

# Kings Cross Underground Redevelopment

Kings Cross, LONDON - UK

**Monitoring of Grade I & II listed buildings, Network Rail station platforms and London Underground Station tubes during the excavation of new ticket halls and tunnelled pedestrian links.**



*Above : The Southern façade of Kings Cross Station with its distinctive clock tower and twin arched windows*

King's Cross is one of London's busiest stations, with 11 British Rail platforms running above 7 different LUL lines including the Northern, Victoria, Piccadilly, Circle, Metropolitan and the Hammersmith & City lines as well as the Thames link tunnel passing through the site. Current estimates suggest that up to 55,000 commuters pass through the station at peak hours of travel.



*Above : The "CYCLOPS" continues its monitoring cycle in the Piccadilly line even during rush hour.*



*Above : Within the train shed three "CYCLOPS" monitor the internal facades, spine wall and the track sleepers.*

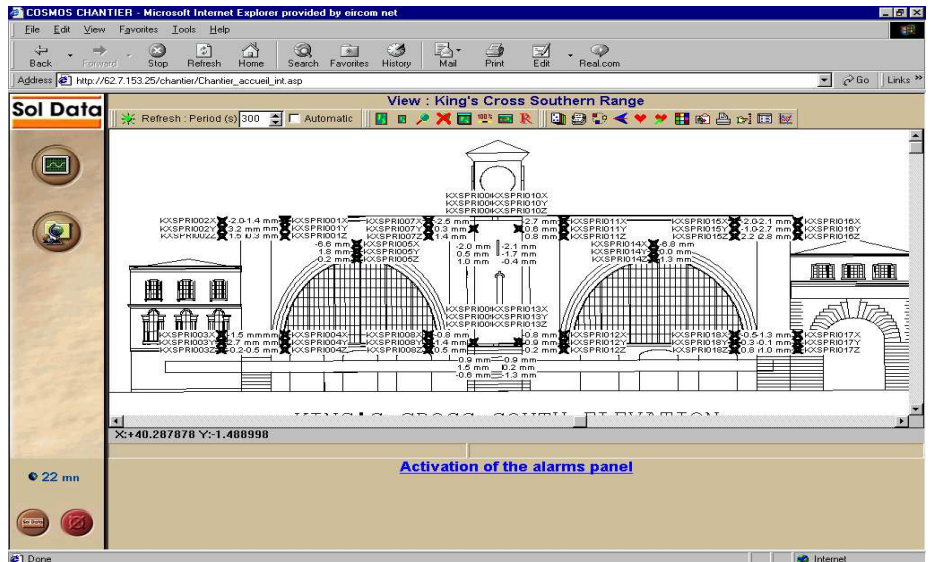
London Underground Limited is redeveloping the station to include a new Northern ticket hall, extending the existing ticket hall and constructing a number of tunnel connections between the ticket halls, the existing infrastructure of the station and the adjacent St Pancras station where the new Channel Tunnel Rail Link (CTRL) will terminate.

Sol Data has been employed by Metronet SSL to monitor the grade I & II listed Victorian structures above the underground station, including the eastern façade of St Pancras, the double arched southern façade of Kings Cross as well as the seven storey Great Northern Hotel, which is situated between the two stations, and is also a listed building.



Above : A "CYCLOPS" monitors the southern façade of Kings Cross and the Great Northern Hotel

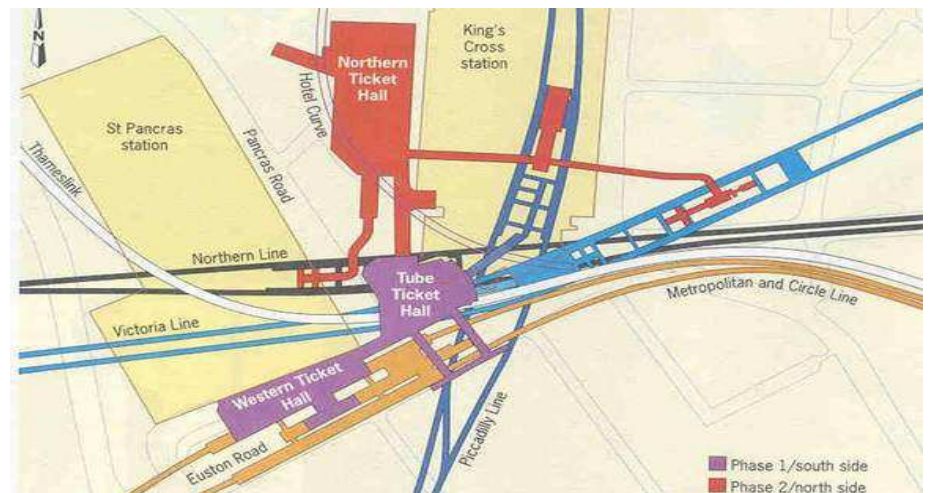
Sol Data are involved with the detailed design of the monitoring system and the company has designed and installed a network of 5 Cyclops theodolites on various buildings around the station to monitor the external facades, and a further 3 theodolites inside the main line station to monitor the internal facades. These instruments also monitor the sleepers along tracks 1 – 8 within the train shed. Another 6 theodolites within the Piccadilly, Northern and Victoria line station tubes monitor underground station deformations.



Above : The on screen display of the Southern façade when accessed through the internet

In addition to these automatic theodolites, surveyors are employed to perform manual surveys of ground studs, settlement monuments and defect monitoring points throughout the site area, to supplement the automated systems and verify the movements.

Both automatic and manual data are recorded and displayed on Sol Data's GEOSCOPE software, which can be accessed via the internet by all parties involved with the project 24 hours a day. The system is configured to display X, Y & Z readings as well as movements parallel and perpendicular to each building's façade for quick and easy interpretation of any movements as and when they occur.



<b>CLIENT :</b>	LONDON UNDERGROUND LTD.
<b>CONSULTANT :</b>	OVE ARUP & PARTNERS
<b>PROJECT DURATION :</b>	2002 - 2007
<b>SCOPE OF WORKS :</b>	
<ul style="list-style-type: none"> <li>• 14 CYCLOPS (8 above ground, 6 in the underground station platforms)</li> <li>• Manual Inclinoimeters.</li> <li>• Precise levelling.</li> <li>• Real-time Monitoring, Alarms, Reporting.</li> <li>• Project Management.</li> </ul>	