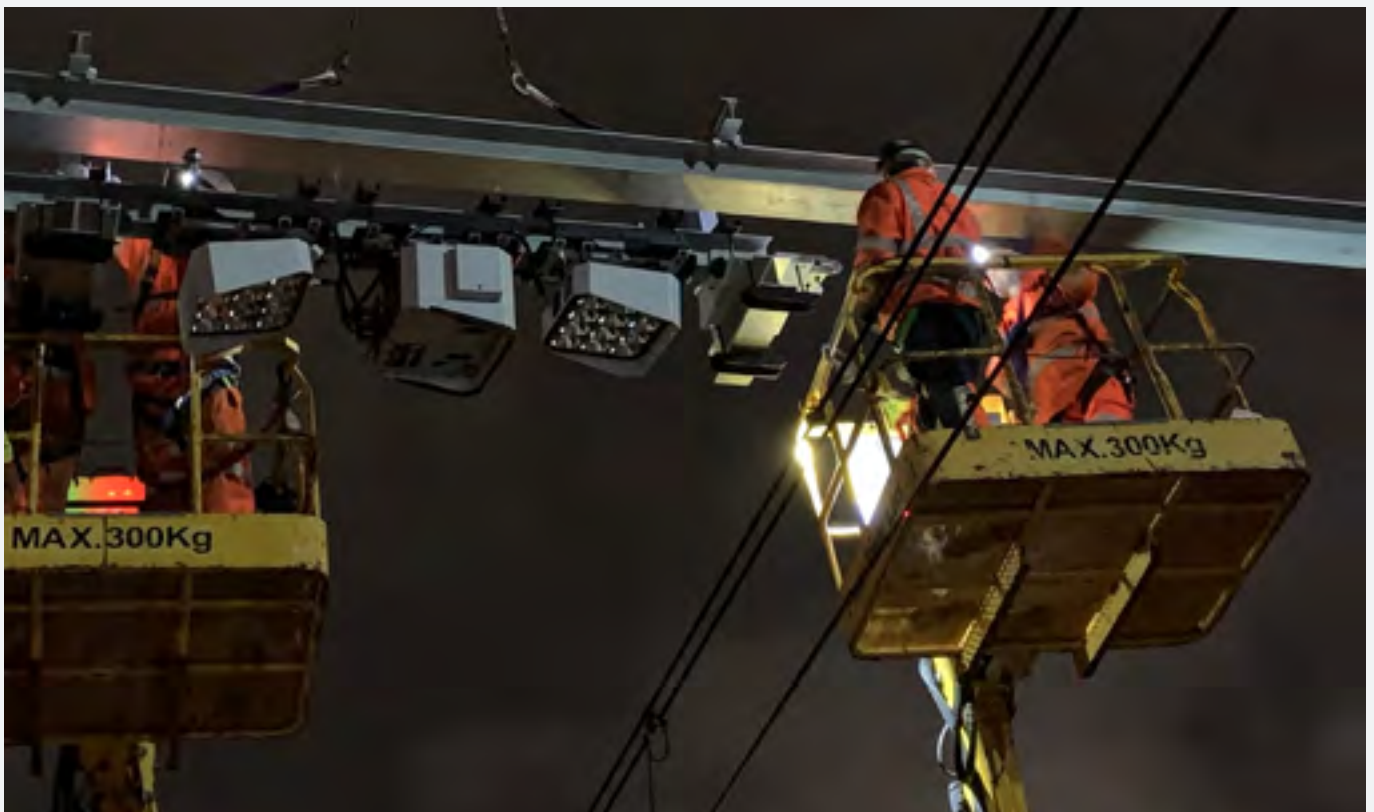


KeolisAmey Metrolink_(KAM)

Pantograph Carbon Wear Case Study



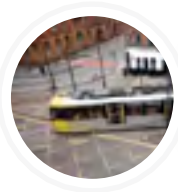
KeolisAmey Metrolink & Camlin Rail

PROJECT BACKGROUND

Greater Manchester Metrolink is Britain's largest tramway system, owned by the public body Transport for Greater Manchester (TfGM) and operated and maintained under contract by KeolisAmey Metrolink (KAM). Originally opened in 1992 at 31km in length, the line has since been extended to over 100km, carrying around 120,000 passengers each day, making it the most extensive light rail system in the United Kingdom.



Britain's largest tramway system



Over 100km in length



120,000 average passengers per day



"Monitoring the pantograph is a key part of KAM's maintenance strategy as if it gets damaged, it could damage the overhead line which interrupts service, resulting in loss of revenue and more. If we identify any pantograph faults before the damage occurs and remove the vehicle, this is clearly beneficial..."

— Clive Pennington,
Technical Director, Amey

As part of KAM's contract with TfGM, there is a requirement not only to maintain the network but also to monitor, report on and extend asset life. Having recently extended the line, KAM were looking for specialised ways to improve maintenance monitoring of the asset's performance, improve fault response and analysis. Having carried out extensive market research, KAM looked into the benefits of pantograph monitoring and discovered Camlin Rail's solution, PanVue.

Camlin Rail installed PanVue at Deansgate-Castlefield, Zone 1. This strategic point of the network and key location was purposefully selected to maximise coverage and efficiency, enabling 100% inspection on the operating fleet.

Camlin Rail PanVue Solution

CARBON WEAR INCIDENT

Carbon wear rate is not consistent, due to several variable factors. The speed of the train, uplift and weather conditions can affect the wear rate and changes in these parameters can greatly increase the rate of wear. Manual inspection routines may not be able to detect these sudden drops, due to the infrequency of these inspections.

"PanVue provides railways and operators a mechanism to increase inspection and minimise the impact of a damaged pantograph, while maintaining current manual inspection levels or even reducing them. For example, at KAM, manual inspection occurs every 20,000KM (typically 10 weeks) and with the introduction of PanVue, pantographs are now being inspected up to 10 times a day providing early fault detection that is otherwise unachievable."

— Philip Heaney, Product Manager, Camlin Rail

Camlin Rail's PanVue solution solves this problem by enabling multiple in-service inspections, everyday. This previous 10-week manual inspection window could potentially leave a worn pantograph running, causing detrimental effects to KeolisAmey Metrolink's service continuity.

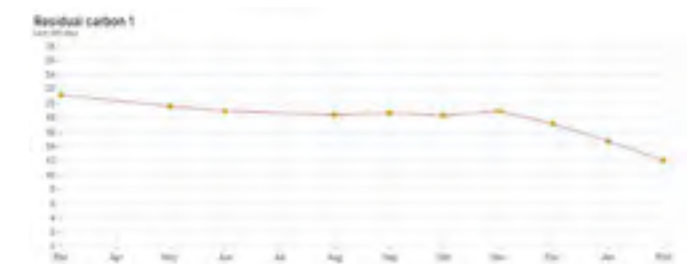
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Since installing PanVue, KAM has already seen the positive impact by already identifying trams that need to be withdrawn from service with issues. The effectiveness of Camlin's technology has already been proven, and we are now in the stages of fine-tuning the project details."

— Bilal Mohamed, Engineering Director, KAM

Changes in wear over a year

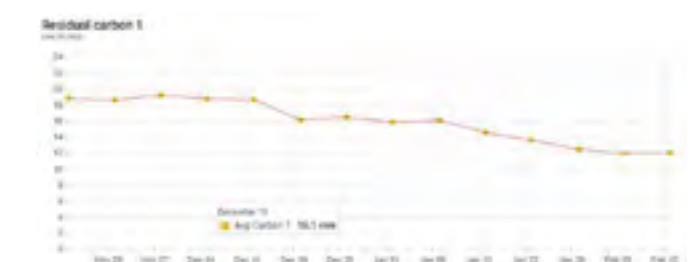
Graph shows the carbon wear rate is stable from March until November until a sudden increase in wear rate due to adverse weather conditions in the Winter.

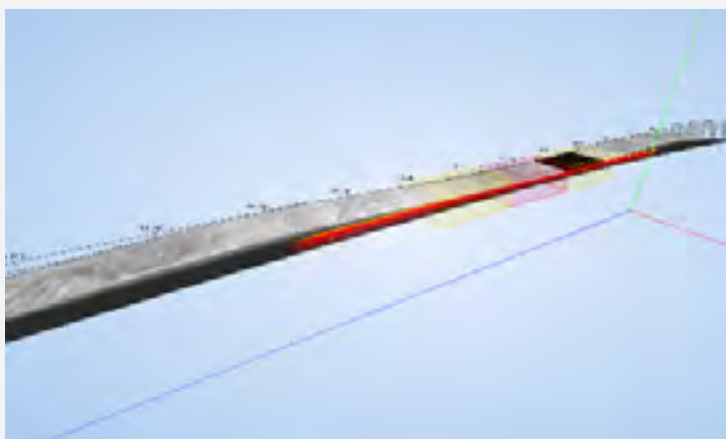
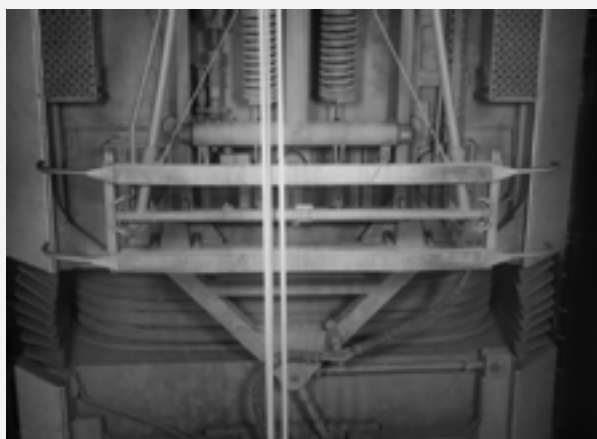


Changes in wear over 90 days

Graph shows the carbon wear rate is increased further, due to sub-zero temperatures over a one-week period. Changes in wear over 90 days

The graph shows one carriage with a drop of 3mm; however this period affected the whole fleet, with an average reduction of carbon thickness of 2mm.





Camlin Rail are delighted to be collaborating with KAM and Metrolink and look forward to working alongside both partners to provide solutions that enable the best impact and continued results.

PanVue is part of our TrainVue product suite, pioneering in-service inspection for our partners. TrainVue is currently deployed globally by train operators including Heathrow Express (UK), Network Rail (UK), MTR (Hong Kong), Deutsche Bahn (Germany) and RFI (Italy), SEPTA, Stadler Rail USA, Caltrain (US).

To find out more about
Camlin Rail and PanVue, get
in touch with the team or
visit camlingroup.com/rail
today to take the
journey further.

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