



# UTILITY SURVEY EXCHANGE

UK Power Networks Lane Rental Industry Publication



# INTRODUCTION

In the street and road works sector, utility surveys and other ground investigation activities are routinely carried out before and during projects, which produce a wealth of information about the location and disposition of buried assets. However, the information produced is generally siloed within project teams and not typically shared with the utilities who own and operate those buried assets.

Maintaining data quality is extremely difficult for asset owners like UK Power Networks (UKPN), responsible for the distribution of electricity in three areas, East Anglia (EPN), London (LPN) and South Eastern England (SPN). Under the operating license conditions, UKPN is required to update and maintain accurate records of their network assets. The accuracy and completeness of asset installation records vary, particularly for old assets with positions changing over time. Opportunities to improve data are rare which can have a significant impact on asset management, network planning and safety on site.

Information on buried assets detected and observed during a project, as well as details of the changes made during activities, can therefore be highly valuable for maintaining data accuracy. A project was therefore proposed to make highly valuable survey data readily available to UKPN teams, along with other asset owners to confirm or improve legacy data quality.

Delivered by Utility Survey Exchange Ltd., through a series of software development sprints, their pre-existing platform was further developed to meet UKPN requirements and allow the ingested survey data to be directly compared against existing asset data, with the aim of creating a single source of truth.



# THE PROJECT

The software development was split into six sprints, each roughly one month duration. As per the agile process adopted by USX, the development goals were broken down into broad themes, then into epics, encompassing a range of features and finally into user stories encapsulating a single requirement. An epic represents a functional area of the system greater than a single user story and considered an amalgamation of several.

These themes, epics and user stories were mainly derived from the functional design delivered early in the project, which was based on the discovery process undertaken at commencement and incorporated with elements of the USX roadmap. The aim was that each user story would be sized to encompass no more than one day of work, although this was not always achieved with more complex functionality. The risk of more expansive user stories was mitigated by close communication between the front-end and back-end developer to ensure the project remained on track.

At the start of each sprint, the product owner defined the sprint backlog based on the broader product backlog, with user stories incorporated suitable for a month-long sprint, and ranked based on high level priorities uncovered in the discovery process, ongoing priority discussion in monthly project meetings, and underpinned by a logical development sequence to streamline the development effort. Each user story in the list had a scope checklist to track progress of the implementation, and an acceptance criteria checklist to allow the product owner to test the feature once deployed to accept or reject compliance.

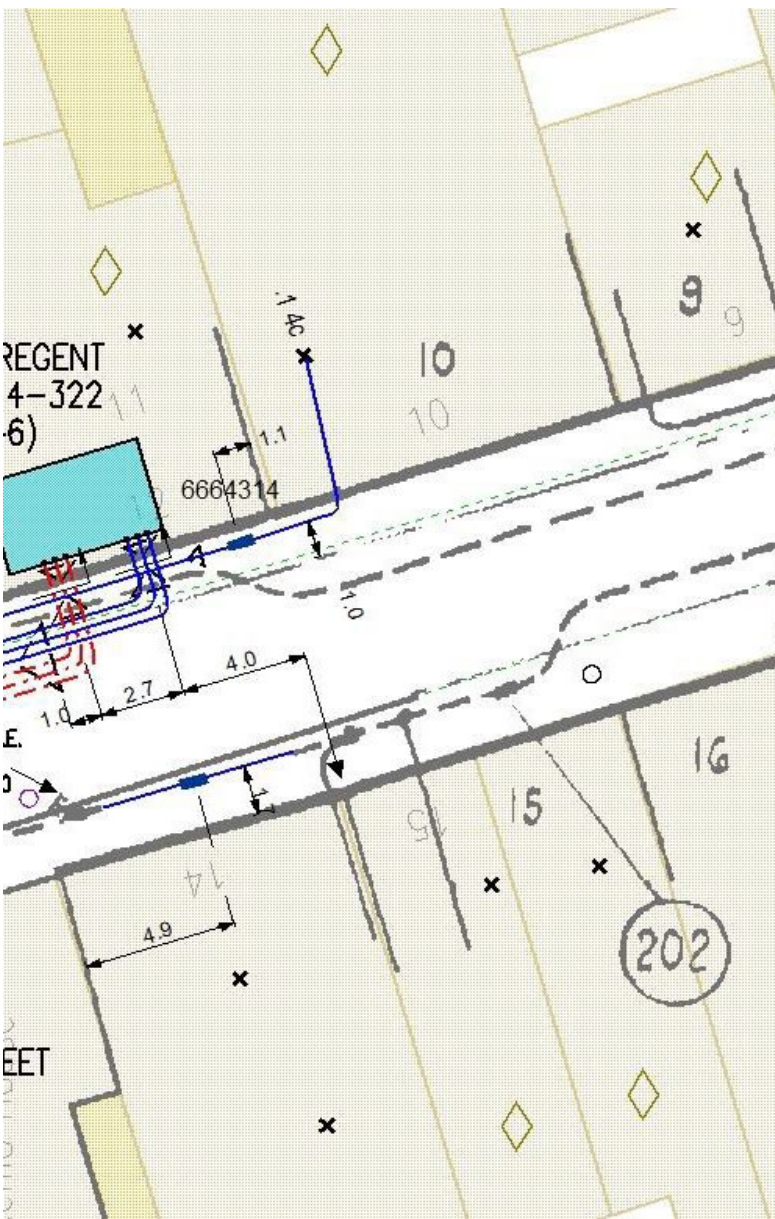


# EXISTING FEATURES (HIGH LEVEL)

The USX platform was developed as a concept prior to this project with a set of core features, focussed on system login, navigation, the workflow around map-based discovery of surveys and field reports. The following high-level features were already within the system prior to project commencement:

- Comprehensive data model
- Secure login
- Survey HQ map display and navigation
- Street/town search
- Spatial bookmarks
- Display of surveys and field reports in spatial context
- Query of surveys and field reports to preview attribute information
- Display of “full details” for surveys and field reports
- Mobile application capture and submission of field reports
- Simple notifications system

This base set of features and functionality provided the foundation for building a more sophisticated feature set during the project. The decision was made early in the project to not conduct specialised user training. This strategy was adopted to test the usability of the platform, with a view that the workflows and features implemented should be highly intuitive to users with the skills and experience of the target audience.



# PLATFORM TESTING

GIS specialists extensively used and tested the platform throughout the project undertaking assessments of the potential value and usability of survey data provided producing a detailed worked-through example of the assessment and adoption of a survey. The generalised area covered by the survey was first identified in the overview map.

This can then be viewed alongside the existing as-laid data, which allowed for determination of whether the survey could add value to the existing asset plans. In this instance, the survey was deemed to contain information that could potentially be adopted as the survey highlighted discrepancies in existing data at points where UKPN assets entered and exited the road from the footpath, the survey also indicated that asset depth record could be improved upon in this area.

Once checks had been carried out the survey could be updated in the platform. In this case, the status for this survey was updated to “adopted” along with an explanatory note.

The status update was then stored only for the organisation to which the user making the update belonged to. This meant that all other users from the same organisation would be able to see the status update / explanatory note, but users belonging from other utilities would not be affected by the change.

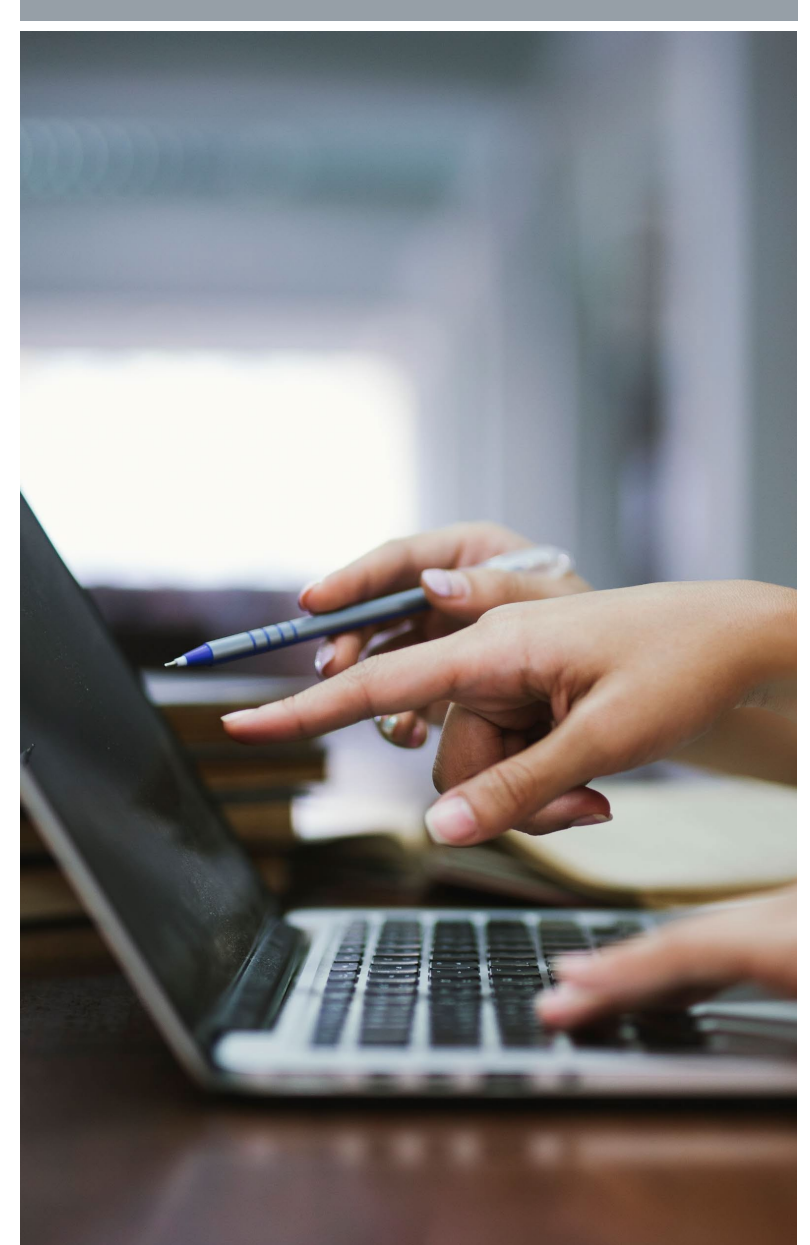
# SURVEY BENEFITS

The project team concluded that a survey may:

- Confirm that existing assets are captured correctly
- Identify realignment of cable routes may be necessary
- Provide additional information for existing assets (e.g. new depth markers)
- Identify unknown assets (although this may be both useful and ambiguous)
- Identify areas that require further investigation
- Not provide any useful information

The USX platform is aimed at specific users such as GIS professionals and surveyors, with sufficient knowledge, experience and expertise to accurately evaluate the survey data against existing asset records. The USX platform does not over-value the usefulness or impact of a survey, it represents a realistic, and not necessarily correct, view of assets at a point in time within a set of industry standard criteria.

A key consideration is that the surveys are not undertaken or provided with a particular requirement to be adopted or used in any way by UKPN or any other asset owner, as these are not the original clients or recipients of the service. The data is therefore provided from an entirely independent viewpoint, with no particular agenda to be used by UKPN.





# OUTCOMES

Due to the USX platform's improved data quality, the below positive outcomes can be delivered in future:

- Fewer excavations, assuming reductions in third party damage
- Fewer, faster and smaller excavations due to greater certainty
- Quicker customer restoration (for all utilities)
- Saving of time and costs associated with congestion, through fewer and quicker excavations
- Reduced emissions through reduced works and traffic congestion

Based on trial findings, it can be assumed there may be a positive impact from adoption of the platform on data accuracy, completeness and currency. It can be estimated that use of the USX platform may increase overall confidence in the quality of data for about 3.5% of the UKPN network. This increase in confidence is likely to have an impact for that proportion of the network on damages, the number of excavations required to locate assets, and the length of occupancy and level of disruption in those areas due to reduced impacts of inaccurate asset data. Based on estimates, the use of USX could see a saving of about £95,000 a year on excavations. This figure does not include the savings from reduced injuries and damages arising from fewer excavations based on a higher degree of confidence in the data.

The financial benefits of improved data quality are difficult to quantify. Various studies indicate that improving the quality of buried asset data can produce a return on investment of between 2 and 21 times. As part of stakeholder engagement and dissemination plan, the project team created a short video to introduce the project and its benefits to the general public:

<https://vimeo.com/413644846/ae9fe03ed3>

A USX website, as part of the UKPN Innovation website, was also created.

# CONCLUSION



A primary function of UKPN's geospatial network records is to inform internal and external stakeholders of the nature and position of the network assets. The completeness, accuracy, reliability, ease of access and simple interpretation of these records is therefore key in ensuring the safety of anyone who is working on or near the electricity distribution network, whether UKPN staff, contractors, third parties or members of the public.

This project has been successful in achieving its outcomes. It is hoped that other utilities will make use of the USX platform to improve, validate and enrich their GIS data.



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## TfL Lane Rental Scheme

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

