

Case Study:	HSC/S 1
Location:	Stephenson Drive Leicester
Client:	Leicester City Highways
Contract Date:	January 2011
Engineer:	Mr Nigel Goshawk

### **Background:**

Highway Systems were contracted to carry out there Crack & Seat process by Leicester City Highways after successfully Cracking & Seating Spencefield Lane Leicester in 2009.

Stephenson Drive located in the New Parks area of Leicester is a 150mm – 200mm thick concrete carriageway. The carriageway is 8.3m wide on average and just under 700m in length.

Highway Systems Mr Des Burns assessed the site, and was able to advise on various aspects to the suitability for their Crack and Seat process and its success for this particular site.

After the assessment Highway Systems were confident that their process would be greatly beneficial to this road.

### **Problem:**

Stephenson Drive had a major problem of moving and rocking road slabs making it impossible to simply resurface it without reflective cracking appearing almost immediately.

Mr Nigel Goshawk of Leicester City Highways explains,

“The road (constructed during WW2) is heavily used by buses and vehicles commuting between the inner and outer ring roads of the city.

Over time as a result of poor support under the existing carriageway due to foundation damage from poor drainage and general deterioration of the concrete, a large number of bays had failed. They had either heavily cracked or the bays that had not failed were significantly moving when vehicles travelled over them.

Larger vehicles including buses caused a lot of movement and this was causing concern as well as residents being unhappy as the vibration was being felt in their properties.

Surveys and trial holes were carried out to establish the extent of any voiding under the carriageway.

In order to stop the concrete slabs from moving and also to reduce the effects of horizontal and vertical movement it was decided to consolidate the ground and concrete slab”.



### Solution:

Mr Goshawk continues, “This was carried out using a cracking and seating process, once the ‘crack and seat’ works had been completed the surface was used in its current state for nearly 3 months before being overlaid with a new road surface. ‘Crack & Seat’ used minimal traffic management with the road remaining open as the work commenced and the cracked surface could be driven on by vehicles without any problem.” The surface had an asphalt regulating course 20mm in thickness, an asphalt grid was then placed on top of this with a bituminous bond coat and this was then overlaid with a further 50mm of asphalt material.

### Results:

“It is hoped that by using the ‘crack and seat’ process the asphalt pavement life will have been increased by up to 10 years, and by using asphalt reinforcement a further 10 years may be expected.

Although there will inevitably be some movement of the carriageway by taking the steps above the pavement life has hopefully being maximised.

The alternative of removing the failed concrete carriageway would have been impractical due to time, cost, disruption and environmental issues. The excavation and disposal costs alone would have been very expensive, not to mention the new material required to construct the new carriageway” adds Mr Goshawk.



### Conclusions:

Mr Goshawk’s final conclusions were,

“In summary using ‘crack and seat’ has allowed us to re-use the existing failed carriageway without the need for removing it. The ground has been consolidated and a thin surface over laid to provide a new running surface.

Stephenson Drive looks like a brand new road and it is also a smooth and quiet running surface.

Due to the lack of maintenance budgets for concrete carriageway repairs this system is ideal for preserving existing concrete roads and allowing them to be reused as a base for thin surface overlays”.



### Summary:

Mr Des Burns Operations Manager for Highway Systems says,

“This site was typical of the sites we encounter day to day where Engineers are looking for a cost effective maintenance solution to problematic concrete based carriageways.

The finished job highlighted the successful implementation of Highway Systems Cracking and Seating process, where the 65 year old carriageway was reconstructed with little disruption to residents, buses, motorists or the environment.”

