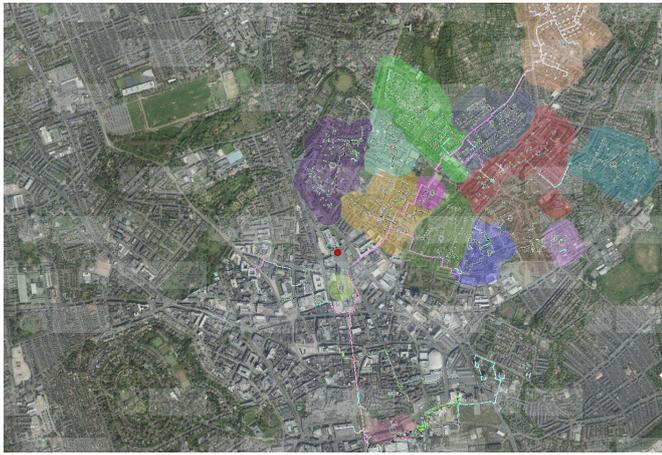




Nottingham lead the way for smart city technology and renewable energy

Nottingham City Council uses its Local Street Gazetteer (LSG) to visualise the location of the underground assets hosting the city's district heating system network. Via an app powered by the LSG, utilities can check whether planned streetworks are impacted by the heating network, resulting in safer streetworks for operatives and the public.



Introduction

A District Heating system is an alternative method of heating system that forms an important part of the government's plan to reduce carbon emission and cut heating bills for UK customers by 2050. In order to meet these targets, cost effectively, The Committee on Climate Change (The CCC) estimates that around 18% of UK heating will need to be resourced from heat networks.

A District Heating system takes its energy from a central source, before being distributed through a system of insulated pipes to both domestic and non-domestic buildings.

Nottingham City Council are an early embracer of District Heating systems, establishing EnviroEnergy Ltd-an autonomous energy company owned by the council-in 1995. Nottingham uses renewable energy to power its District Heating System, which is powered predominantly through their main resource: burnt refuse. The 160,000 tons of municipal refuse burnt annually at Nottingham's incinerator is converted into around 180,000 megawatts of high-pressure steam, creating enough energy to power around 100 businesses and 4,700 homes around Nottingham, including Universities and The Victoria Shopping Centre.

Challenges

Despite the multiple benefits of District Heating Systems, they can present a potential danger to the public if piping is tampered with. The system needs to distribute high pressure steam through the system in order to generate heat for buildings, which means implementing a large piping structure underground, running under public roads and streets.

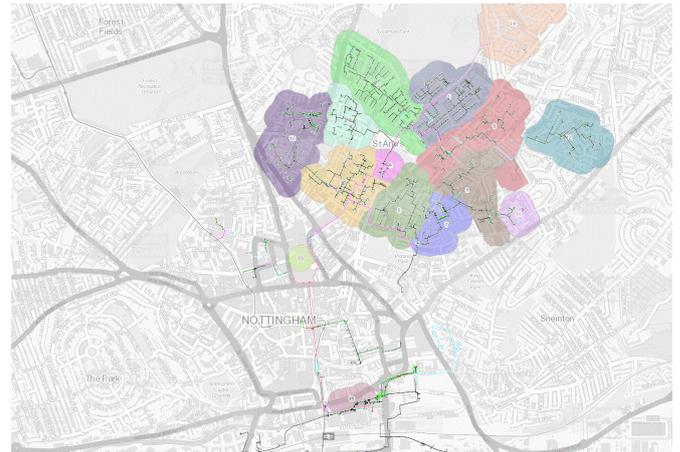
This leads to serious concerns around the implications of street works, with utility companies digging up roads unaware of the piping systems running underneath, which in turn could potentially cause serious injury or fatalities to the general public.

There were previously no formal arrangements for communication in place between the council and utility companies around digging up roads, with no definitive reference point for companies to assess piping. With growing concerns around the safety implications of

conducting street works without this vital information, mounting pressure was placed on the council from utility companies to act to prevent any incidents.

Solution

Through a collaboration between Nottingham City Council and Enviroenergy, as well extensive coordination across different management and technical teams, an app was created that displays the locations of district heating systems using GIS, in order to accurately map out where piping is located.



The app was created using an FME model, combining two different datasets to produce a single data source. The FME model in this instance places a layer of district heating network mapping on top of the National Street Gazetteer, creating a single source of accurate GIS data, to monitor and record where district heating systems are placed.

When a utility company submits a request for a permit to undertake street works, they are directed to view the app via the associated street data held in the Local Street Gazetteer. They are then advised to contact the council if their designated work is within 3 metres of the piping.

Users can view if any works are happening in their area by selecting the Network-District Heating filter option on the right-hand side of the app and typing their address or postcode into the search bar. The Map will then zoom to the desired location, displaying where piping is in their area.

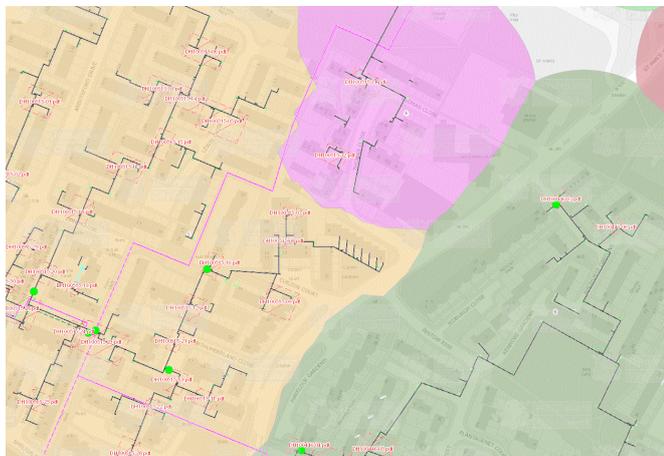


The system picks up from 10ft from the edge of the highway and will display whether there is presently work being conducted within 3 metres, creating a reference point for utility companies to coordinate street works and view the locations where district heating systems are implemented.

In addition to the app they have also incorporated a special designation against any Unique Street Reference Number (USRN) into the Additional Street Data (ASD) of the NSG. This means that information is freely accessible to all users of the NSG (both Statutory Undertakers and Local Highway Authorities), creating awareness of any potential hazard at the earliest stages of planning. Users can view the link to the app in the description for more detailed information.

Conclusion

Through innovative use of the NSG and FME technology, in addition to considerable collaboration and coordination across teams, Nottingham City Council have successfully created a tool for utility companies that could potentially be lifesaving. This creative implementation of GIS demonstrates the power of utilising accurate location data to manage assets and Nottingham leads the way towards creating smart cities, something that other councils in the UK will be sure to incorporate into their own asset management in the future.



GeoPlace is a public sector limited liability partnership between the Local Government Association and Ordnance Survey