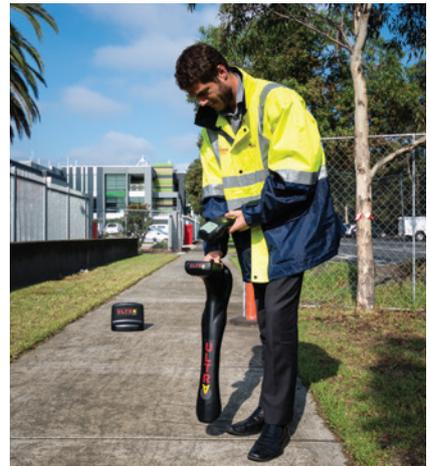
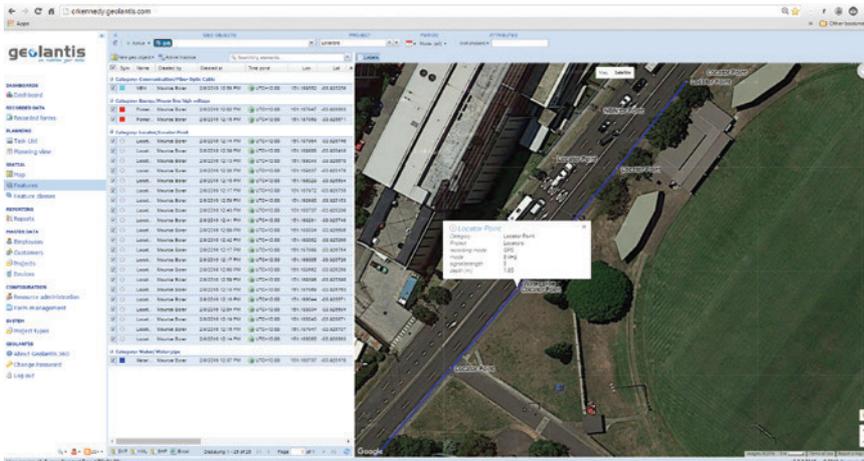




Enhancing Value and Confidence through ACCURATE ASSET LOCATION DATA

Knowing the precise spatial position of assets, especially those buried underground, allows utility operators to rapidly locate their assets when required, enhances planning and helps prevent costly, dangerous and all-too-common incidents of accidental asset strikes.



INSTANT MAPPING AND VISUALISATION OF UTILITY SURVEY.

The location data stored in a utility's GIS is also vital for asset management, public and workplace safety, emergency planning and response, and for maintenance activities to be undertaken efficiently and effectively.

This article presents an integrated solution, featuring handheld hardware devices capable of accurately determining the location and depth of buried utility assets, and powered by a smart mobile and cloud-based GIS, which enables an almost fully automated workflow from field to office.

UNLOCKING THE POTENTIAL OF GIS

Geographic Information Systems (GIS) are invaluable to modern utility companies. Among other things, GIS enables operators to effectively manage assets throughout their large, complex infrastructure networks so that they can continue to provide vital services to the public.

Yet to fully unlock the functional possibilities of a GIS, the spatial data detailing the location and nature of

assets must be spatially accurate, reliable and comprehensive.

Additionally, asset owners face significant challenges associated with assets that were constructed decades ago, where location data was never recorded, or was recorded inaccurately. This lack of data contributes to utilities having to spend millions of dollars each year to repair assets that are damaged through accidental excavation. This often occurs where high power or pressure assets are involved. The consequences of accidental excavation is much more than monetary costs, but lost lives as well.

Considering its importance, traditional methods of acquiring accurate asset location data are challenging, time consuming and open to error. It requires data to be handled and transcribed multiple times before being incorporated into the GIS, which creates the potential for human error.

C. R. Kennedy, SmartNet Aus and Geolantis, three leading companies in the geospatial industry, have joined forces to provide a comprehensive solution for locating both above and

below ground assets with centimetre accuracy.

AN IDEAL INTEGRATED SOLUTION

The traditional workflow of asset location typically involves the field crew using utility service locators to detect underground utilities, then marking the location with spray paint and recording (often on paper) measurements such as frequency, signal strength and depth. In a separate process, a surveyor is required to accurately survey the point location. Later, the two sets of data are combined in the office and added to the asset owner's GIS.

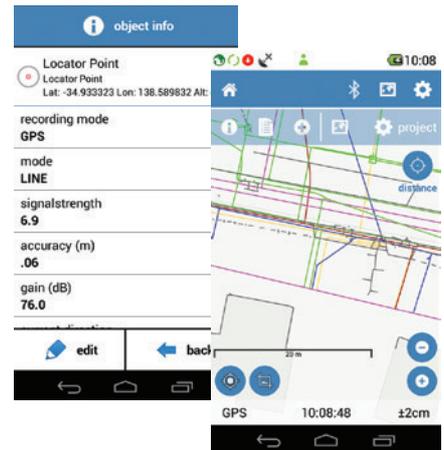
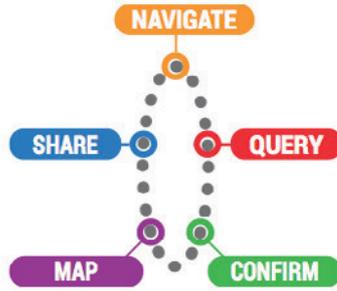
The solution presented by C. R. Kennedy, SmartNet Aus and Geolantis integrates the process and simultaneously captures all data digitally. This combined solution is highly accurate, data rich and provides a streamlined workflow that is substantially quicker, less costly and most importantly it avoids many of the opportunities for error inherent in the traditional methodology.



Accurate asset location data enhances value and confidence



A WELL DEFINED WORKFLOW UNDERPINS THE APPLICATION IN THE FIELD AND OFFICE.



A REVOLUTIONISED WORKFLOW

The centrepiece of the solution is the mobile data collection platform. The Leica Zeno 20 GNSS/GIS handheld device is an extremely accurate and intuitive data collector, which enables field users to navigate to assets easily. Its additional benefits include the ability to record various attributes about infrastructure, including technical, maintenance and condition details for each asset in customisable forms, and easy importing and exporting of shape files for processing in ArcGIS or other GIS/CAD programs.

In this integrated solution, the Zeno 20 hardware platform is powered by the cloud-based GIS software suite from European software house Geolantis GmbH. This provides a streamlined data flow, from full digital data capture in the field when an asset is located, to instant upload and display of the data in a cloud-based mapping and data management system.

Running the handheld GNSS mobile device with Geolantis's powerful mobile application provides accurate locations against the backdrop of customer uploaded utility maps, design data, OpenStreetMap or satellite imagery, all of which provides the field operator with helpful guidance. Existing utility information can also be queried interactively via the map display to determine an underground asset's characteristics.

Critical to the solution are the GNSS real time kinematic (RTK) corrections provided by SmartNet Aus' comprehensive Continuously Operating Reference Station (CORS) network, which addresses errors inherent to all GNSS satellites and thus enables centimetre accurate positioning in

real-time. The SmartNet Aus base stations receive positioning signals from GPS/GNSS satellites to calculate extremely accurate RTK corrections (down to +/- 2 centimetres) and broadcast them to GPS/GNSS receivers.

After navigating to the recorded location of the asset, the next step involves determining and confirming the position of buried infrastructure using a subsurface service locator. The solution described supports Leica's series of locators, including the Digicat 650i and the industry leading ULTRA model and other brands. The 650i is the ideal tool to confirm the existence of underground utility assets, while the ULTRA will enable accurate detection of both the location and depth of the assets.

Measurements from the locator are then automatically transmitted to the Zeno 20 via Bluetooth, enabling the asset information to be integrated with the GPS position and GIS feature details. The GPS position and GIS feature details are then instantly mapped on the mobile application as well as on the GIS mapping portal.

Information sharing across an organisation and beyond becomes a seamless process. The mobile software operates in online as well as offline mode and the synchronization occurs in the background without any interruptions to the field to the field work.

The easy to use online portal provided by Geolantis allows all aspects of documenting utility location tasks to be effectively managed, including personnel and equipment resource planning. The user can switch between street view, satellite imagery and cartographic street maps. Field acquired survey data is instantly available and

can be accessed by users anytime and anywhere. For areas where GPS reception is problematic or where assets are inaccessible, the Leica S910 laser distance meter can be paired with the Zeno 20 handheld GNSS device. Once combined, the platform is transformed into a remote point measurement solution, known as gamtec. This package turns the Zeno 20 into something akin to a traditional Total Station that records GIS data.

THE ADDITIONAL BENEFITS OF GOOD DATA

In addition to the previously mentioned benefits, collecting data that is comprehensive, GIS ready and as accurate as possible, also ensures usability and interoperability with other, new and future technologies. As regulations continue to tighten, ongoing adoption of best practices helps an organisation stay ahead of the curve and maintain a strong foundation for the future.

For instance, technology that allows workers in the field to visualise the positions of buried assets in 3D in an augmented reality environment is already available, and is just one of many innovations that rely on reliable location data.

An integrated spatial data capture process, such as that provided by C. R. Kennedy, Smartnet Aus and Geolantis, can greatly improve confidence in the accuracy and completeness of spatial data. This provides a wide range of benefits, from mitigating the risks of accidental excavation, to enhancing asset management, empowering planning and preparing an organisation to take full advantage of technological innovation. **U**