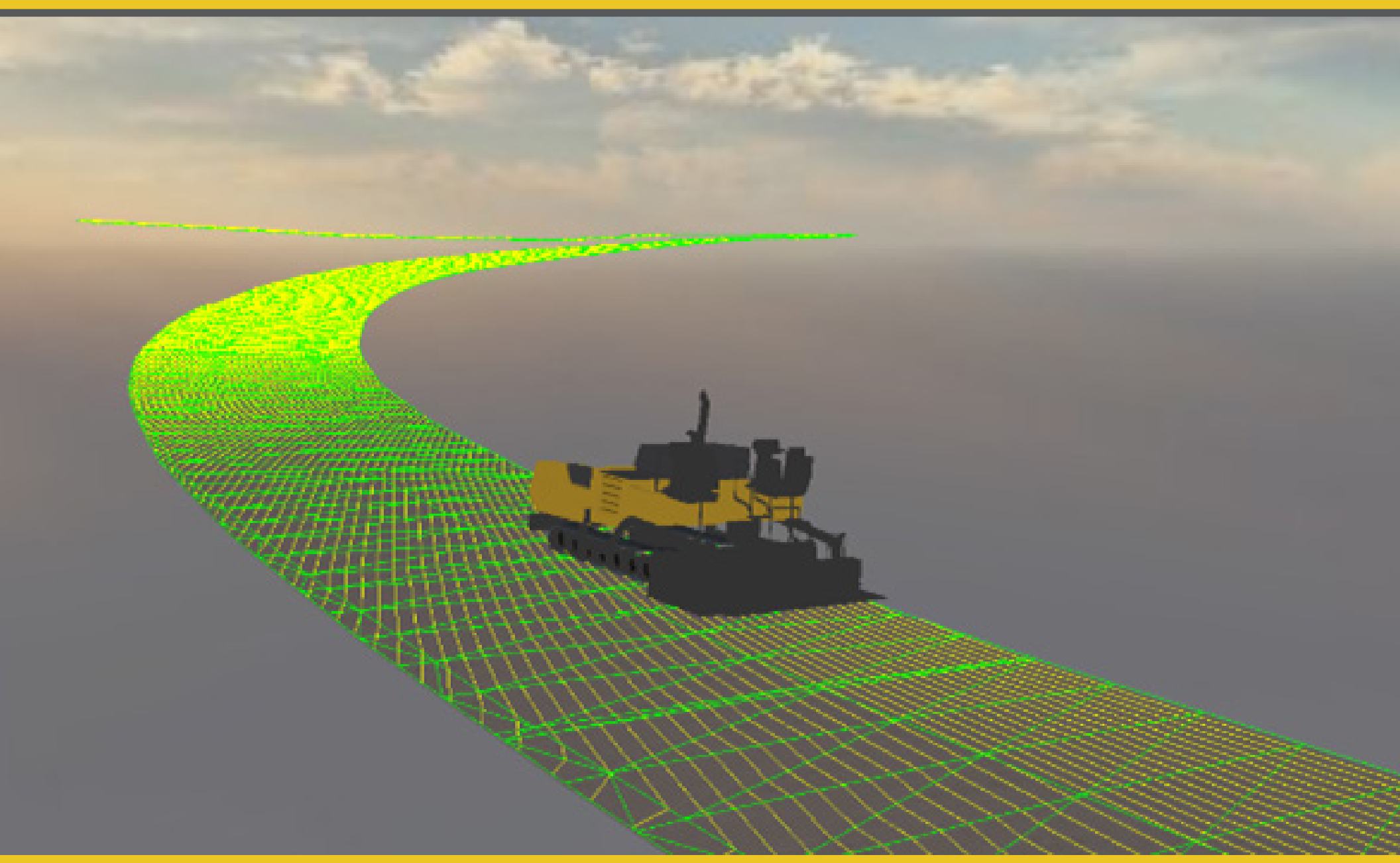
ROADS
RUNWAYS
RACETRACKS

A889 Case Study

Setting a new benchmark in UK road surfacing

- 41% IRI Improvement
- Precise Material Usage
- Zero Survey Road Closures



October 2024

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Project Overview

BEAR Scotland partnered with R3 Ltd to deliver a UK-first in road resurfacing on the A889 near Dalwhinnie, using advanced digital construction methods. Working with contractor Breedon, the team deployed Topcon's SmoothRide and machine control technology for exceptional milling accuracy.

The result: a 41% improvement in surface quality, material use predictions within 5% of actuals, and significant reductions in waste, costs, and environmental impact.

Category	Roads
Project	A889 Dalwhinnie Resurfacing
Client	Transport Scotland
Principal Contractor	BEAR Scotland
Surfacing Contractor	Breedon
Milling Contractor	EJ Douglas + Sons
Partner(s)	Topcon SmoothRide
Date	October 2024
Solution(s)	Machine Control

±5% Material Prediction Accuracy

41% IRI Reduction

Lower Maintenance Costs

The Challenge

- **Irregular road profile**: The existing surface was highly uneven, making traditional resurfacing techniques unsuitable.
- **Poor drainage:** Water pooling and inadequate surface runoff indicated underlying structural issues.
- **Need for a tailored solution:** Standard methods were insufficient; a data-driven, site-specific strategy was required.

The Solution

R3 Ltd replaced traditional resurfacing methods with a fully integrated digital workflow— a proven approach trusted on F1 racetracks and international airports for its unmatched precision and performance.

1. **High-Speed LiDAR Scanning**
   No road closures required
2. **3D Digital Twin :**
   Optimal design for smoothness & drainage
3. **Smart Milling :**
   Mill only where needed, reducing waste

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Outcomes

This project marked a significant shift from traditional resurfacing methods to a fully digital workflow - reducing materials, cutting future maintenance and improving surface smoothness (IRI) by 41% with minimal disruption.

Reduced Material Use	Material predictions within 5% accuracy — reducing waste, cutting costs and lowering CO_2.
Lower Maintenance Costs	Smoother surfaces reduce wear and mean fewer potholes and repairs over time.
Improved Surface Quality	The road's International Roughness Index (IRI) improved by 41% (2.48 km/m to 1.46 km/m).
Minimal Disruption	No full closures; data capture completed in live traffic.
Sustainability Gains	Lower emissions, reduced waste, and longer-lasting surfaces.
Fuel Efficiency Gains	Improved surface smoothness reduces rolling resistance, lowering fuel consumption.
Extended Asset Life	Less surface vibration reduces structural stress, leading to a more durable surface.
Improved Safety & Efficiency	Digitised survey process limited the need for on-site personnel, lowering health and safety risks.
Insights for Future Planning	Digital outputs can be used for asset management. maintenance forecasts and future upgrades.

> Collaborating with R3 Ltd and Topcon to shift away from traditional methods was a pleasure. The results, including an F1 racetrack-standard milled surface, showcase the project's success. The improvement in IRI is clearly demonstrated in the data produced by the digital model.
>
> **John Scott**
> **Pavement Manager, BEAR Scotland**

Fig 1 a-c : Digital Survey Output Examples

Fig 1. a

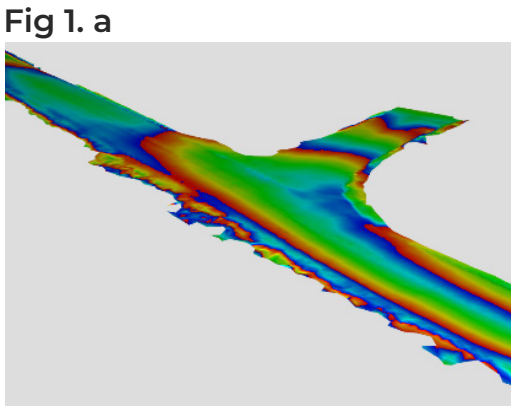


Fig 1. b

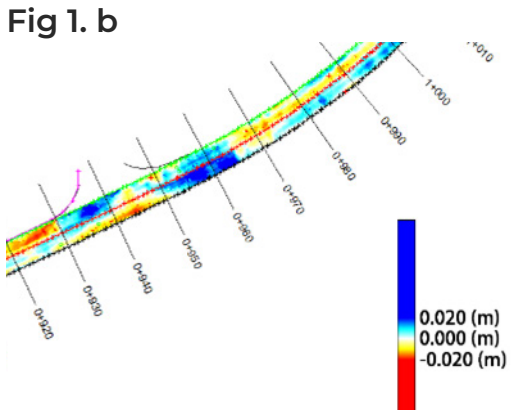
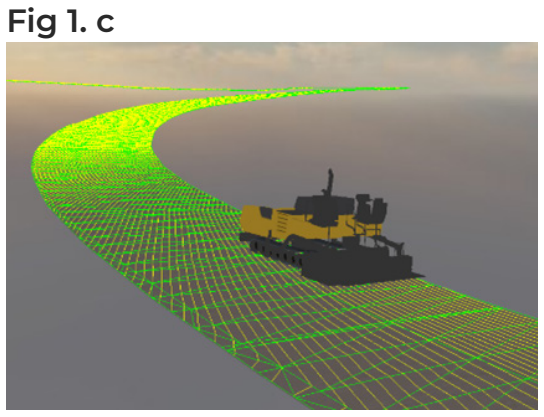


Fig 1. c



Ready to Transform Your Roads?

See the difference R3 Ltd can make — precision, performance, and longevity with racetrack-grade accuracy for smoother, longer-lasting roads.

Talk to the R3 Ltd Team Today

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