

# Going underground

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A major project to create 3D underground maps of the UK has begun, which will save the UK millions of pounds in road maintenance.

The first 3D maps of the UK underworld are to be created in a new £2.2m project which will save the UK millions of pounds by reducing the amount we dig up our roads.

There are enough pipes and cables buried under our streets to stretch to the moon and back ten times, but we don't know where many of them are. Researchers from the Universities of Leeds and Nottingham will help to locate them, by finding a way to integrate existing digital and paper-based records and link these with data from satellite and ground-based positioning systems.

They aim to bring all this information together in a format that's easy to understand for contractors, utility companies and planners – so it can be displayed visually on a PC in the office or handheld unit in the street.

Four million holes are dug each year in the nation's road – one every seven seconds – to repair pipes and cables or install new ones, at an estimated cost of £1bn per annum. With indirect costs, such as congestion, this rises to an estimated £5bn p.a. – over £80 for every inhabitant of the UK.

By creating more accurate information, the project will help reduce the numbers of holes dug, ensure they are dug in the right place and that unexpected pipes and cables aren't damaged in the process. Reducing

roadworks by just 0.1% would save the UK economy millions of pounds a year.

Announcing £900,000 funding for the research from the DTI's Technology Programme, Minister for Science and Innovation, Lord Sainsbury, heralded the project as 'world beating' and said it would help 'develop a competitive advantage for British business'.

Leading the research at Leeds is Professor of Automated Reasoning, Tony Cohn. He said: "We'll always need to dig holes in the street, but reducing the amount of roadworks would bring enormous economic and environmental benefits, with fewer traffic jams and exhaust emissions. From a human point of view, we also hope to reduce the number of fatalities and injuries every year from accidental hits on gas pipes and electrical cables.

"Many of the country's underground pipes were laid in the 19th and early 20th century, when it wasn't seen as important to keep accurate records of location and depth. Even where we have records, many are now very inaccurate, as reference points such as kerbs or buildings have moved or been demolished. And because each company has their own records there's no easy way of providing an integrated view. Our aim is to create the technology to enable the construction of a dynamic map of all the UK's underground assets."

One of the challenges facing the researchers is to create a centimetre-accurate satellite-based location technology which can work even in 'urban canyons' to record in-street observations. Another challenge is linking these recordings to existing information held by each utility, to create a complete picture of what lies underground. The final step will be ensuring this information is provided to those who need it in a form that is accessible and comprehensible.

The research is being led by the University of Leeds, in collaboration with the University of Nottingham and 19 companies and organisations from the utilities, transport and engineering sectors and managed by UKWIR (UK Water Industry Research Ltd).

Source: University of Leeds

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