

CORE & VAC 2nd Generation

SGN Lane Rental Industry Publication



TRANSPORT
FOR LONDON

EXECUTIVE SUMMARY



SGN's keyhole strategy aims to shift operations from conventional methods to safer keyhole technology to minimise occupation of the road network, decrease operational costs, reduce carbon emissions and limit disruption for the travelling public.

The project successfully designed, developed, and trialled an improved version of the core and vac technology, which will allow gas main repairs to be completed in 6 hours instead of the conventional four to five days, delivering significant benefits.

A specialist operations team has been trained to utilise the Core and Vac Mark 2 vehicle which will target gas repairs on the Transport for London Road Network which were previously carried out using traditional methods. This technology will continue to drive further investment and innovation within SGN to implement their keyhole strategy, with additional deployment of these vehicles across the gas network.

INTRODUCTION

SGN operates the Gas Distribution Network (GDN) in the South of London. From the operations carried by SGN, approximately 97% is still carried out using the traditional methods of excavation, utilizing mechanical excavators and hand-digging. Undertaking excavations in this way usually takes between four and five days to complete, causing extended delays and disruption to members of public who travel around the city daily.

The development of core and vacuum technology (commonly known as core & vac) has enabled the remaining 3% of works to be carried out using this improved method, significantly reducing highway occupation to eight hours.



CORE AND VAC TECH REVIEW



■ With the current fleet at the end of serviceable life, SGN wanted to take the opportunity to review the current technology against advancements in this field to establish if improvements could be made to overall performance and mitigate highway occupation even further. Investigations were undertaken on the three main elements of the system:

- coring pod technology
- vacuum excavation technology; and
- air pick technology

■ Based on these findings, a single vehicle would then be purchased to trial and prove early indications which highlighted the operation could be limited to just six hours and enable works to be completed in a single day. If successful, SGN would look to purchase additional vehicles to supplement the trial vehicle and enable further use across particularly sensitive areas of the road network.

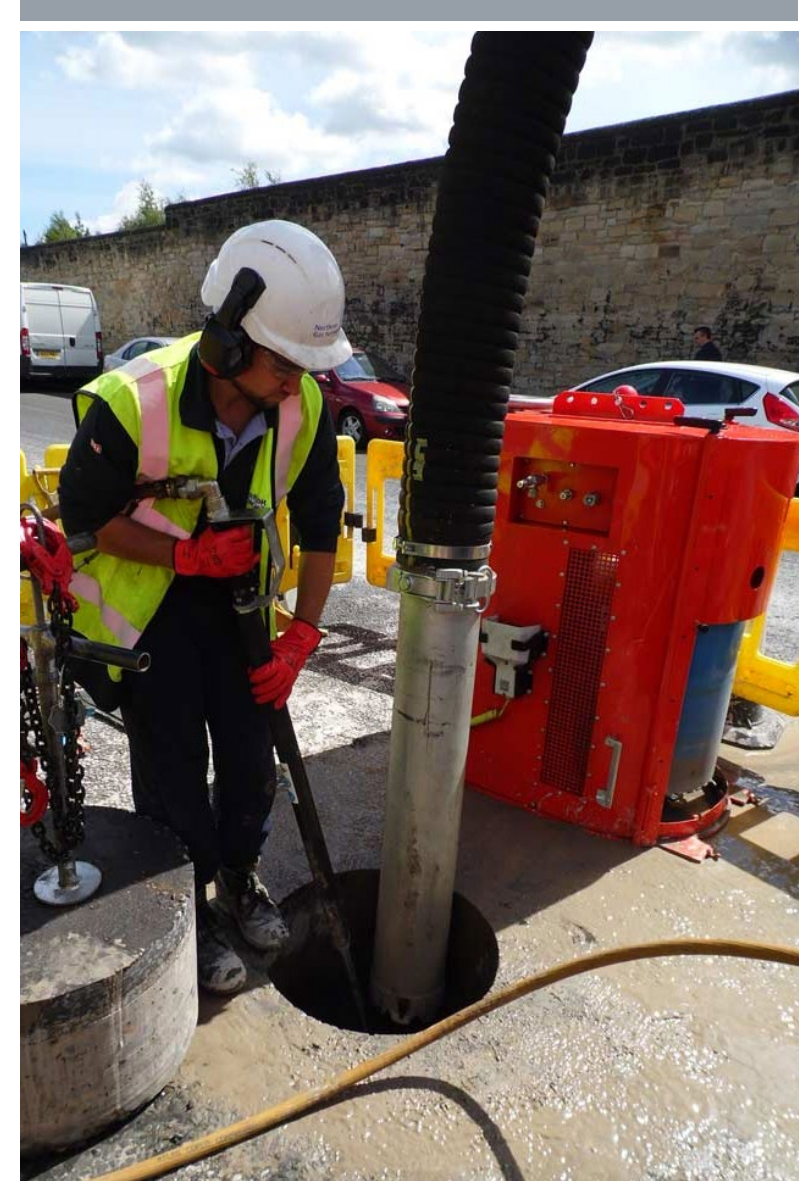
THE PROJECT

The project aimed to demonstrate predicted performance enhancements through development of the technology to enable a new and improved fleet to be acquired.

Advancements in coring technology has removed manual intervention of the core drum, with it now possible to lower and raise the core drum remotely, improving both the safety of operatives and time efficiency. Safety being of particular importance, with the removal of handling vibratory equipment and the potential of hand-arm vibration syndrome (HAVS).

During the design phase, a steering group with support from operational experts and designers, agreed the vehicle specification. Once finalised, the vehicle was constructed by MTS, a global supplier of high-performance testing and simulation systems, in Germany. Due to the pandemic, the build cycle relied on regular virtual meetings to make final decisions and adjustments.

Following the construction phase, the vehicle was delivered to SGN where a specialist operations team was formed and trained to implement the improved technology, trialling the vehicle on a range of operational activities, from repairs to connections across the London region.



OUTCOMES

The Core and Vac Mark 2 project successfully accomplished all objectives associated to the designing and development of an enhanced core and vac vehicle, delivering further reductions in highway occupation.

The proven design now allows operations to be completed within six hours compared to the eight hours using the previous version and four to five days using conventional methods.

Further reducing disruption to the travelling public, improving air quality and reducing the associated carbon emissions: helping to support London's healthy streets initiative.

Case Study - A3 Wandsworth (TfL Red Route)

A leaking joint was found in the north bound carriageway into Wandsworth, made more complex by the pinch point at this location, with three lanes reducing down to one. To gain access to the asset, two-way traffic lights were put in place along with the closure of a side road and bus stop. The improved system completed the repair in six hours, inclusive of traffic management deployment. Started after the morning peak at 11am, through a small 600mm keyhole excavation and reinstatement before the evening peak at 5pm.



LESSONS LEARNT



Disruption caused by the pandemic led to delays in the design and delivery of the vehicle. New ways of working have led to this risk being mitigated with the potential of future design work being completed remotely.

The pandemic and Brexit also caused delays with the supplier stock of key components for the vehicle. For future projects, alternate suppliers should be sourced within the planning phase to mitigate this risk.



CONCLUSION

SGN's keyhole strategy aims to deliver safer methods to minimise highway occupation, carbon emissions and disruption. This project has successfully designed, developed and tested a Core and Vac Mark 2 system that allows operations to be completed in six hours as opposed to eight hours for the previous version and four to five for conventional methods, providing significant benefits.

The core and vac method is dependent on location and vicinity of other buried plant. It is SGN's ambition to use this technology as the preferred excavation method where site conditions allow and anticipated to increase the number of works where this could be used between 5-10%. Additional vehicle with the improved technology has already been obtained to commence the replacement of the existing fleet.

The next stage of the keyhole strategy is to look at the future potential of using electric vehicles and machines to minimise noise and emissions, to provide a positive impact for the public and net zero carbon targets within London and wider SGN GDN. This would be in addition to further developments of the coring system with a flexible cutting system to allow any size and shape, within reason, to be cut and. In the short term SGN will be considering further use of this technology across different types of operation including, mains replacement, trial holes, camera surveys and pipe disconnections.

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TfL Lane Rental Scheme

Optimising customer journeys through the delivery of safer, innovative and sustainable roadworks

