



Bridging the Gap

**Connecting Financial Managers to Physical
Asset Managers**



WHAT IS ASSET MANAGEMENT



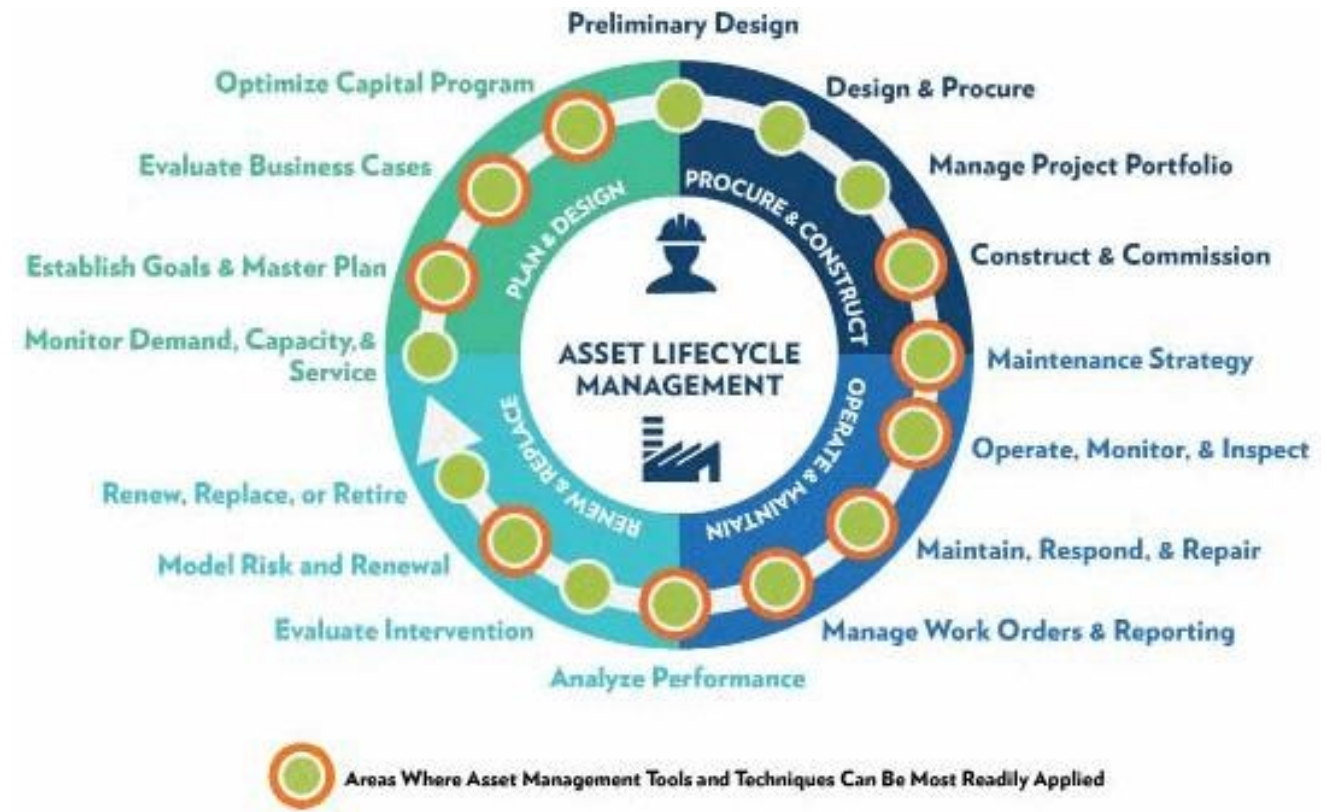
“A MANAGEMENT SYSTEM FOR THE MANAGEMENT OF ASSETS”

IT IS THE BRIDGE

Not Software



...Rather a management system to make these happen



Formalized Management System - To Realize Value FROM Assets



Who Defines This Formalized System?

...Depends on who you ask



[Home](#) / [Regulations and Programs](#) / [Asset Management](#)

Transit Asset Management
Overview

Getting Started

TAM Plans

TAMPLATE

Transit Asset Management



Who Defines This Formalized System?

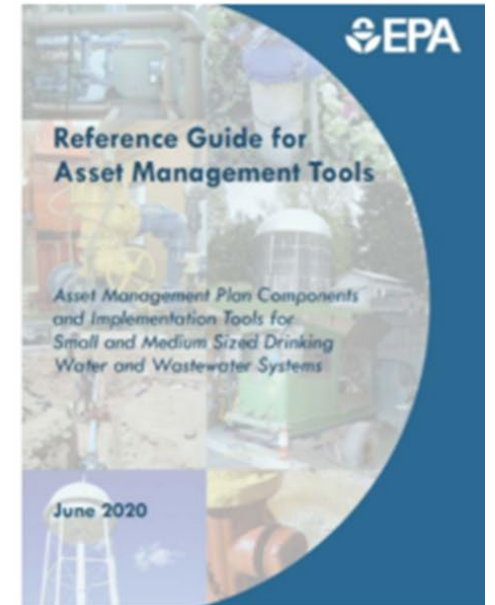
...Depends on who you ask

requires any publicly owned treatment works (POTWs) that receives a CWSRF loan to develop a Fiscal Sustainability Plan (FSP). FSP's include many of the same components of an asset management plan.



The CWSRF and Asset Management

To encourage asset management planning by utilities, the Clean Water Act, as amended by the Water Resources Reform and Development Act of 2014, requires any publicly owned treatment works (POTWs) that receives a CWSRF loan to develop a Fiscal Sustainability Plan (FSP). FSP's include many of the same components of an asset management plan. To assist borrowers with meeting requirements, CWSRF programs distribute guidance documents and provide training and on-site technical assistance on asset management planning and FSP development.



Who Defines This Formalized System?

...Ask the agnostic experts...



North
America



International
Organization for
Standardization



Europe



Asia



South
America



Africa



Australia
New Zealand

Formalized Management System - *To Realize Value From Assets*



International
Organization for
Standardization

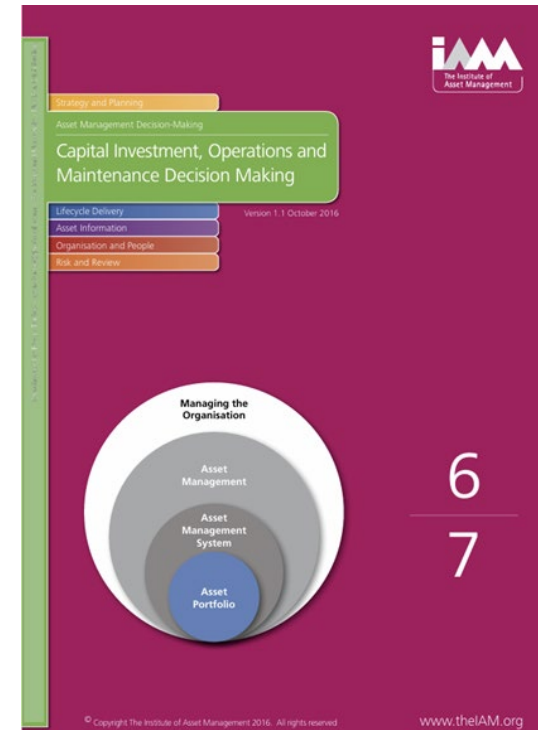
80+ Management System Standards

22,700+ Standards Total

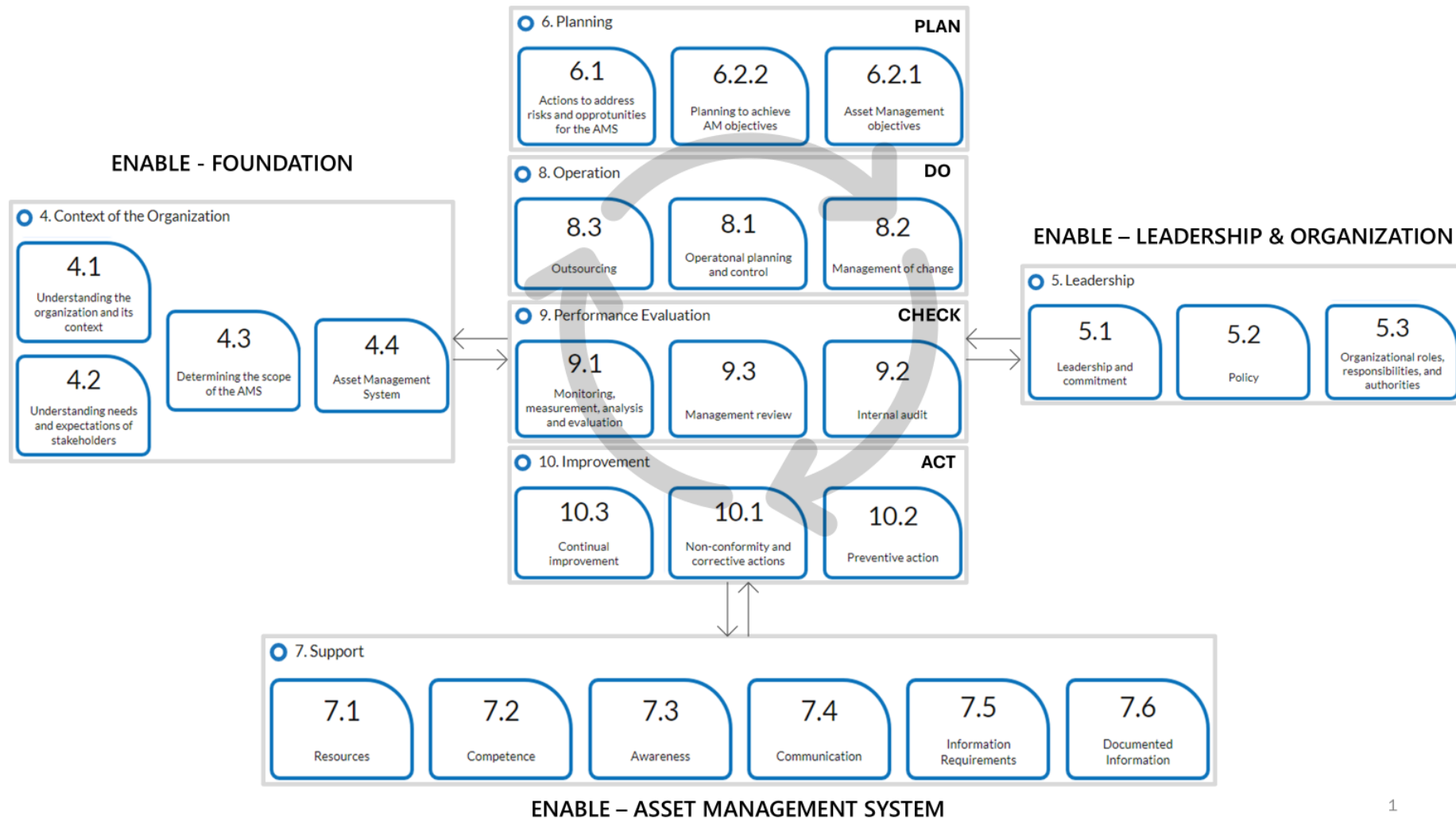


"...a management system for the management of assets..."
ISO 55000

Industry Commitment to ISO 55001

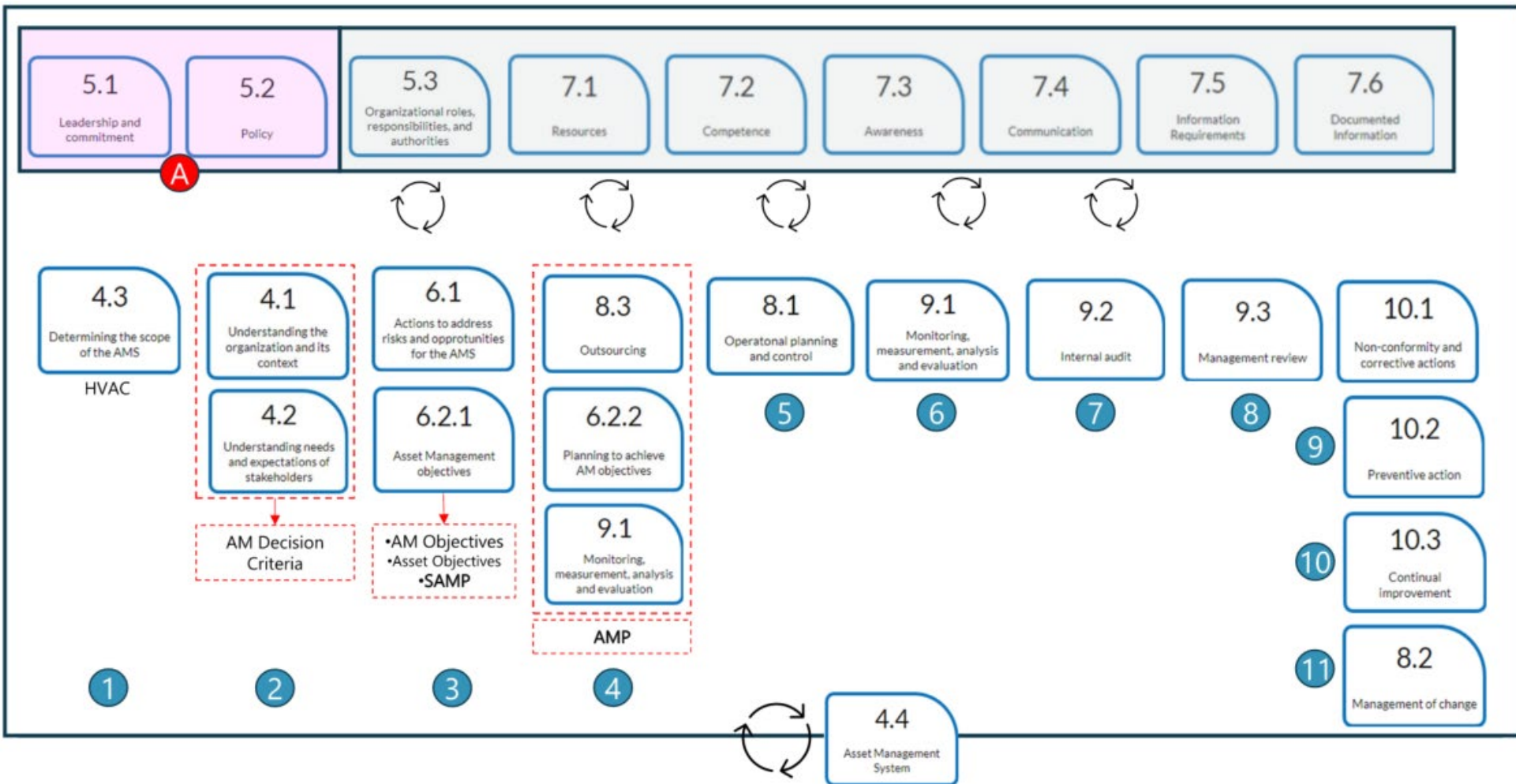


Contents of an ISO 55001 Asset Management System



Contents of an ISO 55001 Asset Management System

....asset management fails because utilities do not realize it cuts across the organization and 'business as usual'



Service from Physical Assets

(Not Financial Assets)



“ASSETS EXIST TO DELIVER VALUE TO STAKEHOLDERS”
ISO 55000

Questions - Participation

What is the public service you are in the business of delivering?

- In other words: Why do you exist?

What are the quality expectations of the service you deliver?

- In other words: Who are your rate payers, regulators, lenders, etc...what do they expect (or even demand) from you?

Can you deliver your service(s), while meeting stakeholder expectations, without well managed physical infrastructure assets? Why?

Poor Performing Assets Degrade Service Quality (Value)

What are you in business to do?

Own, maintain, renew pipes, plants, tanks?



Provide a service, safely, reliably, affordably?



Because Poor Performing Assets Degrade Service Quality (Value)

These are assets used to accomplish.....



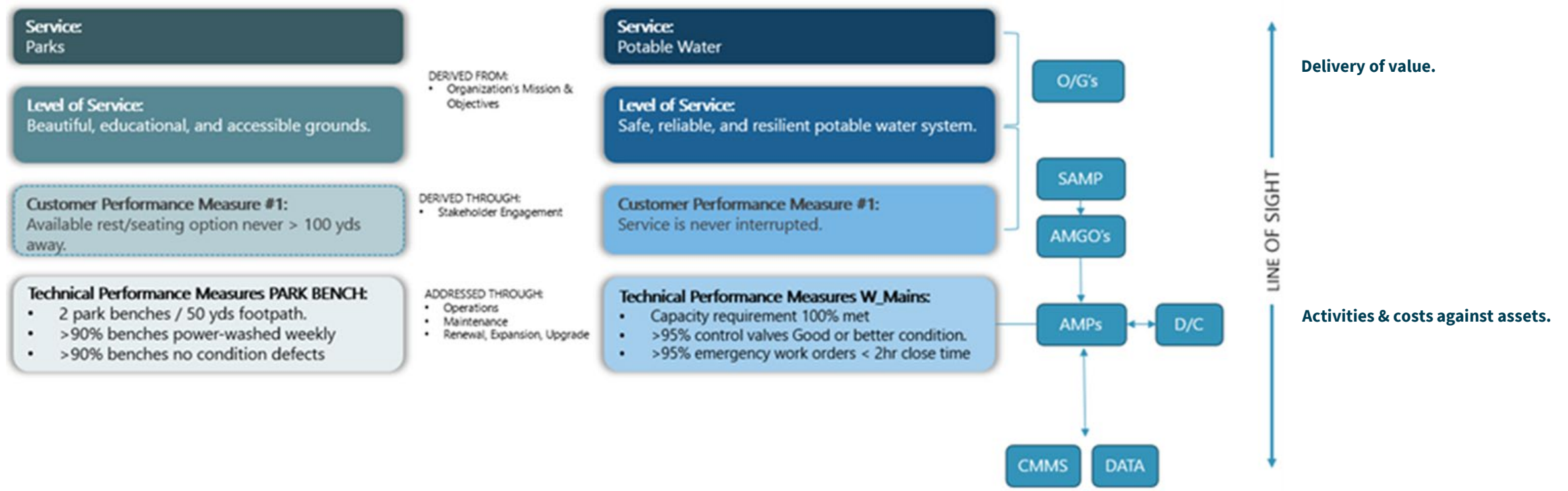
DELIVERY OF SERVICES AT EXPECTED LEVELS



Physical Infrastructure Assets



Levels of Service – Asset Management Core Principle (Defining ‘Value’)



Physical Assets <> Financial Assets



Levels of Service – Asset Management Core Principle – *Infrastructure Gap*

Are you spending enough to maintain existing asset performance?

Is current asset performance good enough?

What about paying for growth (master plan)?



DELIVER SERVICES AT EXPECTED LEVELS



Review of Concepts

- ASSET MANAGEMENT IS A COMMITMENT TO A NEW “BUSINESS AS USUAL”
- IT IS ABOUT MANAGING ASSETS FOR VALUE **FROM** THEM (NOT **OF** THEM)
- ASSET MANAGEMENT **ALIGNS** WITH OTHER MANAGEMENT SYSTEMS / PROCESSES



Where and How Asset Management and Finance Meet



Accounting Asset



The term *capital assets* is used to describe assets that are used in operations and that have initial useful lives extending beyond a single reporting period. Capital assets include major government facilities, infrastructure, equipment and networks that enable the delivery of public sector services. The performance and continued use of these capital assets is essential to the health, safety, economic development and quality of life of those receiving services.

Budgetary pressures often impede capital program expenditures or investments for maintenance and replacement especially for governments that don't prepare a multi-year capital plan or properly consider the impact of capital projects on the operating budget. This lack of investment makes it increasingly difficult to sustain the asset in a condition necessary to provide expected service levels. Ultimately, deferring essential maintenance or asset replacement could reduce the organization's ability to provide services and could threaten public health, safety and overall quality of life. In addition, as the physical condition of the asset declines, deferring maintenance and/or replacement could increase long-term costs and liabilities. Government entities should therefore establish capital planning, budgeting and reporting practices to encourage adequate capital spending levels. A government's financial and multi-year capital plans should address the continuing investment necessary to properly maintain its capital assets. Such practices should include proactive steps to promote adequate investment in capital renewal and replacement and necessary expenditure levels for maintenance.

Capital Asset: Assets used in operations...Useful life beyond one (1) reporting period.

“Budgetary pressures often impede capital program expenditures for maintenance, replacement.....

“....Especially for governments that don’t prepare a multi-year capital plan...”

“...ack of investment makes it INCREASINGLY difficult to sustain assets in a condition that maintains service levels.”

Not reflected in the Audited Financial Statements

- Depreciation expense
- Undepreciated cost of capital assets reported on balance sheet
- Based on historical cost

A long term, future-focussed approach

- O&M costs
- Cost of periodic future interventions
- Future replacement
- Estimated useful life

Ontario (Canada) and its municipalities

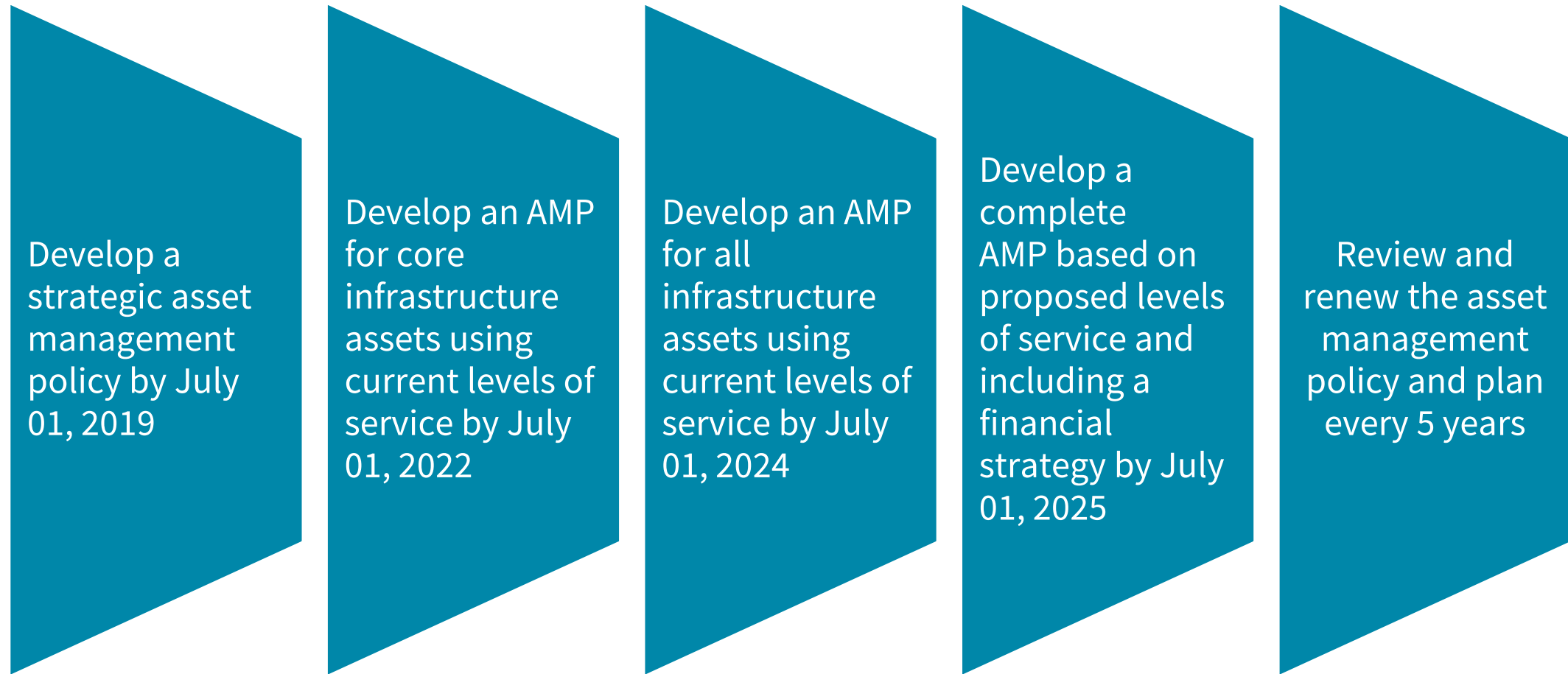
ONTARIO

- Second largest province in Canada: 415,600 m² sq miles (California = 163,700 m²)
- Population = 14.2 m (California = 39.4m)
- 444 municipalities – upper tiers, lower tiers and single tiers (50% have population <25,000)
- Municipal services: water/wastewater, waste management, roads and bridges, stormwater, public transit, emergency services, parks and recreation, museums and libraries, public health, social services (housing, income support, seniors and child care), some courts, cemeteries, building permits, planning, airports, etc.

INSTITUTIONAL FRAMEWORK

- Balanced budget – legislative requirement
- Municipalities can only issue debt to finance capital works (not operating costs), term of such debt cannot exceed the useful life of the assets being financed, term max = 40yrs
- Regulated annual debt repayment limits (max = 25% of own-source revenue)
- Provincial Asset Management Regulation
- Heavy reliance on property taxes – municipalities cannot impose an income tax or a sales tax

Asset Management Regulation - O. Reg. 588/17 – (aligned to ISO 55001)



Compliance with the regulation is a condition for receiving grant funding under various senior government funding programs

Asset Management, meet Finance...

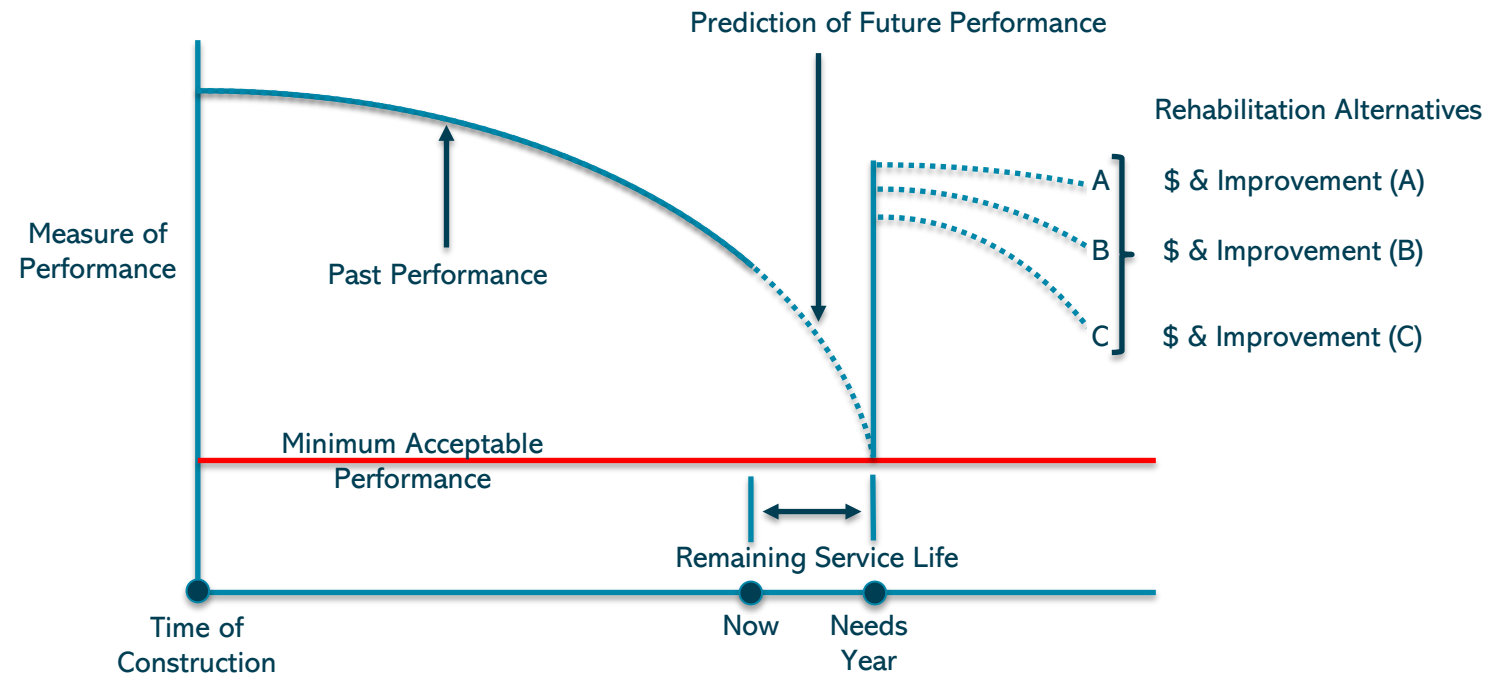
ASSET MANAGEMENT PLAN

- Municipalities own ~65% of public infrastructure in Canada
- AMP covers all infrastructure and assets: Inventory, age, condition, level of service
- Operating cost projection:
 - asset operations and maintenance
 - funded mainly by user fees
- Capital cost projection:
 - asset renewal, rehabilitation and replacement, plus new assets needed to serve growth, plus donated assets (development agreements)
 - financed by reserves and long-term debt

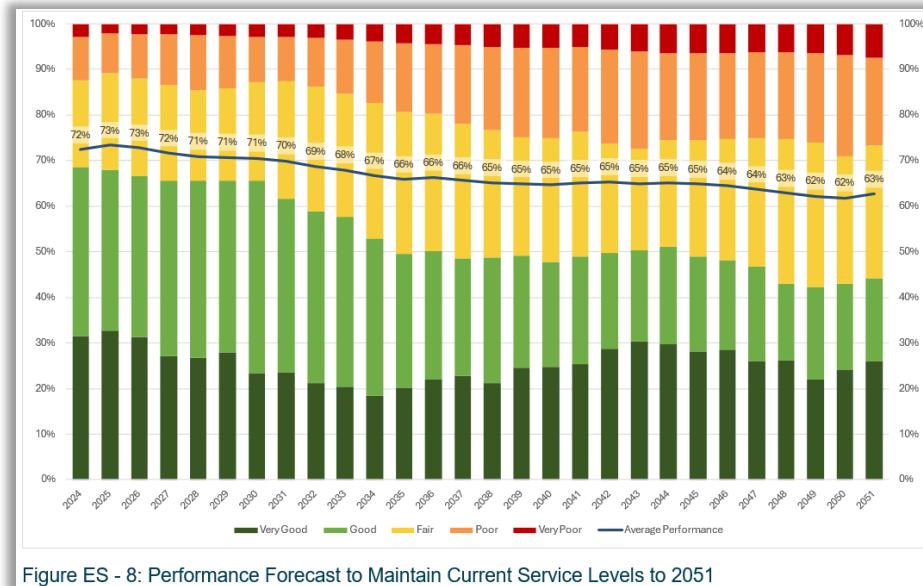
THE BUDGET

- The AM plan is a key input to the asset renewal portion of the municipality's capital budget, while the O&M costs are included in the operating budget
- Goal: Prepare a data-driven, risk-based capital plan that prioritizes investments
- Adjust the AM plan to reflect:
 - Project coordination (fix roads and pipes underneath at the same time)
 - Alignment of work with other agencies
 - Available staff and contractor capacity
 - Capital reserve and debt capacity

Calculating – *Infrastructure Gap*



Calculating – *Infrastructure Gap*



First Principles Asset Information

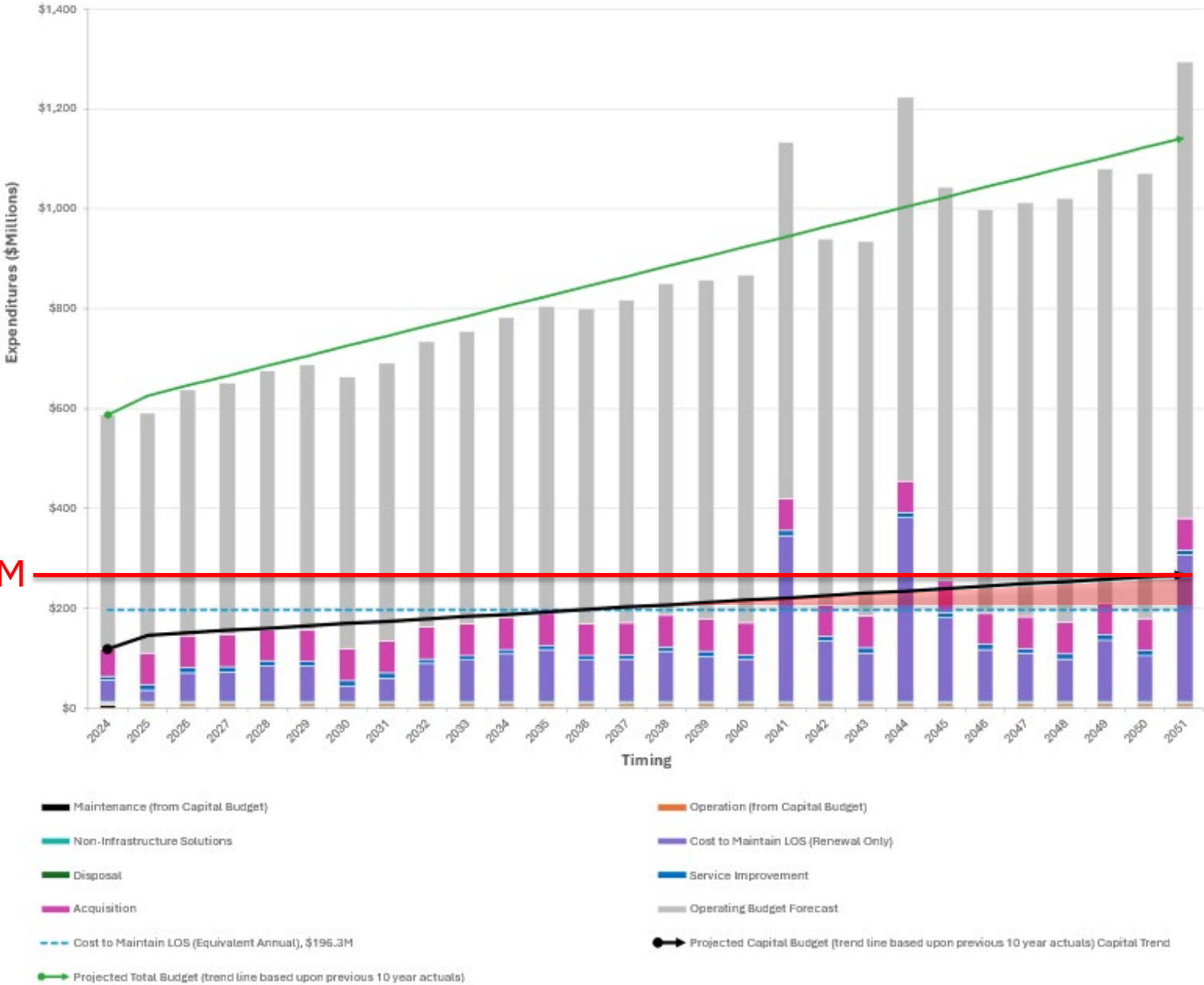
- Age (Known or Estimated)
- Condition (Known or Estimated)
- Capital Treatment(s) Applied
- Costs of Capital Treatments
- Post Capital Treatment Performance Score
- Post Capital Treatment Estimated Service Life
- Performance Degradation Curve
- Prioritization Criteria (i.e., Risk)

Calculating – Infrastructure



\$68M

Cost to Maintain Current LOS



Asset Management, meet Finance...

THE INFRASTRUCTURE FUNDING GAP

- Compare the funding needed for Asset Management O&M and renewal/rehabilitation to the available capacity in the operating budget and capital reserves and debt limits – in most cases, there will be a funding gap
- Options to deal with the gap:
 - Adjust service levels (but be mindful of higher O&M costs), prioritize, seek efficiencies, etc.
 - Increase funding in the form of higher property taxes and user fees, increased investment income, seek out grant funding
 - Increase debt financing (long-term borrowing), which leads to higher debt servicing costs

How Asset Management and Finance interact

OPERATING BUDGET

- AM - O&M spending estimates
- FINANCE prepares the budget, and calculates user rate impacts
- Challenge: Rate affordability, legal risks, aging infrastructure, climate action

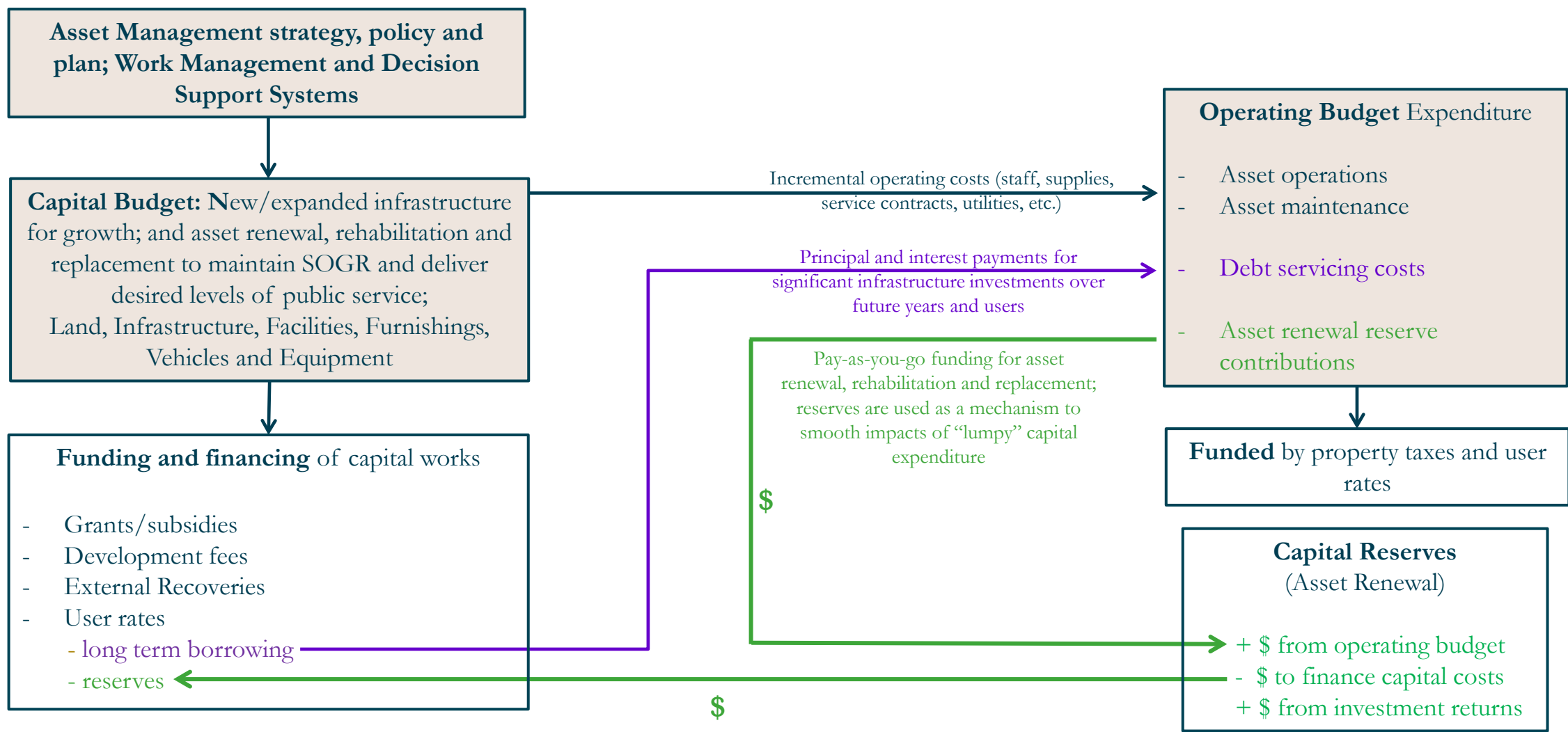
CAPITAL BUDGET

- AM - forecast of asset renewal, rehabilitation and replacement
- FINANCE builds a capital financing plan using capital reserves and long-term financing
- Challenge: tension between AM and growth

RESERVES and DEBT

- Reserve forecast: sources and uses of funds, interest earnings and reserve balances
- Debt outstanding and debt service cost forecast
- Assess capital reserve sustainability and debt affordability

Where and how Asset Management meets Finance



Challenges and Opportunities

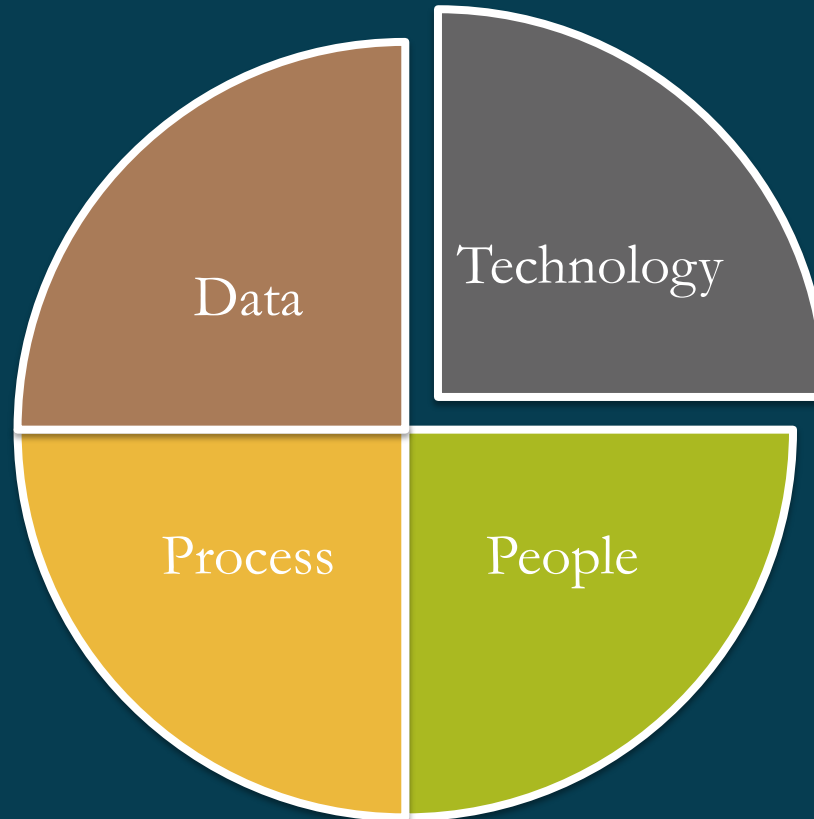
CHALLENGES FOR BOTH AM and FIN

- Material increases in the cost of infrastructure and operating expenses, along with a higher cost of borrowing
- Aging assets and declining asset condition
- Climate adaptation and mitigation
- Long term planning is often overlooked as we focus on day-to-day matters

TACTICAL APPROACHES

- Build the AM/FIN relationship:
 - AM: improve your financial acuity
 - FIN: increase your understanding of AM principles and data, and the risk of deferring renewal work
- Better data (accuracy, consistency, management and security) and more of it - one source of truth
- Take a risk-based approach to capital budgeting using the AM Plan as a key input
- Show stakeholders how data is being used to ensure the right work is being done at the right time on the right assets at the right cost
- Incremental progress is key – use KPIs to track and forecast progress

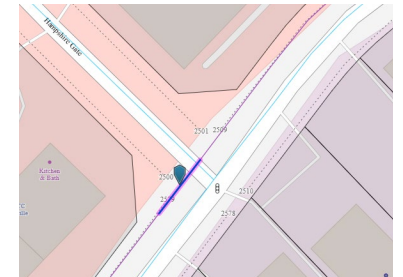
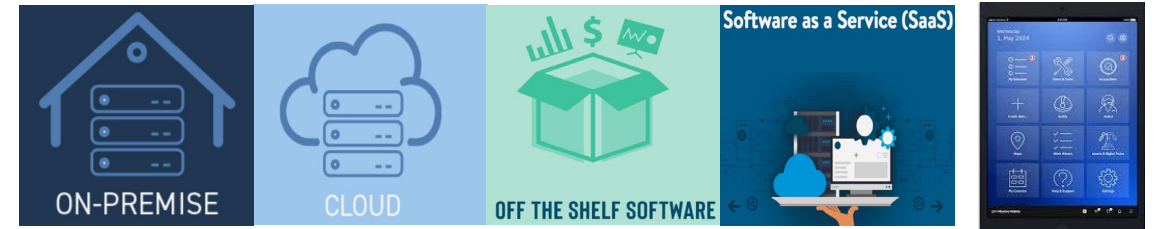
Enterprise Asset Management



All the standard choices



IBM
maximo



Infrastructure Assets Register, Op/Mtce and Capital Planning in ONE place

1) Launch pad

All Service Requests

Chart Type: **BAR**
All SR tickets for the users department (By Status)

All Work Orders

Chart Type: **PIE**
Work Orders By Status (By Status)

Direct IT Ltd. ReadyEAM

Take a tour

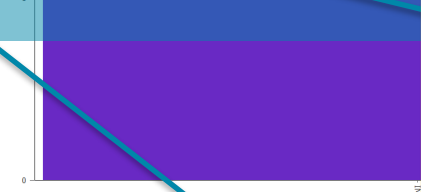
George Lykoudis Default Site: DEPT21

1) Launch pad Asset Health Asset Planners (Rdy) Assets (Rdy) Champion / Supervisor (Rdy) Configur

All Service Requests

Chart Type: **BAR**

All SR tickets for the users department (By Status)



Status

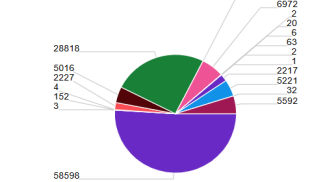
INPROG

List View

All Assets

Chart Type: **PIE**

Assets for departments the user belongs to. (By Classification)



Classification

- Distribution Mains (< 400mm)
- Demo - Distribution Main
- Biosolids Management Centre
- SRV
- TRUNK
- Wastewater Pumping Stations
- CLCTR
- Demo - Service Line
- Wastewater Treatment Plants
- Demo Low-lift pumps
- Wastewater Storage Tank
- DSCHG
- Services
- Gravity Mains
- Booster Stations, Reservoirs and Storage Facilities
- Water Treatment Plants
- Trunk Mains (>400mm)
- Demo - Fire Hydrants
- Undefined

Count

Percent (%)

58598	50.98
3	0
152	0.13
4	0
2227	1.94
5016	4.36
28818	25.07
2	0
6972	6.07
2	0
20	0.02
6	0.01
63	0.05
2	0
1	0
2217	1.93
5221	4.54
32	0.03
5592	4.86

List View

Mobile Start Center

Assets Register, Op/Mtce and Capital Planning in ONE place

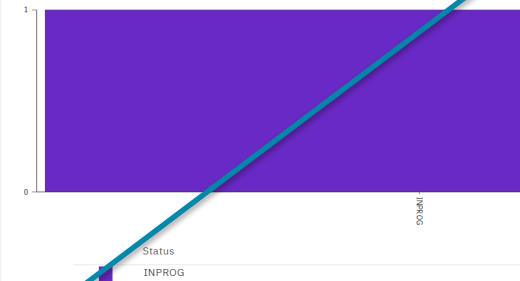
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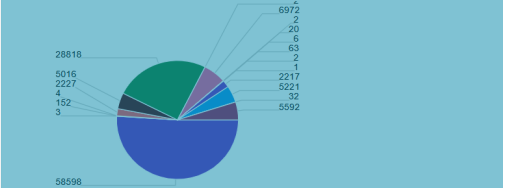
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List View

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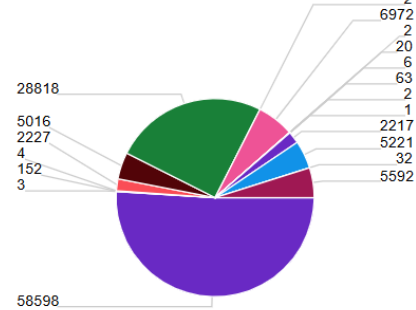
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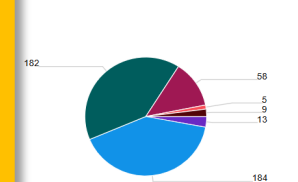
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- Undefined

Assets by Status (By Status)



Status	Count	Percent (%)
APPR	13	2.88
CAN	184	40.8
CLOSE	182	40.35
COMP	58	12.86
INPRG	5	1.11
WAPPR	9	2

Assets Register, Op/Mtce and Capital Planning in ONE place

Assets (Rdy)

[← List View](#)

[All Bookmarks](#)

Asset Specifications Lifecycle Location Financial Work Advanced Map Relationships Safety

Asset: WM-81129
Asset Description: 400 mm Trunk Main - 2512 to Bristol Circle
External Reference ID: 81129

 Location: ZONE5-RSVR > Zone 5 Reservoir

Attachments (1 - 1 of 1)

Asset Specifications Lifecycle Location Financial Work Advanced Map Relationships Safety

[Change Status](#)
[Move/Modify Assets](#)
[Swan Assets](#)

Asset Status: ACTIVE
Is GIS? ☒ Linear? ☒

List View

Find navigation item

All Bookmarks

Common Actions

New Asset

Save Asset

Clear Changes

Change Status

Move/Modify Assets

Swap Assets

Associate Users and Custo...

Create Report

Unlink GIS Feature

Import Digital Data

Delete linked GIS Feature

More Actions

View Asset Template History

Define Maintenance Schedule

Manage Maintenance Schedule

Define Operational Schedule

Manage Operational Schedule

Asset Details

Report Downtime

Manage Downtime History

Add/Modify Linear Referencing ...

Create

Create (Spatial)

Open Drilldown

Apply Item Assembly Structure

Associate Services

View

Unit of Measure and Conversi...

Enter Meter Readings

Manage Meter Reading History

Reset/Replace Meters

Issue Items from Storeroom

Asset Specifications Lifecycle Location Financial Work Advanced Map Relationships Safety

Acquisition

Acquisition Year

1989

Installation Date

1/1/89

PO

Purchase Price

28,978.23

Vendor

WWERX

Manufacturer

AQUACOM

Warranty Expiration Date

Operations and Maintenance

Replacement Cost

52,859.90

Current Replacement Value

52,859.90

Date of Replacement Cost

7/2/24

Planned Replacement Year

2049

Target Replacement Year

2050

YTD Cost

0.0

Budgeted

0.0

Current Value

21,143.5

Inventory

0.0

Asset Performance

Estimated Usefull life

60

Estimated EOL

Expected EOL

1/1/49

Performance Score

0.7700

Condition Score

0.7700

Condition Rating Type

AGEBREAK

Age and Breakage Based

Condition Assessment Reports

Condition Assessment Reports

Report ID	CA Date	Condition Rating Type	Conditionrating	LoS	Performance	CoF	Age	Replacecost	Age Weighted \$	ESL Weighted \$
GEI2400-HALTON2024		AGEBREAK	0.7700	0.20	0.77	1	35	52,859.90	1,850,090.00	3,171,590.00

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Expected EOL

1/1/49

Condition Score

0.7700

Condition Rating Type

AGEBREAK

Age and Breakage Based

Condition Rating

Very Low

Consequence of Failure

(5) Very High

Likelihood of Failure

Almost Certain

Generic Straight Line - 60 Yrs

759

Condition Assessment Reports (IIQ)

Condition Assessment Reports (GEI)

Report ID

CA Date

GEI2400-HALTON2024

AGEBREAK

0.7700

0.20

0.77

1

35

52,859.90

1,850,090.00

3,171,590.00

Assets Register, Op/Mtce and Capital Planning in ONE place

Asset

Specifications

Lifecycle

Location

Financial

Work

Advanced

Map

Relationships

Safety

Asset

Asset Description

External Reference ID

WM-81129

400 mm Trunk Main - 2512 to Bristol Circle

81129

Reporting

Report Level 1

General Gover

Proceeds on Disposal

0.00

Report Level 2

Governance

Salvage Value

0.00

Valuation Summary

FIR (1 - 10 of 36)

Year	NBV - Open	Closing Balance	Amortization Closing Balance	NBV - Close
2024	22,024.96	21,143.96	31,715.94	21,143.96
2023	22,905.96	22,024.96	30,834.94	22,024.96
2022	23,786.96	22,905.96	29,953.94	22,905.96
2021	24,667.95	23,786.96	29,072.94	23,786.96
2020	25,548.95	24,667.95	28,191.95	24,667.95
2019	26,429.95	25,548.95	27,310.95	25,548.95
2018	27,310.95	26,429.95	26,429.95	26,429.95
2017	28,191.95	27,310.95	25,548.95	27,310.95
2016	29,072.95	28,191.95		
2015	29,953.94	29,072.95		

Valuation Summary

FIR (1 - 10 of 36)

Year	NBV - Open	Closing Balance	Amortization Closing Balance	NBV - Close
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Assets Register, Op/Mtce and Capital Planning in ONE place

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0.7700

Estimated EOL

Condition Score

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Expected EOL

2049-01-01

Condition Rating Type

AGEBREAK

Age and Breakage Based

Condition Rating

1

Very Good (1)

Criticality

Very Low

Consequence of Failure

(5) Very High

Likelihood

Almost

Degradation Curve

759

Generic Straight Line - 60 Yr

Open Drilldown

Apply Item Assembly Structure

Associate Services

View

Unit of Measure and Conversi...

Manage Meter Reading History

Reset/Replace Meters

Issue Items from Storeroom

Change Item Number

Depreciation Schedule

Manage Asset Collections

Attachment Library/Folders

Delete Asset

Add to Bookmarks

View Tool Usage

View Asset Status History

Attach Data Sheets

Run Reports

View Crew Assignments

Asset Performance

Estimated Usefull life

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Estimated EOL

Condition Score

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Expected EOL

2049-01-01

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AGEBREAK

Age and Breakage Based

Condition Rating

Condition Assessment Report

Condition Assessment Report

Report ID

GEI2400-HALTON2024

AGEBREAK

0.7700

0.20

0.77

1

35

52,859.90

1,850,090.00

3,171,590.00

Assets Register, Op/Mtce and Capital Planning in
ONE place

[← List View](#) <

All Bookmarks ▾

Common Actions

- [+ New Asset](#)
- [Save Asset](#)
- [↶ Clear Changes](#)
- [Change Status](#)
- [Move/Modify Assets](#)
- [Swap Assets](#)
- [Associate Users and Custo...](#)
- [Create Report](#)
- [Unlink GIS Feature](#)

Asset

Specifications

Lifecycle

Location

Financial

Work

Advanced

Map

Relationships

Safety

Asset

Asset Description

External Reference ID

WM-81129

400 mm Trunk Main - 2512 to Bristol Circle

81129

Acquisition

Acquisition Year

1989

Installation Date

1989-01-01

PO

Purchase Price

Vendor

Is Real Asset? Do not replace?

Operations and Maintenance

Assets Register, Op/Mtce and Capital Planning in ONE place

(1 - 1 of 1)

Condition Rating Type	Conditionrating	LoS	Performance	CoF	Age	Replacecost	Age Weighted \$	ESL Weighted \$
AGEBREAK	0.7700	0.20	0.77	1	35	52,859.90	1,850,090.00	3,171,590.00

[Manage Meter Reading History](#)

[Reset/Replace Meters](#)

[Issue Items from Storeroom](#)

[Change Item Number](#)

[Depreciation Schedule](#) ▾

[Manage Asset Connections](#)

[Attachment Library/Folders](#) ▾

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[Add to Bookmarks](#)

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[Attach Data Sheets](#)

[Run Reports](#)

[View Crew Assignments](#)

[Associate Inspection Form](#)

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Estimated EOL

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2049-01-01

Performance Score

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Condition Score

0.7700

Condition Rating Type

AGEBREAK

Condition Rating

1

Criticality

Very Low ▾

Consequence of Failure

(5) Very High ▾

Likelihood of Failure

Almost Certain ▾

Degradation Curve

759

Generic Straight Line - 60 Yrs

Age and Breakage Based

Very Good (1)

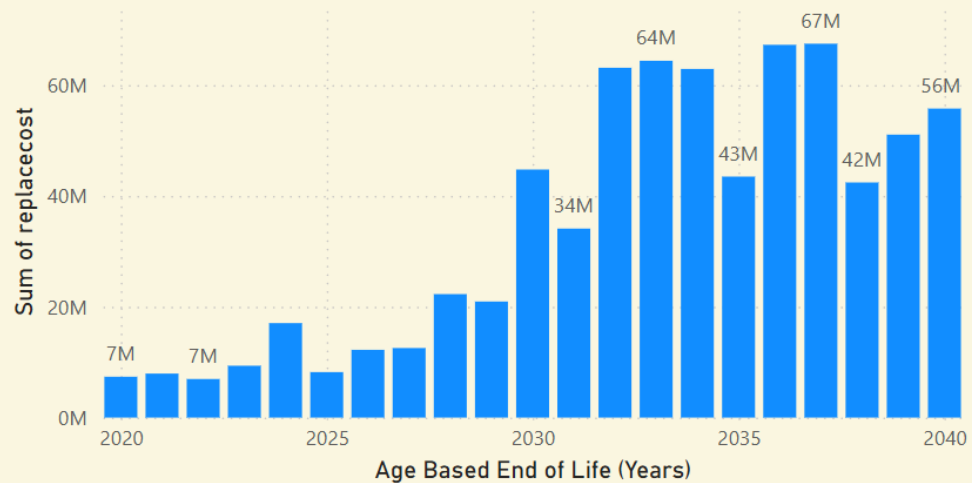
Condition Assessment Reports (IIQ) (0 - 0 of 0)

Condition Assessment Reports (GEI) (1 - 1 of 1)

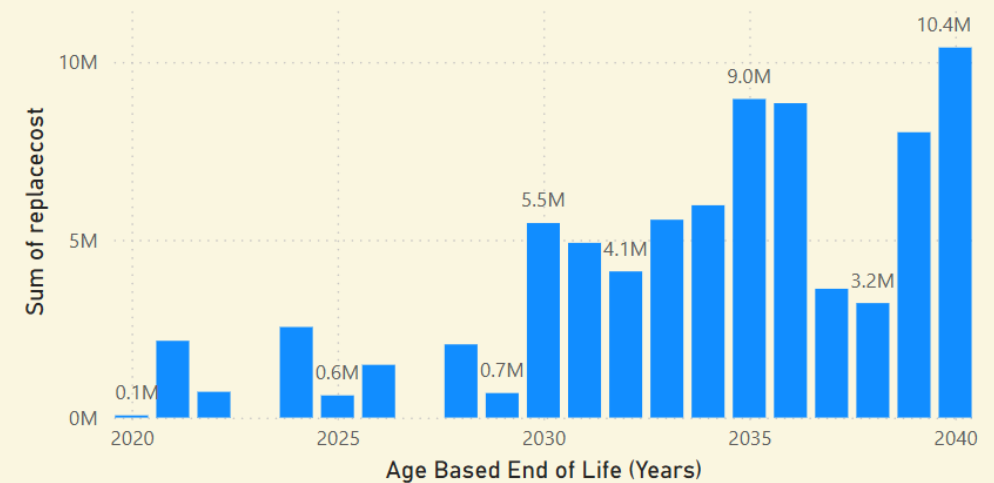
Report ID	CA Date	Condition Rating Type	Conditionrating	LoS	Performance	CoF	Age	Replacecost	Age Weighted \$	ESL Weighted \$
GEI2400-HALTON2024		AGEBREAK	0.7700	0.20	0.77	1	35	52,859.90	1,850,090.00	3,171,590.00

Replacement Costs by Age

Replace Cost by End of Life - Distribution Mains (<400mm)

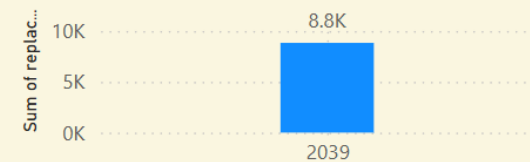


Replace Cost by End of Life - Trunk Mains (>400mm)



**Reports & Analysis based on
a single source of truth**

Replace Cost by End of Life - Services





Risk Exposure

Risk Exposure - Condition by Criticality (Replacement [\$m])

Condition Rating	(1) Very low	(2) Low	(3) Moderate	(4) High	(5) Very High	Total
0	19.07M	4.84M	17.29M	10.41M	19.13M	70.74M
1	4.44M	7.97M	6.59M	15.07M	11.76M	45.83M
2	8.34M	9.10M	20.36M	6.38M	10.90M	55.08M
3	19.58M	22.65M	5.57M	4.60M	4.36M	56.77M
4	37.29M	24.58M	14.00M	64.32M	19.52M	159.71M
5	6.01M	12.22M	24.98M	2.91M	8.04M	54.16M
Total	94.73M	81.35M	88.80M	103.68M	73.73M	442.29M

Risk Exposure - Condition by Criticality

Condition Rating	(1) Very low	(2) Low	(3) Moderate	(4) High	(5) Very High	Total
0	4.31%	1.09%	3.91%	2.35%	4.33%	15.99
1	1.00%	1.80%	1.49%	3.41%	2.66%	10.36
2	1.89%	2.06%	4.60%	1.44%	2.46%	12.45
3	4.43%	5.12%	1.26%	1.04%	0.99%	12.83
4	8.43%	5.56%	3.17%	14.54%	4.41%	36.11
5	1.36%	2.76%	5.65%	0.66%	1.82%	12.25
Total	21.42%	18.39%	20.08%	23.44%	16.67%	100.00

Risk Exposure - Likelihood of Failure by Consequence of Failure [\$m]

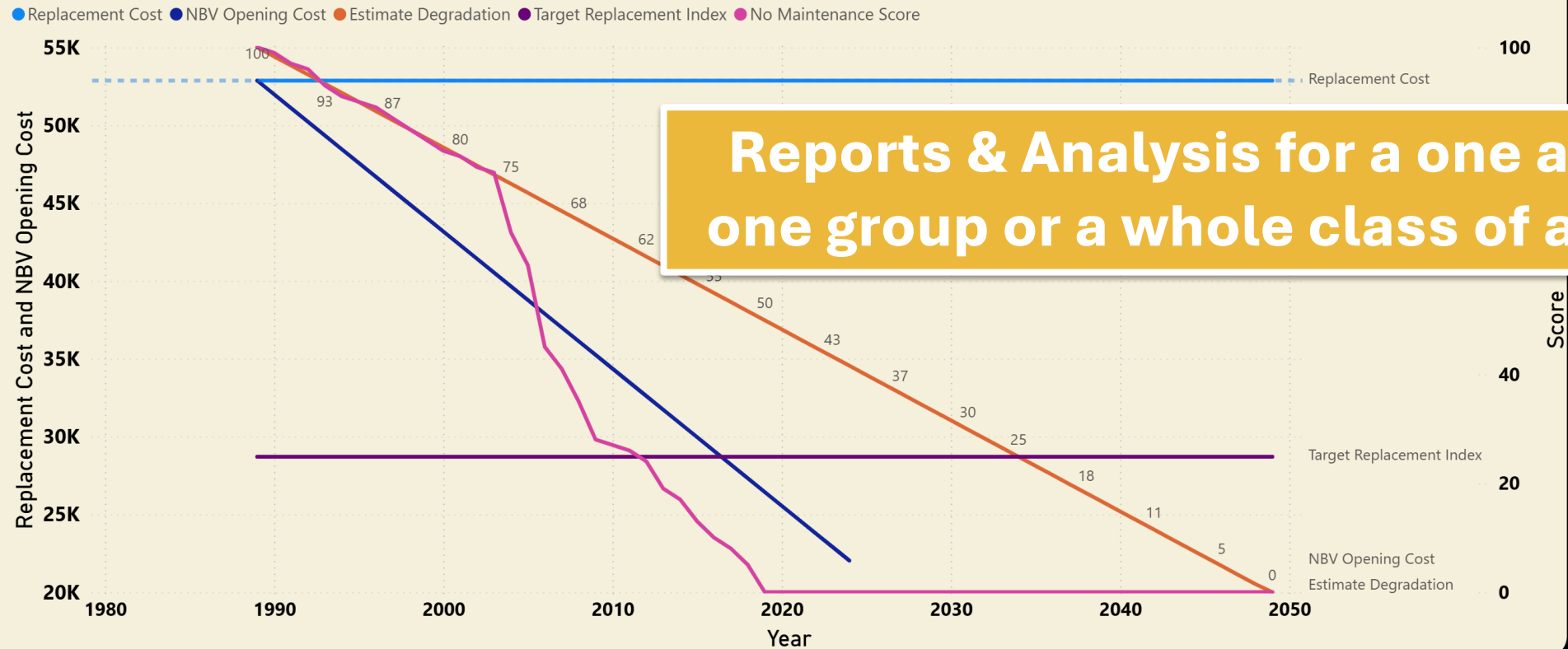
Likelihood of Failure	(1) Very low	(2) Low	(3) Moderate	(4) High	(5) Very High	Total
1	36.84M	13.09M	12.33M	50.20M	14.53M	126.99M
2	5.41M	7.38M	31.91M	14.69M	8.88M	68.27M
3	11.40M	12.92M	16.94M	6.05M	8.21M	55.52M
4	15.46M	30.79M	13.15M	21.17M	23.97M	104.55M
5	25.62M	17.17M	14.46M	11.57M	18.13M	86.95M
Total	94.73M	81.35M	88.80M	103.68M	73.73M	442.29M

Reports & Analysis based on
a single source of truth

(1) Very low	94.73M	430
(2) Low	81.35M	472
(3) Moderate	88.80M	438
(4) High	103.68M	421
(5) Very High	73.73M	456
Total	442.29M	2217

Financial State & Degradation

Financial State for Asset WM-81129



**Reports & Analysis for a one asset,
one group or a whole class of assets**

Assets (Rdy)

← List View

🔍 Find navigation item

All Bookmarks

Common Actions

- New Asset
- Save Asset
- Clear Changes
- Change Status
- Move/Modify As
- Swap Assets
- Associate Users and Custo...
- Create Report
- Unlink GIS Feature
- Import Digital Data
- Delete linked GIS Feature

More Actions

- View Asset Template History
- Asset Details
- Add/Modify Linear Referencing ...
- Open Drilldown
- Apply Item Assembly Structure
- Associate Services
- View
- Unit of Measure and Conversi...
- Manage Meter Reading History
- Reset/Replace Meters

Asset Specifications Lifecycle Location Financial Work Advanced **Map** Relationships Safety

🏠 🔍 ↶ ↷ ↻

WM-81129 - 400 mm Trunk Main - 2512 to Bristol Circle

WM-81129 - 400 mm Trunk Main - 2512 to Bristol Circle

WM-81129 - 400 mm Trunk Main - 2512 to Bristol Circle

Tolerance

20

Watermain2400

RMOHID	81129
Operationa	OAKVILLE
Material	DI
Pipe_Diam	400
Street	BRISTOL CIR
WatermainT	TRANS
Length_m_	22.86

Assets & Geography deeply integrated

Top Down

Asset Management Policy & Steering Committee

Questions & Answers

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