

New research helps ID weak water mains before they burst

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A split pipe underground. Only a small minority of critical urban pipes are currently inspected, due to the high costs involved. Credit: Sydney Water

Only a small minority of Australia's critical urban water pipes are currently inspected due to the high costs involved, and it can be hard for authorities to know which pipes to prioritise for costly check ups and renewals.

Now researchers at the University of Technology Sydney (UTS), Monash University and the University of Newcastle are trialing advanced techniques to assess the state of the underground pipes, preempting potential breaks before they happen.

The \$16 million project, officially called the Advanced Condition Assessment Pipe Failure Prediction Project and dubbed Critical Pipes, is

due to be completed in 2016.

In collaboration with Sydney Water, UTS researchers are analysing data collected from pipe inspection tools, including electromagnetic and acoustic sensors, in a one kilometre stretch of water pipe at Strathfield in Sydney's Inner West.

The aim is to remove the guesswork from critical pipe inspection.

Among the inspection tools on trial is a submerged sensor that is released on one end of the pipe and collects data as it moves through the water, before being picked up at the other end.

Other data on wall thickness and defects is collected by external sensors that are applied to the outside wall of the pipe once a small section is exposed for inspection.

"The internal tools generate an electromagnetic field or an acoustic signal that allows us to estimate the thickness of the pipe wall, and the presence of defects, as it moves from one end to the other," said Professor Gamini Dissanayake, director of the UTS Centre for Autonomous Systems and a member of the Critical Pipes research team.

"What the utility companies want to do is prevent disruption, so people don't get pools of [water](#) outside their places. They obviously also want to minimise the expense they incur in replacing pipes, so they only do that when it needs to be done," said Dr Jaime Valls Miro, an Associate Professor at the UTS Centre for Autonomous Systems and a member of the research team.

Monash University is providing an analysis of internal and external factors and stresses affecting the pipe network and the different material types and locations within the system.

The University of Newcastle is analysing the deterioration rates of the pipes within the network, focusing on why and how corrosion and leaching occurs.

Sydney Water has provided over \$5m toward the project, as well as access to a buried one kilometre, 600mm diameter test pipe at Strathfield.

"We're using that [pipe](#) to gather data and to understand whether our models are working," said Associate Professor Valls Miro.

"This is a five year project. We're only two years into it but we feel we are on the right track."

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