Digitising drawings for London Underground

CADS created digital asset records of 130 underground stations, geospatially inserting them in the master map and asset tagging 18,000 items in the 12-week project.

Survey case study by
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27/07/2015

Digital asset records of every station

The London Underground, originally known as the Tube due to the shape of the tunnels, is the oldest metro network in the world. It serves a total of 270 stations transporting over 4.2 million people every weekday over 402km of track. In 2014 as part of its digital development, London Underground Ltd (LUL) wanted to create a digital asset record of all its stations. The original information was held in hundreds of project-related Microstation files which had been accumulated over many years from many different sources.

Creating an accurate 2D spatial model viewable in GIS

The digital asset record was being created as an accurate 2D spatial model of the London Underground stations that could be searched and viewed in their Geographic Information System (GIS). London Underground also wanted any asset visualised in the GIS to integrate with any system that contained information about that asset. This included their asset management systems – Ellipse and Maximo, Oracle and Access databases, and even their Livelink document management system. To do this each room or area had to be tagged with the relevant identification code and coordinates.

London Underground completed the first stage of the project in-house, but then employed the skills of CADS to complete the project due to the challenges of in-house resource and capacity.

Creating geo-spatial locations for 130 stations

The first stage of the project was to geospatially insert over 130 stations into the company's master technical map the London Survey Grid system. Over time LUL will be able to enrich the information held about the stations to include 'as-built' or new project drawings.

Multiple drawing files had to be pieced together using internal documents including old drawings featuring station entrances and exits, OS maps, and track plans to create the station layouts.

The next stage was to add polylines for each of the rooms in the stations and then tag the data with relevant information. This information included the station name, room number, which floor it was on, and what the room was used for, which were also obtained from the internal documents mentioned above.

18,000 items tagged for translation into GIS

Nearly 18,000 items were tagged over the 12-week asset digitising project from March to June 2015. London Underground can now extract this information in reports as needed and the data is ready for easy translation into the London Underground GIS System.

The team focused on adapting the processes as the project evolved and developing an excellent collaborative working relationship with London Underground staff. This meant that CADS was able to immediately address any unforeseen problems with the quality and delivery of information back to LUL.

CADS implemented an automated quality checking process using FME (Feature Manipulation Engine) software to ensure the data for the objects were completed correctly. We also established and maintained a detailed project tracker which was used to record and communicate the project process and any issues to the client.

Dino Nola, Core Asset Information Manager, London Underground Ltd

"This was an interesting and challenging project that was successfully completed based upon a pragmatic and collaborative working relationship between CADS and London Underground. Quite simply, CADS worked with us to ensure that the right methodology was adopted, we shared knowledge and by working together you helped us to get the job done.

Prior to starting the project LU had developed a methodology based upon assumptions regarding the available data. Where these assumptions were not valid, workarounds were agreed. This project demonstrates the difference in the use of CAD for the purposes of producing drawings and the use of CAD to produce spatial models for use in a GIS."