

Your Asset Management Plan Has a Blind Spot.

The majority of your capital dollars go to assets your tools barely cover.

Pipe networks get the sophisticated tools: GIS-based condition mapping, failure-rate models, leakage indices. Treatment plants and other vertical assets get age-based schedules and OEM recommendations. The problem: treatment assets command the majority of capital dollars, not pipes — and the research literature shows the same imbalance.

**52% vs
29.5%**

SHARE OF MUNICIPAL WATER
& WASTEWATER CAPEX:
TREATMENT VS. PIPE
(BLUEFIELD)

24 of 108

PERFORMANCE-INDICATOR
STUDIES FOCUSED ON
DISTRIBUTION PIPES (AQUA
2024)

30%

UTILITIES WITH A FULLY
IMPLEMENTED ASSET
MANAGEMENT PLAN (ASCE
2025)

81% / 15%

AVG. CAPACITY
UTILIZATION / PLANTS
ALREADY AT OR BEYOND
CAPACITY (ASCE)

Sources: Bluefield Research, Segmenting Utility CAPEX: U.S. Municipal Water Infrastructure Forecast, 2019–2028 · Bluefield Research, U.S. Water & Wastewater Treatment Infrastructure CAPEX Forecasts, 2025–2035 · AQUA — Water Infrastructure, Ecosystems and Society, IWA Publishing (2024) · ASCE 2025 Infrastructure Report Card (Wastewater & Drinking Water) · AWWA does not sponsor, endorse, or affiliate with third-party companies, products, or services.

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Where the Money Goes, and Where the Tools Don't.

Pipe networks get the lion's share of attention in water utility asset management — GIS-based condition mapping, failure-rate models, leakage indices, hydraulic simulation. Yet pipe networks are not where most of the capital is actually going.

Bluefield Research's segmentation of municipal water and wastewater CAPEX found that treatment assets — plants and systems — account for 52% of total forecasted spending, while pipe collection and distribution accounts for 29.5%, with the remainder spread across pumps, lift stations, storage, and network hardware. More recent Bluefield forecasts for 2025–2035 point the same direction: treatment infrastructure upgrades and new builds are projected at roughly \$426 billion, compared with roughly \$117 billion forecasted for pipe infrastructure across the U.S. and Canada over a similar window. The scopes of these two forecasts aren't directly comparable, but the imbalance they each point to is consistent: the majority of capital dollars are flowing to the asset class with the least developed planning tools.

This isn't just an industry impression. It shows up in the research itself. A 2024 AQUA review — examining 108 published studies on water utility performance indicators — found that of those studies, 24 investigated distribution pipes and 19 investigated leakage management, while only nine focused on asset management broadly.

WHERE THE RESEARCH GOES

Distribution pipes	24
22% of the 108 studies reviewed	
Leakage management	19
18% of studies	
Utility management	16
15% of studies	
Asset management	9
8% — the whole-system view, least studied	
Other	40
37% — water cycle, drought, demand, and more	

“Asset management studies should cover not only distribution pipelines but also treatment plants.”

AQUA — WATER INFRASTRUCTURE, ECOSYSTEMS AND SOCIETY, IWA PUBLISHING, 2024

The pattern is consistent whether you look at where utilities buy software, where researchers focus, or where capital planning methodologies were originally built: pipes first, plants as an afterthought.

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Why Vertical Assets Get Left Behind.

The imbalance isn't random. Pipes are spatially native — they map cleanly to GIS, there are millions of miles of them, and that scale produces rich, statistically tractable datasets for failure prediction and condition modeling. Treatment plants are the opposite: far fewer of them, but each is a heterogeneous mix of process trains, mechanical equipment, and control systems that doesn't generalize easily across utilities.

It's harder to build a one-size-fits-all model for a clarifier, a blower, and a UV disinfection system than for a length of ductile iron pipe. That difficulty doesn't make vertical assets less important — it makes them more likely to be planned with weaker tools. The *Horizontal vs. Vertical Assets* comparison in the sidebar lays out the contrast dimension by dimension.

Only about 30% of utilities have fully implemented an asset management plan, with just under half still in the process — and the plans that do exist were, more often than not, built around the pipe-network model first. The decline shows up in renewal rates too: over the last decade, the wastewater sector's renewal and replacement rate for large capital projects — the category that includes treatment plant rehabilitation — fell from 3% to 2%, even as collection-system failure rates climbed. Even the academic literature mirrors the gap it's supposed to be closing: a review built to study utility performance indicators ends up spending most of its own attention on the same asset class utilities already over-tool for.

HORIZONTAL VS. VERTICAL ASSETS

Scale

Pipes: millions of miles nationally.

Plants: ~16,000 nationally.

Data structure

Pipes: spatially native, GIS-ready.

Plants: heterogeneous process trains.

Failure modes

Pipes: a small, well-understood set.

Plants: dozens of interacting subsystems.

Tooling maturity

Pipes: condition models and leak indices. Plants: largely age-based / OEM schedules.

Share of CAPEX

Pipes: 29.5%. Plants: 52%.

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What This Costs, and What to Do About It.

Capacity Blind Spot Cost

The nation's 16,000-plus wastewater treatment plants run at an average of 81% of design capacity, and 15% are already at or beyond it. These are exactly the assets where capital decisions carry the highest consequence — a plant failure means a full service disruption or a regulatory violation, not a localized leak — yet they're the assets utilities can see least clearly in their own CIP tools.

Process Complexity Cost

A pipe segment fails in one of a small number of well-understood ways. A treatment plant fails through dozens of interacting subsystems. Utilities that haven't built planning frameworks specific to that complexity tend to fall back on age-based replacement for vertical assets — the same default that's already been discredited for pipe networks.

Renewal Rate Erosion Cost

A shrinking large-capital-project renewal rate, concentrated in exactly the asset category with the least planning maturity, compounds quietly. Deferred plant rehabilitation doesn't show up as a visible failure the way a water main break does — until capacity is exceeded.

Portfolio Distortion Cost

A CIP scenario-planning process built and tested on pipe-replacement logic will keep treating vertical asset investment as a category to slot in around the edges, rather than a planning problem with its own condition data, lifecycle assumptions, and capacity thresholds. The capital allocation ends up reflecting which assets are easy to plan, not which assets carry the most risk.

FOUR MOVES FOR VERTICAL ASSETS

- 01** Inventory your CIP by asset class — horizontal vs. vertical — and check whether your prioritization method was built for treatment-plant assets or just adapted from a pipe-network model.
- 02** Treat heterogeneous process and vertical assets as their own planning category, with condition and risk criteria suited to their complexity — not a generic age-based score.
- 03** Cross-check capital allocation against actual risk concentration, so the dollars going to vertical assets reflect consequence of failure, not just share of asset count.
- 04** Extend scenario planning and dependency-aware scheduling to vertical assets specifically, with their own condition data, lifecycle assumptions, and capacity headroom.

None of this means pipe-network tools were a mistake — they solved a real and urgent problem. It means the next planning maturity step for most utilities isn't more pipe analytics. It's building the same rigor for the assets that already carry the majority of the capital risk.

About Invizion

Guy Barlow is President of Invizion, a purpose-built capital lifecycle management platform for water utilities. Invizion integrates CIP management, prioritization, scenario planning, and performance tracking in a single unified system — enabling utilities to plan vertical and horizontal assets with the same rigor, instead of forcing every asset class through a pipe-network model.



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