



Centre of Excellence  
for Decarbonising Roads

# APSE Update



Department  
for Transport

ADEPT  
**LIVELABS2**  
Decarbonising Local Roads



**NORTH  
LANARKSHIRE**  
COUNCIL



Transport for  
West Midlands

Amey



COLAS

WE OPEN THE WAY

# Introduction

**A Live Labs 2 theme - paving the way to a low-carbon future through material innovation and collaboration across the highways and local roads sector.**

Delivered by North Lanarkshire Council and Transport for West Midlands, in partnership with Amey and Colas



Aims to reduce siloed working and encourage low-carbon material adoption



Supported by live testbeds and knowledge bank for LAs



# Demonstrator Programmes

1



## Pothole Repairs Phases 1 + 2

We have evaluated around 15 pothole repair materials with 3 different methodologies across 15 roads in the North and South,

2



## Surface Treatments Phase 1 + 2

Four asphalt preservation and rejuvenations options have been trialed across two distinct phases, across 20 roads and over 60,000m<sup>2</sup> of treatment

3



## Resurfacing Trials

A major focus for 2025 has been resurfacing options. Carried out in NLC and the West Midlands, with three "supersite" trials to investigate Surface and binder course options

4



## Wider Services

Roadmarking trials, signs and posts trials have been carried out to assess the performance and carbon of laying parallel lines and trialing of passively safe posts

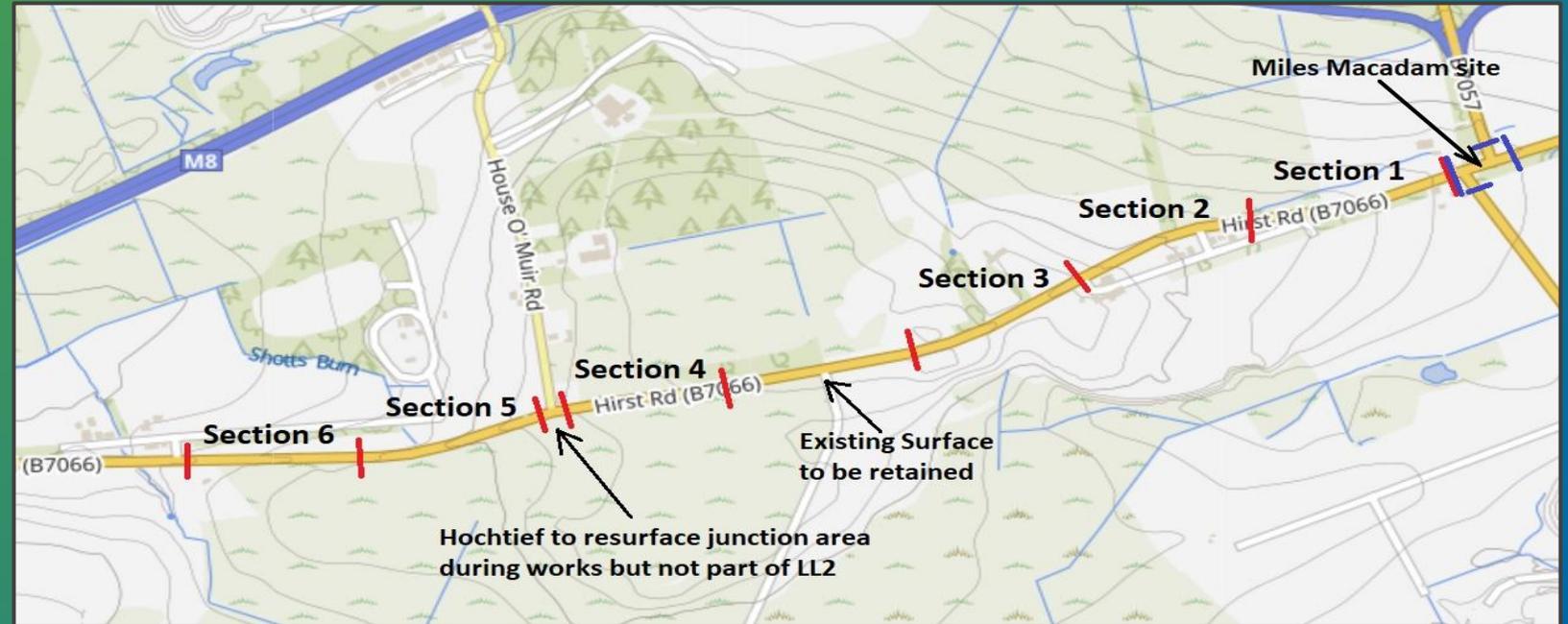
# Surfacing Supersite - NLC

5 comparative low-carbon binders and 1 benchmark

In-situ recycling in binder course

Miles MacAdam junctions

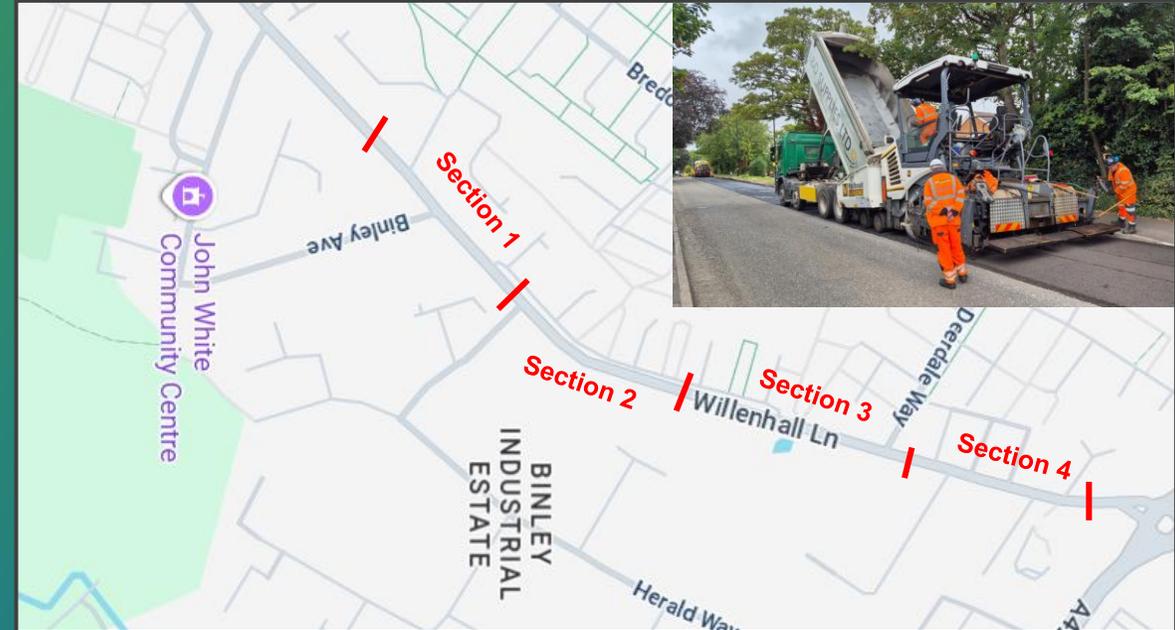
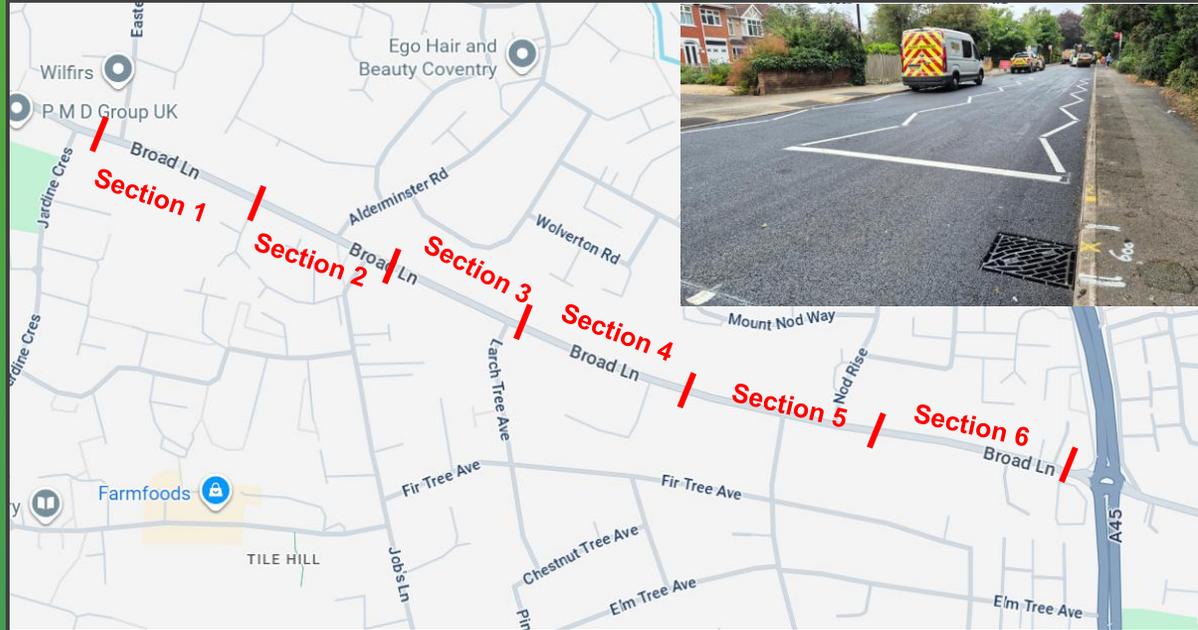
Timeline: July 2025



Surface course: 50mm
Binder course: 100mm

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1. GiPave	2. Styrelf bio-PMB	3. Warm HRA	4. Control Section	5. UltiPave Bio	6. Warm HRA
Regen				SPL	

# Surfacing Supersites - TfWM



10mm PMB control surface course				
AC20 HDM Control	AC20 HDM + Graphene	FoamMix Eco + ACLA	FoamMix Eco + E20 lignin / biochar	AC20 HDM Bio

10mm PMB Bio	E50 Lignin	10mm TSCS + Graphene	10mm PMB control surface course
AC20 HDM Control Binder Course			

# Asphalt Preservation – Phases 1 and 2

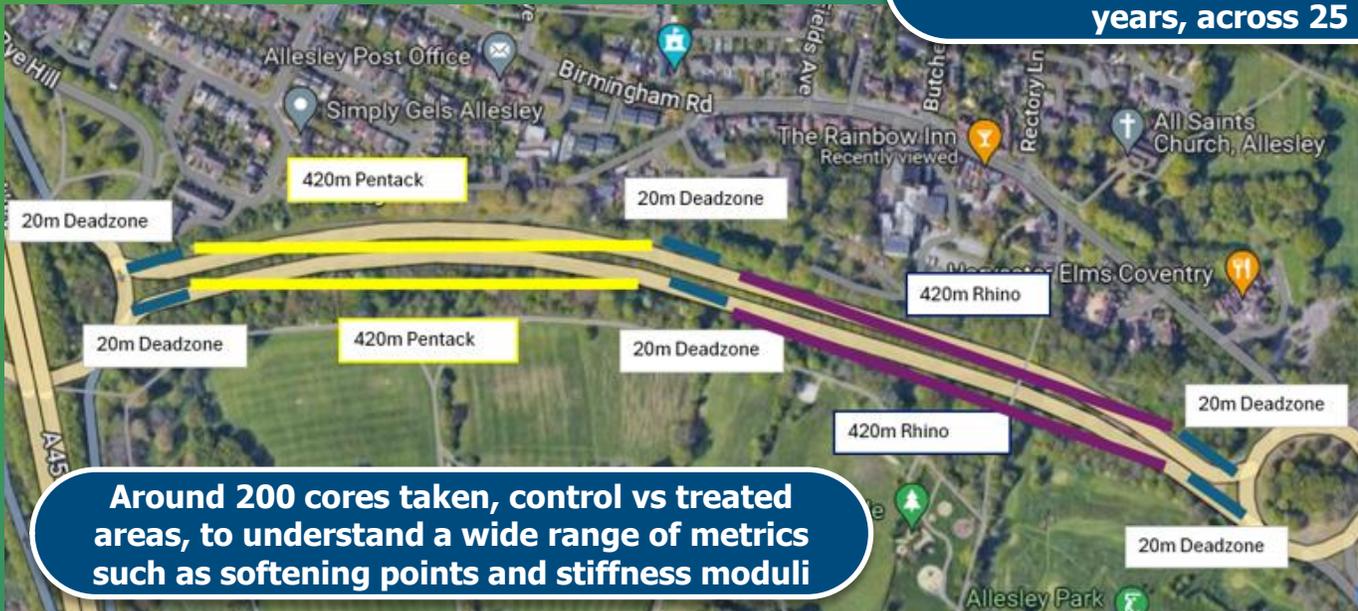


Preservation, Rejuvenation and Sealing, with Reclamite, Pentack, Rhinophalt and Everphalt

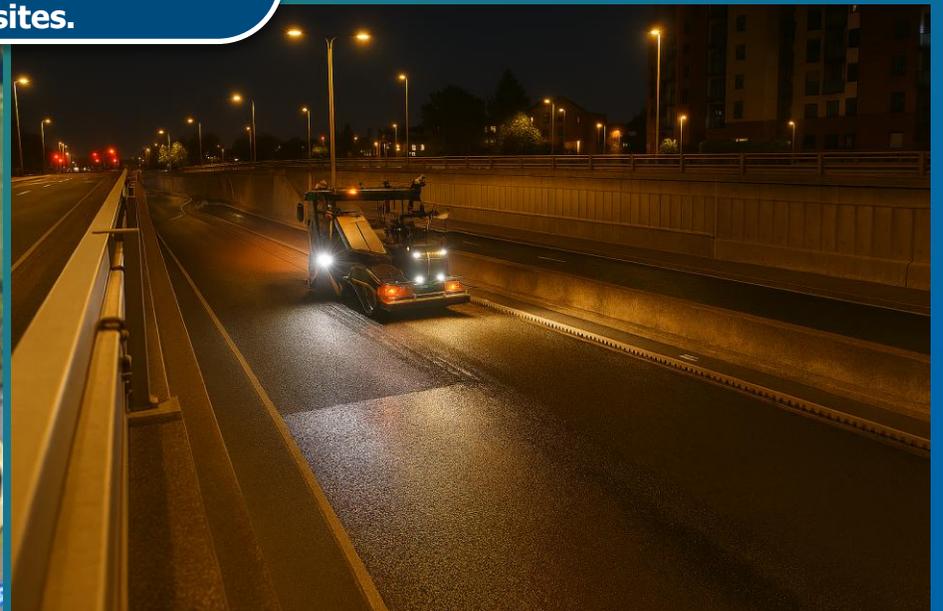
# Asphalt Preservation – Phases 1 and 2



Circa 100,000m<sup>2</sup> of preservation treatment has been applied over two years, across 25 sites.



Around 200 cores taken, control vs treated areas, to understand a wide range of metrics such as softening points and stiffness moduli

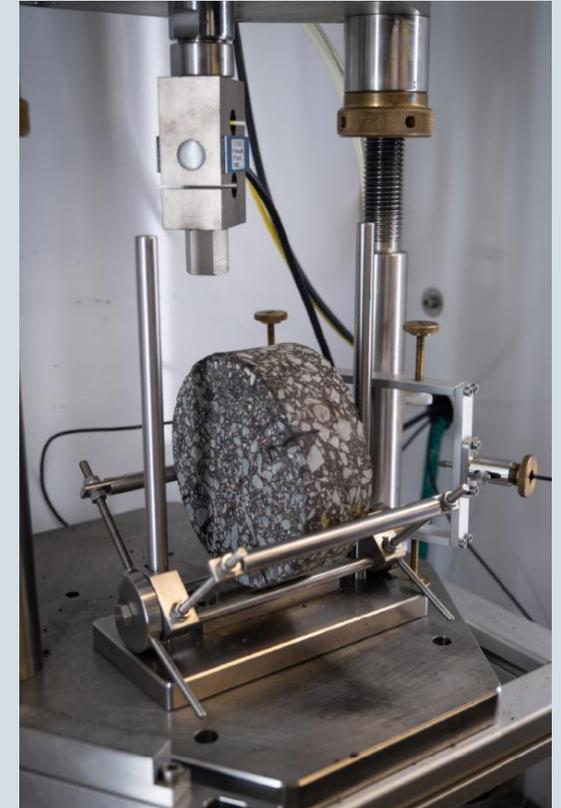
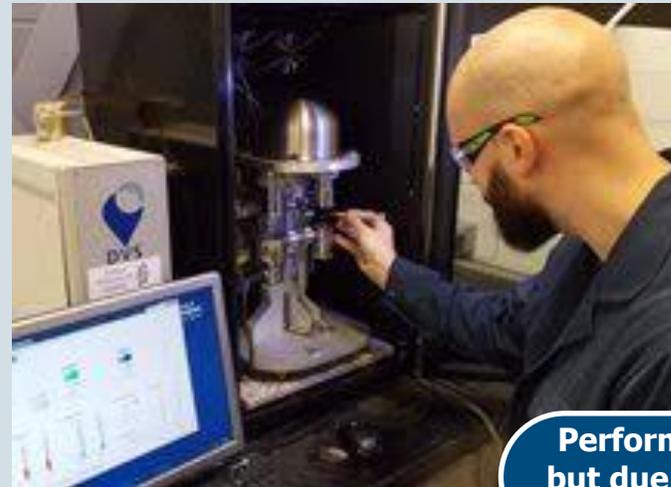


# Academic Review Programme

## Virgin binder and loose bulk mix testing with University of Nottingham, aligned to BS-EN standards and NH SPaTS testing programme

Destructive?	Testing measurement
D	Penetration / Softening point - Needle / Ring&Ball
D	Stiffness Bitumen - DSR
ND	Stiffness Asphalt - ITSM
Site	Sand patch / Texture depth
ND X6	Water Sensitivity ITSR
D	Freeze / Thaw
Semi	Fatigue - ITFT
D	Bitumen Content
ND	Void Content
D	Maltenes IP143 - Asphaltene content / SARA
Site	Skid resistance - SCRIM / Pendulum / Grip test
Site	Mean Texture Depth - SCANNER
Site	Cracks - SCANNER
D	RLAT

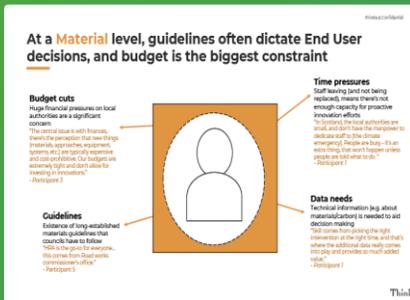
University of Nottingham and Aston engaged to evaluate the performance of material samples



Performance and Carbon to be analysed, but due to large volume of testing, results are expected by the end of 2025

# Knowledge Bank Journey

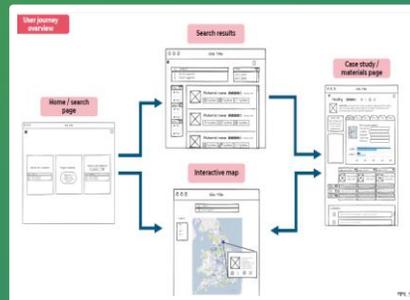
1



## End-User Requirements

Working with Think's Insight, we conducted behavioural research with 10 LAs across the country to assess challenges and initial design prototypes

2



## High-level wireframes

Early-stage wireframes and End-User Requirements presented to suppliers

3



## IT options appraisal and onboarding

Three top suppliers rated against key criteria, and top supplier (Microsoft with Transparency) were onboarded

4



## Design and development

In-depth designs, development and UAT testing over the last 5 months

# Intention of the knowledge bank

## Evidence base for local authority innovation and excellence across the UK

**Featured Case Studies**  
Discover sustainable road construction materials that reduce environmental impact while ensuring durability and safety. [View All Case Studies](#)

**BEAR's Bio-Binders**  
Weatherline Plus | CarbonSink, [+3]  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore...

**In-situ Recycling and Warm-Mix in Clackmannanshire**  
Weatherline Plus | CarbonSink, [+1]  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore...

**Biogenic Binders in Lancashire**  
Shell Bitumen | CarbonSink, [+2]  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore...

**In-situ Recycling and Warm-Mix in Clackmannanshire**  
Weatherline Plus | CarbonSink, [+4]  
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore...

## Comprehensive menu of options, with carbon, cost and performance consistently measured

**Try the Carbon Calculator**  
Estimate the potential carbon savings of different materials before making a decision. A simple tool to help you compare impact and make informed choices. [Get Started](#)

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Home / Materials / Material Detail

### Materials

Material Type:  Activity:  DMIS Series:

Sort by:  [Compare Selection](#)

<b>SuperLow Carbon Bitumen</b> 0700 - Road Pavements   Resurfacing   Binder	<b>Fragments</b> 0700 - Road Pavements   Resurfacing   Binder	<b>Polymer-Modified Bitumen</b> 0700 - Road Pavements   Resurfacing   Binder
<a href="#">Add to Compare</a>	<a href="#">Add to Compare</a>	<a href="#">Add to Compare</a>
<b>Graphene-enhanced asphalt (GPAve)</b> 0700 - Road Pavements   Resurfacing   Binder	<b>Recycled Aggregate</b> 0700 - Road Pavements   Resurfacing   Binder	<b>SuperLow Carbon Bitumen</b> 0700 - Road Pavements   Resurfacing   Binder
<a href="#">Add to Compare</a>	<a href="#">Add to Compare</a>	<a href="#">Add to Compare</a>
<b>Polymer-Modified Bitumen</b> 0700 - Road Pavements   Resurfacing   Binder	<b>Graphene-enhanced asphalt (GPAve)</b> 0700 - Road Pavements   Resurfacing   Binder	<b>Recycled Aggregate</b> 0700 - Road Pavements   Resurfacing   Binder
<a href="#">Add to Compare</a>	<a href="#">Add to Compare</a>	<a href="#">Add to Compare</a>

Part of the ADAPT (at 02022) - decarbonising local roads network, a three year £30million UK-wide initiative funded by the Department for Transport that aims to decarbonise the local highway network.

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Home / Materials / Material Detail

## SuperLow Carbon Bitumen

Discover the key performance and environmental benefits of SuperLow Carbon Bitumen. From reduced carbon emissions to improved installation, this material delivers on sustainability without compromising quality.

[Add Review](#) [Carbon Calculator](#)

**Considerations**  
Discover the key performance and environmental benefits of SuperLow Carbon Bitumen. From reduced carbon emissions to improved installation, this material delivers on sustainability without compromising quality.

- Carbon Negative**  
Captures and stores CO2 within the asphalt, acting as a carbon sink and lowering the environmental impact of road construction.
- Warm Mix**  
Using at lower temperatures, reduces carbon emissions from the heating process and lowers fume emissions to improve working conditions.
- Highly Workable**  
Mixes highly compatible at lower temperatures, allowing for better performance and durability during installation.

**Images**

**Carbon Impact**  
Understand the carbon footprint of SuperLow Carbon Bitumen across its lifecycle stages. The figures below reflect both the environmental savings and the carbon sequestration potential of this advanced material.

<b>A1 to A3 Carbon Cost / unit</b> A1 carbon cost per unit A2 carbon cost per unit A3 carbon cost per unit	<b>A5 Default Carbon Cost / unit</b> A1 carbon cost per unit	<b>Sequestered Carbon / unit</b> A1 carbon cost per unit
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**Reviews**  
★★★★★ 4.9 / 22 reviews  
Hear from local authorities and industry professionals who've used SuperLow Carbon Bitumen in the field. Their feedback highlights the practical and environmental value of choosing this sustainable material.

Reviewer Name	Reviewer Name	Reviewer Name	Reviewer Name
25 Jan 2025	25 Jan 2025	25 Jan 2025	25 Jan 2025

## Peer reviews and culture of local authority collaboration

# The Knowledge Bank

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<https://kb.decarbonisingroads.co.uk/>





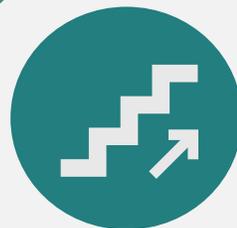
## New Features

- Forum
- User dashboard
- AI chatbot
- 2-way dialogue for reviews
- Specification guidance and toolkit for engineers



## Engagement Plan

- LA booking page to support case study writing
- Alignment with UK Labs Network, supported by FHRG

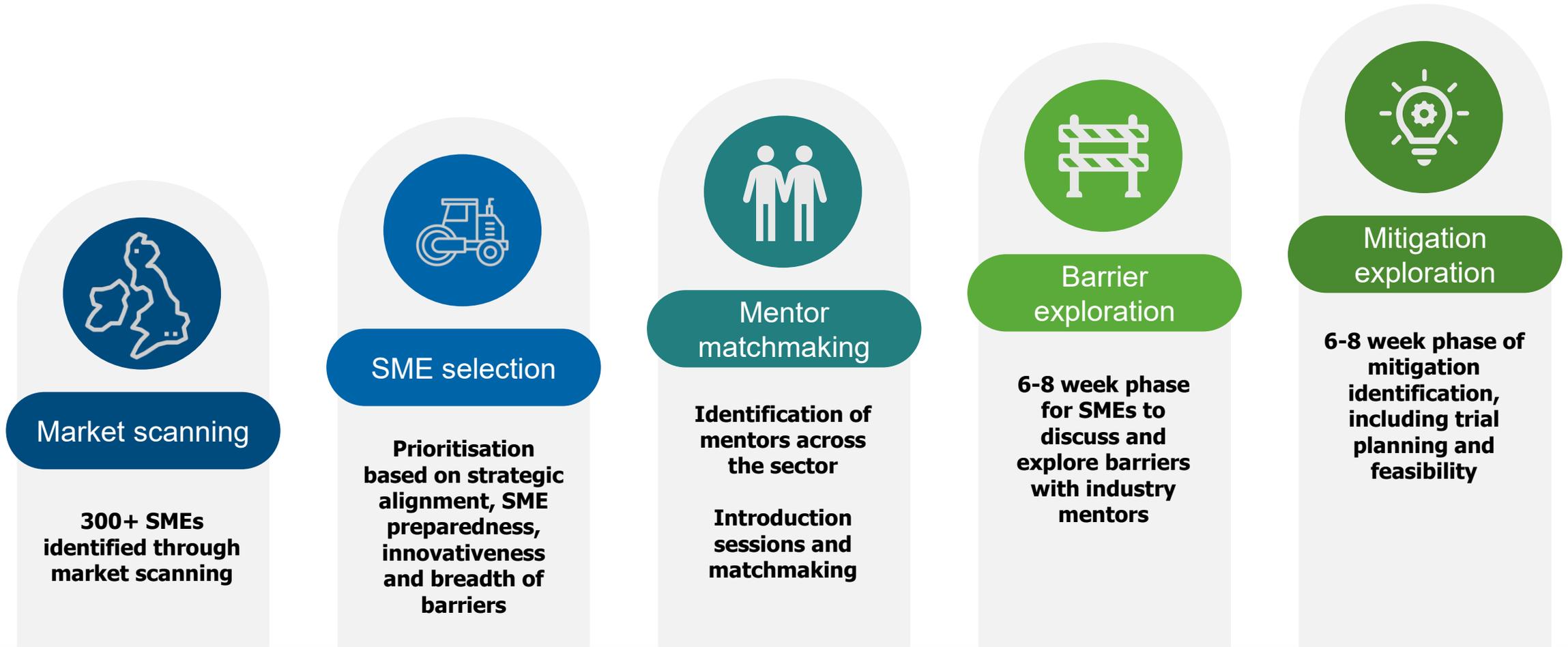


## Supply Chain Role

- Requesting updates / info on supplier contact details and manufacturing sites
- Encourage their LA clients to submit reviews and case studies

# What's next for the Knowledge Bank

# Progress to Date:



# SMEs



## PRG Scotland

- Tyre-derived bitumen from Continuous Reductive Distillation
- 4.48 kg CO<sub>2</sub>e per tonne compared to 215 CO<sub>2</sub>e per tonne for traditional bitumen



## Sima

- Asphalt additive
- Plastic-derived granulation
- Reduces bitumen usage, 5kg per 2kg of product
- Barriers in specification by binder weight rather than volume



## Ecopals

- Berlin-based
- Develop polymer modifiers for asphalt from recycled plastic
- Trials completed in Germany, Switzerland, Austria, Poland, etc.



## Uberbinder

- Binder derived from inverse vulcanization of sulphur byproducts
- Trials in the US and planning trials in Spain



## Biozeroc

- 100% cement-free concrete, with 35 Mpa compressive strength
- Cambridge University spin-out
- Some concerns regarding low-risk applications for highways



## DMAT

- Self-healing concrete developed with MIT through a proprietary additive
- Achieved CE certification and have active commercial deployments





### 'On the ground' ethnographic

- Interviews and Site visits completed with 3 LA's
  - Coventry
  - North Lanarkshire
  - Lincolnshire



### Digital ethnography

- Observational research conducted through a closed WhatsApp chat



### Co-creation workshops

- Workshops combining all the findings so far
- Final outputs to be published in the next month
- Top ideas following workshops were:
  - Decision prompts
  - Innovation Hub
  - Joint innovation
  - Shared success stories

# Behaviour Change Update

# Next Steps and Call to Action

## Using the knowledge bank

We encourage Local Highways Engineers and Asset managers to share their experiences with materials and processes to the KB.

Ongoing

## Engage with the CEDR Team

The CEDR team will be arranging meetings with LHAs across all UK local authorities. These sessions will give LAs the opportunity to share their experiences verbally, and we will use this input to develop content for the website.

Feb – March  
2026

## Suite of evaluations to be published

Through Q1 2026, the CEDR team will be finalising and publishing our findings and reports on our demonstrators, carbon evaluation and lessons learned

Early March  
2026

# Questions & Discussion