

Nynas

Britain's largest bus station outside London might seem ambitious as the location for the first full scale trial of a new fuel resisting asphalt surfacing. But two years on, the material is still looking good.

Fuel resistance goes the distance in Sunderland

More than 160 buses an hour use Sunderland's new Park Lane transport interchange – a figure that rose to 196 in the summer peak. There is only one entrance and one exit, with the buses following a unidirectional circuit in between.

This layout puts the 3,000m² surface under constant and continuous wear. Sunderland City Council's highway maintenance manager Graham Carr says: "It's as if we are running tracked vehicles. Every bus follows almost exactly the same route."

It is highly pleasing then to both the client and the surfacing supplier, that after two years of continuous use, the surface is showing no signs of tracking or of the aggregate pulling up – even in the most heavily used section at the entrance and exit. "They swing round the corner pretty fast and often have to stop at a set of pedestrian lights," explains Carr. "I would have expected it to have moved a bit, but there's absolutely no tracking. It is still early days in terms of lifespan but the results so far are promising."

"Heavy duty macadam gave us the option to reduce the thickness of construction."

Graham Carr

The architect proposed block paving, but Carr vetoed it because he felt it could not stand up to heavy trafficking and would be difficult and expensive to maintain.

Concrete was the other option given serious consideration because of its ability to withstand oil and diesel spillages. Bituminous surfacings have in the past been shunned for applications where fuel spillages might occur, as oil based fuels can attack conventional binders. But concrete is also expensive and is easily discoloured by spilled fuel.

While Sunderland City Council was designing the interchange, bitumen specialist Nynas was launching a modified binder with fuel resisting properties. Small scale trials of the "Nyguard" binder with Tarmac's Masterpave surfacing gave Tarmac sufficient confidence to recommend the surfacing to Carr.

Peter Wheeldon – Tarmac's northern region technical manager at the time – visited other bus stations with Carr to identify what problems might occur and also to decide if a coloured surfacing would be right for Park Lane. "The main lesson we learned was to keep joints to a minimum," explains Wheeldon. "Too many joints can make the surface very ragged – something that was made even more apparent by red pigment." The visit also helped Carr decide to go for an unpigmented finish.

As a result of the visits, and Tarmac's own tests on the Nyguard binder, Carr designed the pavement construction using a 40mm layer of Mastershield wearing course. It incorporates 10mm locally extracted 57psv quartz dolorite aggregate in a slightly denser mix than standard paving to give a less open texture.

Although fuel cannot erode the Nyguard binder, Tarmac was concerned that, if the texture was too open, it might cause the binder to soften. There is no evidence that this has occurred.

The surfacing was laid in two runs with no horizontal joints and just one central longitudinal joint – also painted with the fuel resistant binder. But the surfacing is only one element in the ability of this pavement to withstand the heavy tracking of buses. Beneath the wearing course is what Carr describes as

“pretty heavy construction”.

The Mastershield sits on a heavy duty 60mm base course supported by a 250mm ultra strong road base incorporating 28mm aggregate. As Wheeldon points out, Carr’s job at Sunderland City Council accounts for this “belt and braces” pavement design: his primary concern is maintenance.

“The heavy duty macadams gave us the option to reduce the thickness of the construction,” says Carr. “But the other option is to keep the same layer thickness and increase the life. It’s up to individual engineers, but that is the option I prefer.”

Park Lane interchange

Sunderland City Council’s £6.5M Park Lane transport interchange has won both critical and public acclaim. Last year it attracted the Civic Trust Centre Vision Award as “the scheme that contributes most to the improvement of a town or city centre”.

During the design stage, highway maintenance manager Graham Carr was so concerned about the tight corners on the proposed layout that he created a full scale replica in a field. Using traffic cones to mark out kerb lines, he invited bus drivers to drive the circuit in the different vehicles that would eventually use the facility.

Newcastle based architect Napper Partnership carried out the design in association with Sunderland City Council’s architects. The interchange was constructed by City Contracting Services, the council’s own in-house contractor, and Tarmac was the nominated paving subcontractor.

The interchange was developed as part of a £60M redevelopment of the Bridges Shopping Centre in Sunderland city centre. Also under way is a £100M extension to the Tyne & Wear Metro, which runs beneath and is linked to the bus station. Before construction started, Nuttall carried out an £800,000 contract to build tunnel sections for the Metro – even though the extension had not yet been given the final go ahead.

The box sections were then covered over by one side of the interchange, and are now being linked to the remainder of the rail route. The Sunderland Metro extension is due to be opened in March 2002.

email hotline: info@modernasphalts.com



1. Nynas’ Nyguard binder was used at Sunderland to create a fuel resisting asphalt surfacing.



2. The Tarmac northern region technical manager Peter Wheeldon (left) and Sunderland City Council’s highway maintenance manager Graham Carr (right) visited other bus stations to investigate potential pitfalls before specifying Nyguard.



3. Two years on and the material is standing up well to its heavy use.