The correlation between the number of the pipes with poor structure condition and higher risk assets identified by Rezatec was strong. 

Carl Dooher, Manager of Metershop and Service Advisors, Utilities Kingston
The Solution

Rezatec was tasked with providing a retrospective assessment of the risk of leak/burst events across a pilot area of interest within the Utilities Kingston network. The area of interest was a mixture of urban and rural locations and consisted of 577 km (346 miles) of clean water pipelines across approximately 200 sq.km. (77 sq. miles).

To provide Utilities Kingston with pertinent insights, Rezatec employed its proprietary Pipeline Risk model, which presents a relative leak/burst risk score between 0 and 5 (0 = low and 5 = high) for each pipeline section; known as a Likelihood of Failure (LoF) score.

The first task was to produce a digital map of the network, using pipeline attributes and historic incident event data supplied by the utility company. This was supplemented with diverse geospatial datasets collected from satellite imagery and ground data, and then combined to create a Pipeline Risk model. These data inputs included:

**Network data**
- Pipeline attributes
- Historic incidents

**Environmental data**
- Weather conditions
- Soil types
- Geology
- Topography
- Drainage

**Satellite data**
- Ground movement
- Vegetation intrusion
- Land-use change
THE SOLUTION

With these data in hand, the models were trained and validated using advanced machine learning algorithms to recognise patterns and produce insights into the causes of historic events, and then calculate the individual and combined risk factors for all types of pipeline risk events.

Generating a LoF score for every pipeline segment, Rezatec delivered these insights in the form of a colour-coded risk map within Rezatec’s intuitive web portal. The portal allowed Utilities Kingston to view clustered risk areas and drill down into the LoF score. At Utilities Kingston’s suggestion, further layers were added to the portal to specifically show ground motion trends over time and possible green bloom (unusually vigorous vegetation growth) during summer months.

"Our main goal is to help our clients by providing them with analytics to make more informed critical asset management decisions – ultimately, improving margins, gaining competitive advantage and optimising asset management. Our solutions will help Utilities Kingston manage their assets in a more efficient manner and drive down unnecessary costs.

Philip Briscoe, Chief Operating Officer, Rezatec
THE OUTCOME

The deployment ran over 6 months, and validated by Utilities Kingston, demonstrated that **64% of water leaks occurred in just 20% of the network** that was identified by the model as being at the highest likelihood of failure.

So, by focusing leak detection efforts on the highest risk 20% of their network, Utilities Kingston would have observed 64% of their total clean water leaks. This risk classification can therefore be used going forward to prioritize inspection, detection or maintenance activities in a cost-effective manner. The deployment also provided insights that surprised Utilities Kingston, such as the fact that there were specific areas of subsidence observed where some of the historic incidents occurred - demonstrating the value of monitoring ground movement for pipeline leak detection purposes.

Most importantly, the retrospective assessment conducted within the deployment clearly revealed that LoF results strongly correlate with observed asset degradation. Clear correlation was seen between incidents that occurred after the period of analysis and the location of highest risk segments classified by the Rezatec models. Not only has this provided confidence in Rezatec results, it has also allowed Utilities Kingston to understand what has been observed across the network historically, providing a benchmark of results.

If you would like to learn more about Rezatec, please visit our website [www.rezatec.com](http://www.rezatec.com).

Alternatively contact us on +44 (0)1865 817500 or [info@rezatec.com](mailto:info@rezatec.com) to book a demo of our pipeline risk monitoring solution.