

Software for Road Infrastructure

PLANNING, DESIGN, CONSTRUCTION & MANAGEMENT OF ROAD ASSETS

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Crocodile alley

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Intelligent trenches

Would it not be useful if underground assets could tell you exactly where they are located? Damage could be prevented during road works, workers on site would be protected from the dangers of hitting unexpected gas or power lines, and the costs of so-called dry digs made in the wrong place could be avoided.

These are persistent problems for anyone managing assets or for utilities carrying out work. They cost municipal and road authorities dear, in direct cost and in the reduction of road life.

Nationally an economy like the UK is estimated to suffer nearly €6.6 billion (US\$9 billion) costs annually. They will also now cost utility and other companies additionally if they do not properly record and make available the location of their underground assets under new rules for carrying out streetworks in Britain. Similar regulations are likely in other industrialised countries particularly.

Of course good as-laid records can help locate buried underground utilities, cables and pipes. But these are not always correct. There are detectors too but they are only a guide to what is in the ground.

A self-identifying cable or pipe is the answer proposed by a group of technology companies including highway asset management firm Bentley Exor. Using RFIDs (radio frequency identification chips) they have developed a system for tagging pipelines and cables when they are laid.

The Intelligent Trench system has been trialled by the important central London council in Westminster and has been adopted for its own projects. It is likely to be made compulsory there in the future for utility companies doing work. Meanwhile several other councils are starting trials.

The little RFID tags it uses have a microcircuit on board which responds to radio waves sent out by a transmitter unit, generating a small electric current and in turn sending off a signal. This carries a unique number which can then be fed into a database where as much information as needed can be stored and then made accessible on handheld units or a website.

"You can not only give location and details at this point but full

information of the pipe type, purpose size and so on, links to the manufacturers website perhaps and other useful details," said Steven Voller marketing director for the company. "You can also take a picture, which is worth a thousand words and present that too."

The RFIDs are buried in special balls attached at intervals to the utility line. These keep the tag orientated correctly for later detection by a locator unit produced by 3M, which is similar in appearance to pipe detector units currently in use.

The passive tags, which do not need batteries or anything else, work to a depth of 1.2m. Shallower trenches up to 0.6m deep can use a cylindrical unit. The firm is providing its expertise in running asset database systems with a site where the data can be uploaded, stored and accessed. It works with Infotec to produce the software for the uploading and data capture.

National streetworks survey and asset data from the system will be available for free in a basic form with a charge for advanced and detailed information. The system is paid for partly that way and partly by a fee to mark the sites. Bentley Exor may add other information to the website as well according to Voller, as gathering information from advance notice data from companies about to carry out work at particular locations.

There are interesting possibilities for the future too, suggested Voller. "Bentley has been looking at RFID technology alongside design software. It is possible eventually that a drawing or detailed 3D information could also be called up."

In combination with GPS positioning it may even be possible to display a 3D model at the right orientation to match the direction that someone is pointing their handheld display, or perhaps just a mobile phone. But that is just speculation. ■

Bentley Exor
www.bentleysystems.com



The passive RFID tags can be buried with the pipe and detected at up to 1.2m below surface using the Bentley Exor technology