

Leveraging an Advanced Asset Management Framework to Optimize Investment Decisions

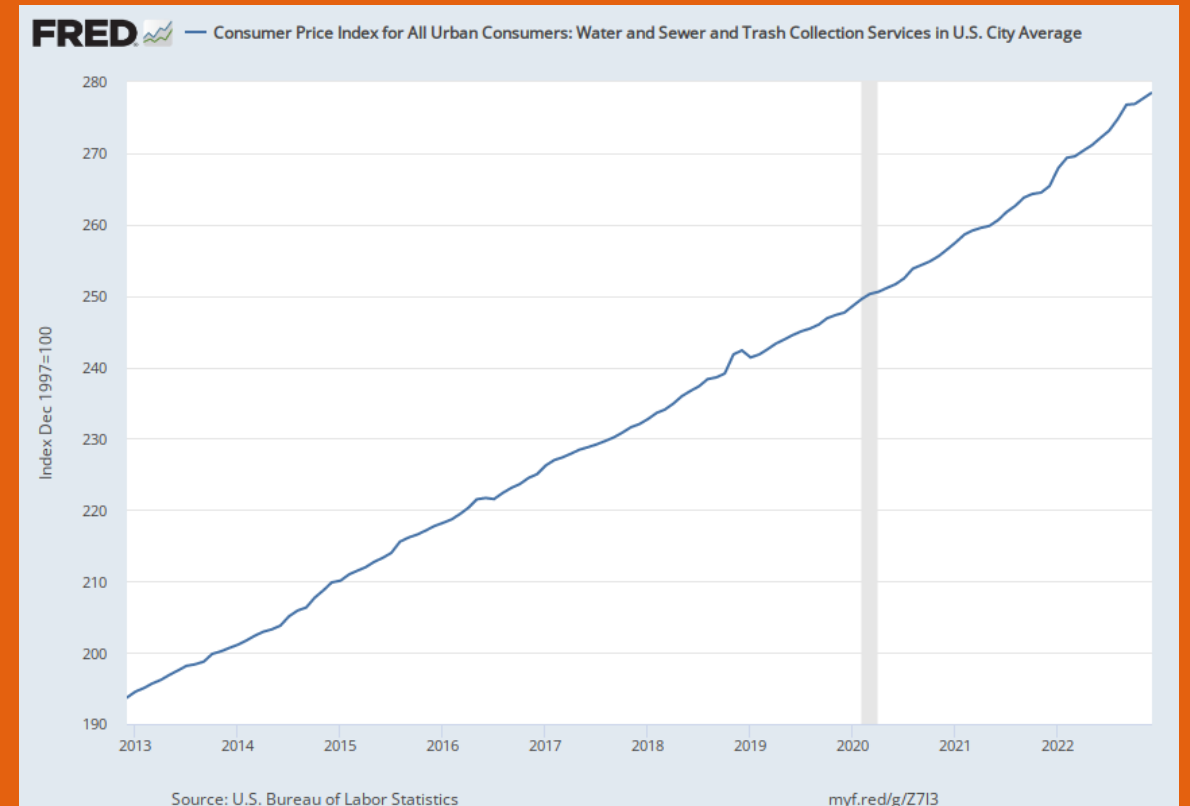
NEWEA Annual Conference

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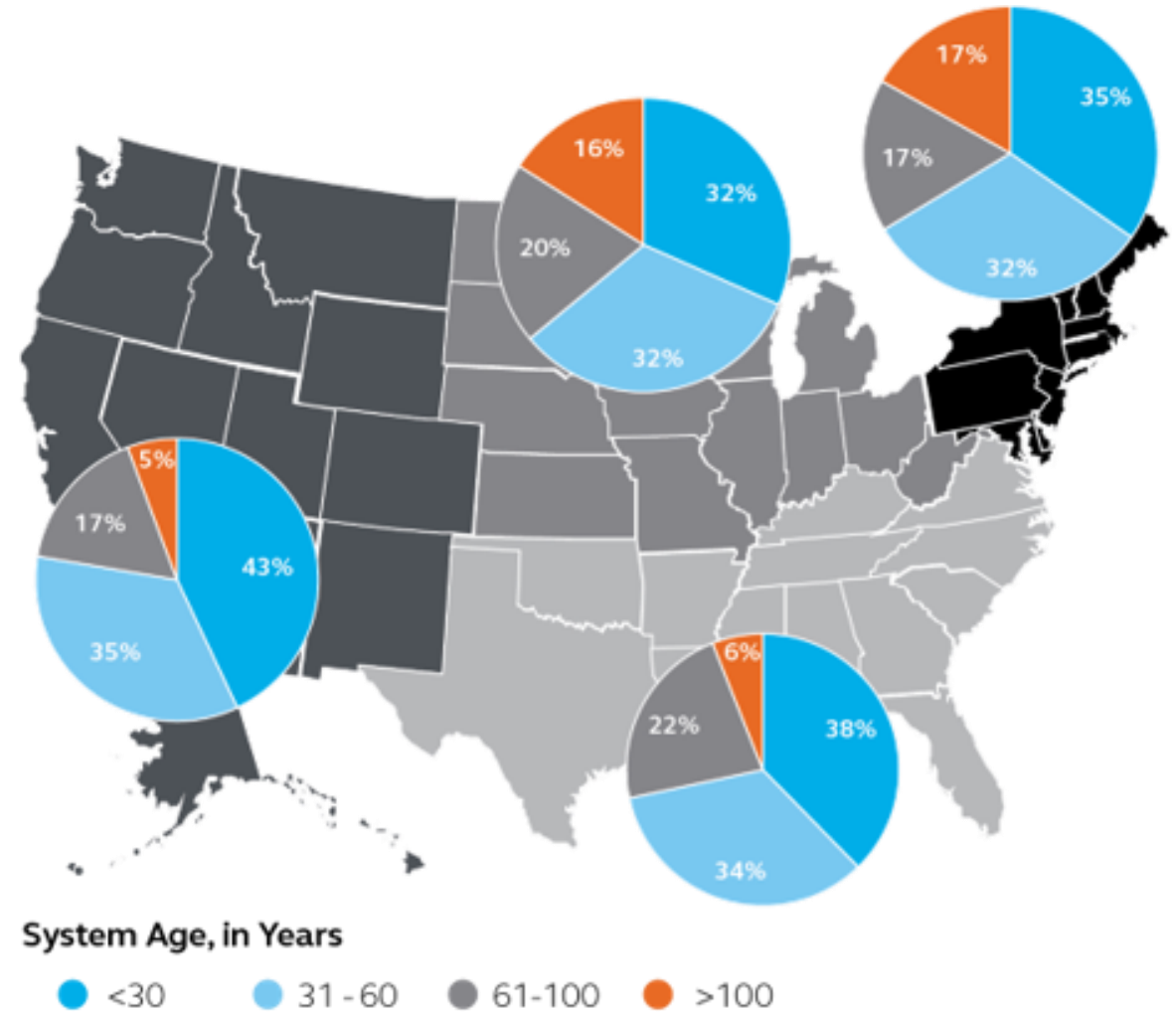
The case for asset management

Since 2013 water and sewer rates have experienced a 144% increase on the CPI index.



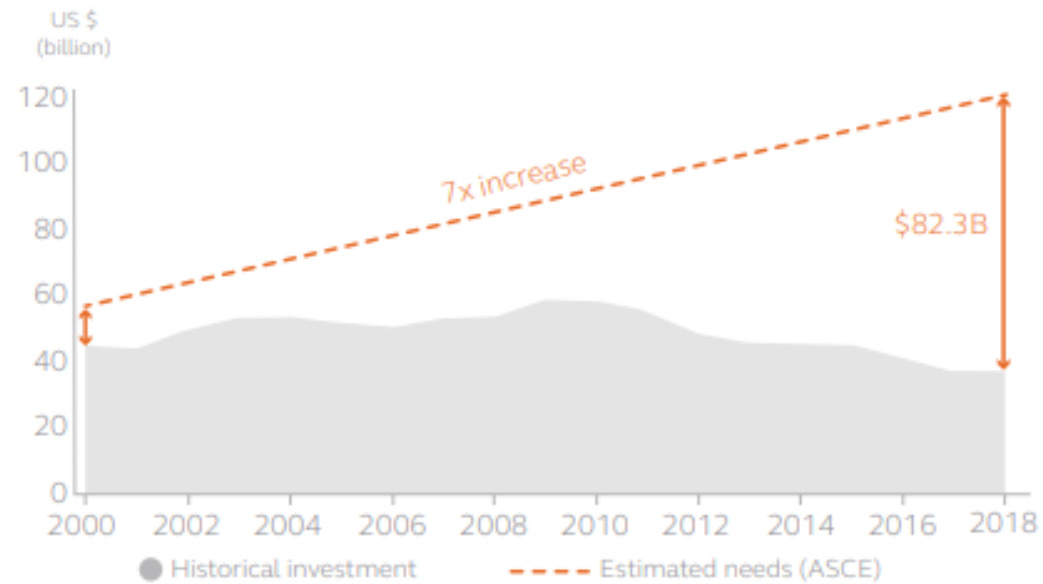
Assets do not get better with age!

The aging infrastructure challenge poses a major challenge to the traditional approach of utility management.



The case for asset management

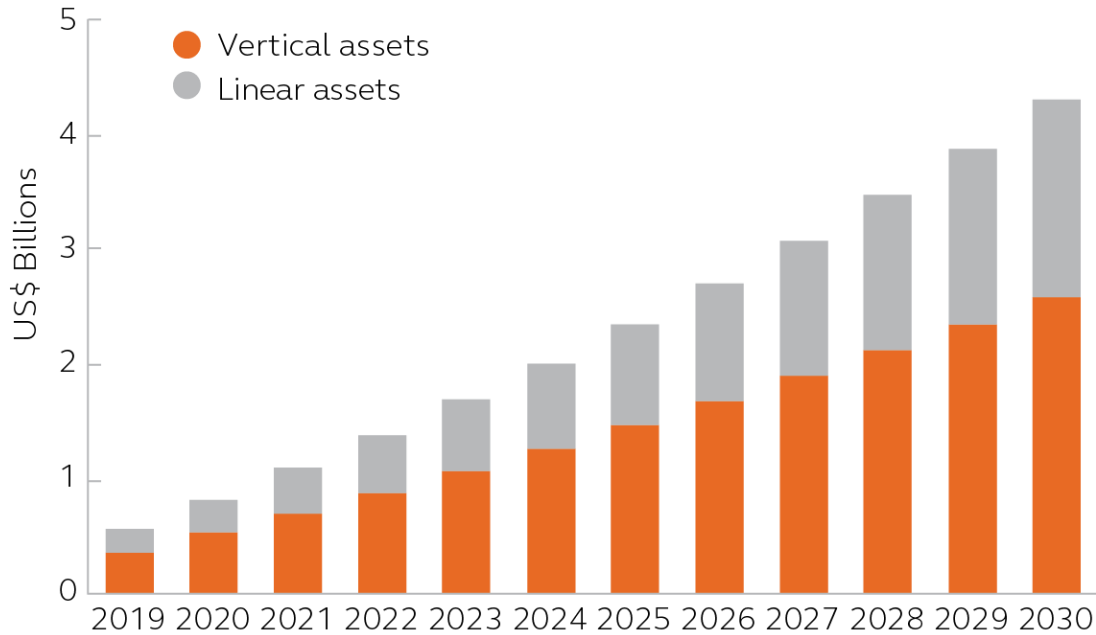
Water and wastewater capital needs vs. historical investment



Sources: American Society of Civil Engineers, U.S. Congressional Budget Office, Bluefield Research

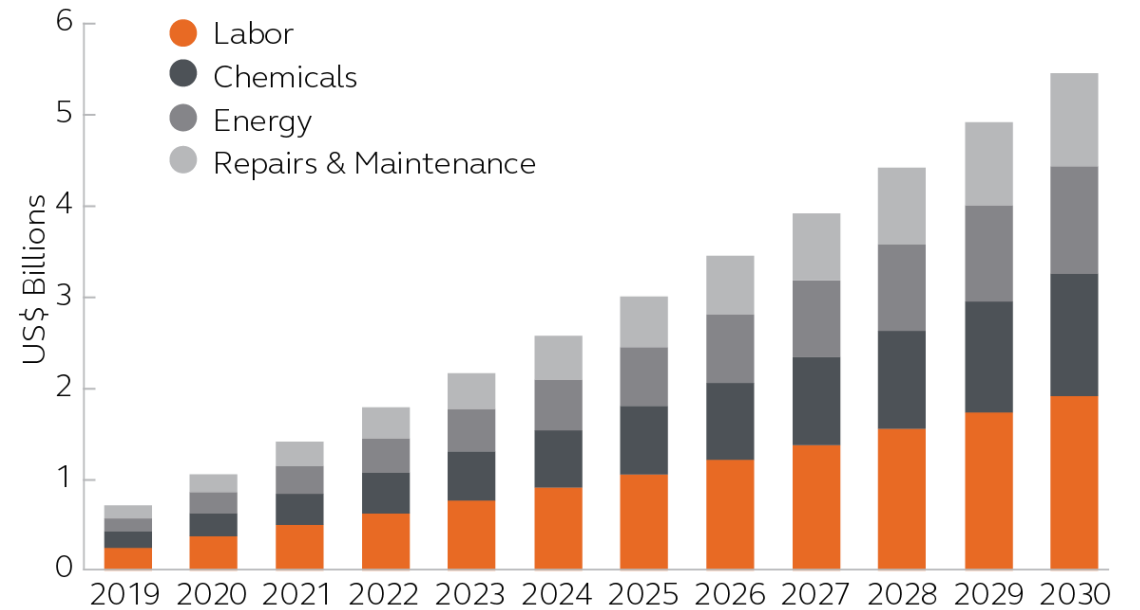
- **Utilities continue to experience high-cost pressures to maintain aging infrastructure.**
- **Water and wastewater rates are one of the higher increasing categories in the consumer price index for the past 15 years.**
- **Most utilities struggle to identify the best investments to reduce risk and maintain level of service in highly fiscally constrained circumstances.**

Advanced asset management CAPEX savings forecast, 2019-2030



Source: Bluefield Research

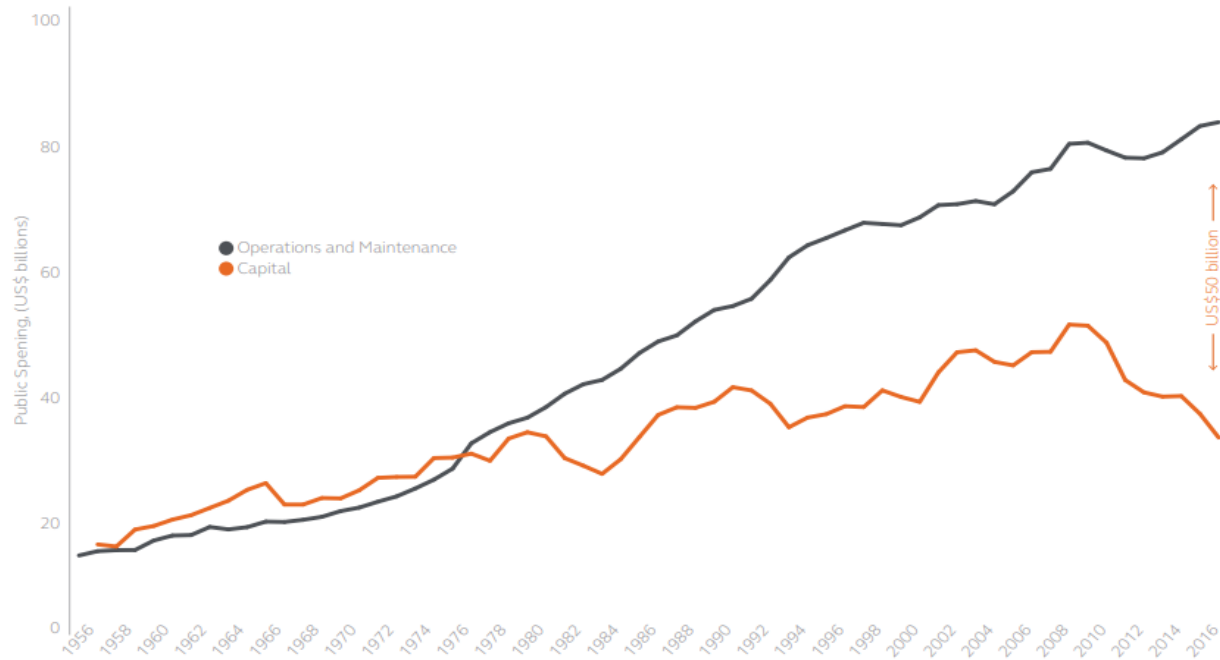
Advanced asset management OPEX savings forecast, 2019-2030



Source: Bluefield Research

The case for asset management

Operations and maintenance costs, 1956-2016



Source: U.S. Congressional Budget Office

- **Maintenance cost reached and all time high in 2017 and are expected continue to rise.**
- **Revenue is flatlining as consumption decreases.**
- **Various input costs have had sharp increases in recent years**
 - Wages
 - Energy
 - Commodity inputs

Shocks and stressors are becoming routine and more severe

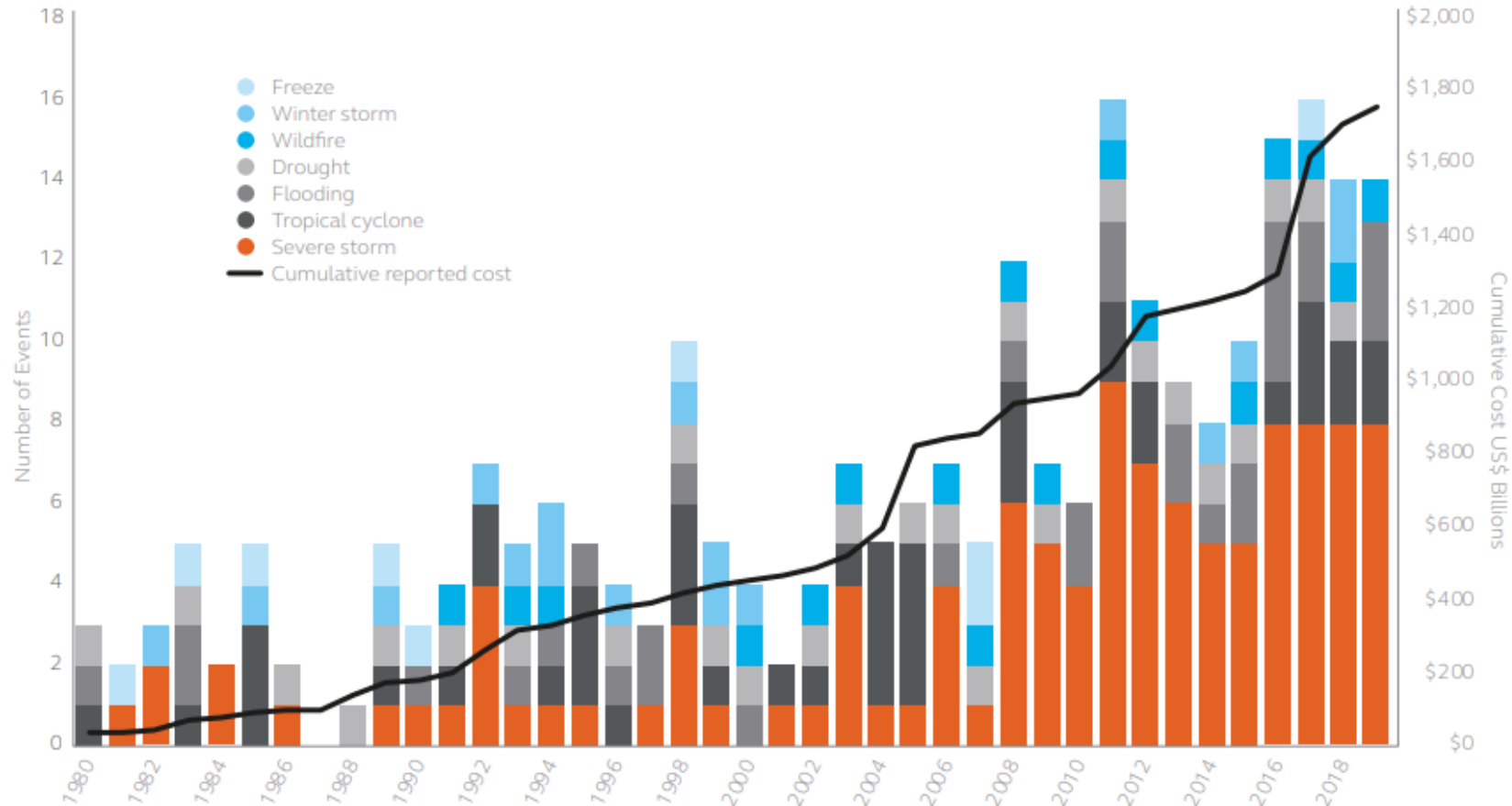
Shocks and stressors are having a real impact on capital and operating budgets.

Major disaster events are not becoming more routine.

System resilience is now more vital for continuous operations.

Optimized capital budget prioritization is critical to viable utilities.

Billion-dollar U.S. weather disasters and cumulative costs



Sources: Brookings Institution, U.S. Bureau of Labor Statistics

Is it real?

High voltage electrical switch gear is one area experiencing acute supply chain effects:

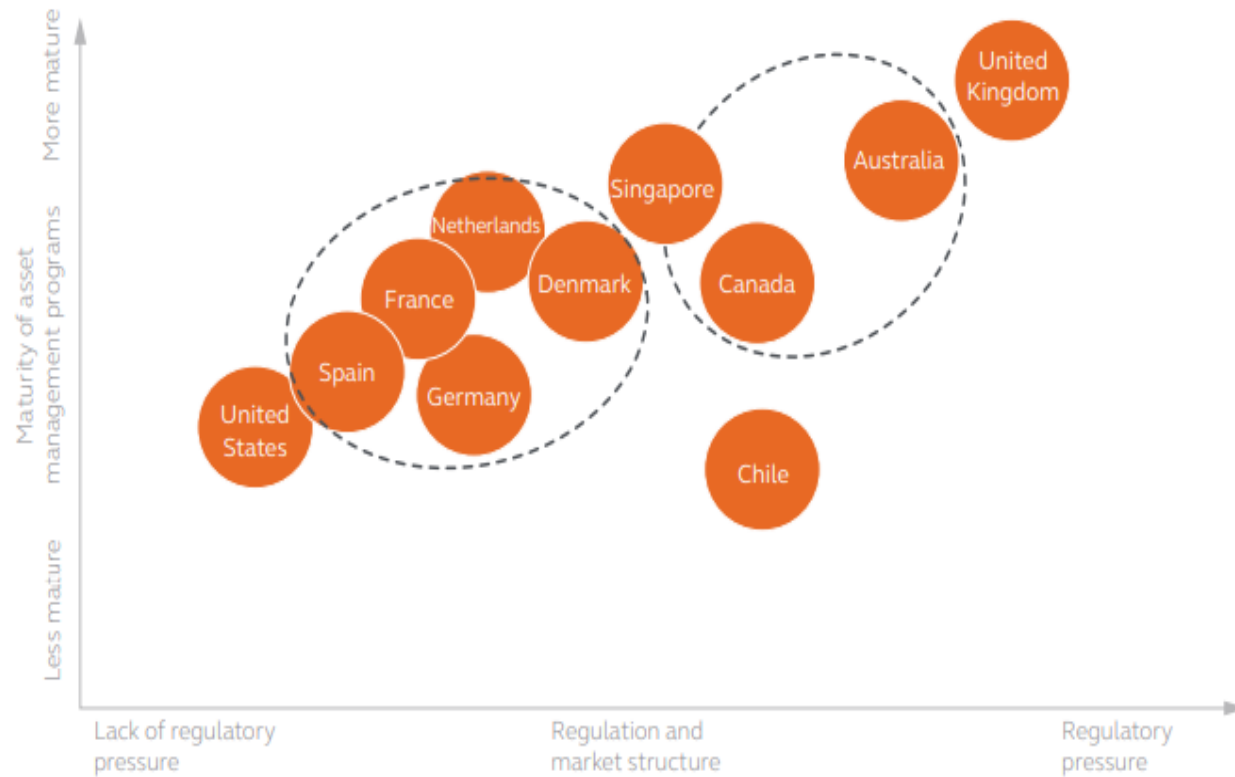
- ✓ Shortage in inspection vendors willing to service older switchgear.
- ✓ Global backlog of switchgear orders.
- ✓ Some clients resorting to sourcing replacement parts on eBay due to manufacturers no longer existing.
- ✓ Industry forecasts put lead times on high voltage switch gear to 12 to 16 weeks.
- ✓ 60% of manufacturers still report a shortage of insulating resin needed for making these products.
- ✓ Prices expected to continue to increase due to manufacturing cost increases and high demand.
- ✓ Limited established manufacturer pool.
- ✓ Chip shortage affecting availability of control panels.

Parts availability/shortage considerations should drive repair/replacement strategy.



The case for asset management

Maturity of asset management programs vs. regulation and market structure, globally



Source: Bluefield Research

Most developed economies comparative the US have moved to a regulatory requirement of asset management.

In many countries this is directly tied to funding.

Asset management has sporadic implementation among US utilities.

Traditional vs Advanced

ASSET MANAGEMENT



Focused on only physical Infrastructure



CAPEX repair and Replacement Prioritization



Historical data reliant and Driven by industry standards



Advanced

Focused on the complete asset Portfolio including people



TOTEX focused with optimization across both CAPEX and OPEX



Leverages historical and dynamic data. Utility specific Performance orientation



Better decisions require better analytics

To tackle the rising demands of stakeholder interests and aging infrastructure the operational culture of utilities must be optimized around a data driven approach.



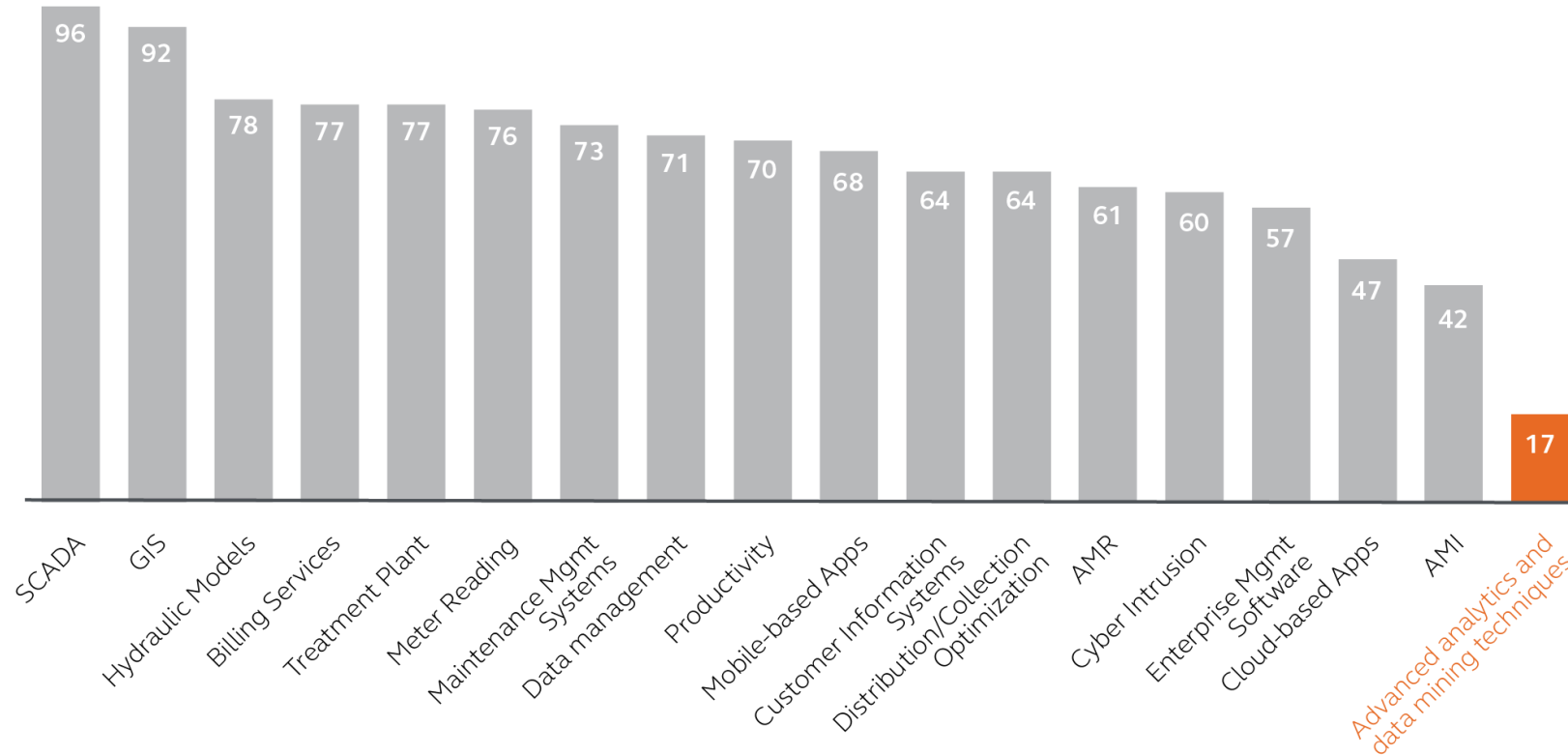
Do's

- **DO** recognize the value of your organizations human assets and capital, and involve them in asset management and investment decisions
- **DO** prioritize and optimize full lifecycle TOTEX costs (i.e., CAPEX + OPEX) when making asset management and investment decisions
- **DO** incorporate real-time asset condition and performance data into maintenance programs, and leverage predictive analytics tools (e.g. AI, ML) to inform decisions
- **DO** supplement your organization's workforce with trained data scientists and analysts to help you unlock the potential of advanced, digitally enabled asset management

Don'ts

- **DON'T** base your organization's asset management and investment on physical linear and vertical assets alone
- **DON'T** make asset management and investment decision on the basis of upfront CAPEX costs alone
- **DON'T** wait for failures, or rely on industry standard assumptions or asset age alone, to determine which assets to prioritize for maintenance or replacement
- **DON'T** rely on traditional utility skillsets alone to confront the challenges of 21st century water and wastewater infrastructure operations and asset management

Digital technology implementation rates by U.S. water and wastewater utilities



Source: American Water Works Association

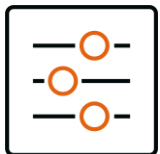
Hindsight to Insight



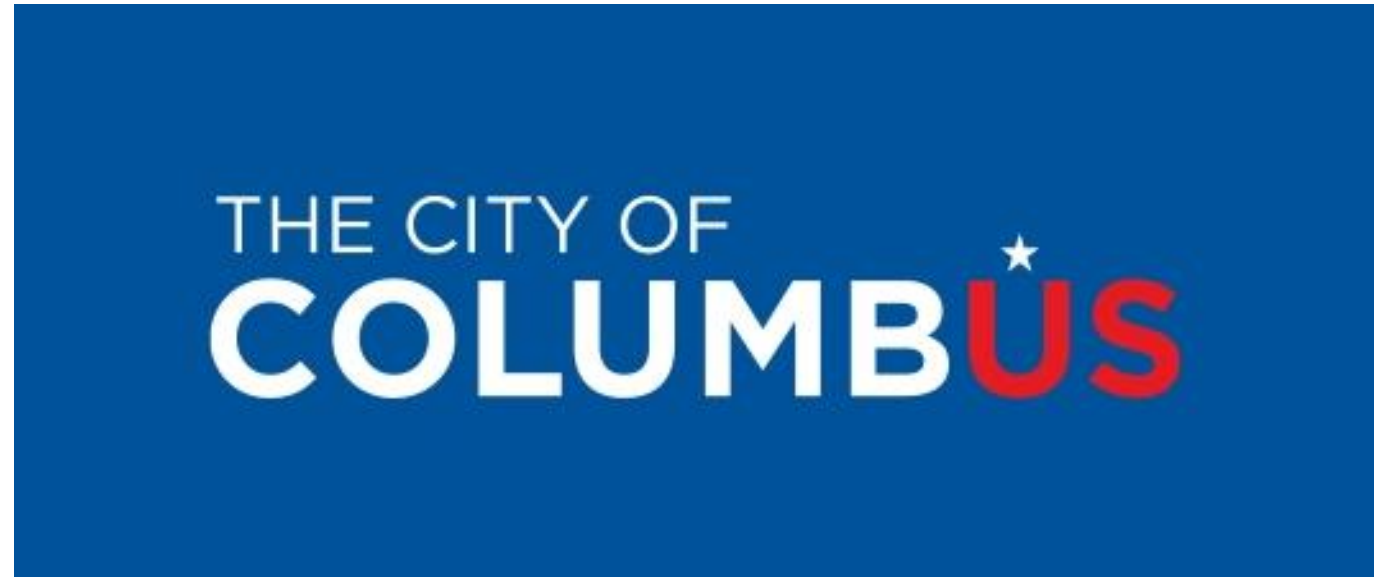
Implemented a comprehensive Asset management plan across all asset portfolios



Asset management program was a catalyst for culture change in an operational shift to proactive management culture



\$60 Million in savings over 5 years through implementation of a risk-based capital planning model.



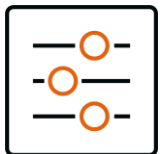
The power of optimization



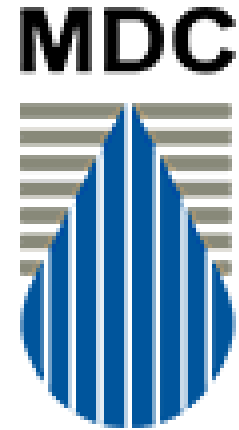
Helped to move its maintenance from a reactive dominant to proactive focused approach



Implemented a digitization project to digitize maintenance and operational manual for dynamic access and updating.



Realized an approximate 50% reduction on certain maintenance spending equating to \$250,000 a year savings.



The Metropolitan District Hartford, Connecticut





Summary Level Roadmap for Staff Communications & Implementation

- Vertical Methodology Development (O)
- Vertical Costing Development (C)
- Develop SOPs (O, C, IT, E)
- Linear Asset Management Plan Development (L)
- AM Roles and Responsibilities (HR)
- Change Management and Stakeholder Engagement Plans (L)
- Improve Linear Decay Curves/Failure Tracking (E)
- Develop Scheduled PMs (O)

Key Phase 2 Activities

- Define Maintenance Processes – Linear (O)
- Develop SOPs (O, E, IT, L)
- Develop Linear Definition SOP (O)
- Clean-up GIS Issues (IT)
- Establish Governance Structure, Policy (L)
- Develop Add'l Levels of Service and KPIs (L)
- Update Strategic Plan (BJWSA)
- Draft Initial SAMP (L)

Key Phase 1 Activities

- Gap Assessment (L)
- Linear Methodology Development (O)
- Initial Linear Risk Assessment (O)
- Initial Levels of Service/KPIs (L)
- Linear Costing Methodology (C)
- Roadmap Development (L)
- CMMS Implementation Preparation Support (BJWSA)

Key Phase 3 Activities

- Skills Gap Analysis, HR Strategy and Staffing Levels (HR)
- Initial Vertical Risk Assessment (O)
- Develop SOPs (O, HR)
- Develop Asset Dashboards (O)
- Develop Data Driven CIP, Budget Scenarios, and Funding Model (C)
- Vertical Asset Management Plan Development (L)
- Develop AM Training Program (BJWSA)

Key Phase 5 Activities

- Develop SOPs (CS)
- Improve CS System and Tracking (CS)
- Improve Spare Parts Storage/Warehouse (O)
- Improve PM Support Tools (IT)
- Evaluate Contract Admin Improvements and Selection (E)
- Improve Process for Maintaining ERP (BJWSA)

Key Phase 4 Activities

Initiatives Driven by Work Teams. Work Teams to be developed in Phase 2

- L** Leadership Team
- E** Engineering
- C** Capital Planning/Finance
- O** O&M
- IT** Information Technology
- CS** Customer Service
- HR** Human Resources



Contact us



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