

CASE STUDY — INNOVATION IN HIGHWAY MAINTENANCE

Graphene-Modified Asphalt Trials: Cricket Green Roundabout and Snowdon Drive

Evidence submission — Local Highways Maintenance Transparency Report 2026/27 (Department for Transport)

Authority	Milton Keynes City Council (MKCC)
Programme	Planned highway maintenance — carriageway resurfacing 2026/27
Trial sites	Cricket Green Roundabout (10mm thin surface course) and Snowdon Drive (hot rolled asphalt, c. 2,000–3,000 m ²)
Innovation	Graphene-modified asphalt (Tarmac Ultrapave D Graphene) as an alternative to conventional polymer-modified binders
Delivery partners	Eurovia (term maintenance contractor), Tarmac (material supplier, Harper Lane plant), specialist graphene technology supplier
Timescale	Snowdon Drive: August 2026 (phased element). Cricket Green: late September – early October 2026
Transparency link	Innovation, efficiency and continuous improvement; whole-life cost; decarbonisation of maintenance activity

1. Background and strategic context

The Department for Transport's 2026/27 funding settlement asks local highway authorities to demonstrate, through their Local Highways Maintenance Transparency Report, how record levels of investment are being converted into better long-term outcomes for road users — including how the authority is adopting innovation, preventative treatments and whole-life cost thinking rather than reactive repair.

In support of this requirement, MKCC's Highways Service is trialling graphene-modified asphalt on the live network in partnership with its term maintenance contractor Eurovia and material supplier Tarmac. The trials have been scoped collaboratively by MKCC's Highway Service Manager and Infrastructure Performance Manager with the supply chain, and are designed to generate directly comparable, site-based performance evidence at no cost premium to the planned programme.

2. The innovation: graphene-modified asphalt

Graphene-enhanced binder technology (supplied through Tarmac as Ultrapave D Graphene) is used as an alternative to conventional SBS/elastomeric polymer modification rather than an additive to it. The evidence base indicates the following benefits over polymer-modified equivalents:

- Increased stiffness and deformation resistance without the brittleness normally associated with harder binders — well suited to heavily trafficked roundabouts.
- An extended effective temperature operating range of approximately 16°C, achieved without sacrificing low-temperature performance.
- Improved UV stability compared with conventional polymer-modified systems.
- A lower carbon cost than polymer modification, supporting decarbonisation of the maintenance programme.
- Simplified production — no dedicated polymer tank is required at the batching plant, widening supply flexibility.

The approach builds on published evidence from the DfT-funded Live Labs innovation programme, including a Tarmac case study from Walsall (autumn 2025) directly comparing a conventional thin surface course (Ultilayer) with Ultrapave D Graphene on an industrial street carrying regular HGV traffic.

3. Trial design

Site 1 — Cricket Green Roundabout (late September / early October 2026)

A large-area 10mm thin surface course scheme covering two roundabouts. The trial will split the scheme 50/50: one roundabout surfaced with the conventional planned product and one with the graphene-modified equivalent, laid under identical conditions by the same delivery team. This creates a like-for-like comparison of installation, early-life performance and durability under equivalent traffic loading. A condition of the trial is that the graphene product is supplied at a cost comparable to, or lower than, the conventional material — the trial carries no cost premium to the maintenance budget.

Site 2 — Snowdon Drive (August 2026)

A hot rolled asphalt (HRA) roundabout of approximately 2,000–3,000 m². Because graphene modification has not yet been proven in HRA in the UK, MKCC has deliberately taken a risk-managed, phased approach: a partial trial section is under consideration rather than committing the full roundabout, while international (North American) HRA performance data is reviewed. This staged approach demonstrates responsible adoption of innovation — building the evidence base before wider deployment.

4. Collaboration and supply chain

The trials are a three-way collaboration between MKCC, Eurovia and the material supply chain. Eurovia brings prior experience of graphene products on other networks; Tarmac will supply Ultipave D Graphene from its Harper Lane plant as a standard orderable product, evidencing that the innovation is deliverable through business-as-usual supply routes rather than as a bespoke, high-cost exception. Technical data, specification sheets and independent case study evidence have been shared across all parties to support material approval.

5. How this evidences the transparency report requirements

- Innovation and continuous improvement — controlled, comparative on-network trials of a new material technology, with published third-party evidence (Live Labs, Walsall) used to de-risk adoption.
- Value for money and whole-life cost — trial admitted only at cost parity or better; anticipated durability gains extend surfacing life and reduce future reactive repair, supporting the shift from reactive to preventative maintenance.
- Decarbonisation — lower embodied carbon than conventional polymer-modified binders, contributing to carbon reduction across the maintenance programme.
- Sector learning — results from the 50/50 comparative trial will be shared with the supply chain and sector groups, and are available to DfT as sampled evidence supporting this report.

6. Expected outcomes and monitoring

Both sites will be monitored against their conventionally surfaced comparators for installation quality, early-life performance, deformation and surface condition under traffic. Outcomes will inform a decision on wider adoption of graphene-modified asphalt across the MKCC planned maintenance programme from 2027/28, including potential extension to HRA sites once the evidence base supports it.

Prepared by MKCC Highways Service — July 2026. Supporting evidence (technical data sheets, Live Labs Walsall case study, trial monitoring records) is held by the Highways Service and available to DfT on request.