Investigation into Future Pipe Subway Potential

TfL Lane Rental Industry Publication

TRANSPORT FOR LONDON

Introduction

10km of pipe subways exist under the London road network, primarily under six central boroughs. All the pipe subways were constructed in the Victorian and Edwardian eras except one, which was built as part of the Crossrail works. It is a legal requirement for utility companies to place any new assets in pipe subways, this has in part, ensured they have been well utilised.

Transport for London (TfL) is continuously looking to drive innovation across its business. About 10,000 utility defect repairs and asset renewal programmes are undertaken across the TfL road network every year alone. This project was to determine the feasibility of expanding the existing pipe subway network. This was with the aim of reducing traffic congestion on London's roads by potentially detailing build requirements for new utility tunnels and developing a general preliminary design.

These could then be used to support identification and construction of possible new build/extension sites. In turn, reducing traffic congestion and bus Excess Wait Time (EWT) while improving Journey Time Reliability (JTR), traffic flows, air quality and operative safety.

The Project

Although mainly a feasibility study, this project looked at the viability of expanding the design and construction of the existing pipe subway infrastructure in London. It was not used as a platform to review pipe subway ownership, existing (albeit historic) legislation or the formula used to determine fees paid by utilities for space occupied within the pipe subway.

Support for future investment was initially garnered by using data analysis, comparing a highway within London that has an existing pipe subway to comparable ones in the city that do not. Data was taken from TfL's Traffic Information Management System (TIMS) which is a database of all incidents recorded on the network. From the TIMS, disruption recorded in minutes, caused by each utility incident was extracted. This was then compared against roads with similar characteristics in the form of 'buddies' as determined by TfL's Outcomes Delivery Tool. Out of the twelve identified highway 'buddies' the highway with a piped subway selected had the lowest level of disruption resulting from utility works.

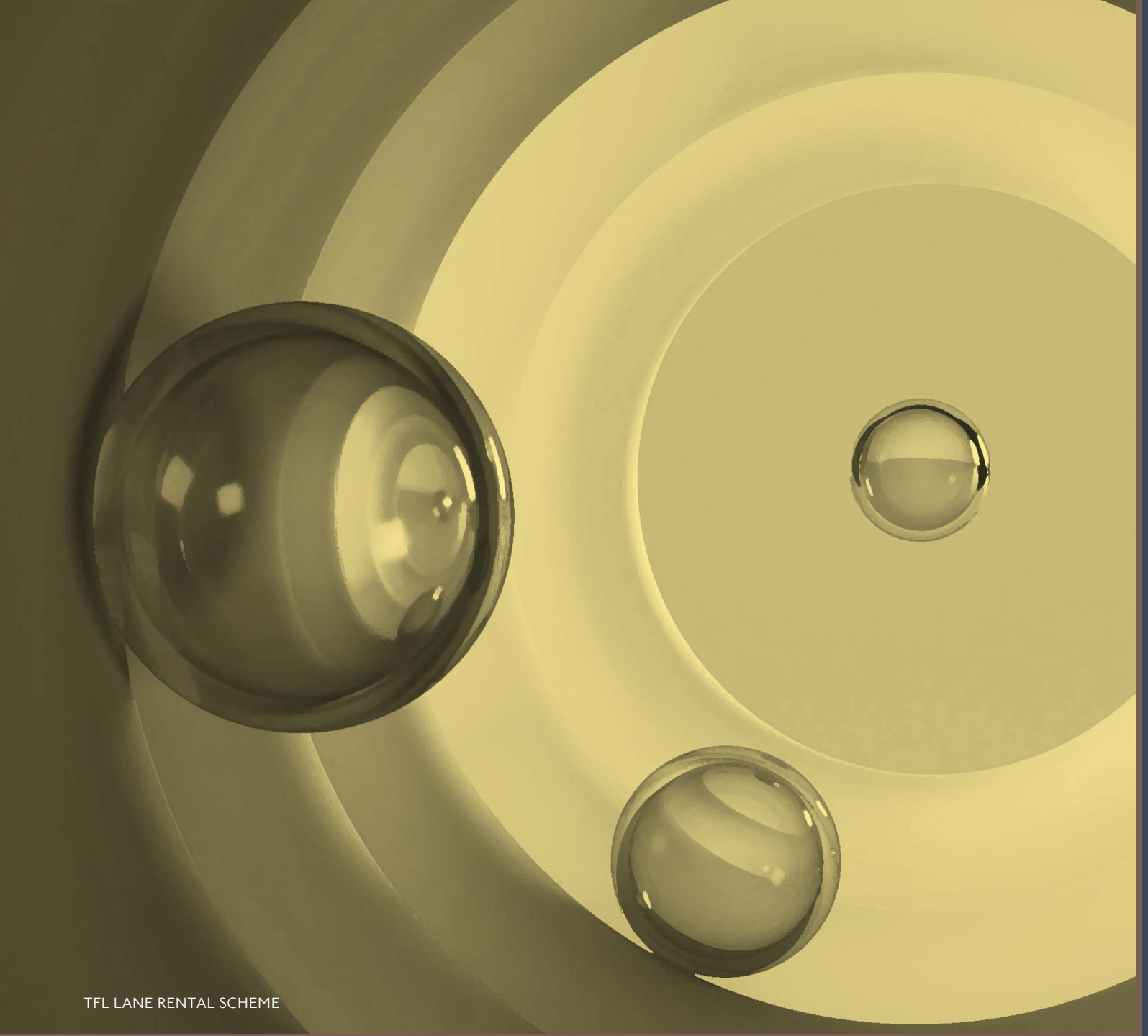
Several existing pipe subways were visited, including those constructed in the Victorian era. This visit and subsequent visits to other subways were mainly to view usage, demand and construction methods. It was clear that the condition of the highway surfacing was excellent. At the time of the visit, the road had not been resurfaced since 1984. This highlighted one of the successes of pipe subways which has removed the need for utility reinstatements and has greatly assisted with the increased longevity of asphalt (up to 40%).

Prague insights

The city of Prague hosts over 90,000 metres of pipe subways, locally termed 'Underground Collectors' which are managed and maintained by the utility company Kolektory Praha, a.s.. As such, it has one of the largest underground utility systems in the world. Unlike London, whose utility pipe infrastructure primarily dates back to the Victorian and Edwardian eras, the majority of Prague's utility tunnels are much newer, built within the last 30 years which incorporates more modern design and management techniques.

Prague's unique selling point is that the subway system is split between deeper level strategic tunnels (about 20m below road surface level) carrying the high-capacity pipes and cables, and secondary tunnels which carry the local utility supplies at around 5m below road surface level.

Detailed insight into these practices were obtained, along with access arrangements and security systems. Discussions with Prague's designers and contractors provided significant benefits around lessons learnt and where further improvements could still be made to ensure new pipe subways for London are truly world leading and fit for the future.



Outcomes

The project proved useful in determining the potential approaches to such works, however, due to the size of construction associated to this, it is recognised that developing any new pipe subway would be an expensive, lengthy and traffic disruptive process.

Conclusion/ Recommendations

Since producing a new pipe subway would be an extended, costly and disruptive process, the recommendation is to pursue any potential construction as part of major redevelopments or projects where significant, new utility services are required.

This is because new utility services would need to be accommodated through substantial highway excavations.

Moving forward while a general outline design has been drafted for a future pipe subway, any designs would need to be considerate of an individual utility company's health and safety requirements for confined spaces.

TfL Lane Rental Scheme

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Date Created: September 2020

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