



# Ultimate Innovation

## BIOGENIC ASPHALT FOR CARBON CAPTURE AND STORAGE

### The challenge

As part of scheduled work to resurface the busy A452 Chester Road in Birmingham the client and principal contractor were keen to explore ways of reducing carbon emissions and contributing towards their net zero strategy. The Chester Road is around 12.5 miles long, located the North of Birmingham and runs from Brownhills to Erdington and is one of the main arterial routes in and out of the city. Given the importance of the route and the high volumes of traffic using it, resurfacing works would need to be undertaken at night to avoid daytime route closures and disruption to traffic. The chosen solution would need to deliver long term durability and resistance to these high traffic volumes.

### Early involvement and collaboration

Tarmac were involved early in the process and worked with the designer and main contractor on proposals to use new and innovative biogenic asphalt. As part of the alliance framework, monthly sustainability forums were held involving all supply partners, to encourage innovation and more sustainable solutions. There was a strong will from all parties to lower the operational carbon footprint. Given the high traffic volumes and importance of this route, a key part of the challenge was to reassure the client that the proposed solution would deliver the same performance as a more conventional asphalt material with no compromise to the long-term performance of the road.

### Innovative, sustainable solution

The proposed pavement design would consist of a biogenic asphalt binder course topped with a high performance Ultilayer SMA10 PMB PSV65 surface course. Biogenic asphalts replace some of the fossil fuel derived binder with at biogenic or plant-based alternative. As well as having a lower carbon footprint during production, the biogenic asphalt binder technology effectively locks away carbon absorbed during the growth of the biomass or plant-based element. This effectively turns the new road surface into a carbon sink. It can capture and store around 6 tonnes of CO<sub>2</sub>e per km of road. Since the asphalt can be recycled at the end of the pavement life, most of this carbon will not re-enter the atmosphere but be incorporated into another road.

## Results and benefits

In all, 530 tonnes of Tarmac's Biogenic Asphalt was supplied to the site being laid along with 630 tonnes of the Utilayer SMA10 PMB PSV 65 surface course. Using a biogenic asphalt binder course instead of the original warm mix asphalt binder saved 6.5 Kg CO<sub>2</sub>e per tonne of asphalt or 3.45 tonnes of CO<sub>2</sub>e in total. The works are undertaken and managed as an alliance with Tarmac, Arcadis (principal designer), Kier (principal contractor), BCL (Birmingham City Council's delivery vehicle) HTM (Traffic management business) WJ (road markings). Detailed data on the early testing and trials of the biogenic binder and the proven track record of Tarmac's Utilayer polymer modified asphalt meant that the client was confident in the long term performance of the new road surface.

"What we are doing here tonight on Chester Rd is part of the future of resurfacing our highways. Making these decisions today, these small changes, will allow us to preserve our planet for future generations.... This material allows asset owners and designers to work towards net zero. It makes improving the condition of our roads, while



simultaneously lowering carbon emissions possible."

Matthew Winnington, Contracts Manager, Tarmac

## Low carbon leadership

Introducing biogenic asphalt underlines Tarmac's commitment to supporting our customers in their journey towards a net zero future for road maintenance. It follows the introduction of other products like our Rubber Modified asphalts which can recycle rubber from up to 750 end of use tyres

per kilometre of road and our decision in 2022 to take the lead in defaulting entirely to lower carbon warm mix asphalt. This decision alone is expected to save around 21,000 tonnes of carbon dioxide per year. This scheme also illustrates Tarmac's commitment to working with clients to help them introduce innovative materials in a smart and considered way, while ensuring consistent performance comparable to conventional materials.