



# **Life Cycle Management of Water and Wastewater Systems**

**Cost and Performance Considerations**



# Who We Are

A not-for-profit network of infrastructure management professionals

Our mandate:

- To support infrastructure management planning for municipalities in Atlantic Canada
- Provide free, open-source tools and resources to municipalities
- Conduct education, awareness and training programs
- Provide direct technical assistance to municipalities

Presenter

Matt Delorme, P.Eng.  
AIM Network Executive Director

# What is the purpose of asset management?

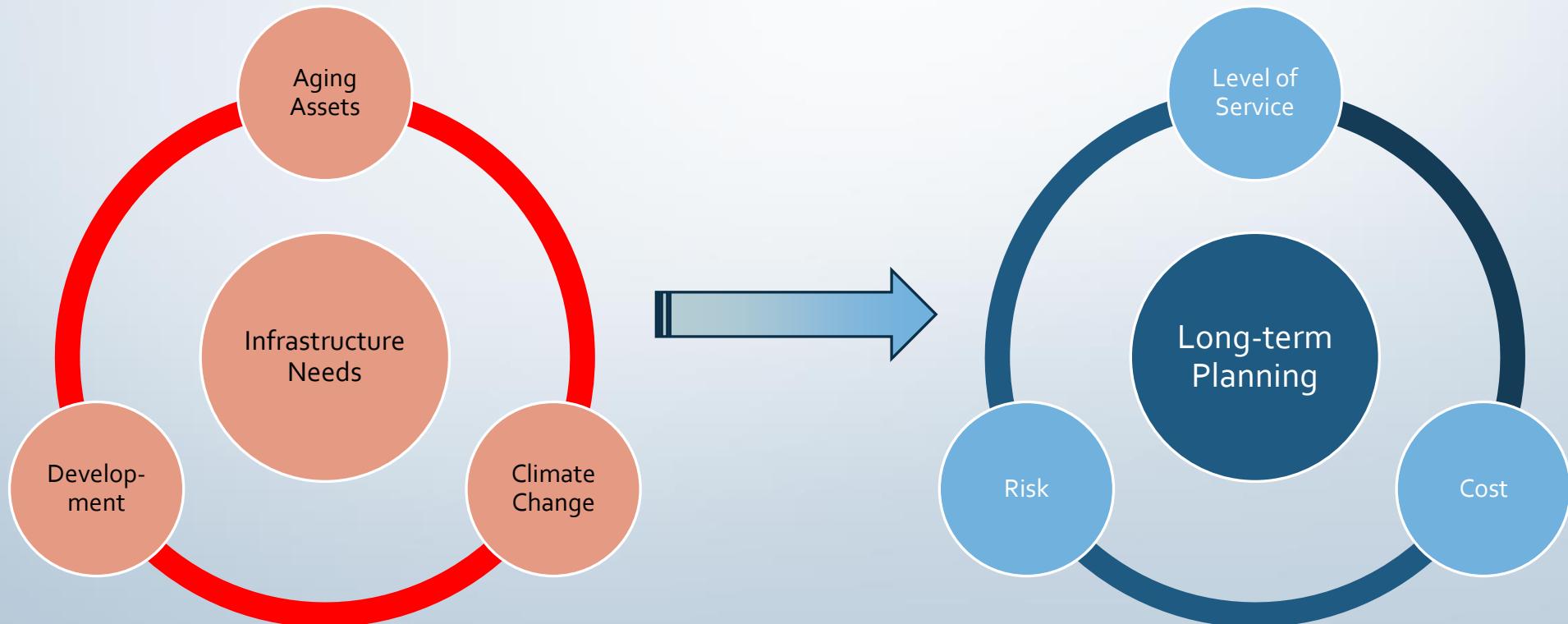
Municipalities exist to provide services:

- At an acceptable level of service
- At an acceptable cost
- At an acceptable level of risk



# Why Asset Management Planning?

*The goal is 'Sustainable Service Delivery'*



# Why Asset Management Planning?

*We can't do everything all at once*

## Level of Service:

- What disruptions are acceptable, how often?
- How will this change over time?
- What is the cost (or savings) to increases (or decrease) LoS?

## Risk:

- How likely is a disruption?
- What are the uncertainties?
- What is the consequence of that disruption?

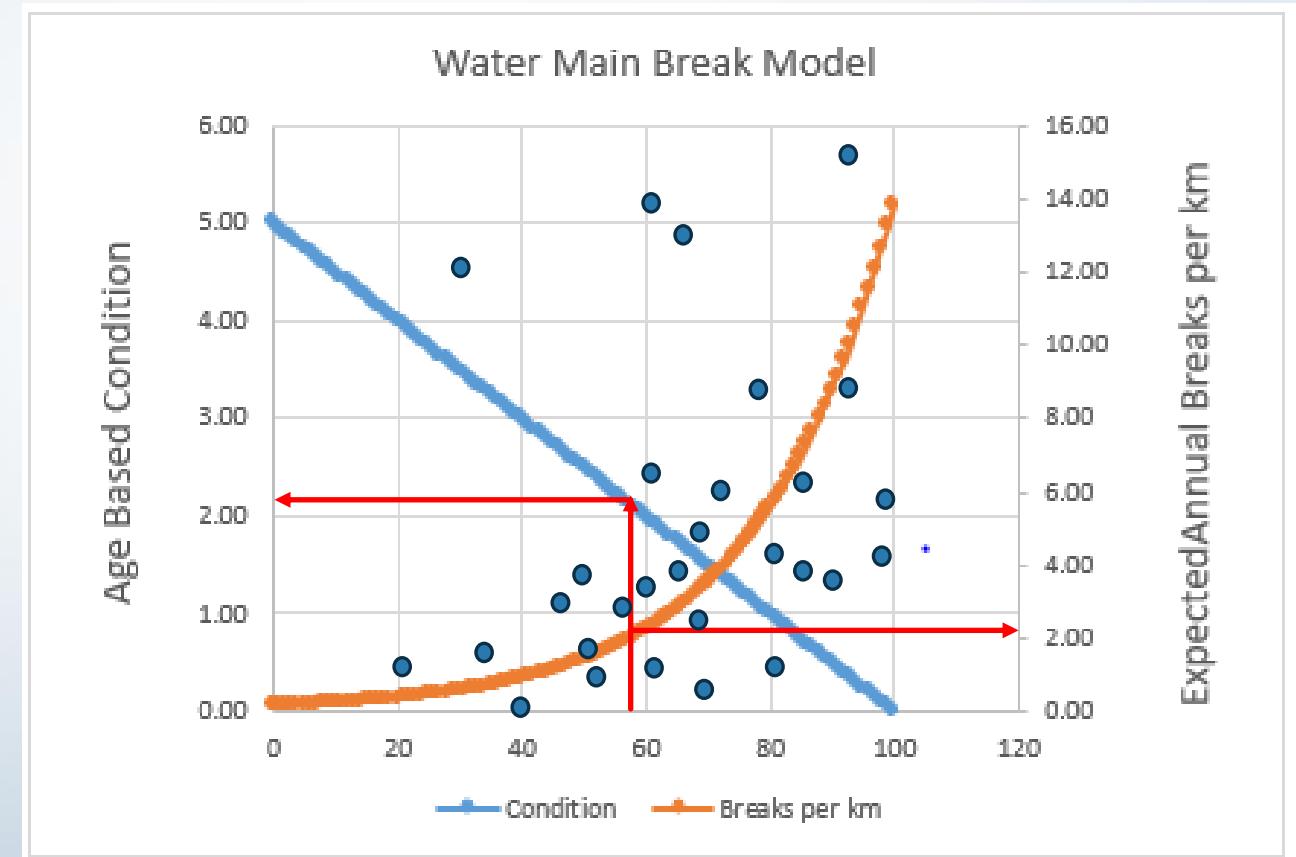
## Cost:

- What is the cost to maintain LoS and manage risk?



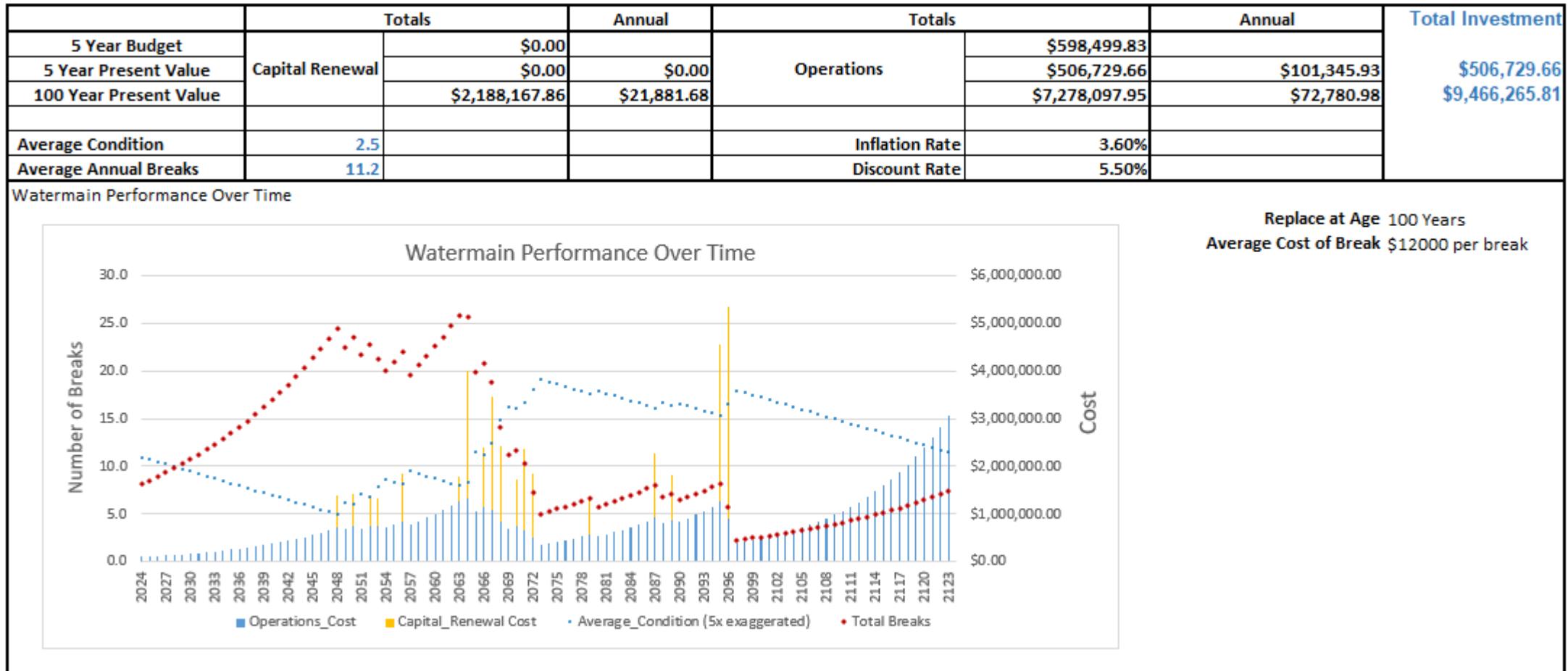
Asset Management is communication to support decisions

# Watermain breaks per year



Data Source: *Analyzing watermain breaks in the Region of Peel*, Chaim Schwartz, ESRI Canada, 2020

# We don't have enough money, what else is new?



# Assumptions Matter

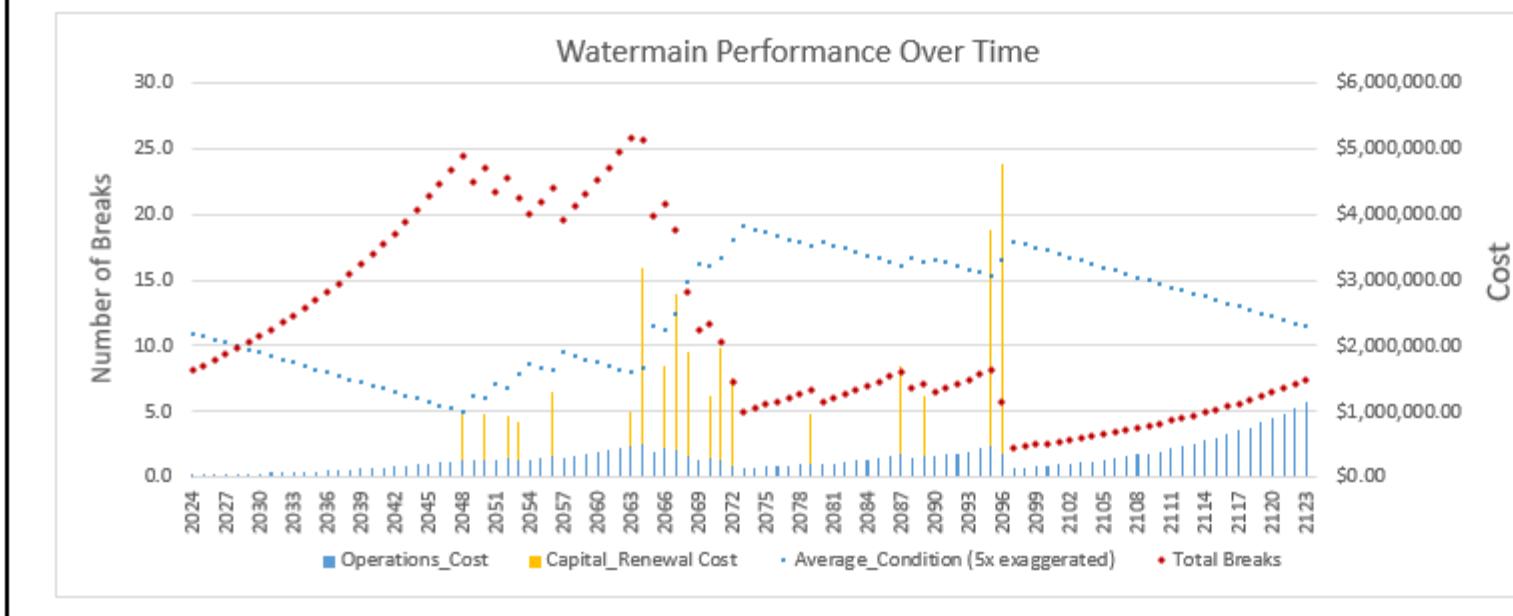
	Totals		Annual	Totals		Annual	Total Investment
5 Year Budget	Capital Renewal	\$3,386,089.85		Operations	\$101,725.62		
5 Year Present Value		\$3,027,879.83	\$605,575.97		\$89,127.61	\$17,825.52	\$3,117,007.44
100 Year Present Value		\$5,599,360.20	\$55,993.60		\$535,590.71	\$5,355.91	\$6,134,950.91
Average Condition		3.6					
Average Annual Breaks	2.6			Inflation Rate	3.60%		
				Discount Rate	5.50%		

#### Watermain Performance Over Time

### Replace at Age 60 Years

Watermain Performance Over Time

Replace at Age 100 Years  
Average Cost of Break \$4500 per break



# What do I need?

## Inventory:

- What do I own, where is it, what condition is it in?
- How can the asset fail to provide a service?
- What is the likelihood of failure – age? run time?

## Level of Service:

- What is my current service level?
- What is my target service level? Forecasted?

## Risk:

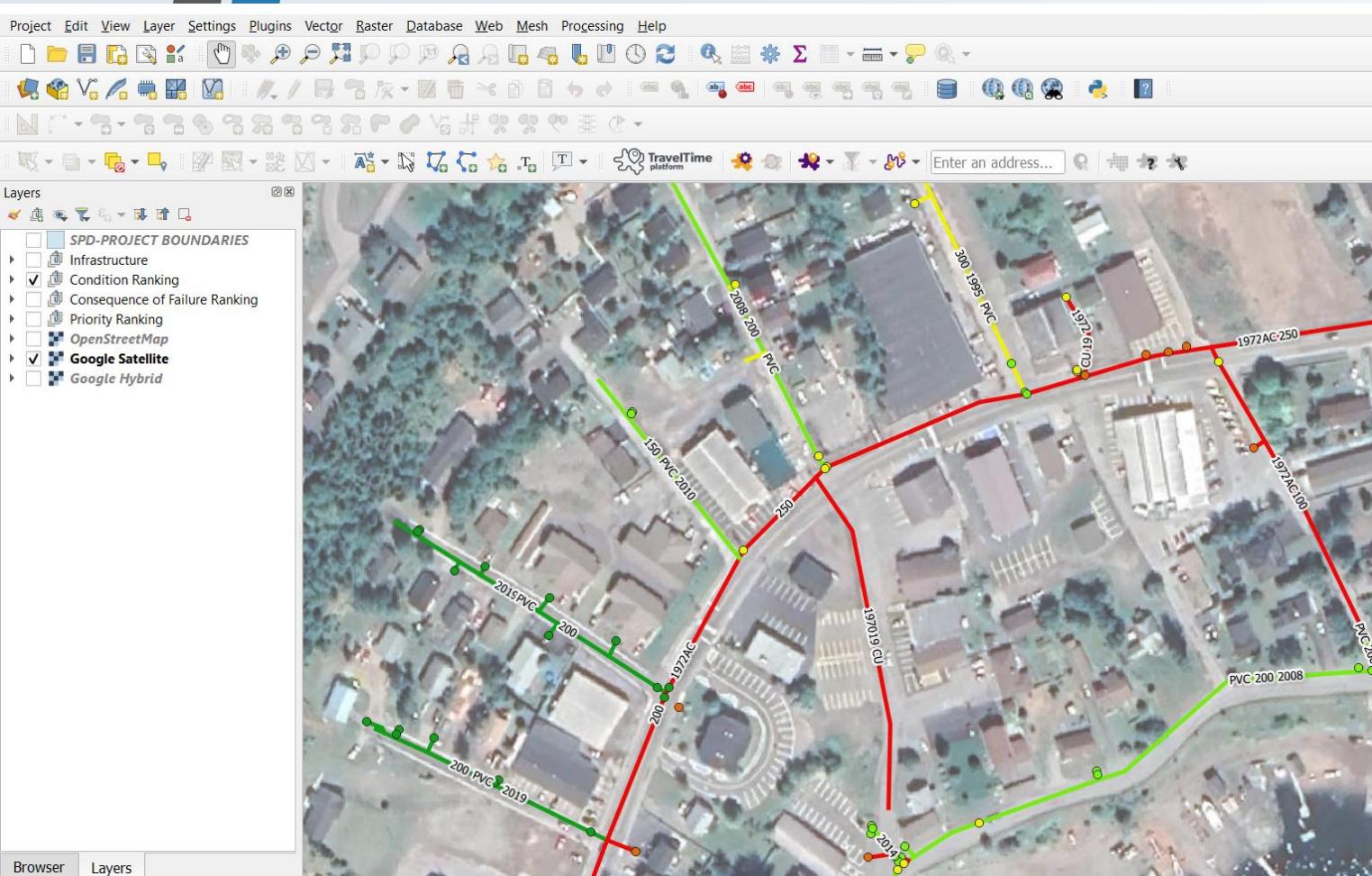
- How good is my information?
- What can influence failure (date of install, soil, age, chemistry)?
- How much can it vary?
- What is the consequence if forecast is wrong?

## Cost:

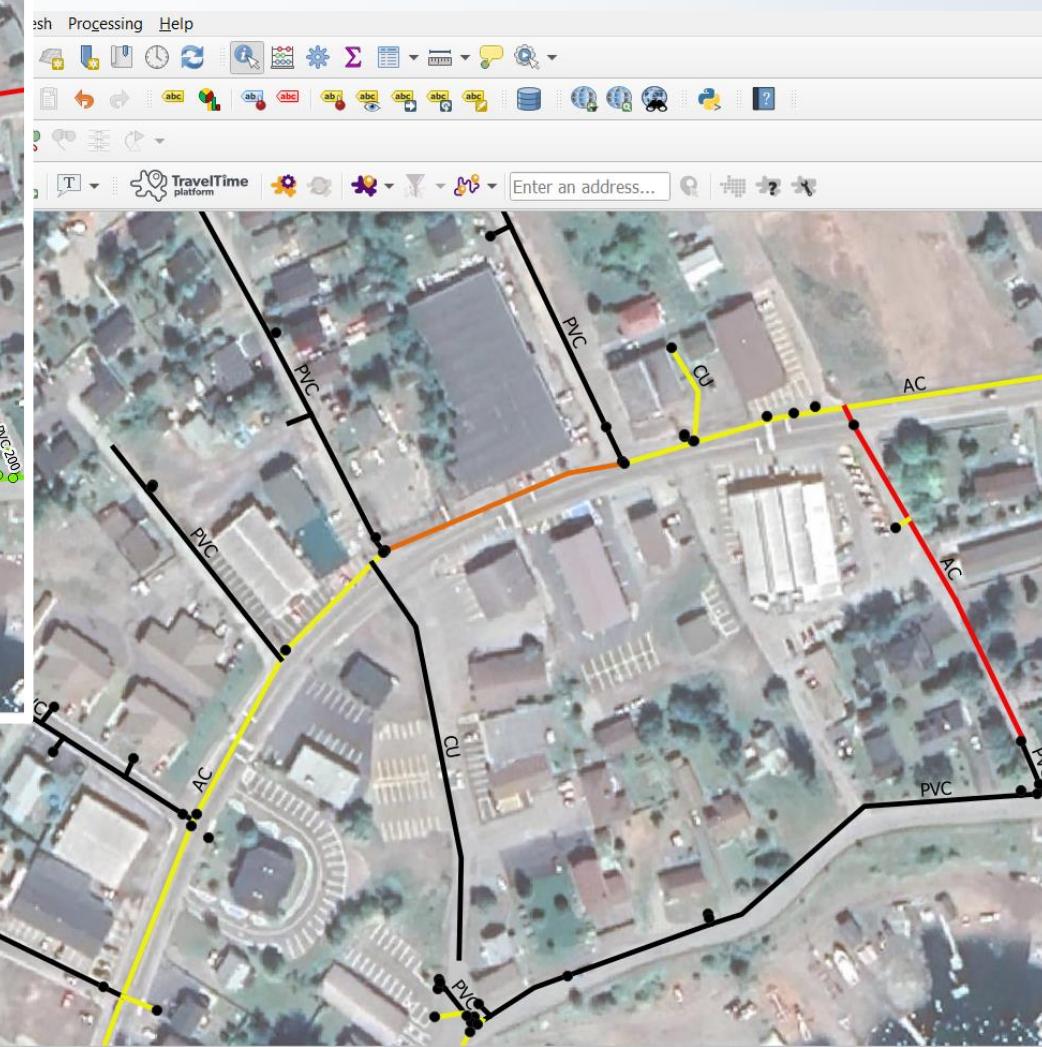
- Cost of operations and maintenance activities
- Cost of capital renewal
- Inflation and “cost of money” assumptions



# QGIS – Mapping and Data Collection



- Location of assets
- Location and type of disruption
- Map to location, age, other data



# AIM Technical Committee

- Manage AIM Network's free, open-source tools (follow NL data standards):
  - Capital replacement cost forecasting based on risk assessments
  - Facility inventory collection and costing
  - Level of service assessment (NEW: natural asset levels of service)
  - Climate vulnerability and risk assessment
  - Asset retirement obligation calculation
- Collect feedback from user groups on tools and decide on updates
- Advise on need for new tools and resources for AIM Executive



[info@aimnetwork.ca](mailto:info@aimnetwork.ca)

[www.aimnetwork.ca](http://www.aimnetwork.ca)