Asset Management Data Needs Considerations

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Water Infrastructure Replacement Cost=$68.6Billion

CANADIAN INFRASTRUCTURE REPORT CARD

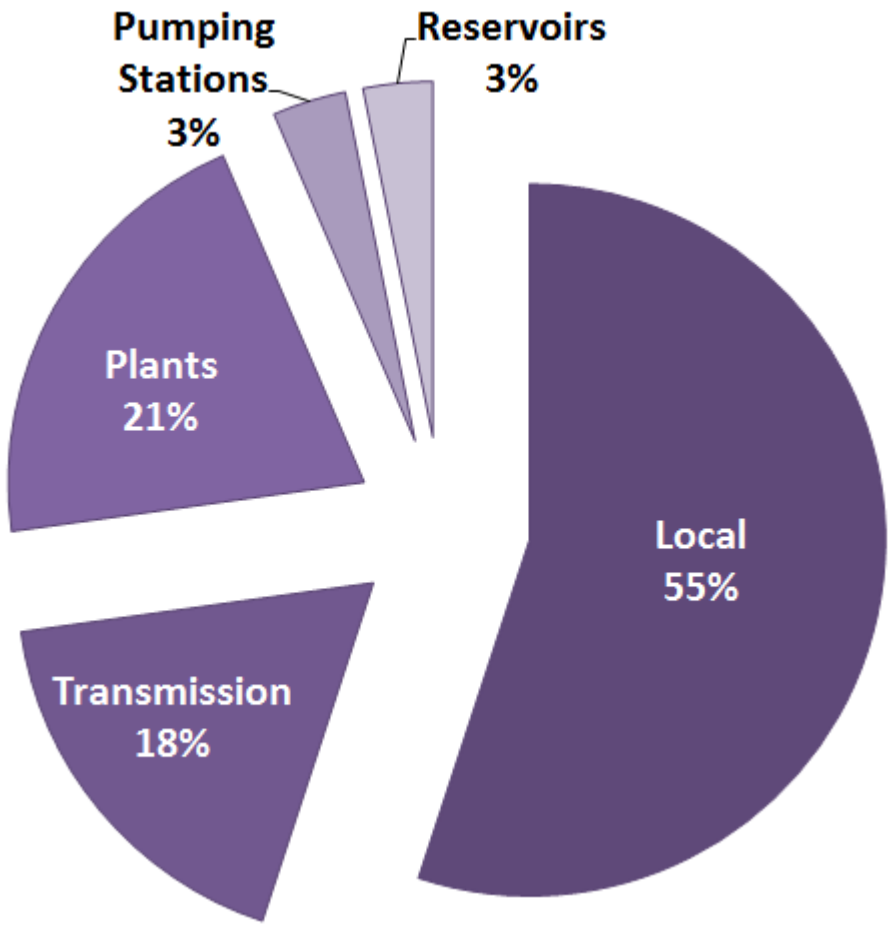
Volume 1: 2012
Municipal Roads and Water Systems

Replacement value: linear assets (pipes)

Local	$37,748,856,532
Transmission	$12,165,631,491
Total	**$49,914,488,023**

Replacement value: non-linear (discrete) assets

Plants	$14,199,688,757
Pumping stations	$2,293,994,013
Reservoirs	$2,159,600,862
Total	**$18,653,283,631**



Linear Assets = 73%

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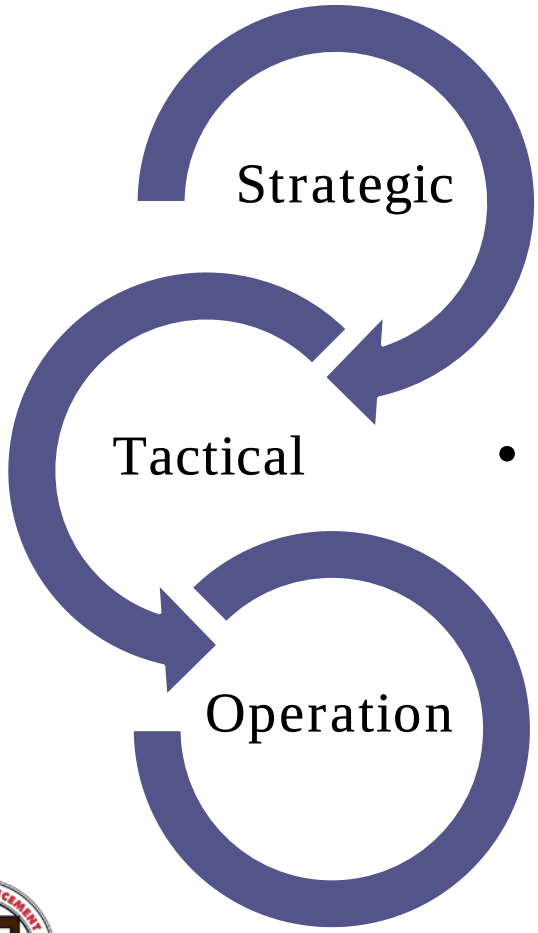
Asset Management Levels



- **50 to 100 years Life Cycle Analysis**
- **5 to 10 year programs**
- **Annual projects**

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August 2013 New Zealand Realization

"Better Local Government: Improving infrastructure delivery and asset management"

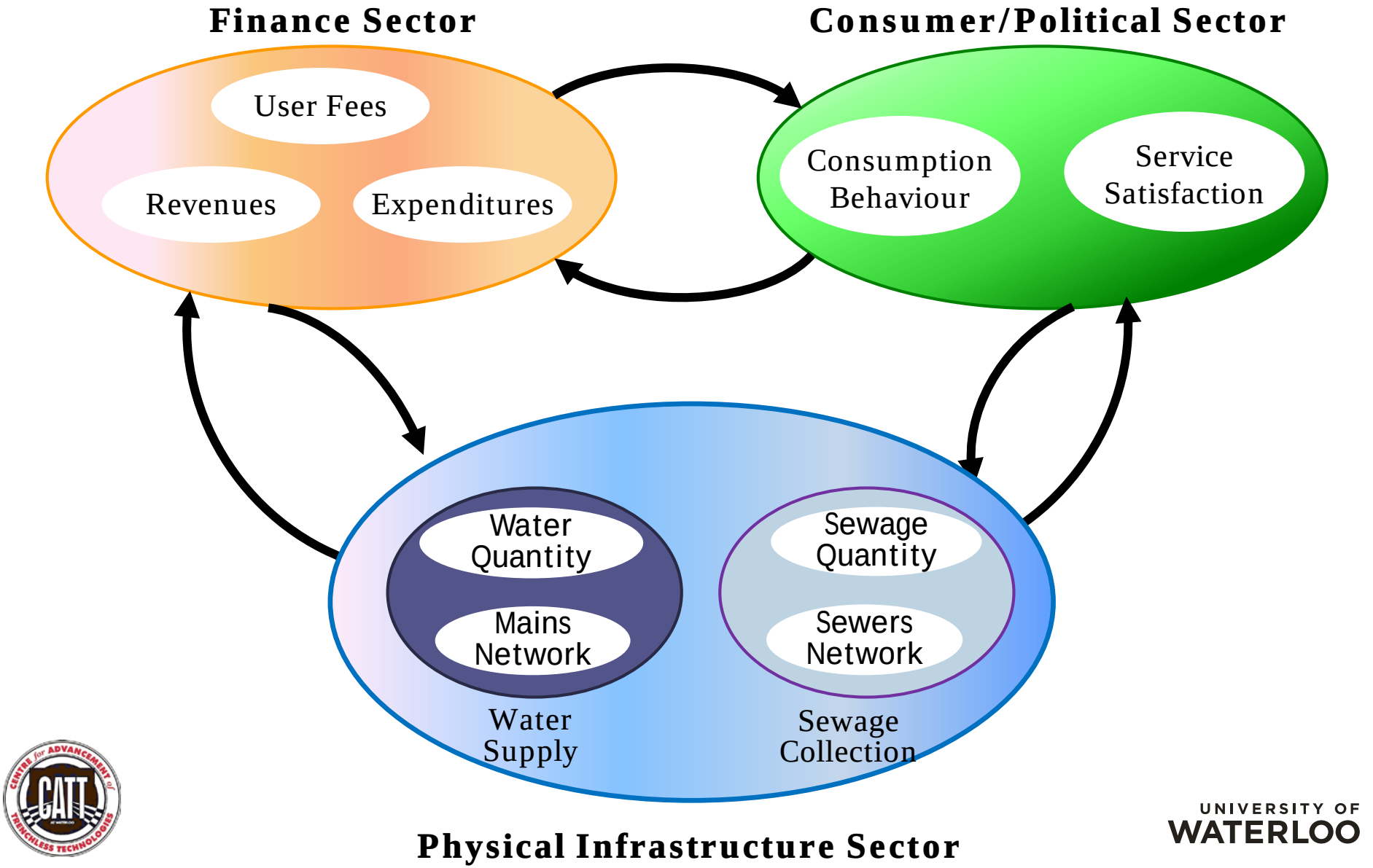
Require councils to prepare infrastructure strategy for at least a **30 year period** and to incorporate this into their long-term plans for 2015

Strategic Modelling Tools

- Complex organizational spreadsheets
  - Can be difficult to follow and validate over time

- Many work orders/operation/maintenance tools
  - Very limited water specific strategic management tools

<u>Above do not take into account the complex feed back loops and interconnections</u>


Finance Sector
Consumer/Political Sector
User Fees
Revenues
Expenditures
Consumption Behaviour
Service Satisfaction
Water Quantity
Mains Network
Sewage Quantity
Sewers Network
Water Supply
Sewage Collection
Physical Infrastructure Sector

University of Waterloo Research Goal

Develop a novel interconnected feedback loop municipal water and waste water asset management framework using the

System Dynamics Modelling Approach

Forrester, J.W., 1958. ***Industrial dynamics: a major breakthrough for decision makers***. **Harvard Business Review** 36 (4), 37-66.

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Research Funding Partners

- City of Waterloo
- City of Cambridge
- City of Niagara Falls
- City of London
- Region of Waterloo
- National Science Engineering Research (NSERC) Collaborative Research Grant
- Centre for Advancement of Trenchless Technologies (CATT)

Total fund value to date approx. $1.1 million

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Building a Representative Model

- Obtain key water utility data
  - Engineering
  - Information technology (data base mining)
  - Finance

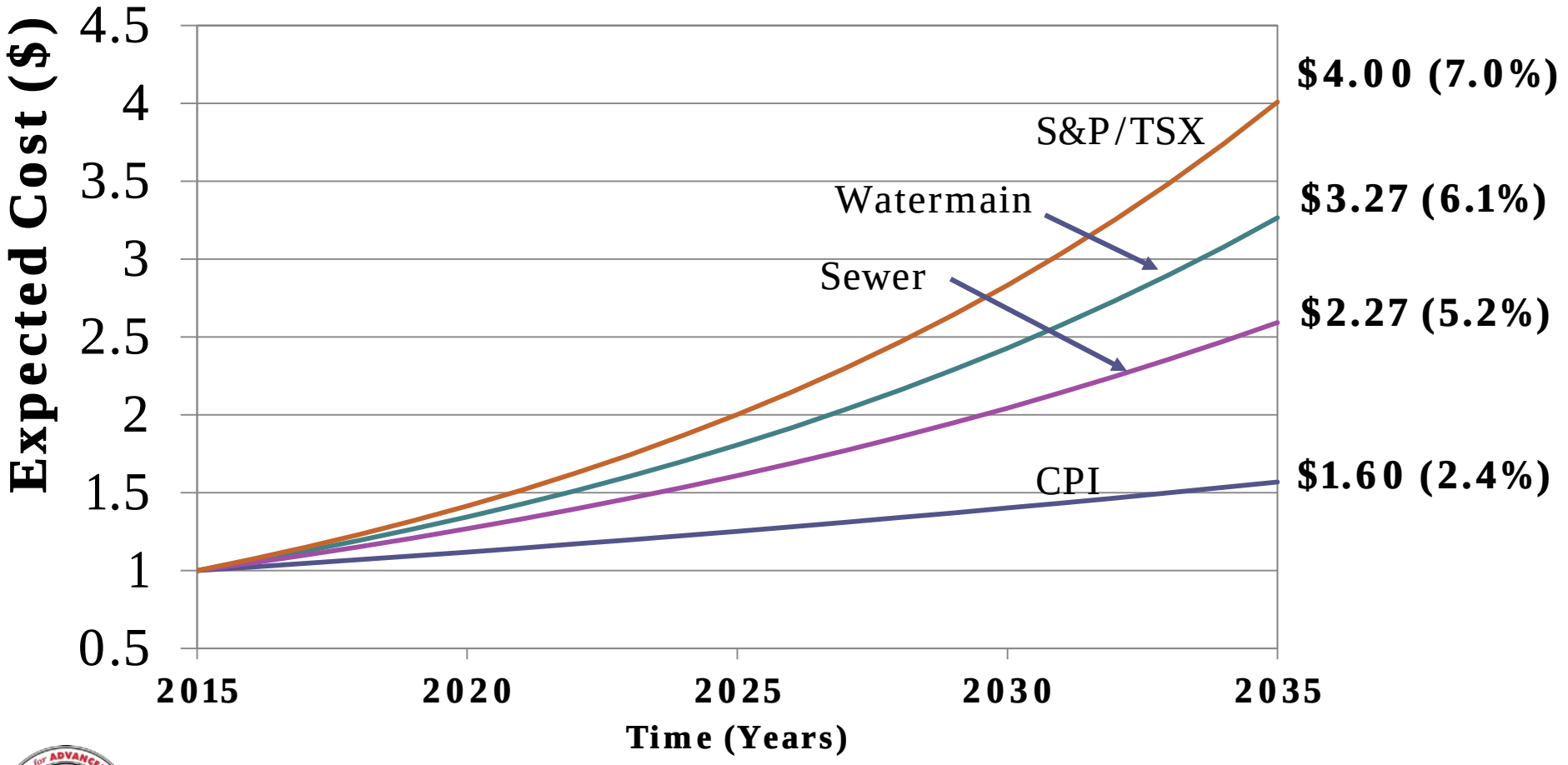
- Can use expert opinion or best guess for missing data

- Not a major effort to populate a model
  - We have done this for several water utilities

Key Data Findings

- Most organizations have silo's between finance, engineering and IT
  - System dynamics approach is great for data needs, data flow and data gaps…
- All data rich utilities are missing critical data for strategic modelling
  - What is inflation rate for Water Capital projects?

Value of $1.00 in 35 years



CENTRE for ADVANCEMENT of TRENCHLESS TECHNOLOGIES CATT

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Asset Data Collection

- It is easy to collect lots and lots of data
- Garbage in equals garbage out

The challenge is not data collection but collecting the right data for the right reasons

Key Data Collection Questions

1. Why is the data needed?

2. How will the data be used....