

Asset Performance Optimization

DEVELOP PROACTIVE, EFFICIENT, AND JUSTIFIABLE WATER ASSET MANAGEMENT PROGRAMS USING ADVANCED ANALYTICS

OVERCOME YOUR MOST PRESSING ASSET CHALLENGES:

- Identify high-risk distribution mains and develop an optimized intervention plan
- Locate lead service lines and prioritize inspection and replacement activity
- Determine valve criticality for inspection and maintenance planning

The responsibilities that come with managing water network assets are as wide-ranging as the systems themselves.

Utility managers are being asked to do more than ever before - with fewer people, smaller budgets and without clear visibility to the true condition or material of the pipelines and valves which make up their network. This can put the community at risk.

Managers traditionally rely on less accurate and efficient methods, such as age-based selection, to assess their water distribution systems and develop asset management plans. But these approaches can often have significant financial, operational, level-of-service, and public health impacts on utilities and the communities they serve. As today's utilities acquire more thorough and wide-ranging data to help understand the state of their networks, they need a solution to help them harness the power of that data and create a more accurate, efficient, and cost-effective approach.

Asset Performance Optimization does just that – combining machine learning, artificial intelligence, and other advanced analytics, all supported by a team of industry and technical experts – to provide utilities with data-driven decision support when identifying, prioritizing, and quantifying potential challenges to their water networks.

Xylem's innovative solution results in a higher level of accuracy than traditional assessment methods so managers can mitigate problems earlier, more efficiently, and with less impact to the community.

Distribution Main Intervention

REDUCE WATER MAIN BREAKS WHILE INCREASING CAPEX AND OPEX EFFICIENCY USING ADVANCED ANALYTICS TO IDENTIFY AND PRIORITIZE ASSET INTERVENTION ON YOUR MOST CRITICAL ASSETS

Regardless of your pipeline network's size or age, Xylem's approach to distribution main intervention efficiently and costeffectively analyzes massive amounts of data – such as pipe break history, impact of pipe segment failures in both dollars and service loss, and more – to identify your network's distribution mains that are most in need of attention, so you can more efficiently prioritize pipeline management strategies.

What You Can Expect

In partnership with your utility, Xylem performs a thorough data health check, data gap analysis, data gap filling, and project road mapping to set goals upfront. We leverage your existing historic leak and break data, including GIS & hydraulic model, previous inspection results, and any other open-source data that may exist.

Next, we use a variety of analytical methods to provide you with three key outputs which help you proactively manage high-risk pipes across your network and guide your pipeline management strategy.

- **Predictive degradation modeling** forecasts optimal timelines for intervention on your most critical assets
- **Quantitative risk analysis** powered by machine learning, determines Probability of Failure (PoF) to identify pipe segments with a high risk of breaking and deliver predictions up to 3-5 years.
- **Cluster analysis** identifies groupings of high-risk pipe segments across your pipeline network, revealing breaks avoided, and forecasts cost savings for mobilization scenarios.

These analyses can be easily accessed through an **interactive decision-support web application with maps and tools**, as well as raw GIS data. You will also receive in-depth reports detailing the analyses performed, and a series of technical workshops to ensure that you can easily digest the data and identify where to focus your attention.



Xylem's distribution main intervention can help you...

- Reduce failures by an average of 4-10x more effectively than traditional methods.
- Lower OpEx spending on emergency break repairs (\$2.4M over 3 years on average), freeing resources for other needs.
- Validate CapEx budgets for pipeline replacements with data.
- Improve customer service with fewer service disruptions.
- Reduce leakage and related non-revenue water.
- Increase safety and efficiency for teams by averting failure of critical infrastructure.

Get More From Xylem's Approach To Distribution Main Intervention

A partner ready to work with you – Regardless of when you began your journey to mitigate risk, improve efficiency, and reduce costs, Xylem's solution can meet you where you are. It provides immediate benefits: from building the data that will give you an overview of your water network, to predicting future events and helping you develop a long-term strategy to optimize and continuously improve your pipeline asset management program.

ESRI integration – As an ESRI Platinum Partner, we are ready to help you take advantage of opportunities to be more effective and efficient by maximizing the benefits of your GIS investment. Xylem's approach to distribution main intervention delivers results in an intuitive ArcGIS web application and allows you to interact directly with the results.

Go beyond repair and replacement – The data gathered from a distribution main intervention engagement is powerful, but not every pipe that needs intervention can receive it immediately. Our team will work with you to build a Strategic Asset Intervention Program, applying gathered distribution main data.

A clear, transparent solution – Many other predictive modeling solutions are "black boxes" that deliver very little transparency into the solutions and forecasts. Xylem's approach to data analysis provides exclusive insights into the process to help you make the most-informed decisions about the challenges affecting your infrastructure.



Achieve significant savings on mobilization costs by suggesting project candidate clusters based on a systemwide analysis that bundles high-risk pipes together for mitigation action.

This is a game changer for us, and it is something we will be able to use for a wide variety of applications.



Adam Haggerty, Water and Sewer Asset Manager for Raleigh Water



Lead Service Line Detection and Replacement

MEET EPA REQUIREMENTS FASTER AND MORE AFFORDABLY USING ADVANCED ANALYTICS TO ACCURATELY IDENTIFY LEAD SERVICE LINES AND BUILD OPTIMIZED REPLACEMENT PLANS

The Lead Service Line Problem

According to the Centers for Disease Control, there is no safe level of lead exposure, yet the EPA estimates there are **still 6 to 10 million active lead service lines** in communities across the country, with around 400,000 schools and childcare facilities remaining vulnerable to the health risks associated with lead contaminated water.

Recent Changes That Impact You

In December 2021, the EPA officially updated the Lead and Copper Rule. These new changes are designed to officially get the lead out of our nation's drinking water and empower communities through greater transparency and access to information. Accomplishing this will require utilities to make significant advancements in identifying and replacing their lead service lines, with key milestones such as completing a service line material inventory and developing an initial Lead Service Line (LSL) replacement plan by **no later than October 16, 2024**.

While the costs associated with Lead Service Line Replacement (LSLR) can be considerable for utilities – the EPA's own research* shows an average cost of \$4,700 per line replaced – there is help available. The recently passed infrastructure bill includes **\$15 billion over the next five years** to help replace lead pipes and service lines across the United States. This is in addition to existing federal and non-federal <u>funding sources</u> which continue to be available as well.

How Xylem Can Help

Xylem's approach to lead service line detection and replacement uses machine learning to analyze your utility's existing data – combining historical census and parcel data with other water distribution network performance data and verified service line material information – to **more accurately predict the location of previously unidentified lead service lines**. Xylem then works with you to prioritize these predictions and bundle them with other future projects, efficiently and affordably folding lead service line verification and replacement into your capital improvement plan and **minimizing potential impact to service levels.**

* Strategies to Achieve Full Lead Service Line Replacement (2019)



XYLEM'S LEAD SERVICE LINE DETECTION AND REPLACEMENT CAN HELP YOU...

- Accurately predict where to find lead service lines across your network.
- Reduce spending by bundling lead service line replacement with your other asset management projects.
- Identify funding opportunities and guide you through the submission process.
- Provide your community with lead service line location information and replacement plan progress.

What You Can Expect

A complete and reliable service line inventory – The advanced machine learning predictions from Xylem's lead service line detection and replacement approach can **significantly increase the success rate for locating lead service lines across your network** when compared to traditional approaches such as random or age-based selection. This allows you to build a complete inventory of your service line materials – a key component of new EPA requirements – and have confidence in its accuracy.



This chart shows predicted probabilities of finding lead service lines using machine learning rather than traditional approaches.

A pathway to efficient and affordable lead service line

replacement – With budgets tighter than ever, utilities are well aware of the costs associated with replacing individual lead service lines. But those costs can be greatly reduced through Xylem's ability to **bundle lead service line inspection and replacement with other future projects**.

When aligned and prioritized against these other asset management activities such as meter management or replacement, pavement replacement, pipe rehabilitation projects, or valve management activities, Xylem can help you **optimize operational efficiencies and significantly lower the average cost of lead service line inspection and replacement** across your network.

A partner ready to work with you – At Xylem, our industry and technical experts will work with your in-house team, acting as your trusted partner and advisor to help you through every phase of your LSLR journey, from detection to securing funding and building an optimized replacement plan. Our goal is to help you protect your community efficiently, affordably, and with greater transparency than ever before, while complying with new state, federal, and EPA regulations.

Xylem Helps You Reach LSLR Compliance Efficiently and Affordably



Raleigh Water

Project Highlights

- Reduced project planning time by up to five days, or 75%.
- Generated pipe risk forecast for more than 88,000 individual pipe segments working in partnership with Xylem's experienced team of industry and technical professionals.
- Optimized CapEx spending and developed a more efficient asset management program.
- Identified and prioritized 16 high-risk pipe segment clusters.
- Utilized clustering analysis to guide sensor placement to identify breaks more quickly in high-risk areas.
- Supported city-wide initiative to increase water equity by utilizing objective data rather than subjective factors to pursue infrastructure projects.

Read the full case study

Mid-Size Mid-Atlantic Utility

Project Highlights

- Developed a plan to reduce customer outages and improve service reliability, while cutting replacement spending by over 70% compared to other prioritization methods.
- Using Xylem Asset Performance Optimization methodology, the utility will experience a dramatic 4X reduction of water main breaks, as compared to legacy prioritization approaches that are mainly subjective.
- The utility and Xylem developed a mobile, field-tracking application to improve break record accuracy, reduce labor time required to update their computerized maintenance management system (CMMS) and their geographic information system (GIS), as well as improve the output of the AI model.

Read the full case study

Additional Xylem Asset Performance Optimization Clients Include:



From pipeline risk assessment and distribution main intervention planning, to lead service line detection and replacement, Xylem's Asset Performance Optimization solution provides a set of comprehensive asset risk analytics and planning support services that you can count on to help your utility operate more efficiently, safely, and affordably.

To start a conversation today, visit our website.



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