

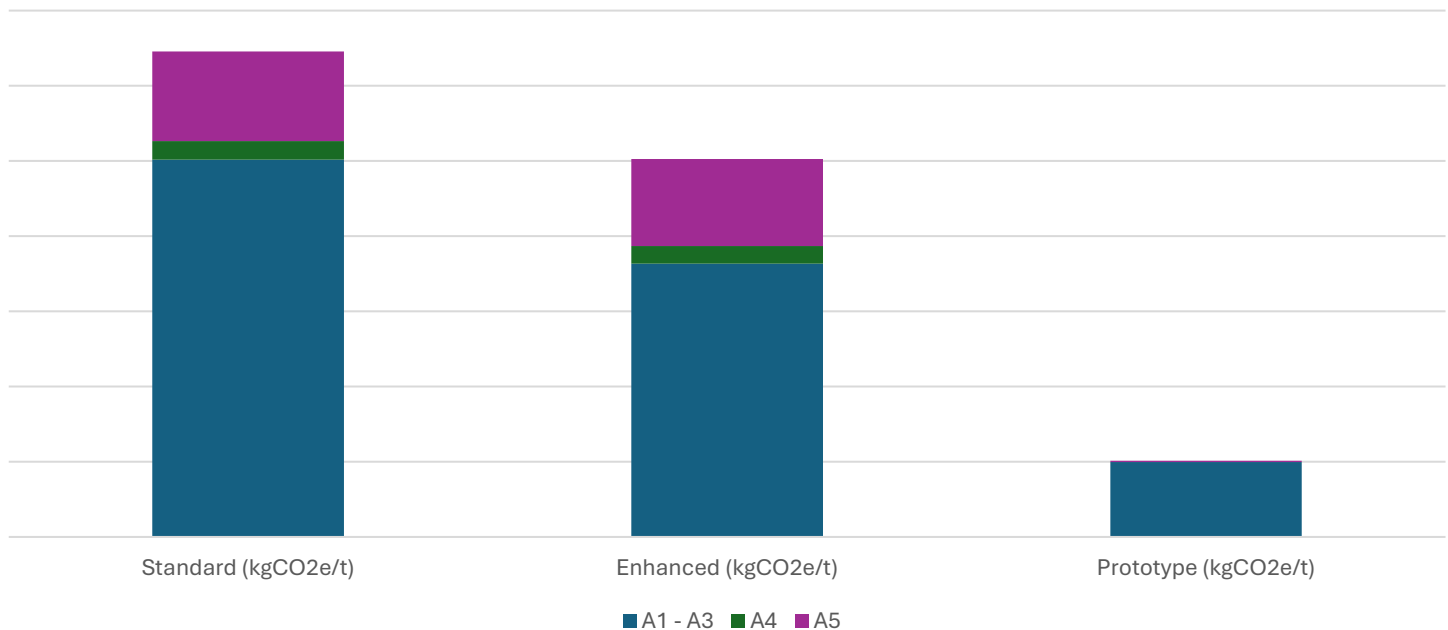


Tarmac National Highways A64 Bramham

High
performance,
low carbon
pavements

Art of the possible

Stockton scenario



	Enhanced vs Standard	Prototype vs Enhanced	Prototype vs Standard
A1 - A3	27.54%	72.56%	80.12%
A4	5.90%	100.00%	100.00%
A5	2.67%	98.69%	98.72%
A1 - A5	22.12%	79.86%	84.31%

A1 - A3
80% reduction

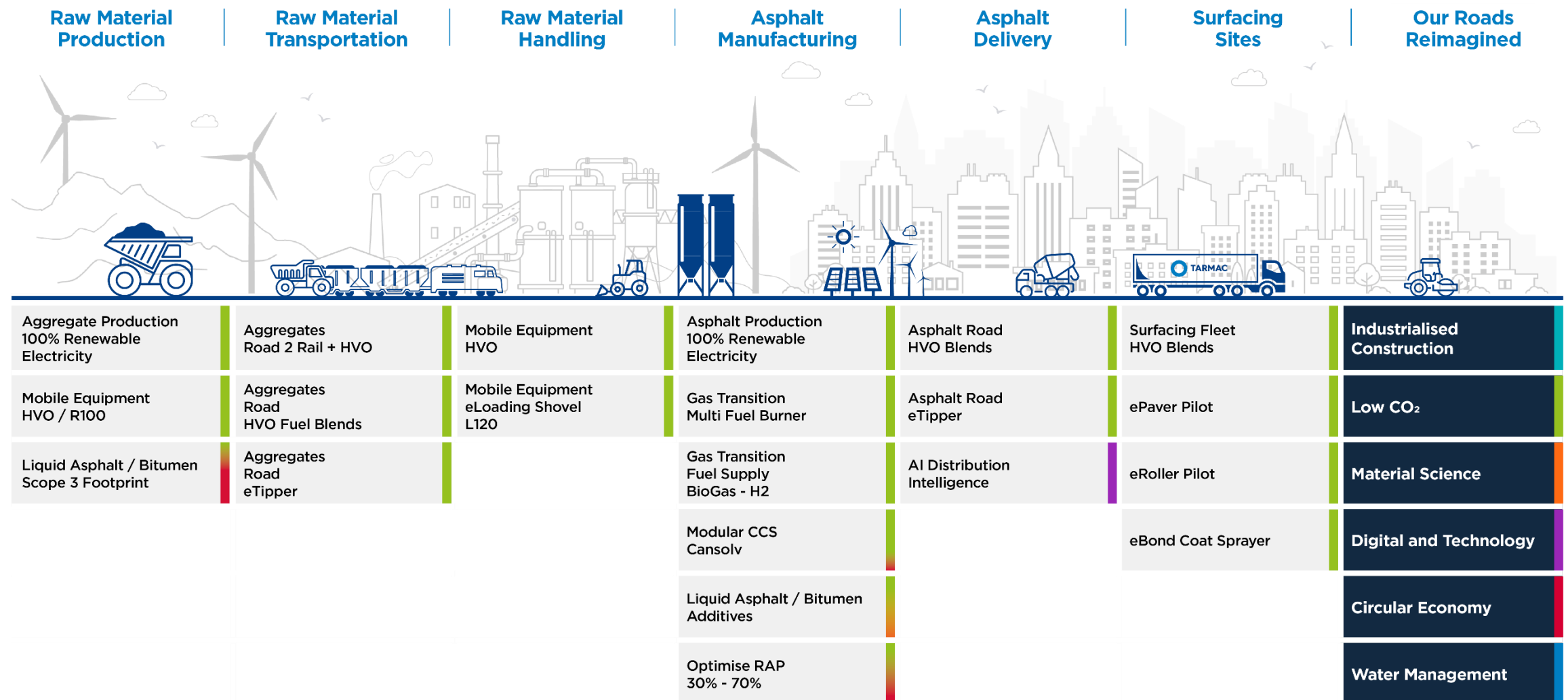
A4
100% reduction

A5
98.7% reduction

Prototype 375
bio content

83%
reduction overall

Roads of the future | Ambition - Net Zero Road 2023



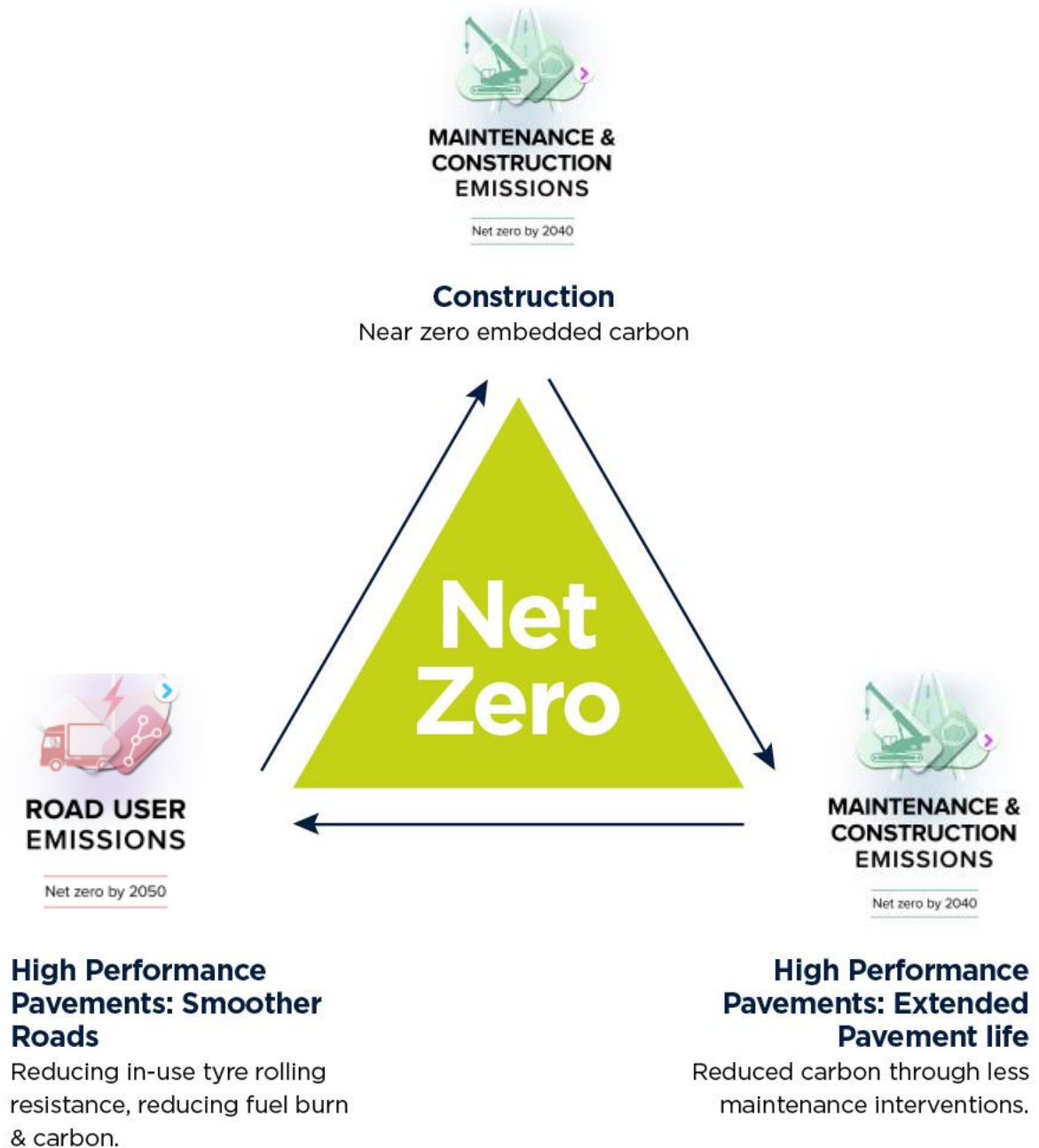
A64 Bramham:

High performance, low carbon pavements

Project aims:

To build on the success of our **'Art of the possible'** solution to deliver performance improvement across **three initiatives**.

2.0
NetZero





MAINTENANCE & CONSTRUCTION EMISSIONS

Net zero by 2040

Near **Zero** embedded carbon

- Bitumen technology – use of innovation biogenic binder
- Asphalt manufacturing plant burner operating on clean, renewably sourced fuel (HVO)
- Quarry and asphalt manufacturing plant operating on clean, renewably sourced fuel (HVO)
- Mobile equipment in quarry and asphalt plant operating on clean renewably sourced fuel (HVO)
- Use of ACLA, an innovative carbon negative aggregate
- Road haulage for materials operating on clean, renewably sourced fuel (HVO)
- Recycling existing carriageway (RAP) at up to 40% into new asphalt mix
- Paving equipment operating on clean, renewably sourced fuel (HVO)
- Fully electric compaction equipment
- Fully electric bond coat tanker/sprayer.



MAINTENANCE & CONSTRUCTION EMISSIONS

Net zero by 2040

A64 Bramham: High Performance Pavements: Extended Pavement Life

- Bitumen technology – use of innovative binder technology with extended 20% pavement life performance
- Change from traditional construction methodology to remove and/or reduce construction joints in pavement layers
- Use of paving equipment, including asphalt feeders, to lay the asphalt with two pavers in echelon
- Use of Ultipave product with higher PMB content will give a pavement life enhancement of 3 years in addition to 20% extension from innovative binder.
- Smoother road increases durability resulting in reduced maintenance interventions.

Extended pavement life:

Reduced carbon through less maintenance interventions.



ROAD USER EMISSIONS

Net zero by 2050

A64 Bramham: High Performance Pavements: Smoother Roads

- Globally, world class IRI performance is an IRI value of 1. Use of paving equipment previously used to deliver high performance pavements such as Silverstone F1 circuit and MIRA test track, achieved an IRI value of <0.5 (lower number = smoother surface).
- 'Multiplex' milling control providing a high tolerance planed surface
- Asphalt feeders, facilitating continuous paving and removing wagon to paver interface and detrimental impact to ride quality
- Paving equipment telematics supporting improved compaction control
- Smoother road facilitates lower rolling resistance of vehicle tyre, reducing in-life carbon. Danish paper in 2016 identified up to 7% reduction in fuel consumption is possible by changing characteristics.

High performance pavement: Smoother roads, reducing in-use tyre rolling resistance, reducing fuel burn and carbon.

PAVE Technology



Highways

NOVEMBER 2022

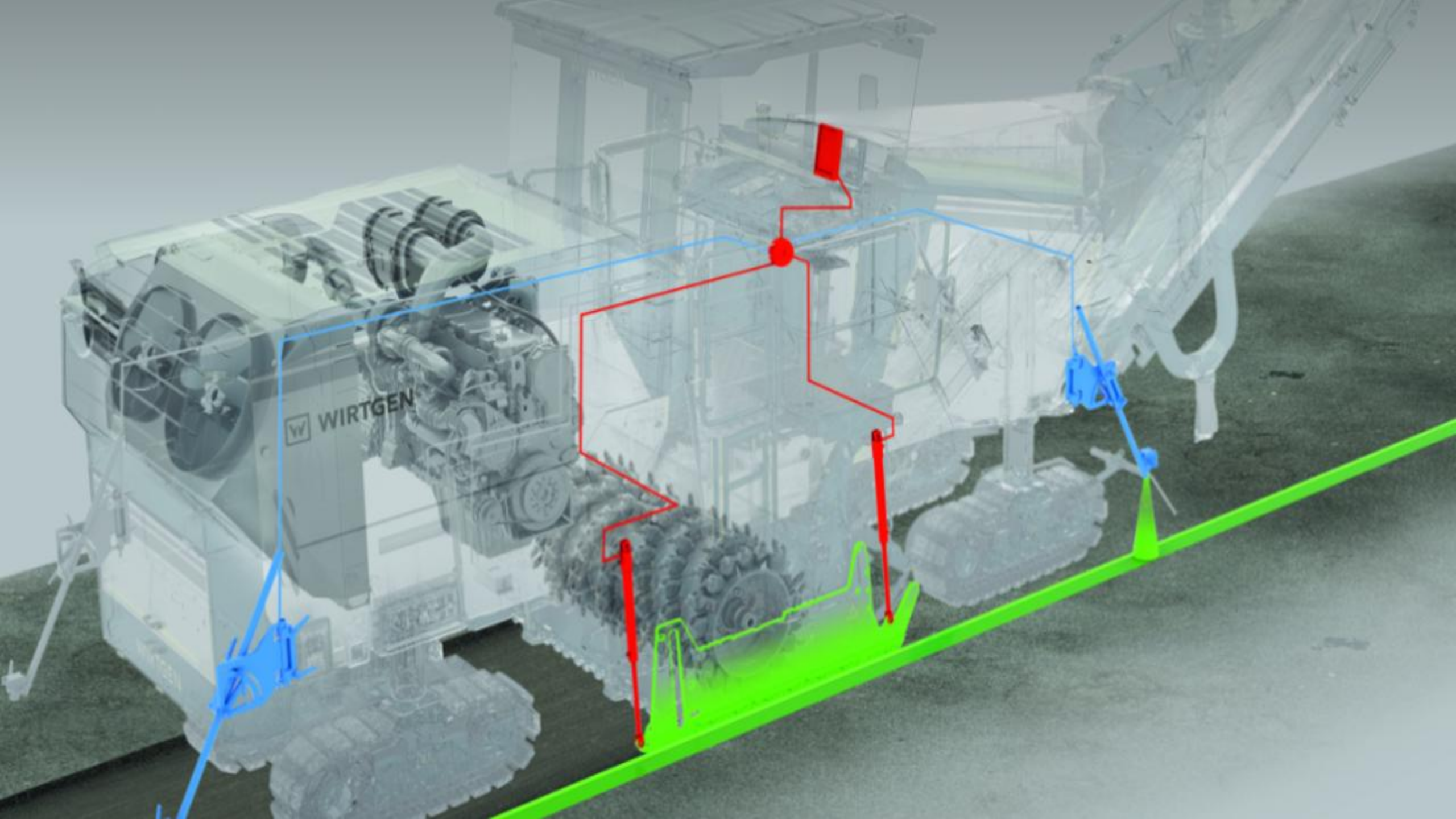
INFORM | INSPIRE | CONNECT

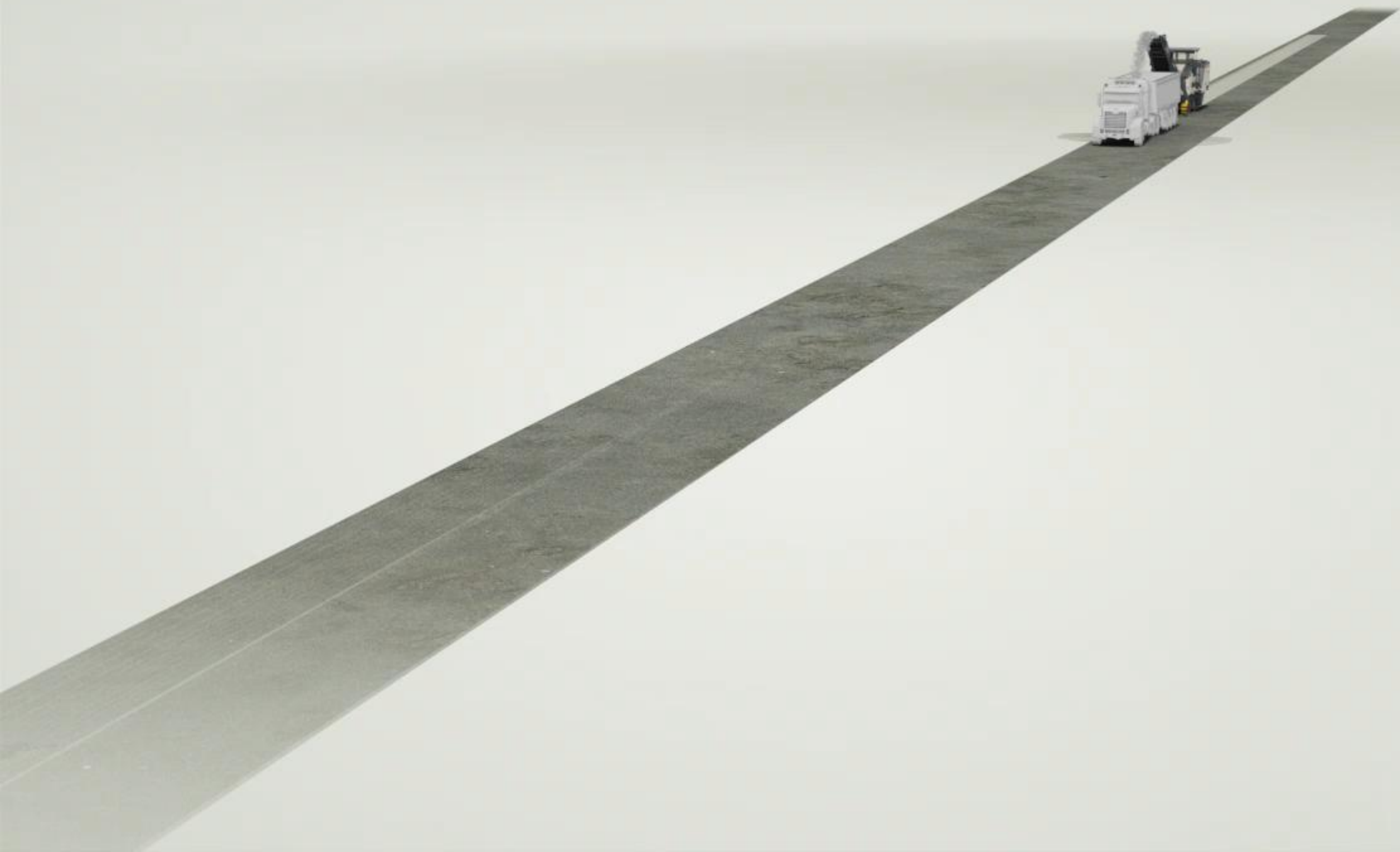
THE WORLD'S SMOOTHEST ROAD?

'Flattest surface ever' laid for CAV trials

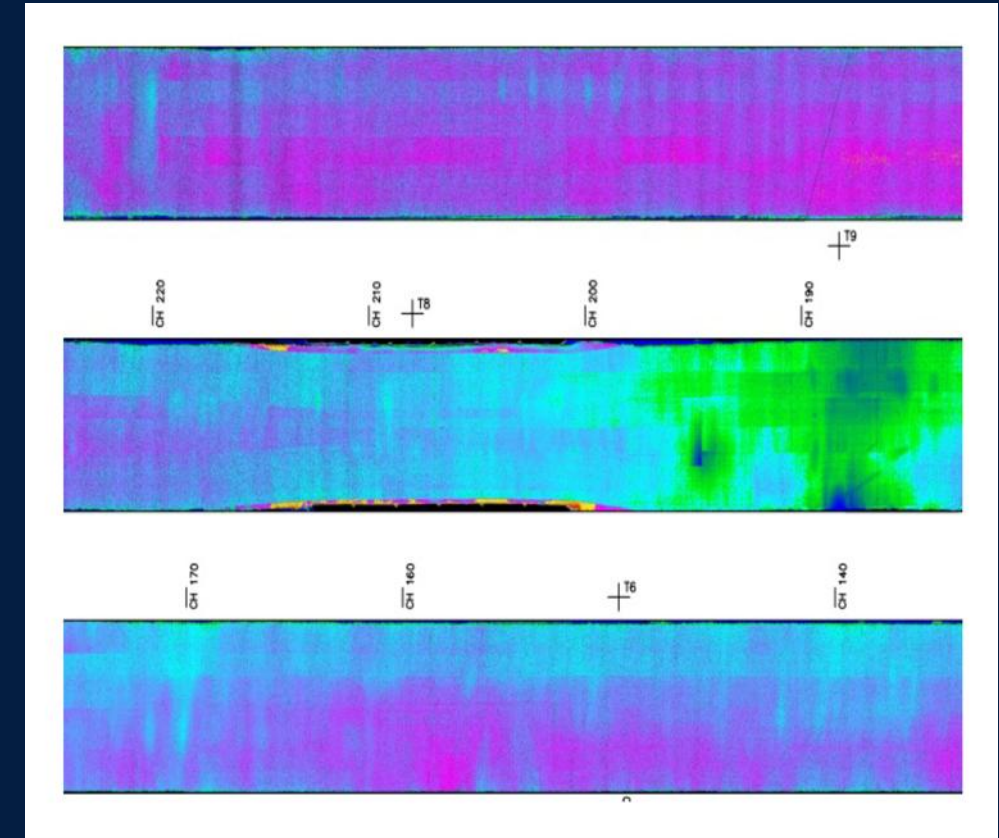
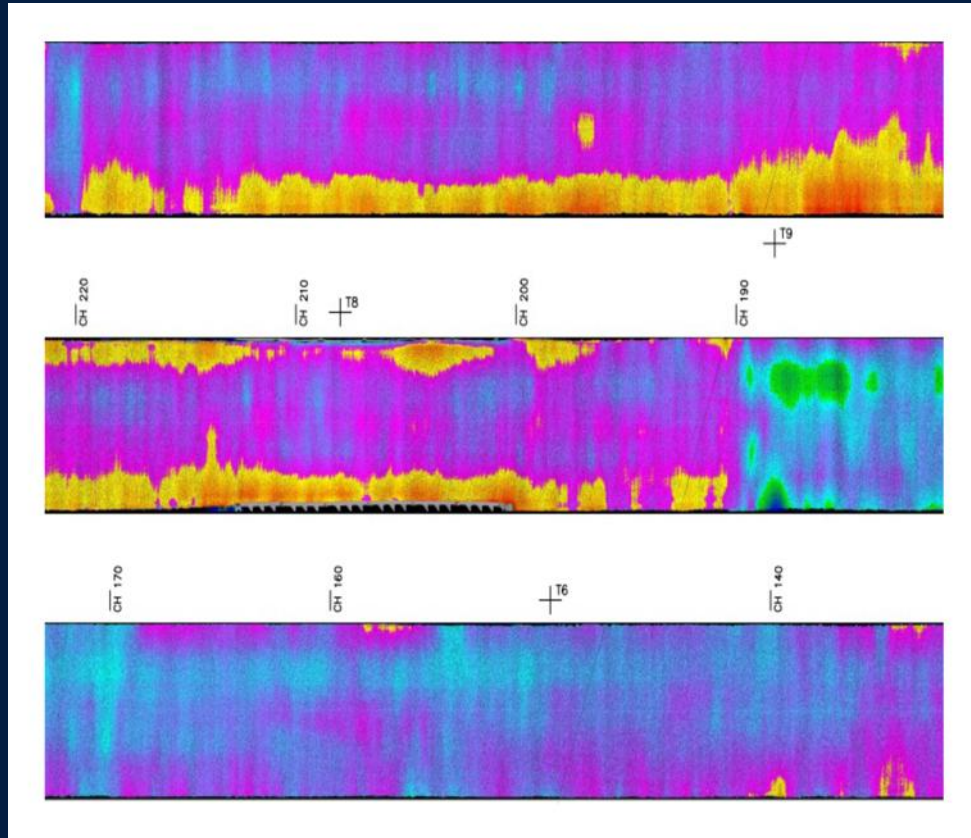








Pre multiplex



Post multiplex

Feeders

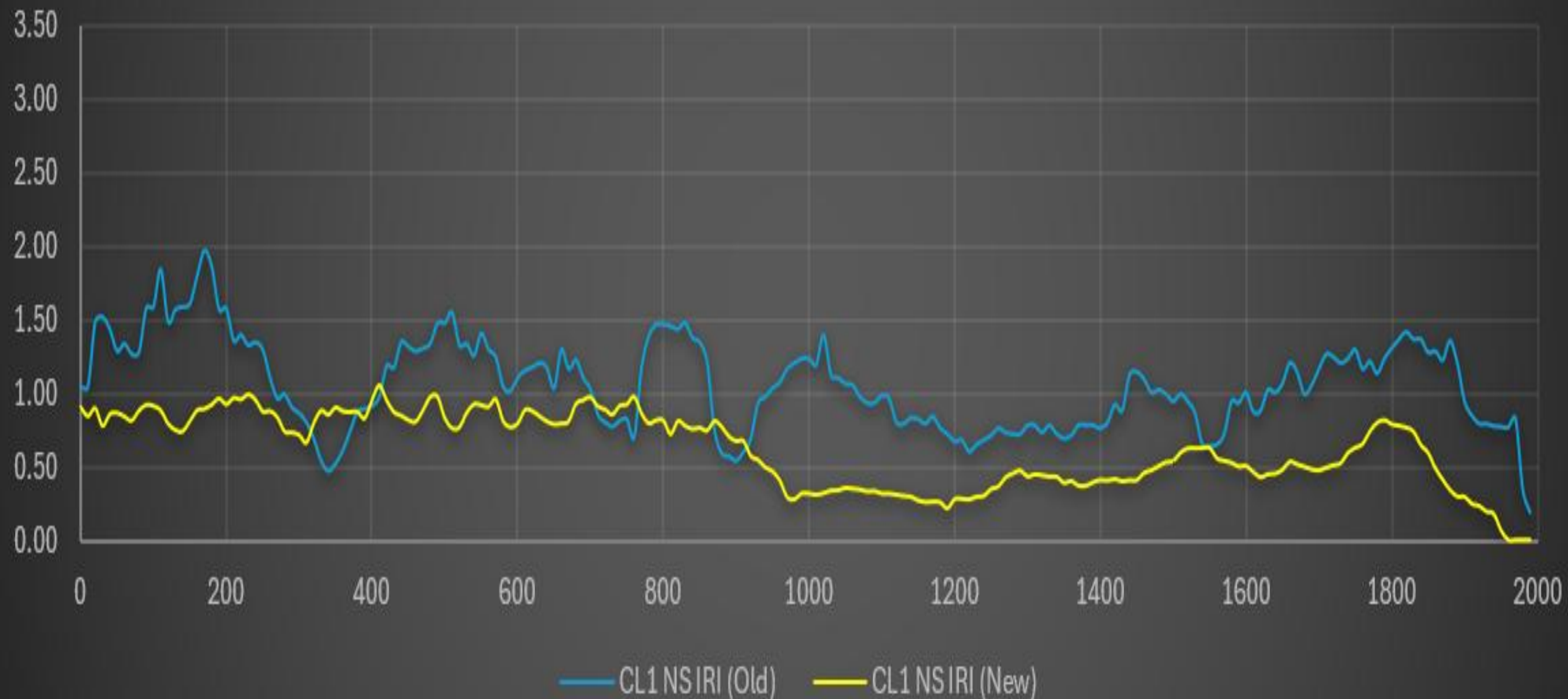
PAVE

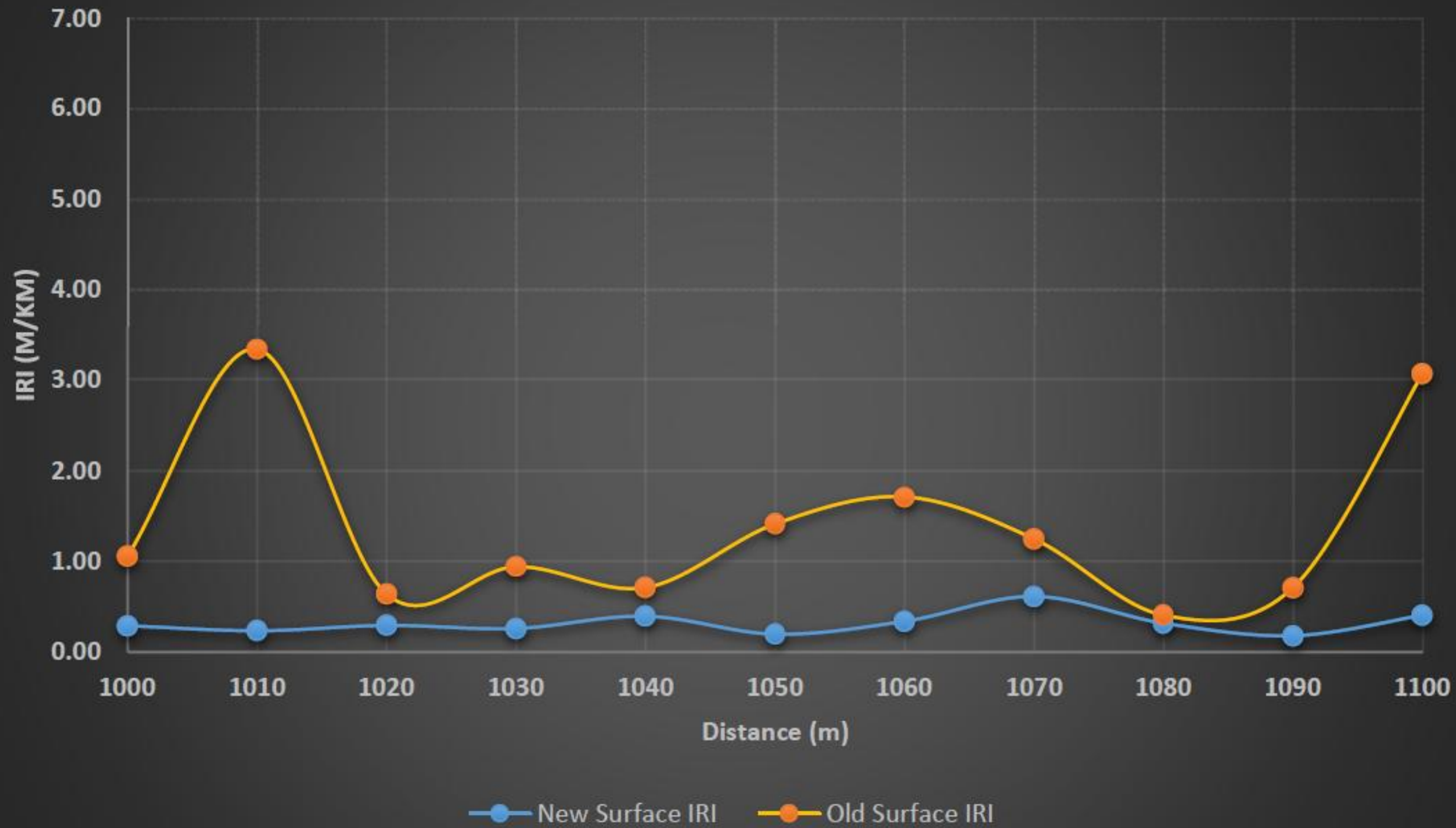
TECHNOLOGY SOLUTIONS

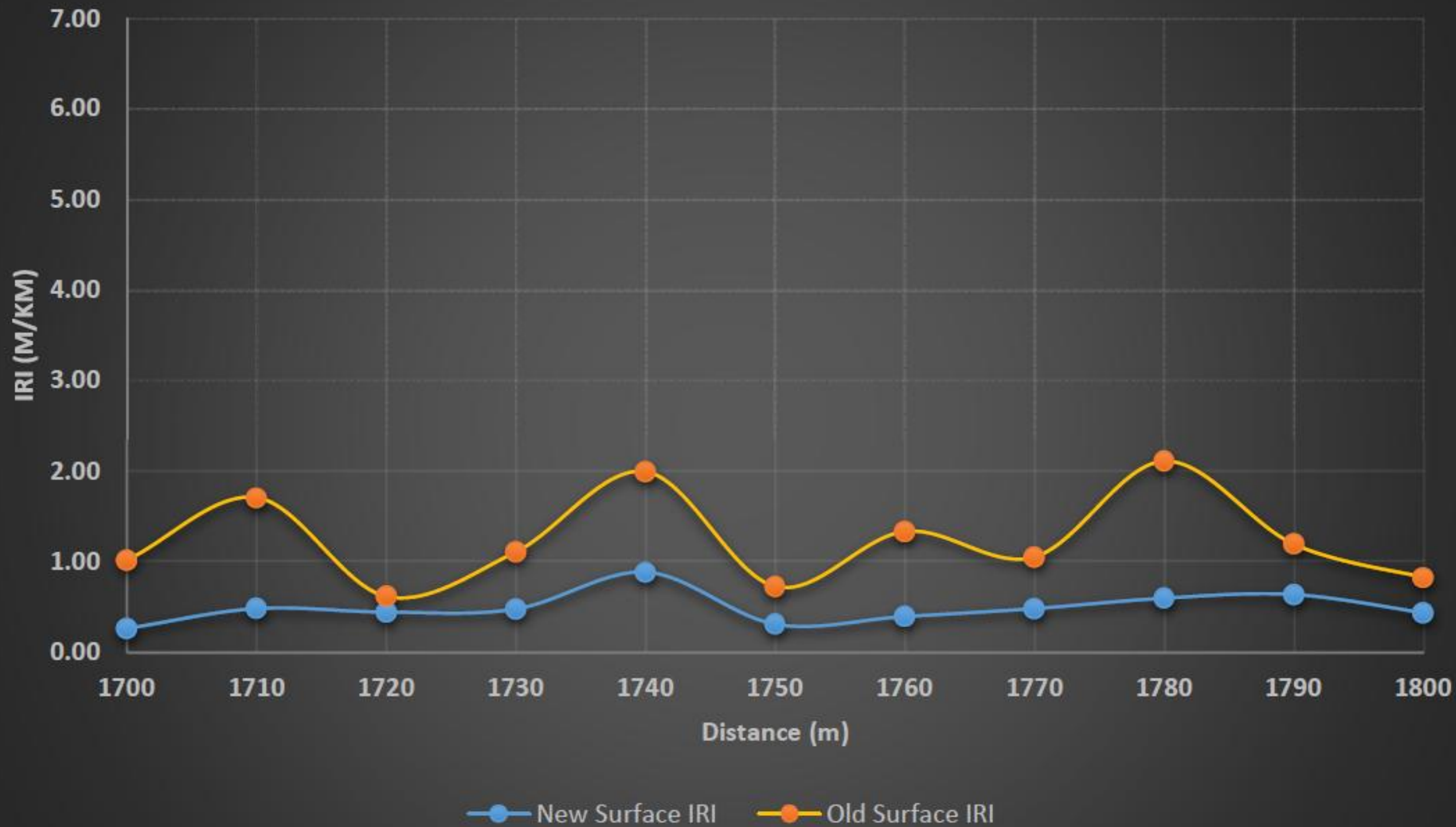




CL1 Nearside (100m moving average)



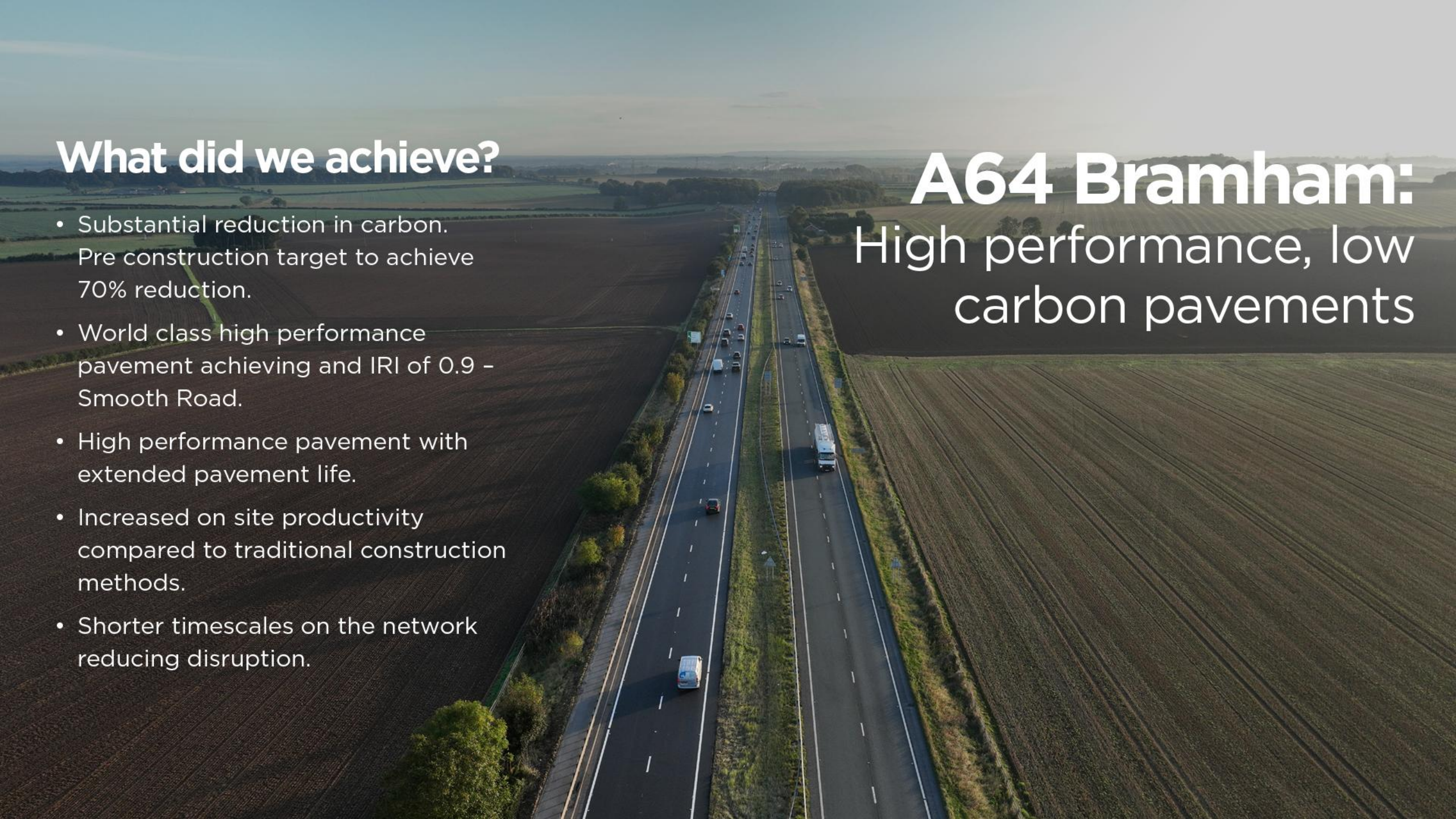




What did we achieve?

- Substantial reduction in carbon. Pre construction target to achieve 70% reduction.
- World class high performance pavement achieving and IRI of 0.9 – Smooth Road.
- High performance pavement with extended pavement life.
- Increased on site productivity compared to traditional construction methods.
- Shorter timescales on the network reducing disruption.

A64 Bramham: High performance, low carbon pavements





TARMAC

A CRH COMPANY