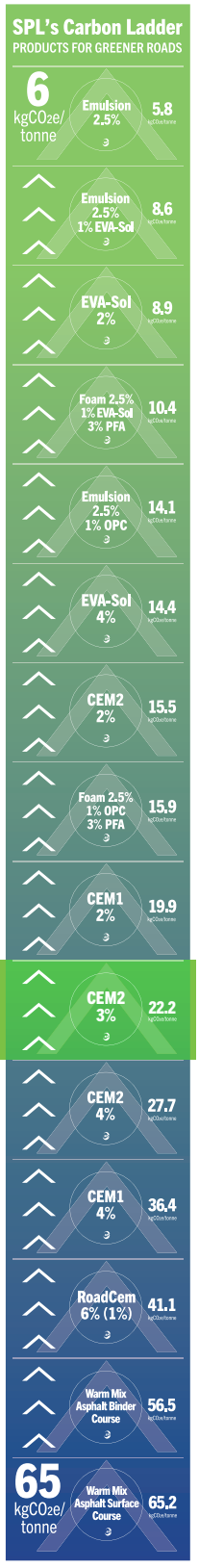
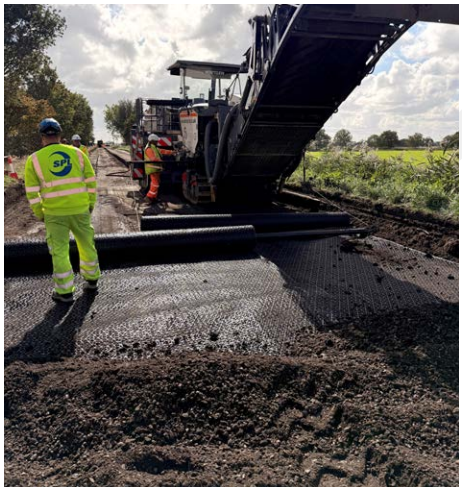
CASE STUDY

In-Situ Recycling of the A1101 Burnt Fen Turnpike





1. PROJECT OVERVIEW	
SCHEME	In-Situ Recycling and Reconstruction – A1101 Burnt Fen Turnpike, Suffolk
CLIENT	Suffolk County Council
CONTRACTOR	SPL for M Group
DURATION	22/9/25 to 26/9/25
LENGTH OF SECTION	411 linear metres (x6.6m wide)
IN-SITU PROCESS	Deep Recycling with Tensar Geogrid
RECYCLED DEPTH	~350mm
SURFACING	100mm Asphalt
CO_2 SAVING	40 Tonnes

OBJECTIVE:

To rehabilitate the existing carriageway through sustainable in-situ recycling, improving ride quality, structural integrity, and overall performance, while minimizing environmental impact.

2. BACKGROUND AND EXISTING CONDITIONS

The A1101 Burnt Fen Turnpike had shown significant surface deformation, cracking, and structural fatigue due to prolonged heavy agricultural and HGV traffic. Traditional reconstruction would have required complete removal and replacement of the pavement layers, resulting in high material costs, increased carbon emissions, and longer road closures.

To achieve a more sustainable outcome, in-situ recycling was selected as the primary treatment method, making use of existing pavement materials to form a structurally sound base layer.

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3. SCOPE OF WORKS

The works comprised the following main activities:

1. Pre-Planning for Shape and Level:

- The existing surface was planed to a depth of 100mm to correct deformations and establish the required longitudinal and crossfall profiles.
- This ensured the recycled layer would sit within design tolerances and provide a consistent base for subsequent pavement layers.

2. In-Situ Recycling:

- The existing pavement material (planed arisings and underlying bound layers) was processed and re-laid using an in-situ recycling train.
- This approach reduced material export/import and maintained the original aggregate grading and binder content.

3. Installation of Tensar HX165 Geogrid:

- Using SPL's 380Cri, a Tensar geogrid reinforcement layer was installed at 450mm below the final finished surface level.
- The grid provided enhanced load distribution, minimized reflective cracking, and improved the long-term stiffness of the recycled pavement.

4. Placement of Recycled Material:

- The recycled mix created during the geogrid installation was placed and compacted above the geogrid, forming the improved foundation layer.
- Density and moisture content were closely monitored to ensure compliance with specification.

5. Surface Course Construction:

- A new 100mm asphalt layer was laid over the recycled foundation to complete the pavement structure.
- The asphalt surfacing restored ride quality and provided a durable wearing surface suitable for both local and heavy traffic.

4. MATERIALS AND EQUIPMENT

- **Recycling Process:** In-situ cold recycling (CIR) using cementitious binder (Cem 2)
- **Reinforcement:** Tensar HX165 geogrid, installed at 450mm depth.
- **Asphalt Surfacing:** 100mm dense bitumen macadam (DBM)
- **Plant Used:**

  Planer (100mm depth)

  Wirtgen 380Cri Recycler and stabilizer unit

  Paver and roller train for placement and compaction

  Grader for shaping recycled layer

5. QUALITY ASSURANCE AND CONTROL

- Levels, moisture and compaction monitored throughout construction.
- CBR and stiffness modulus tests carried out post-compaction to verify design compliance.
- Asphalt cores and density checks completed following surfacing.
- Site supervision ensured correct placement and overlap of the geogrid.

6. ENVIRONMENTAL AND COST BENEFITS

- Material Reuse: Over 90% of existing materials were reused in the new pavement structure.
- Reduced Carbon Footprint: Significant reduction in haulage and new aggregate requirements.
- Programme Efficiency: Reduced construction time compared to traditional reconstruction.
- Sustainability: In-situ recycling supports circular economy principles and long-term pavement resilience.
- By recycling in situ over 200 lorry movements and associated disruption to local traffic was avoided

7. PROJECT OUTCOME

The completed works resulted in a smooth, structurally robust carriageway capable of withstanding current and projected traffic loading.

Post-completion inspections and performance monitoring have shown excellent ride quality and no signs of early distress.

The project stands as a model example of sustainable highway maintenance through in-situ recycling technology, demonstrating both environmental and economic efficiency.

8. KEY PROJECT METRICS

PARAMETER	VALUE
Recycled Depth	~350mm
Asphalt Overlay	100mm
Pre-planing Depth	100mm
Geogrid Installation Depth	450mm below finished level
Material Reuse	>90%
Construction Time Reduction	~30% vs. traditional method
Carbon Reduction	Estimated 40–50% (vs. full reconstruction)

COMPLETED

COMPLETED

9. LESSONS LEARNED

- Early coordination between design and site teams ensured correct grid positioning and recycling depth.
- Maintaining moisture and binder control during recycling was critical for achieving target compaction.
- Use of geogrid reinforcement enhanced the recycled layer's structural performance, reducing risk of cracking and rutting.

10. CONCLUSION

The A1101 Burnt Fen Turnpike recycling scheme successfully demonstrated how sustainable road rehabilitation can deliver durable, cost-effective results with reduced environmental impact.

The combination of in-situ recycling and Tensar geogrid reinforcement provided a long-lasting solution with minimized disruption to road users and surrounding communities.

For more information on SPL's sustainable road solutions, contact: **j.osborne@stabilisedpavements.co.uk**