

How Satellite Data is Solving A \$300bn Pipeline Problem



Pipeline upgrades, one of the biggest points of expenditure for water networks, are set to cost US companies an eye-watering \$300 billion over the next ten years. Outdated upgrade prioritization plans are causing networks to spend billions on replacing perfectly serviceable pipes, while high-risk infrastructure remains in service, dramatically increasing the likelihood of critical failure.

The true cost of poor upgrade prioritization can no longer be ignored, with pipe breakage up 27% in the last six years and the looming threat of catastrophic failure, a Water Leader's biggest fear, increasing exponentially with every year that this multi-billion dollar pipeline upgrade problem goes ignored. Such a failure could occur at any time and cause astronomical expense; for example, a recent Jersey City water main break that left most of the city - including a major hospital - without water, caused the network operator's share prices to fall almost 50% in a month and left them facing a multi-million dollar repair bill.

If we are to shrink the black hole of unnecessary network upgrade costs, protect our investments and prolong the life of our infrastructure, we need a cost-effective, comprehensive and continuous asset monitoring solution, one which allows us to identify areas of pipeline that pose the highest risk, address pressing underlying issues, and prevent unnecessary pipeline replacement.

Eliminating Excessive CAPEX and OPEX Spend

Water Leaders are under incredible pressure to solve underlying pipeline problems that have been present for up to a hundred years, while eliminating unnecessary CAPEX and OPEX spend. The legacy of ageing infrastructure puts a significant strain on resources and highlights the need for better insights that allow for more dynamic decision making.



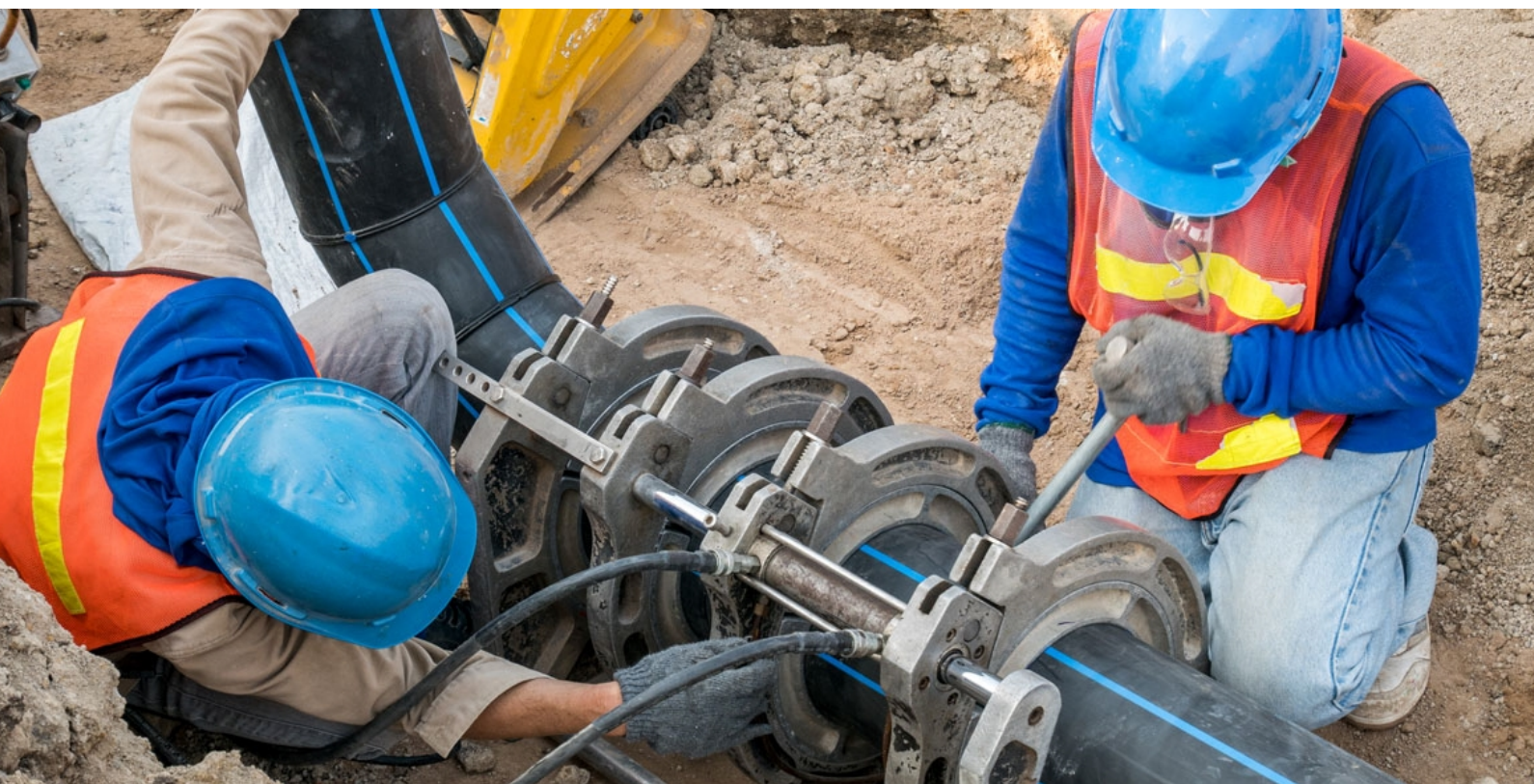
Why have network upgrades been so difficult to plan effectively for so long? The real problem lies in a lack of asset visibility, which leads to the assumption that age-based risk profiles are the best way to prioritize pipeline replacement. Without insights, without data, it is impossible to know which areas of your network are at the highest risk of failure. Indeed, our recent research shows that up to 70% of pipeline problems occur within just 20% of your network infrastructure, and that age is only one of several key factors that contribute to pipeline failure, making it all the more essential to zero in on high-risk areas and prioritize investment correctly.

There is no getting away from the fact that upgrades are a necessary investment in order to ensure compliance, provide continuous service, and meet the high expectations of customers, investors, and regulators. However, it is possible to cut the average cost of annual upgrades significantly, by implementing an optimized, data-driven upgrade plan.

The Data Holes Causing Your Profit Leaks

It is clear that current network monitoring solutions are not comprehensive enough to tackle the \$300 billion pipeline problem. Often reactive in nature and costly to implement, these traditional methods leave large data holes and are therefore best complemented by modern continuous monitoring solutions, to avoid overspend on unnecessary repairs and replacements.

For example, the installation of DMAs, a popular practice in the UK and Europe since the 1980s, was previously considered to be one of the best ways to zero in on water consumption and loss within specific geographies.



In reality, while DMAs are helpful when identifying leaks and reducing NRW, the installation of flow meters on transmission mains and boundary valves involves a multi-year CAPEX commitment for large networks and has been linked to issues with hydraulic efficiency and water quality in several studies, including extensive research conducted by Bluefield Research, which found a connection between DMA installation and water quality events.

In addition to the potential risks of such an approach, the quality of data provided is not sufficient for networks to predict and mitigate risk, or to prevent overspend on unnecessary upgrades. Therefore, when considering the cost of implementation, associated risk, and holes in the resulting data, DMA is no longer thought of as the optimum approach for asset monitoring.

Another common approach to pipeline monitoring is the implementation of leak detection technology, such as distributed acoustic sensing (DAS). This approach is rather costly and time-consuming to implement, but it can monitor infrastructure over a large geographic area and promptly identify a range of acoustic events, such as a pipeline failure or leak event. Acoustic leak detection solutions are limited to the identification of existing leaks and do not allow you to predict failure, identify historical trends, or prioritize future investment based on the likelihood and cost of potential failure. It is an interesting technological advancement with limited benefits on its own.



Historic burst information, while useful, is only one piece of the puzzle when it comes to solving pipeline problems and preventing future failure. It is not possible to tell from this information whether the remaining pipes in a particular area suffer from the same problems as previously ruptured infrastructure, only to make educated guesses about what is likely to occur, based on what already has occurred. Eliminating this guesswork will allow networks to make the biggest upgrade savings.

All of these traditional monitoring approaches, while diverse, suffer from the same issue of missing or under-utilized data. If you cannot see where the areas of highest risk are, if you can't pinpoint those pipes most likely to burst or crack, how can you prioritize upgrades efficiently and prevent overspend on unnecessary pipe replacement?

Forward-looking leaders are investing in data analytics to help them solve this problem and to achieve significant business advantage.

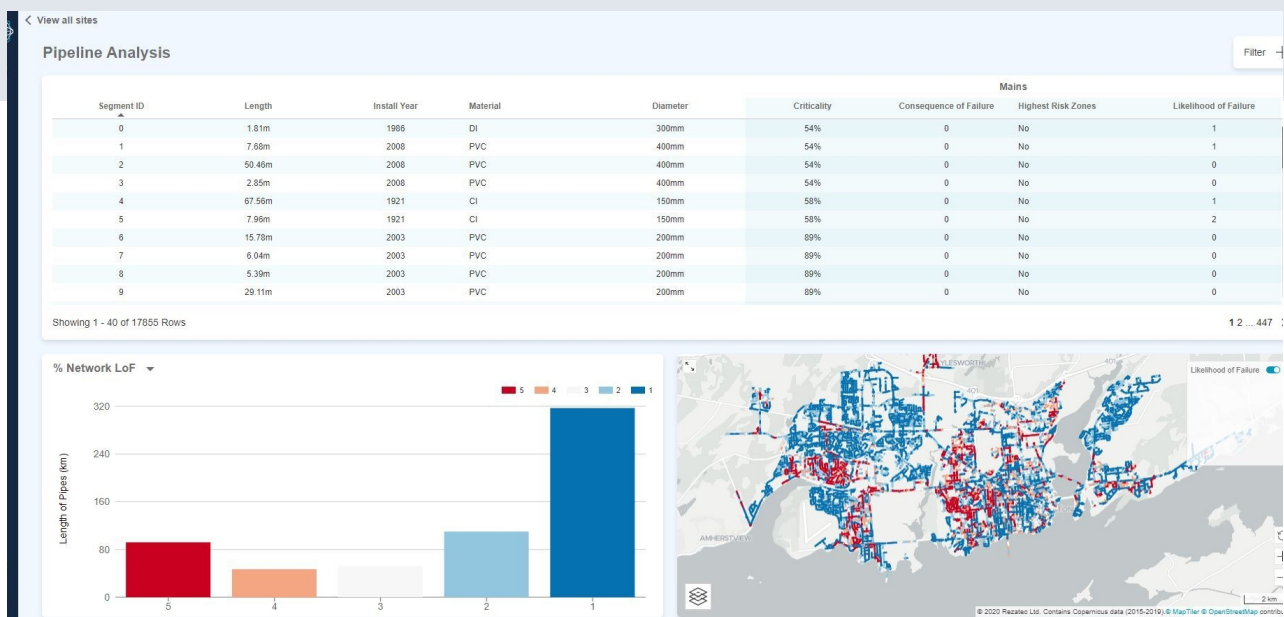
The Solution: Data Analytics

Rezatec's Pipeline Risk Solution monitors your pipelines, establishing the likelihood, consequence, and cost of failure. Our unique geospatial analytics service is designed to supplement your in-house data with unique additional datasets from satellites, applying leading AI analytics to provide actionable insights that transform your approach to asset management.

Once the solution is implemented, you will be able to proactively determine the highest risk of pipeline failure across your entire network - and upgrade it - ahead of time.

The system allows you to:

- ✓ Build a digital risk profile of your entire network that highlights the changing probability of failure and supports dynamic decision making
- ✓ Mitigate risk and reduce costs with remote sensing analysis that precisely quantifies the likelihood of failure across your entire network
- ✓ Focus on the top 20% of your network where most leaks are likely to occur, and proactively plan repair, maintenance, and upgrades
- ✓ Reduce leakage and non-revenue water, by cutting non-targeted upgrade costs and optimising CapEx and OpEx



By combining satellite input and other data feeds with the most advanced AI analytics on the market, we remotely provide a view of your entire water pipeline network that allows you to assess its condition, determine the risk and cost of failure, and optimize your upgrade plan accordingly.

If you would like to discuss how our market-leading Geospatial Analytics solution could help your company to dramatically reduce the cost of pipeline upgrades, don't hesitate to get in touch and [request a free demo](#).



Resources:

<https://www.bluefieldresearch.com/dma-not-dma-smart-water-question/>

<https://www.commondreams.org/views/2019/12/19/looming-us-water-crisis>

https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1173&context=mae_facpub

https://www.researchgate.net/publication/266171989_Case_Studies_on_Water_Pipeline_Failures_in_the_Active_Zone

<https://www.insidernj.com/press-release/jc-water-main-break-shows-need-fix-old-infrastructure/>

<https://www.theguardian.com/commentisfree/2019/apr/08/us-unsafe-water-crisis-unite-americans>