London HADES

(Highways Apparatus Data Exchange System)

Thames Water Lane Rental Industry Publication

TRANSPORT FOR LONDON

Introduction

Approximately 400,000 roadworks take place across the capital every year and records of utility apparatus must be obtained every time the road is excavated. The data is only available to the organisation commissioning the survey and any additional information collected during excavation has historically not been passed on.

To try and address the issue, Scotland has had a national record system for the last 5 years, operated by the Office of the Scottish Road Works Commissioner and is accessible via the Scottish Road Works Register (SRWR), known as the Scottish Community Apparatus Vault (Vault).

This allows registered users to view any digitised records with the option of selecting some or all of those on the register and downloading a print copy. There is no such system in England or Wales, so the project looked to align with the Scottish Vault while trying to improve on this foundation by investigating new technologies that have since been developed.

It was determined that the trial for the London System would be called 'Hades', as it would fit the acronym 'Highway Apparatus Data Exchange System' and reflects the largely underground nature of the information collected. In addition to the learnings from the Vault, several other projects have been considered;
• Data from the public good NIC report
• Project Iceberg
• BIM

While the timing of this project is particularly fortuitous, it has driven a solution which is flexible, so outputs and developments from these can be taken on board at the appropriate time.
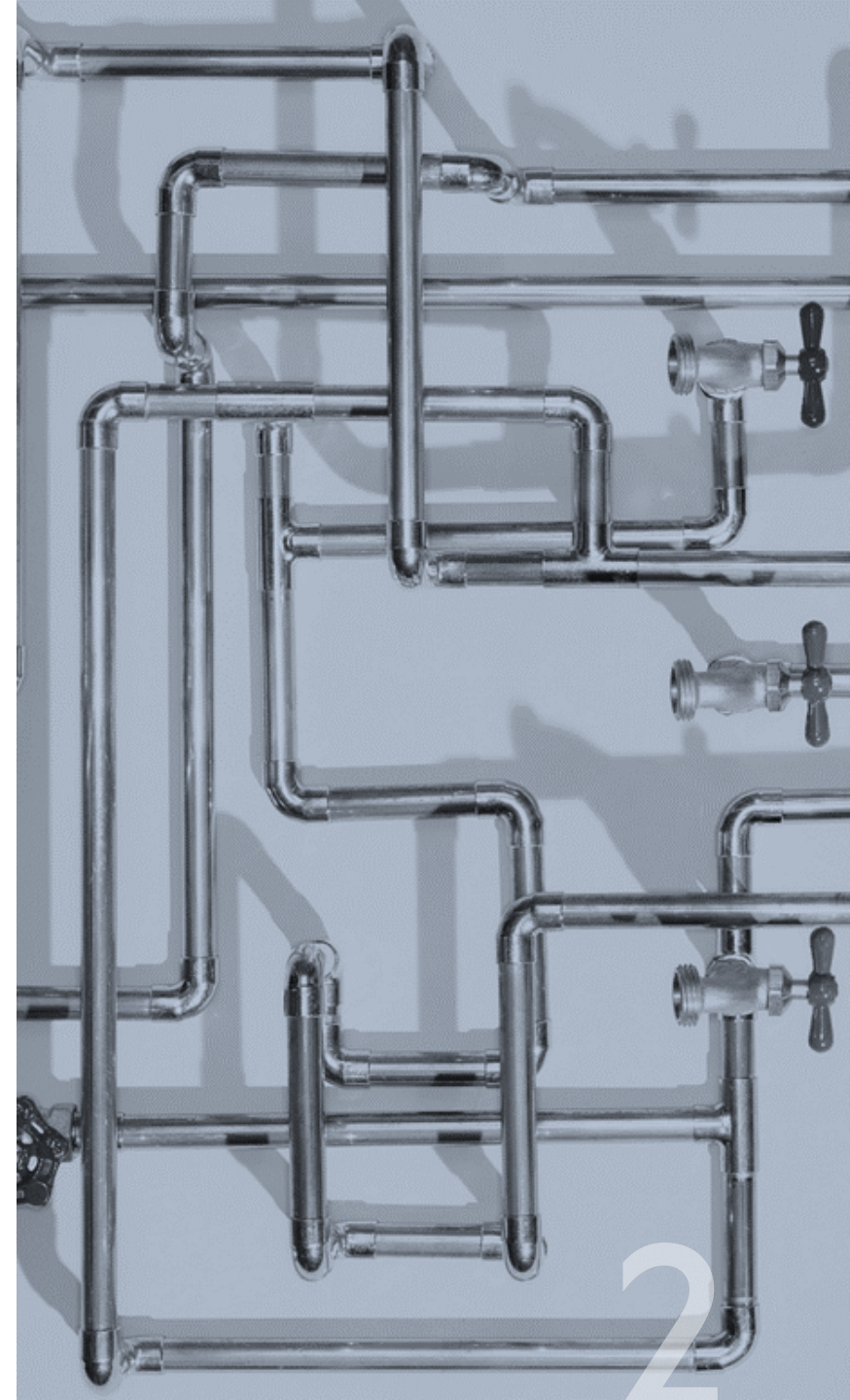
The Project

A steering group was established to assist with the running of the trial. This included representation from Symology who would host the information as they had assisted the Scottish Vault, TfL and three utilities (Thames Water, Cadent and UK Power Networks) all providing data on their relevant networks. Ordnance Survey and the Utility Survey Exchange were also included given their common goals and the University of Leeds, as they had assisted with the development of the Scottish Vault.

Each utility provided a copy of their underground assets for the areas selected to Symology which was then transformed using an agreed schema. The initial trial looked at two different areas: Vauxhall Bridge interchange and the south side of London Bridge however, additional areas were added as not all the participants had digitised data for these and it was important to show as many utilities as possible.
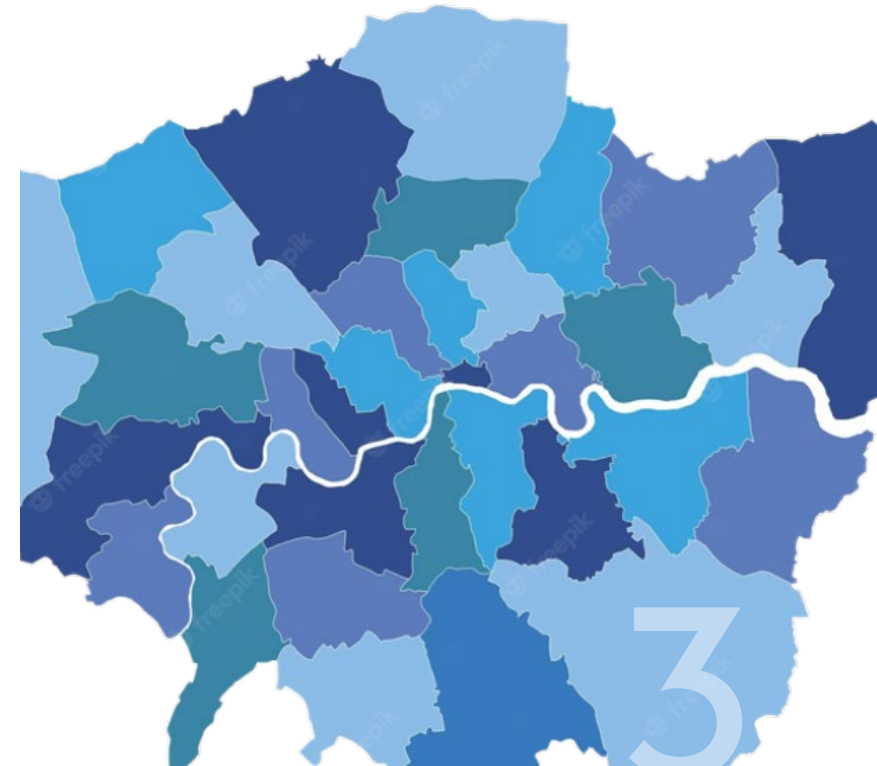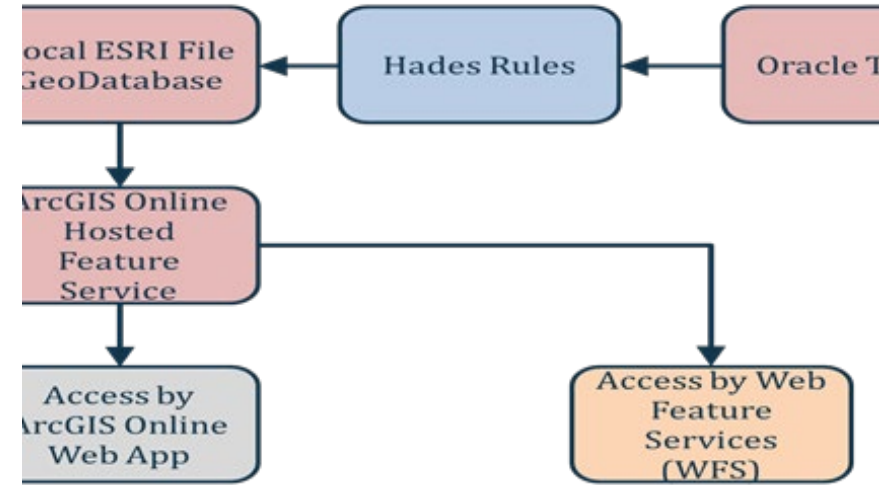
The system

The same architecture was adopted as that used for the Vault system; using agile development techniques which can easily adapt to new developments.

Polygons, point objects and linear objects were used to provide a simple, clear and uncluttered display. Additional indicators could be added to provide greater clarity and can be determined by input from all users going forward. The system is accessible via a bespoke web site, which can be customised as appropriate for the final system and can pan into an area with the assets being shown, once the scale reaches around I:6,000. The user can then choose which assets will be viewed with the facility of selecting different features

A summary list of assets in the area can be brought up by choosing the select tool and then drawing an area on the map. The selected assets are highlighted in blue, and their full details can be seen via a table at the bottom of the screen. A variety of other functionality is available via a drop-down menu.

Data can be exported through several options and information such as date and time, disclaimers, copyright information etc. can be added, with the potential to develop any requirements for statutory obligations. Consideration needs to be given to controls around the export, security and permissions of data, as well as the maintenance, display and symbolisation once downloaded. This would need to be established for a London wide implementation.

It was agreed that 3D would be considered in the future so, depths, where applicable, will be included in the data to facilitate this move. Some utilities have cross sections, and these will be included as will photographs and any other details at specific points. Some detailed survey work includes more extensive depth information but although this was included in the data conversion process, anomalies in t

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Data

Data suppliers were asked to provide as much information as possible about their data structure and any metadata they maintain. In developing the Scottish system, it was found that the more formalised and documented the data structure and metadata, the quicker and easier the data processing can be. Symology accepted the data in any of the standard spatial formats and data was generally transferred via a zipped file. Over 33,000 features were incorporated into the system for the trial.

Symology uploaded the processed data to the cloud-based ESRI ArcGIS Online platform using Symology's corporate Developer Account storage. The uploaded data was then converted to a hosted Web Feature Service (WFS) which could be accessed by any GIS tool capable of consuming WFS data. However, this was not tested as part of the trial. In addition, Symology created an ESRI ArcGIS Online Web App hosted on the ESRI ArcGIS Online platform to demonstrate the processed data and how it could be viewed.

Outputs

An initial prototype system was developed for review by the steering group which was subsequently modified following feedback. This showed how the system can be accessed via the web as well as how data can be downloaded. Additional facilities were developed to allow detailed drawings and photographs to be included and accessed via the system.

A report was produced explaining the work carried out, it also considers how this trial could be extended and develops a business case to cover the whole of the London area.

A detailed stakeholder engagement plan was also drawn up to list stakeholder categories and organisations. Where available, contacts have been listed however, some are still to be identified, which would be required as part of a roll out phase.
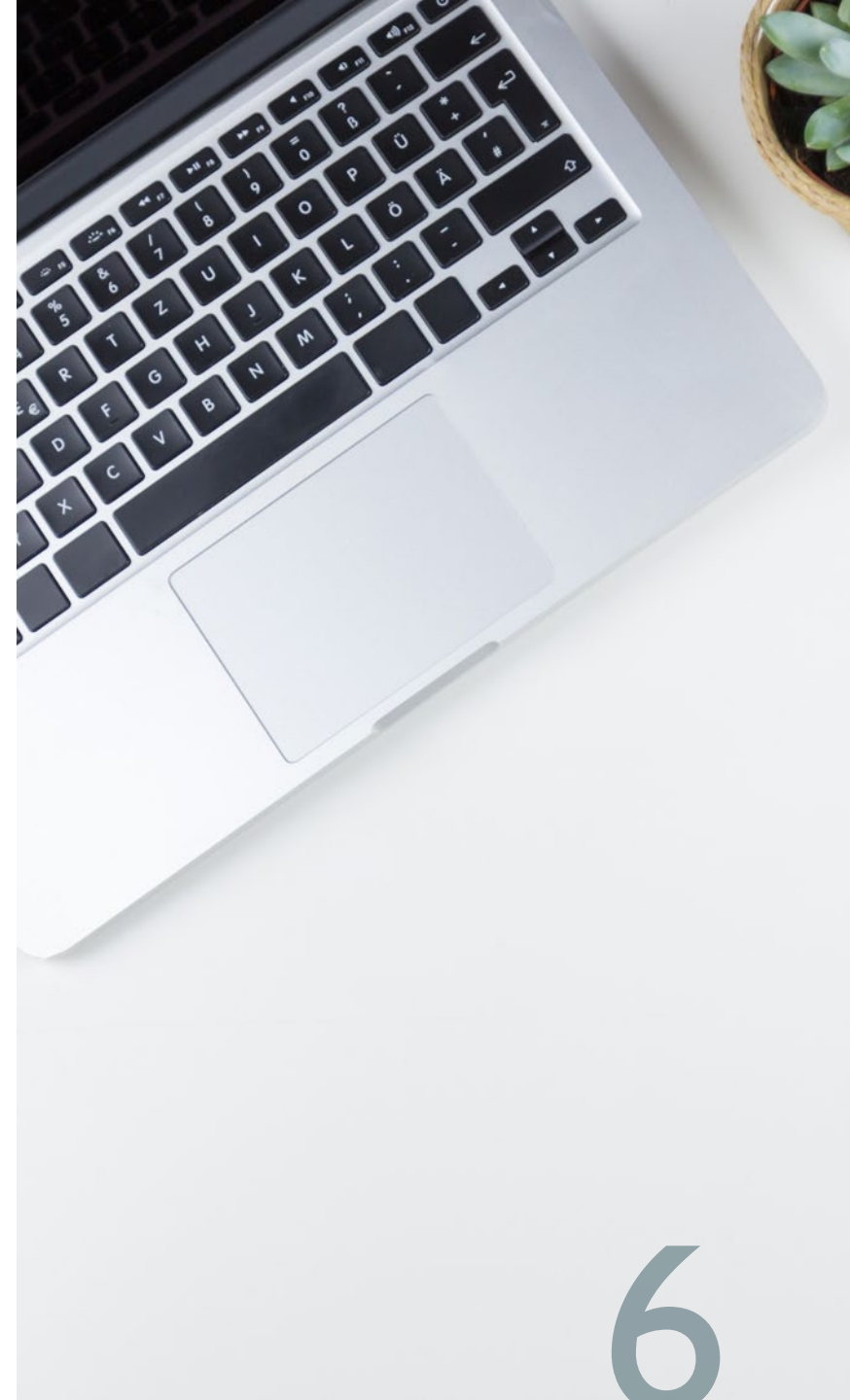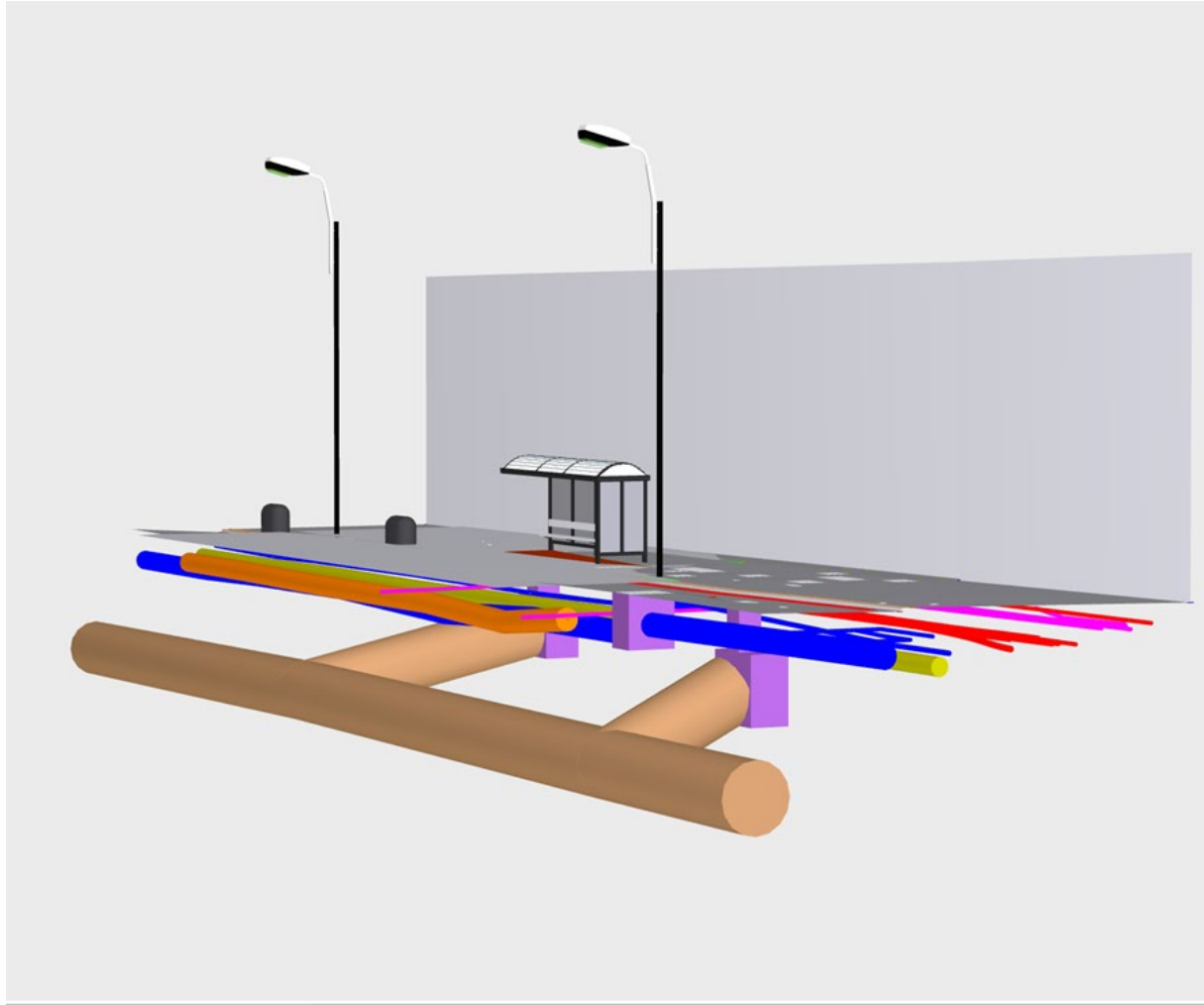
Outcomes

The project delivered all the objectives identified; raising awareness of the system and encouraging the uptake of the system from asset owners in London. In addition to proving the feasibility of implementing a London wide system, the pilot allowed costs to be estimated and a full business case has been produced. The social cost of utility strikes in London far exceeds the estimated costs of implementing and maintaining a system like this so would prove beneficial for the sector.

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Lessons Learnt

The project proved the viability of an integrated buried asset system for London based on the approaches used for the Scottish Vault but allowing for updated technology. It also provided costs for a London wide system to be estimated. However, there are a number of key organisational issues which will need to be managed for this to provide benefit.

1. Asset owners must have complete confidence in the security of the system.

2. There are a number of additional services which could be made available but for ease of implementation a basic service should be implemented first.

3. The issue of scanned drawings has still not been completely resolved. Utilities with scanned buried asset records should be encouraged to convert these to vector drawings. A parallel project could be implemented for key utilities.

Conclusion/ Recommendations

An initial system has been produced with other locations and utilities being added with relative ease. It has proved the feasibility and benefits of an integrated buried asset records system and allowed potential users to review the system to ensure it meets their needs. The business case provides an overwhelming argument for both safety and financials to implement a wider collective system.

A project team should be established to implement a London wide system. The first step should be to identify an appropriate organisation and department to act as owners of the system and manage this. In addition, there should be an ongoing communications programme to explain the benefits and encourage both London Boroughs and utilities to provide data.

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Optimising customer journeys through the
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