county's historic infrastructure.

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TECHNICAL APPROACH: RETREAD 125 PROCESS

The Retread 125 is an in-situ carriageway maintenance technique designed for lightly trafficked roads.
The process involves:

- Pulverisation of 75mm – 125mm of existing surfacing to create granulated material.
- 75mm to 125mm as specified on a site-by-site basis, bearing in mind the findings of the site investigation. The depth of planing/milling is taken from the level 1m from the clean carriageway edge.
- Reworking the granulated material with approved aggregate and binder to form a new bound surface layer.
- Achieving a final reworked layer thickness of 125mm.
- Double Surface dressing with 10mm and 6mm aggregate after compaction to provide a durable running surface.

WHY RETREAD 125

Retread 125 was selected as the most appropriate treatment for High Lane due to its ability to deliver structural improvement, carbon savings, and cost efficiency within the constraints of a rural environment.
The road exhibited surface deterioration but retained sufficient underlying strength to justify in-situ recycling rather than full reconstruction.

Key benefits included:

- Minimised disruption – rapid in-situ process with minimal haulage and site traffic.
- Environmental advantages – the reuse of existing materials significantly cut CO_2 emissions and waste.
- Cost-effectiveness – avoided the need for new aggregate and asphalt, reducing both material and transport costs.
- Durability – the 125mm recycled layer provided a strong, long-term structural solution suitable for local traffic loading.
- Overall, Retread 125 offered the optimal balance between performance, sustainability, and value for money for the council's rural network.

MATERIALS AND SUSTAINABILITY

- Only clean, recycled materials such as planings and crushed concrete were used.
- Where necessary, imported materials were evenly distributed using a paver before scarification.
- Unsuitable existing materials were removed to ensure quality and performance.

This approach supports circular economy principles and reduces the environmental footprint of road maintenance.

CONCLUSION

The High Lane scheme exemplifies how modern engineering techniques can be harmonized with historical infrastructure to deliver sustainable, cost-effective road maintenance. Lincolnshire County Council and Balfour Beatty have demonstrated leadership in adopting environmentally responsible practices that preserve road functionality while reducing carbon impact.

ENVIRONMENTAL IMPACT

- Using recycled materials in the Retread 125 process for the High Lane project saved approximately 98.4 tonnes of CO_2e compared to using virgin asphalt. This figure is based on the following calculation:
- **Volume of material used:**
  5,962 m^2 × 0.125 m = 745.25 m^3
- **Mass of material**:
  745.25 m^3 × 2.4 tonnes/m^3 = 1,788.6 tonnes
- **Virgin asphalt emissions:**
  1,788.6 tonnes × 85 kg CO_2e/tonne = 152.03 tonnes CO_2e
- **Recycled asphalt emissions:**
  1,788.6 tonnes × 30 kg CO_2e/tonne = 53.66 tonnes CO_2e
- **Estimated carbon saving:**
  152.03 - 53.66 = 98.37 tonnes CO_2e