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STRICTLY HIGHWAYS

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Towards Net-zero highways maintenance

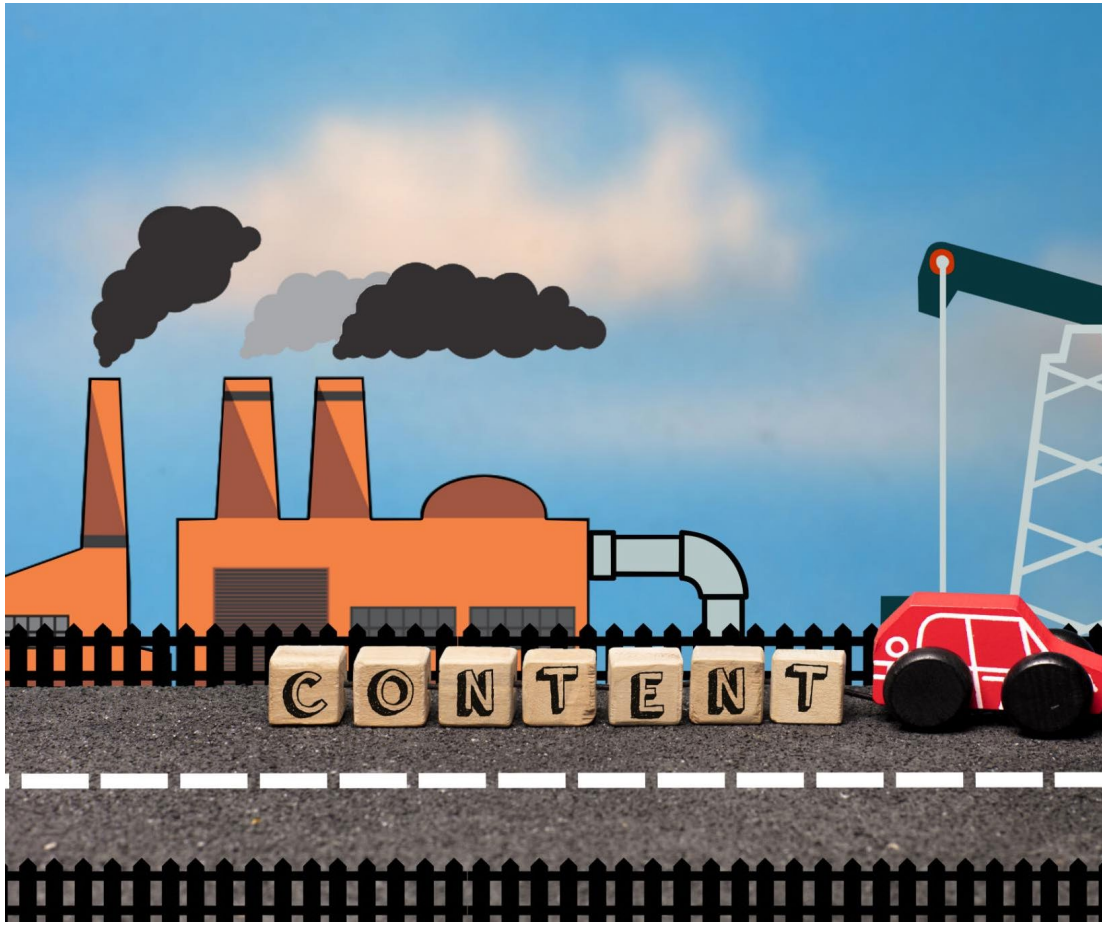
“From ambition to delivery: making net zero work on local roads”

Daniela Pometti
Head of Highways Asset Management
London Borough of Barnet

Balancing Priorities

- Performance: Maintain safety and reliability
- Productivity: Efficient delivery and resource use
- Funding: Whole-life cost optimisation
- Carbon: Embed sustainability in all decisions

Why Highway Maintenance Must Change for a Net-Zero Future



Environmental Impact of Highways

Highway infrastructure contributes significantly to national carbon emissions through construction and maintenance activities.

Challenges of Ageing Infrastructure

An ageing highway network with deferred maintenance increases defects and user disruption amid rising traffic demands.

Funding and Decision-Making Pressure

Budget constraints lead to reactive repairs, increasing long-term costs and carbon footprint rather than proactive solutions.

From Vision to Delivery: Building a Net-Zero Maintenance Model



Using Digital and Data Innovation to Improve Maintenance Outcomes: shift to Predictive Maintenance, risk-based strategies, optimizing timing and location of interventions.

Advanced Asset Management and life cycle planning: Integrating condition data, traffic, and environment with remote sensing and embedded sensors enhances asset health monitoring.

Low-Carbon Material and Modern Maintenance Techniques: Adopting recycled asphalt, warm-mix asphalts, and alternative binders. In-situ recycling and surface treatments extend asset life, minimizing waste and reducing traffic disruption.

BARNET ·ZERO·

In Barnet, we're on an ambitious journey to tackle climate change and protect biodiversity across the borough. Through our BarNET ZERO initiative, we aim to become a net zero council and borough by 2042.

- committed to reduce the amount of carbon we emit as an organisation
- committed to supporting residents, communities and businesses reduce the carbon they emit across the borough
- championed sustainability
- raised awareness of the impact of a changing climate on our environment

Barnet Case studies: Carbon Savings

In collaboration with our contractor **Marlborough Highways,** we tested the market for innovative materials and techniques to reduce carbon emission during carriageway resurfacing.

<u>Carbon reducing elements:</u>

Materials:

- **ACLA™ from LCM:** carbon negative aggregate in the binder course (approx. 7%)
- **SuperLow™ from Holcim** warm mix biogenic material in binder and wearing course

Electric and HVO fuel plant: electric tandem rollers and vans, battery-operated cutters and vibratory plates. Where electric equipment could not be used, HVO-powered machinery was selected instead.

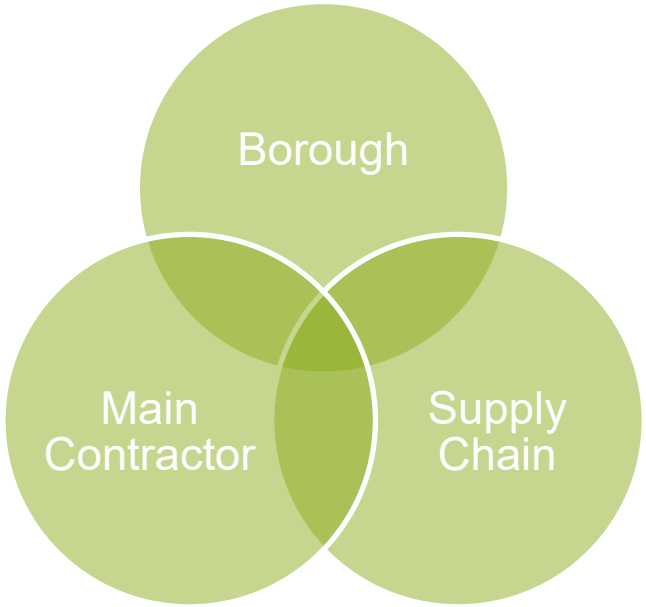
Recycle road planings: by returning this waste material to suppliers, it could be reused in new asphalt production – a **circular approach** that decreases future demand for virgin materials, limits waste sent to landfill and keeps valuable resources in productive use for longer.



Barnet Case studies: Carbon Savings

Collaboration required and essential.

- Term Contractor Marlborough Highways acted as conduit between Low Carbon Materials (ACLA supplier) and HOLCIM (Asphalt supplier)
- HOLCIM conducted tests about combining ACLA and SuperLow
- Worked together to provide commercially viable solution

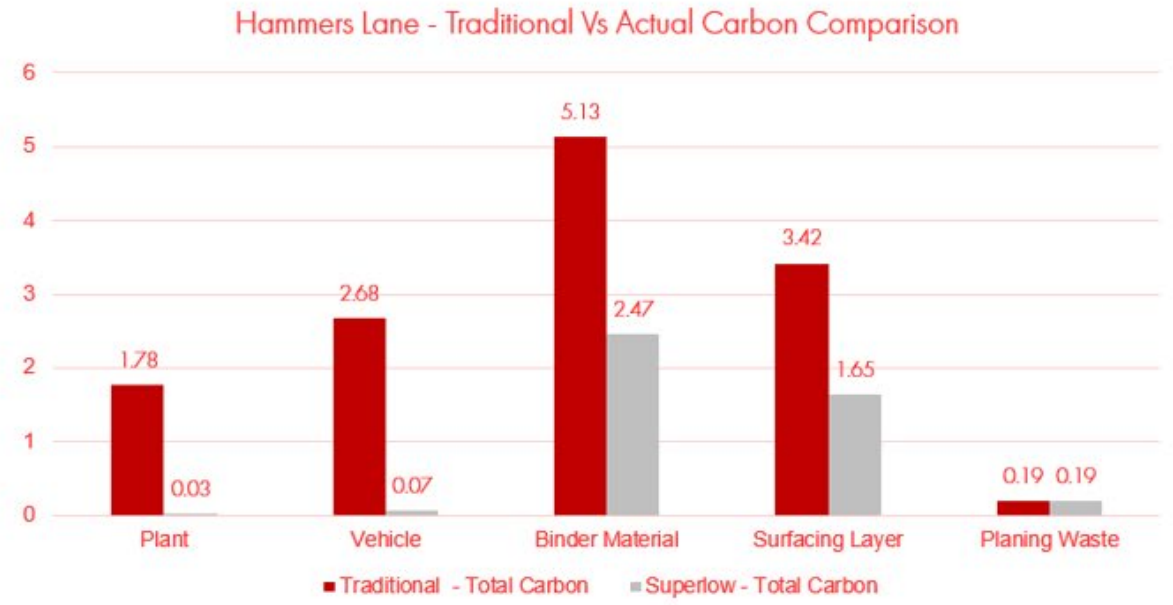


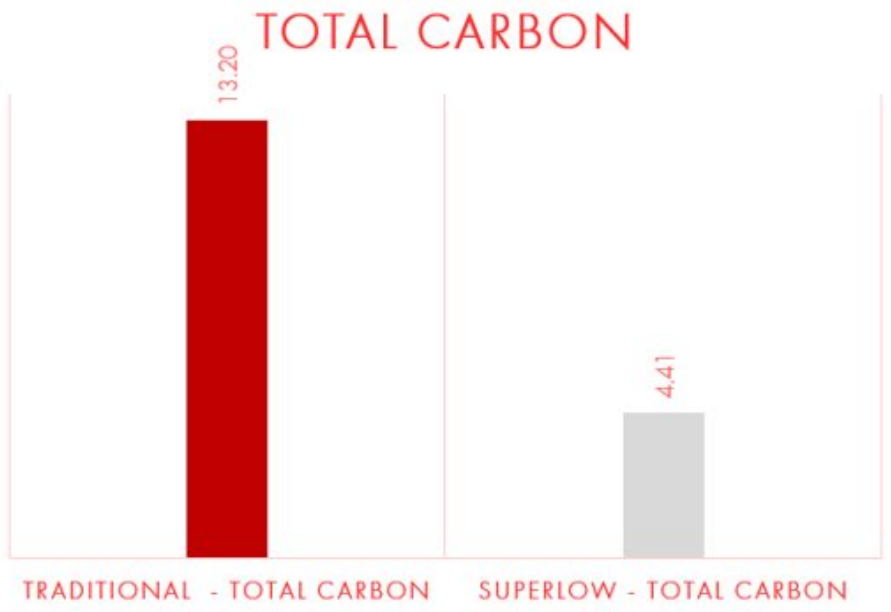


Barnet Case studies: Carbon Savings

Hammers Lane (total 640 m²)

Carbon Saving – 8.79 tCO2e

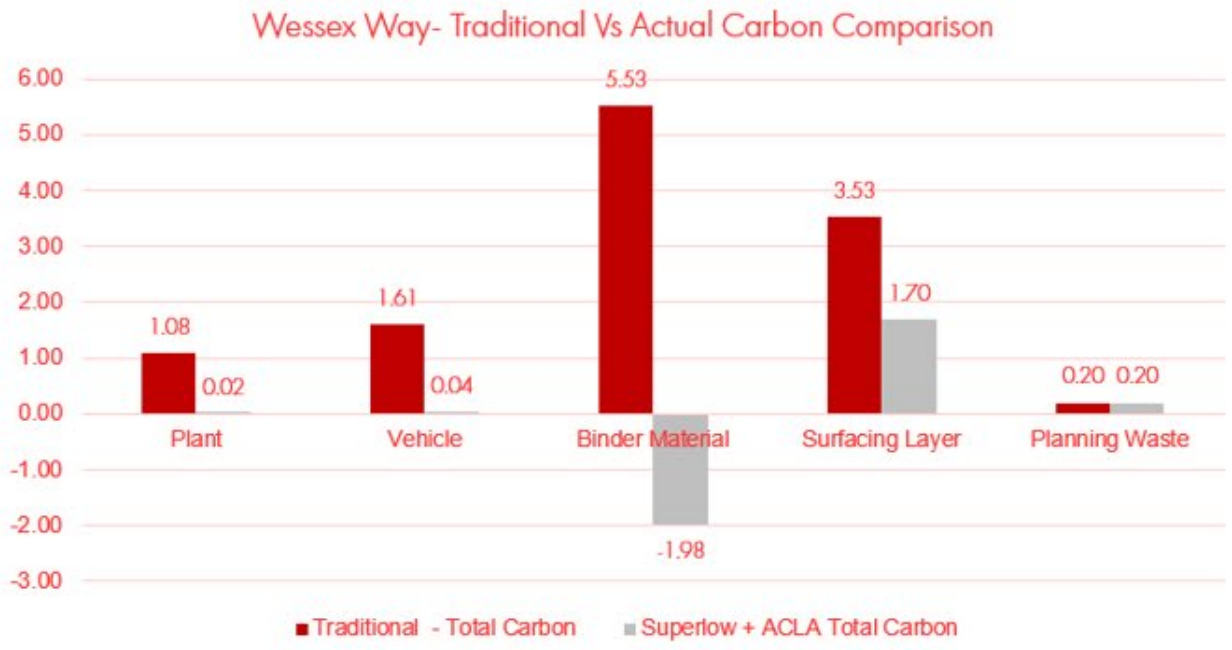


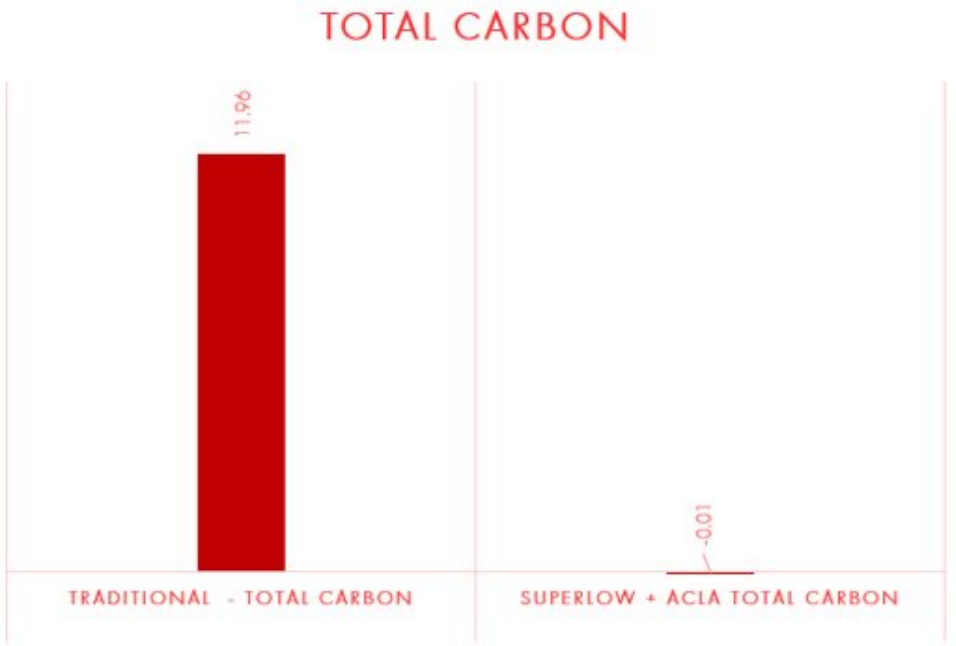


Barnet Case studies: Carbon Savings

Wessex Way (total 675 m²)

Carbon Saving – 11.95 tCO2e

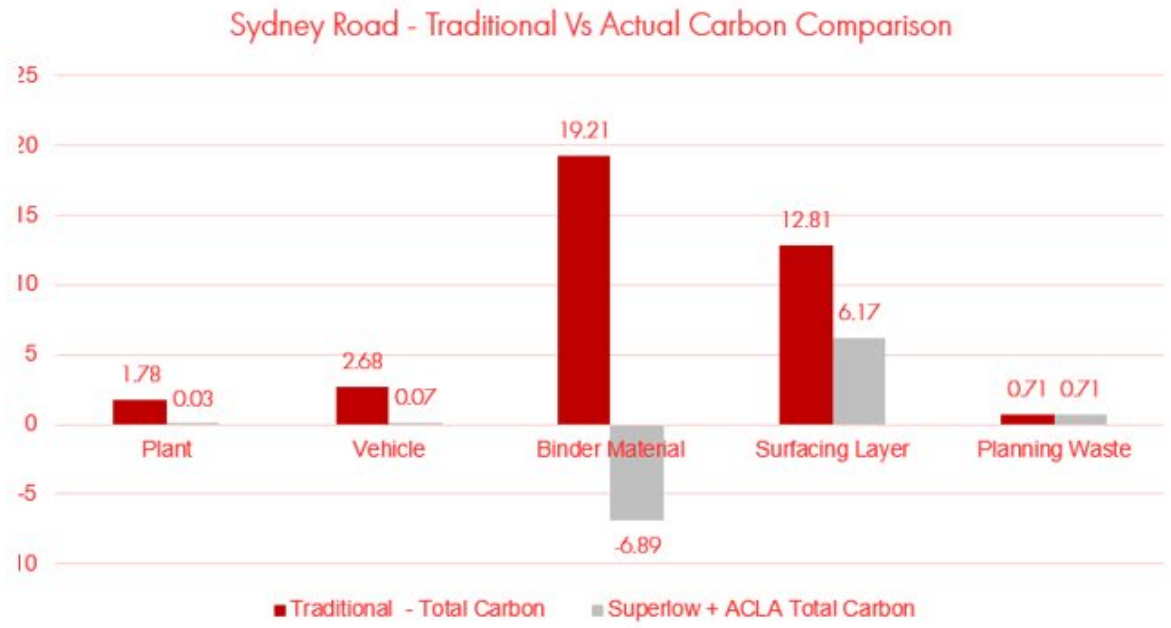


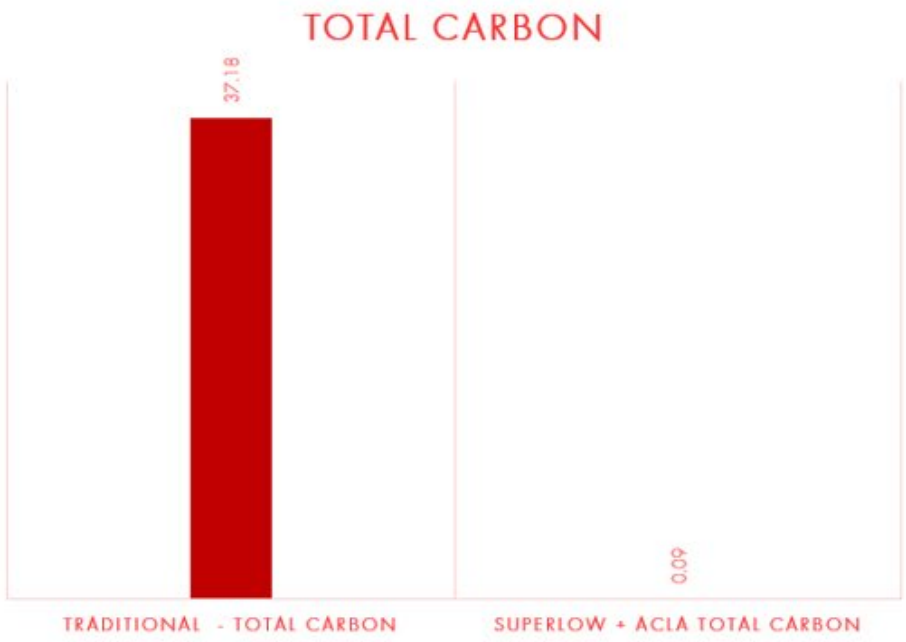


Barnet Case studies: Carbon Savings

Sydney Road (total 2390 m²)

Carbon Saving – 37.09 tCO2e






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Conclusions and lessons learnt

- **Sustainability** is possible and was embedded at every stage of the project through the use of innovative materials, low-emission plant and circular practices. As a result, the scheme was able to reduce carbon emissions by up to 92%, creating a blueprint for scalable, sustainable highways delivery.

- **Collaborative Delivery and Innovation:** Collaboration with contractors, early involvement is essential. The collaborative approach ensured that carbon reduction, resource efficiency and long-term performance were considered holistically, resulting in a low-carbon specification aligned to the borough's long-term environmental ambitions.

- **Scalability:** Innovation must scale—not remain as trials. This methodology is practical, sustainable and well-suited to routine works. It provides a scalable model for how lower-carbon highways networks can be delivered, maintained and improved over time.

"If we get maintenance right, we don't just reduce carbon—we redefine the sustainability of the entire network."

Thank you

