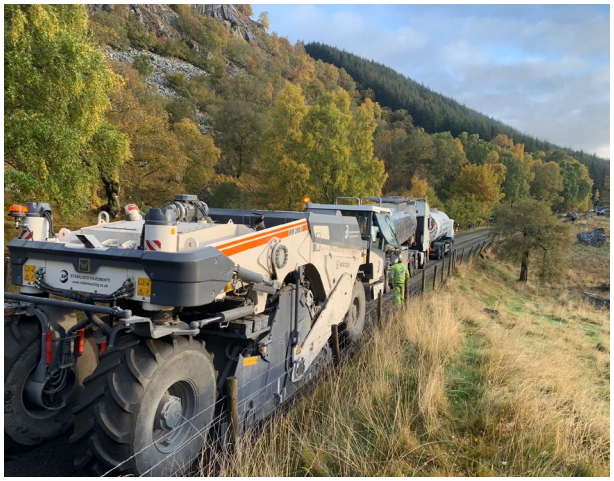
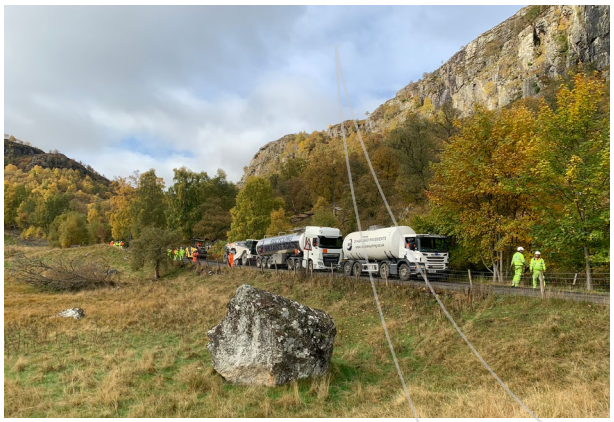
CASE STUDY

In-Situ Foam Mix Recycling

Transport Scotland achieve 49% Carbon reduction and avoid 320 vehicle movements on the A86 by recycling "In Situ"

Scheme:	**A86 Newtonmore, Cairngorms National Park**
Client:	**Transport Scotland**
Main Contractor:	**Bear Scotland**
Date:	**October 2022**
Area:	**6,157m²**
In-Situ Process:	**220mm Deep In Situ Recycling**
Surface:	**60mm Asphalt Binder & 40mm Surface Course**
CO_2 Saving:	**119 tonnes**
Tar:	**Approx. 1800 tonnes of Tar bound material encapsulated**





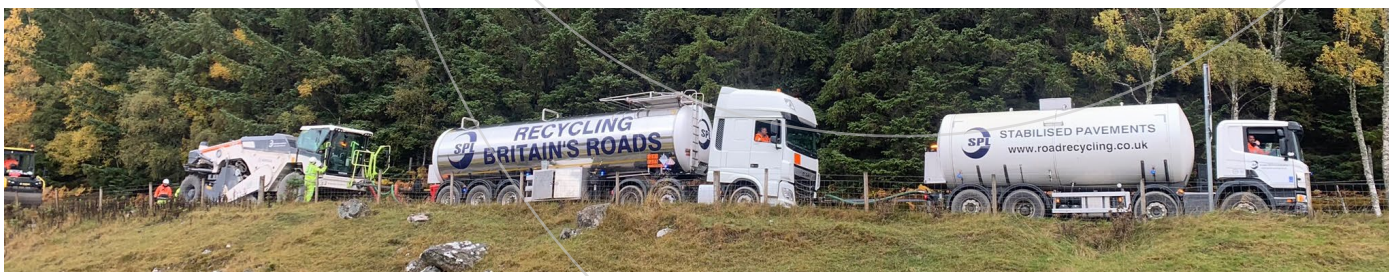
The A86 trunk road links the A9 at Kingussie with the A82 at Spean Bridge. It is important for commercial, commuter, tourist, and local traffic.

The scheme lies in a remote area on the A86 trunk road between Newtonmore and Laggan. There are a few scattered residential properties in the southern half of the scheme within 300m of the proposed works.

Located on the boundary of Cairngorms National Park and environmental sensitivities were an important consideration. The Environmental Impact Plan highlighted the considerations toward the park itself, the River Spey (100m from the site at its nearest point), and protected wildlife including Otters and Red Squirrels.

In Situ Recycling's environmental credentials include reduced vehicle movements thereby reducing the impact of traffic and associated air quality. The re-use of existing carriageway materials minimises waste and encapsulates any hazardous tar bound arisings without introducing additional aggregate to site.

Reduced construction times have positive environmental and commercial benefits, in particular lessening the impact of emissions on local air quality as well as minimising the inconvenience to the travelling public.



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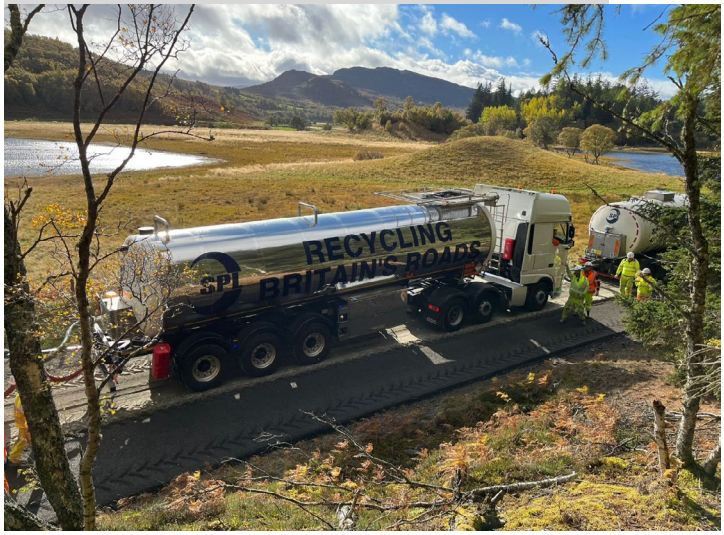

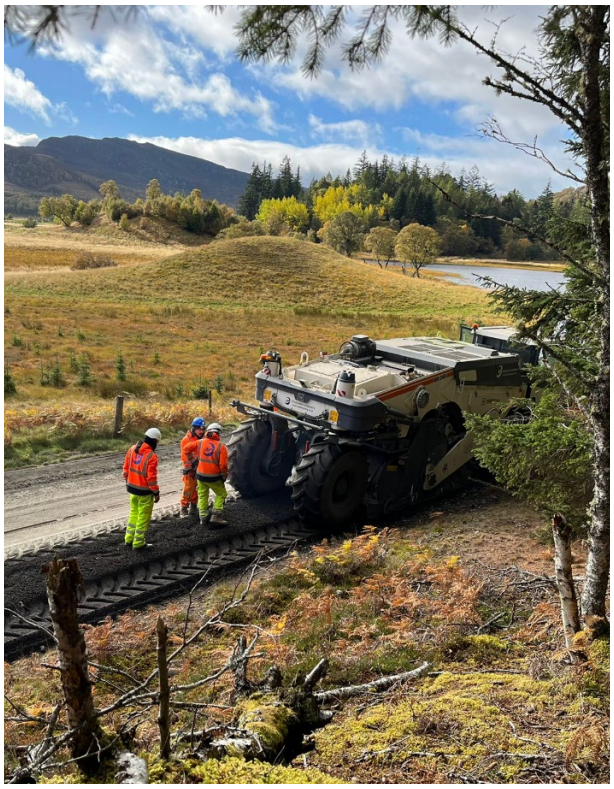

The principles of the process have made for an excellent fit for BEAR in this sensitive environment and as importantly the design selected, based on extensive trialling will create a sound and lasting platform for the surfacing of the A86.

Based on the upper layer LWD data an assumed Class 1 Foundation to be available to support the recycled layer. However, the presence of granite lumps around 200mm below the existing surface level restricted the available depth of material hence a pulverisation depth of 190mm was proposed with final mixing at 220mm.

This 220mm recycled layer consisted of a mix of existing pulverised road materials with 1% OPC, 4% PFA and 3% Foamed Bitumen. Powders were placed onto the road in measured quantities before adding a controlled quantity of water and bitumen.
The machine also draws in water to create the foam reaction within the foaming chamber.

The accuracy of the finished product in terms of design was demonstrated through a series of "as built" documents based on independent site testing of spread rates, layer thickness, PSD, Water content, In Situ density and surface modulus.

The result was a robust structural rejuvenation of the carriageway, delivered using an environmentally sympathetic process which carried a CO_2 saving of 49% over traditional treatments as well as saving 320 lorry movements to remove and replace around 3180 Tonnes of material which was recycled on site.