UNIVERSAL MATTER
ADVANCED MATERIALS

A UK first : Graphene on the roads in Redcar & Cleveland

Andrew Curry

- Privileged & Confidential

Local authorities are not short of problems

A practical local-authority case for trialling longer-lasting asphalt.

Every time a road fails early the bill is bigger than material alone

- Crew time and labour
- Traffic management and resident disruption
- Budgets diverted from elsewhere
- Potholes are at the forefront of public discourse

Potholes: UK's roads like 'the surface of the moon', after record rise in breakdowns, RAC says

Some are in a "desperate state", the firm says, and councils may be "patching up potholes rather than fixing them properly".

Heavy rain leads to surge in vehicles breaking down due to potholes

The number of drivers reporting breakdowns linked to potholes rose to more than 6,000 last month, with the rise being blamed on defects being hidden under water.

What is Graphene

A high-performance form of carbon

First isolated in Manchester about 20 years ago

Extremely strong and highly conductive

Added in small amounts to improve materials

Can increase durability and extend service life

Who We Are

Universal Matter is a British-Canadian materials company

Formed from technology spin-outs in Durham and Houston

UK production based at Wilton, Redcar (former ICI site)

Focused on practical graphene additives for construction

Helping infrastructure last longer and reduce carbon

Redcar and Cleveland Council

Two trials carried out.

- Flatt's Lane Country Park ~ 200 tonnes of asphalt
- Pennyman Walk, Marske-by-the-Sea ~ 180 tonnes of asphalt
- Asphalt supplied in both cases by Tarmac, delivered from Coxhoe plant, County Durham
- Story picked up by Top Gear (and others)
- **https://www.topgear.com/car-news/tech/a-new-kind-road-surface-might-make-potholes-a-thing-past**
- **https://www.gazettelive.co.uk/news/teesside-news/genable-pavement-redcar-road-surface-31117105**

Genable™ Pavement in the Field

Product Validation

ADEPT LIVELABS2 Decarbonising Local Roads

Working with **Walsall Council** large-scale, real-world trials of innovative materials and technologies focused on **decarbonizing** and **modernizing** highways.

Trial was ~ 180 Tonnes of Asphalt, compared to a premium grade – early results show our material outperforming the competition.

Genable™ Pavement in the Field

Successful Field Trials

DEPARTMENT OF TRANSPORTATION

Completed a 3-mile section of Minnesota Route 12 as part of the approval process with Minnesota Department of Transport.

- GENABLE™ PAVEMENT

NCAT Test Track Data

National Center for Asphalt Technology NCAT at AUBURN UNIVERSITY

The Details:

Located on a 309-acre site, NCAT's Test Track is a 1.7-mile oval where research is conducted on experimental asphalt pavements. The track is comprised of 46 200-ft test sections funded as a cooperative project among highway agencies and industry sponsors. 5 78 Tonne Trucks are driven around the track for 16 hours a day

NCAT research experiments, based on single test sections or groups of test sections, provide sponsors the confidence to move concepts into practice, saving state departments of transportation millions of dollars each year.

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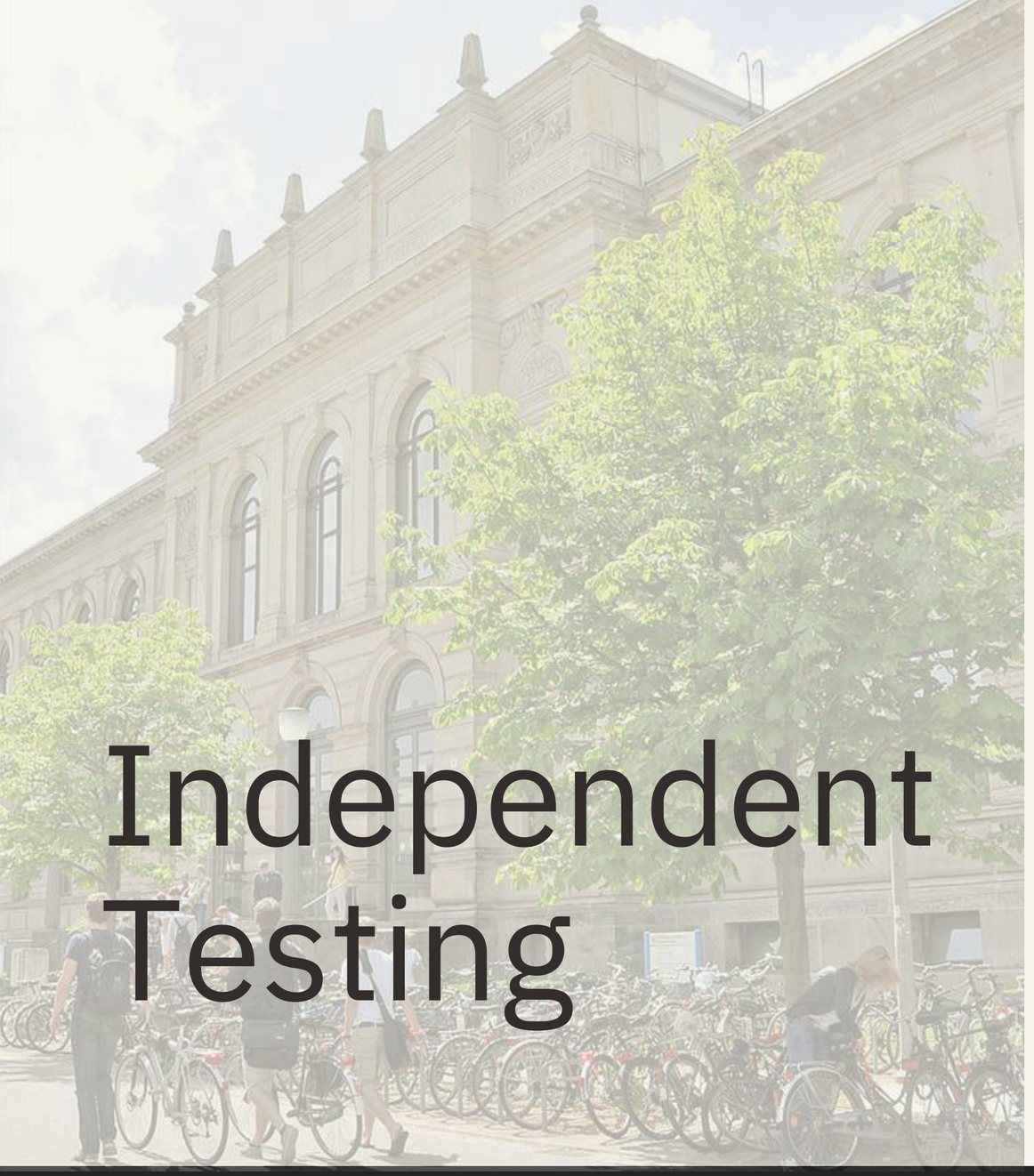


Independent Testing

Technical University of Braunschweig

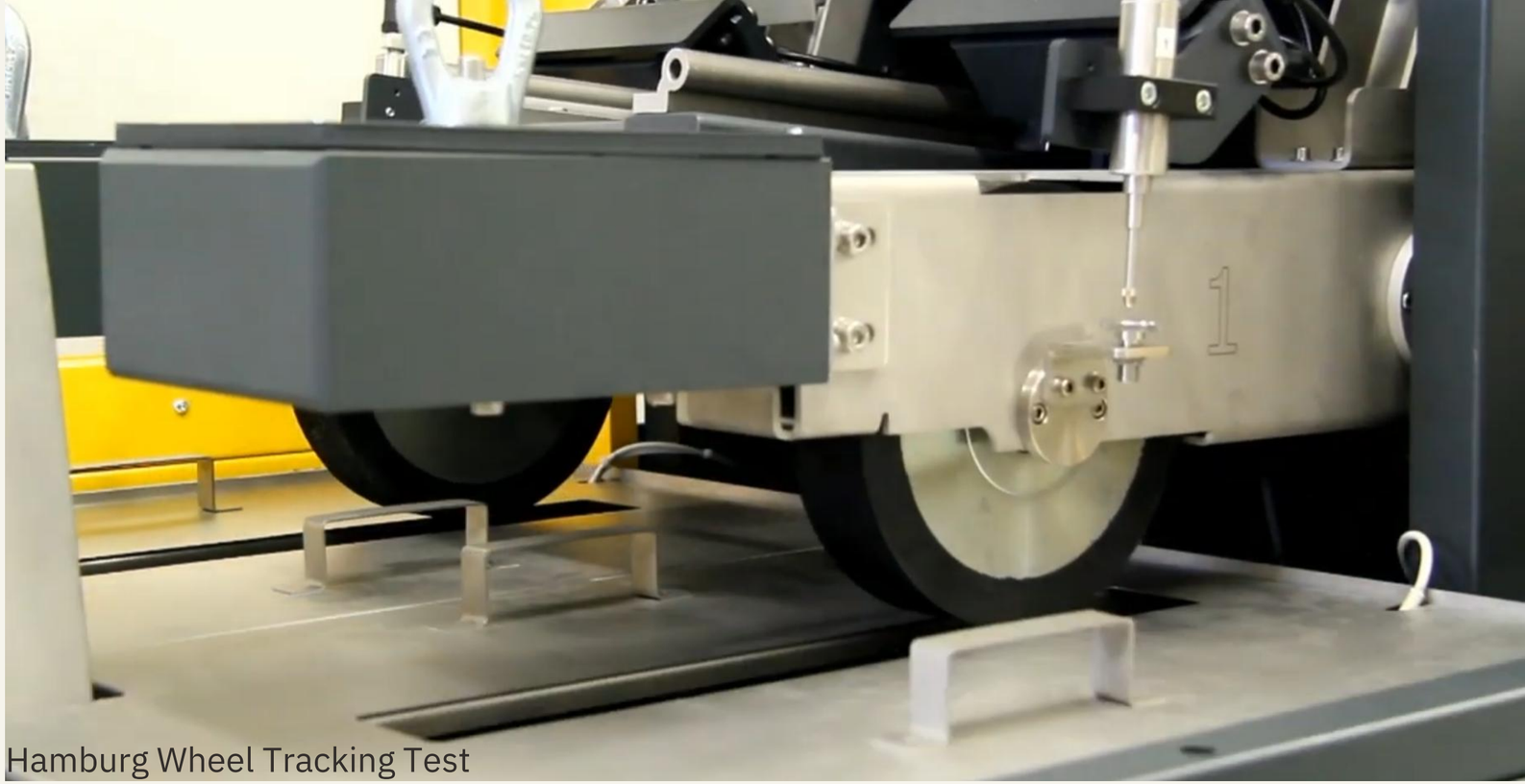
The university hosts the Braunschweig Pavement Engineering Centre (ISBS), a dedicated research institute focused on design, durability and performance of asphalt pavements for highways and airports.

Its research programmes include structural optimisation of asphalt layers and durability improvement under traffic and climate loading, which are core pavement-engineering topics.

They run major sustainability-driven asphalt projects, such as bio-binder and high-recycling asphalt concepts tested at large scale (e.g. “NOBIT”, “ANNA”, “KARIN”).

The institute also has a large accredited asphalt testing laboratory (operating since the 1970s) used for mix design validation and quality control in road construction.

Fatigue Crack Initiation Performance (ITFT)


Hamburg Wheel Tracking Test

Testing Methods

The Real Cost of Asphalt is not just the material

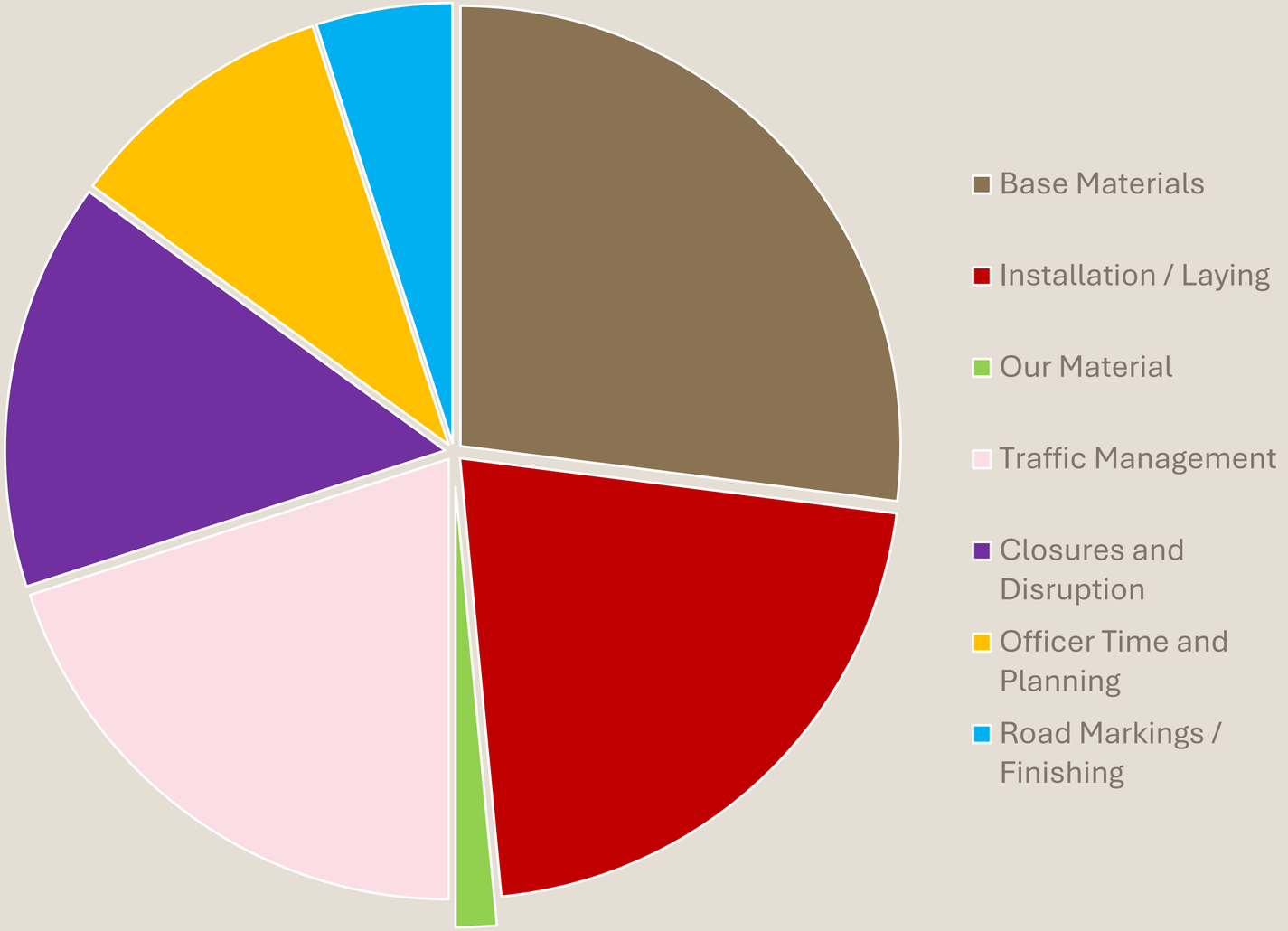
Visible Upfront Costs

- Asphalt
- Installation

Wider Intervention Costs

- Traffic Management
- Lane / Road Closures
- Public Disruption
- Officer / contractor time
- Road markings / finishing
- Repeat Maintenance Visits

- Local Authorities pay for the intervention



Up to 40% longer pavement life

Testing suggests the potential to extend pavement life significantly. If that translates into the field, it could mean fewer major interventions over the life of the road.

If roads last materially longer, councils may need fewer major interventions over the life of the asset.

- A modest improvement in pavement life can have a large effect over decades
- Fewer resurfacing cycles means less spend, less disruption and less pressure on highways teams
- The goal is not a perfect road — it is getting more life out of every intervention

Standard road
Year 0 | Year 10 | Year 20

Longer-life road
Year 0 | Year 14 | Year 28

What should councils do next?

The future of roads can start small — with one trial in one authority.

- We can work with your existing partners
- We aim to make trailling straightforward
- We will support the trial design and evaluation
- We’d love to work with you

1. Identify a suitable trial section
2. Compare against your current approach
3. Measure performance over time
4. Build local evidence for future decisions