# Doing the best we can – or are we?

## Using CCTV Data to create optimised Asset Management Plans

Ann Pugh, *Innovyze*

Innovyze®

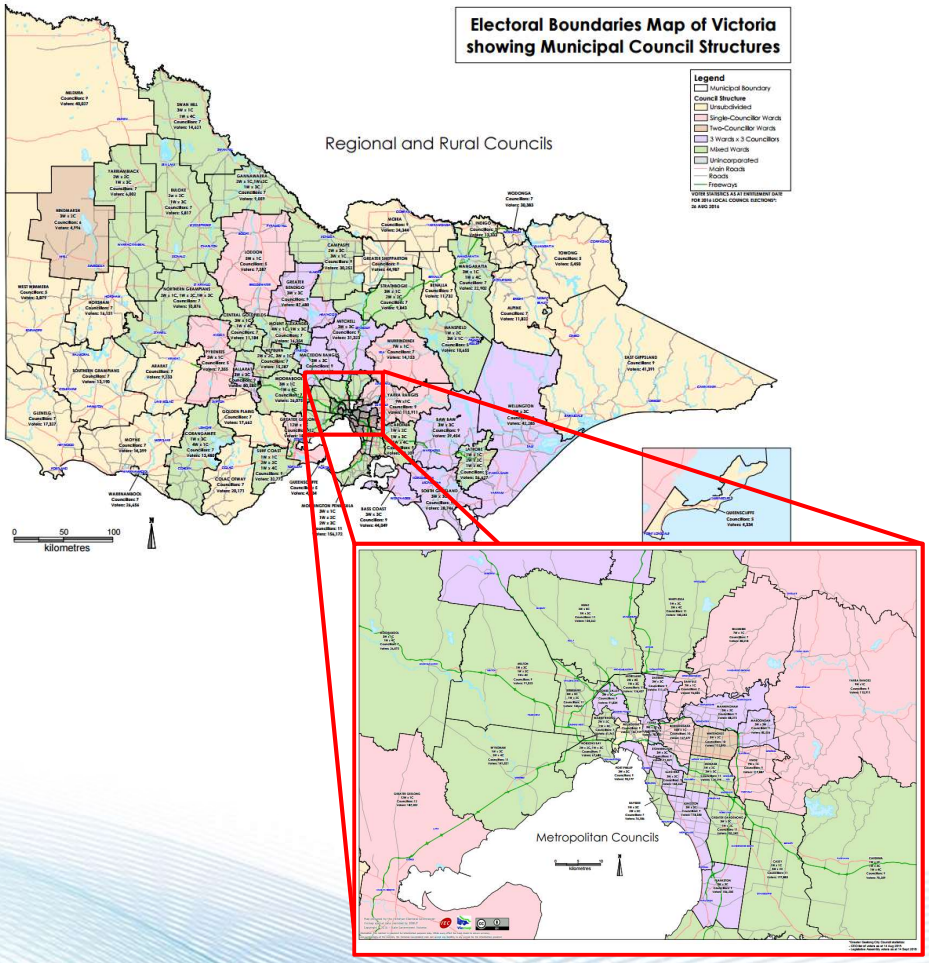
# Overview

Three simple questions

- How much do we spend on CCTV?
- What do we do with this data?
- Is there a better option?

Innovyze®

# How much stormwater network is there ?




- 79 Councils in Vic
- Roughly 1/3rd highly urbanised
- No freely available data on stormwater lengths
- ABS 2003 – 75,600 km sealed roads in Vic
- Not all have drains, but some will have both sides
- Say 100,000km drainage network

Source: Victorian Electoral Commission, November 2016

Innovyze®

# What do we spend on CCTV?

- Assume:
  - each council between 10-20km per annum
  - CCTV rates $6 per metre
- As a state we spend between $5-$10 million pa in *data collection*

- What does it cost to turn this into *action?*
- How can we use this for effective *management?*

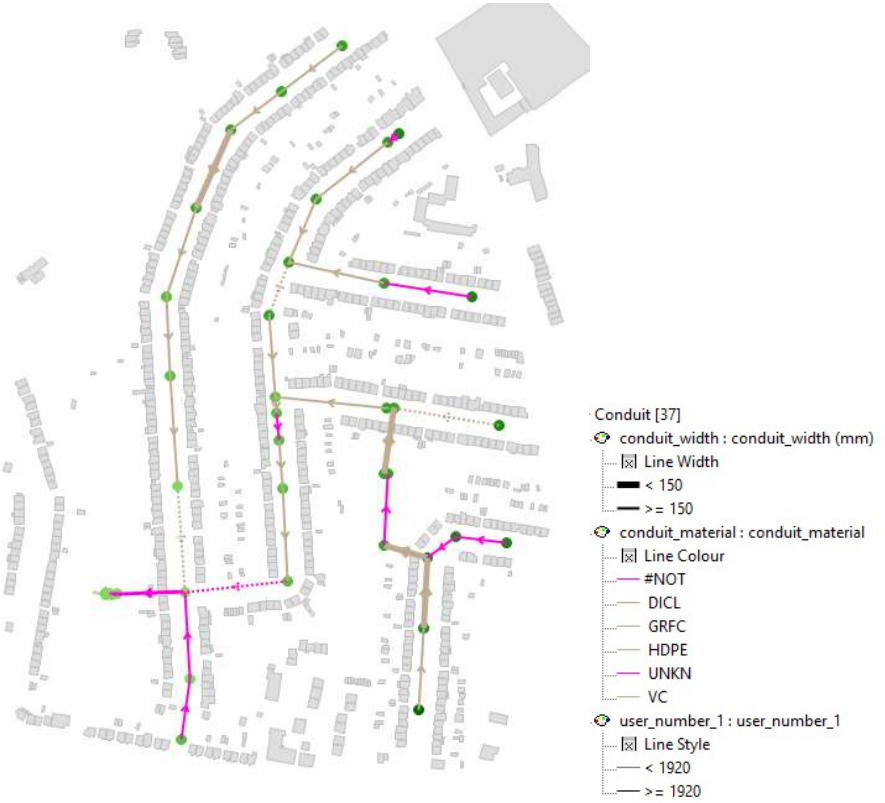
Innovyze®

# An "Asset Management Plan" plan


Innovyze®

# Step 1: Current Asset Condition

- Lots of questions …
  - Where is it?
  - How big is it?
  - What is it made of?
  - How old is it?




- What do we do with
  - Known unknowns ?
  - Unknown unknowns ?

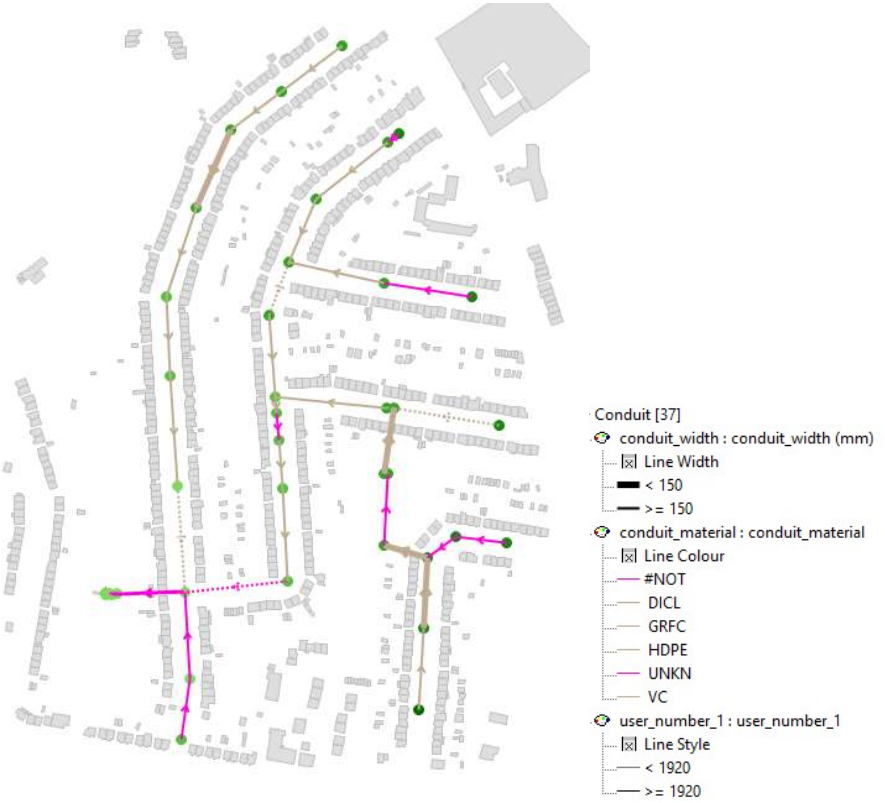
Output is a Data Collection Strategy to infill the gaps

Innovyze®

# Step 1: Current Asset Condition

- Lots of questions …
  - Where is it?
  - How big is it?
  - What is it made of?
  - How old is it?
  - What is its function?
  - What is its value?

- What do we do with
  - Known unknowns ?
  - Unknown unknowns ?




Output is a Data Collection Strategy to infill the gaps

Innovyze®

# Step 2: Required Levels of Service

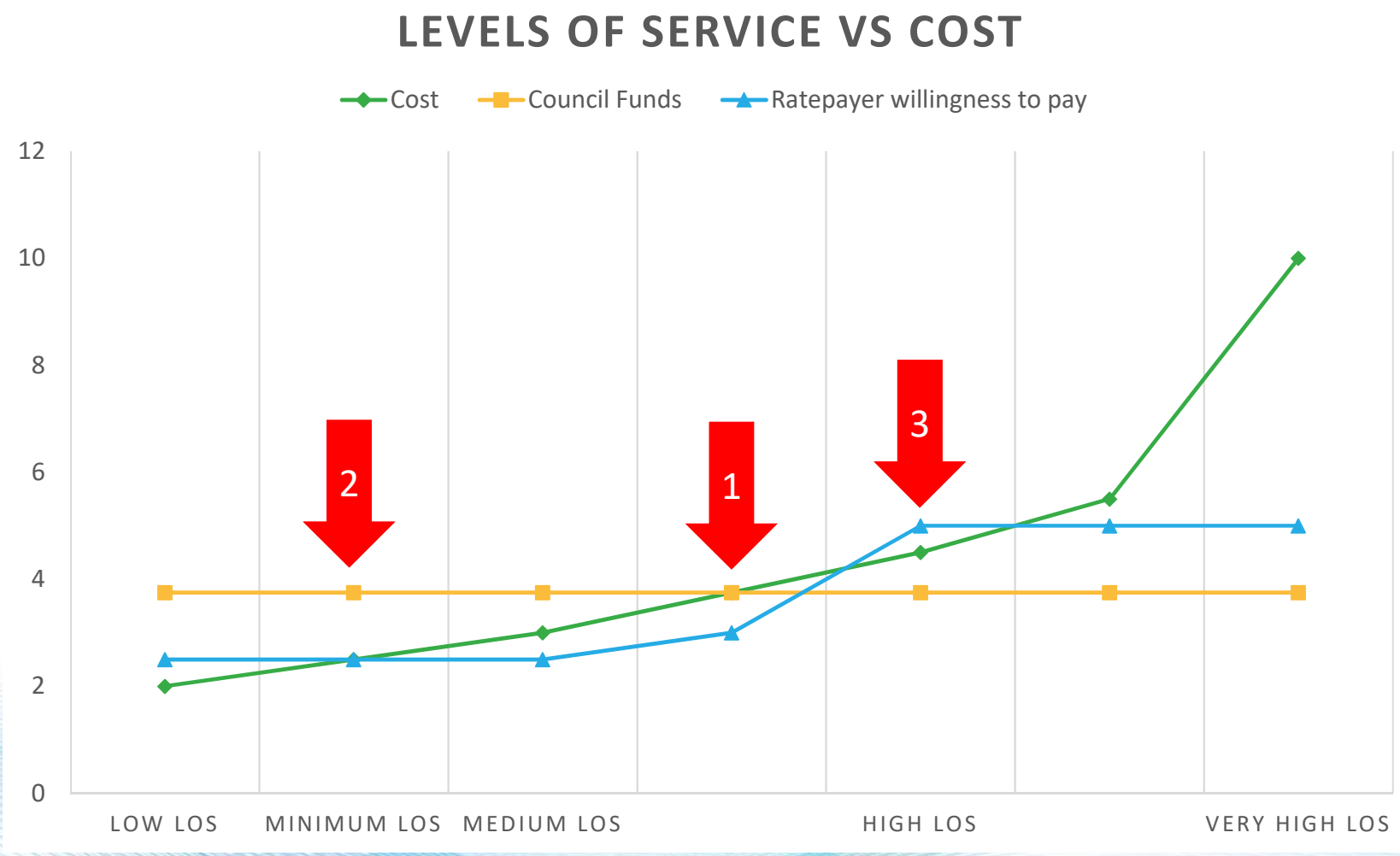
- Mandated by legislation or customer expectations

- Assessed numerically (i.e. with a model)
- Will identify additional data collection requirements
  - Inverts, connectivity
  - Different types and detail of model – fit for purpose

- Can be used to assess function
  e.g. storage vs conveyance
- The current function performed by an asset may not be what it was designed to do – this may affect the replacement cost.

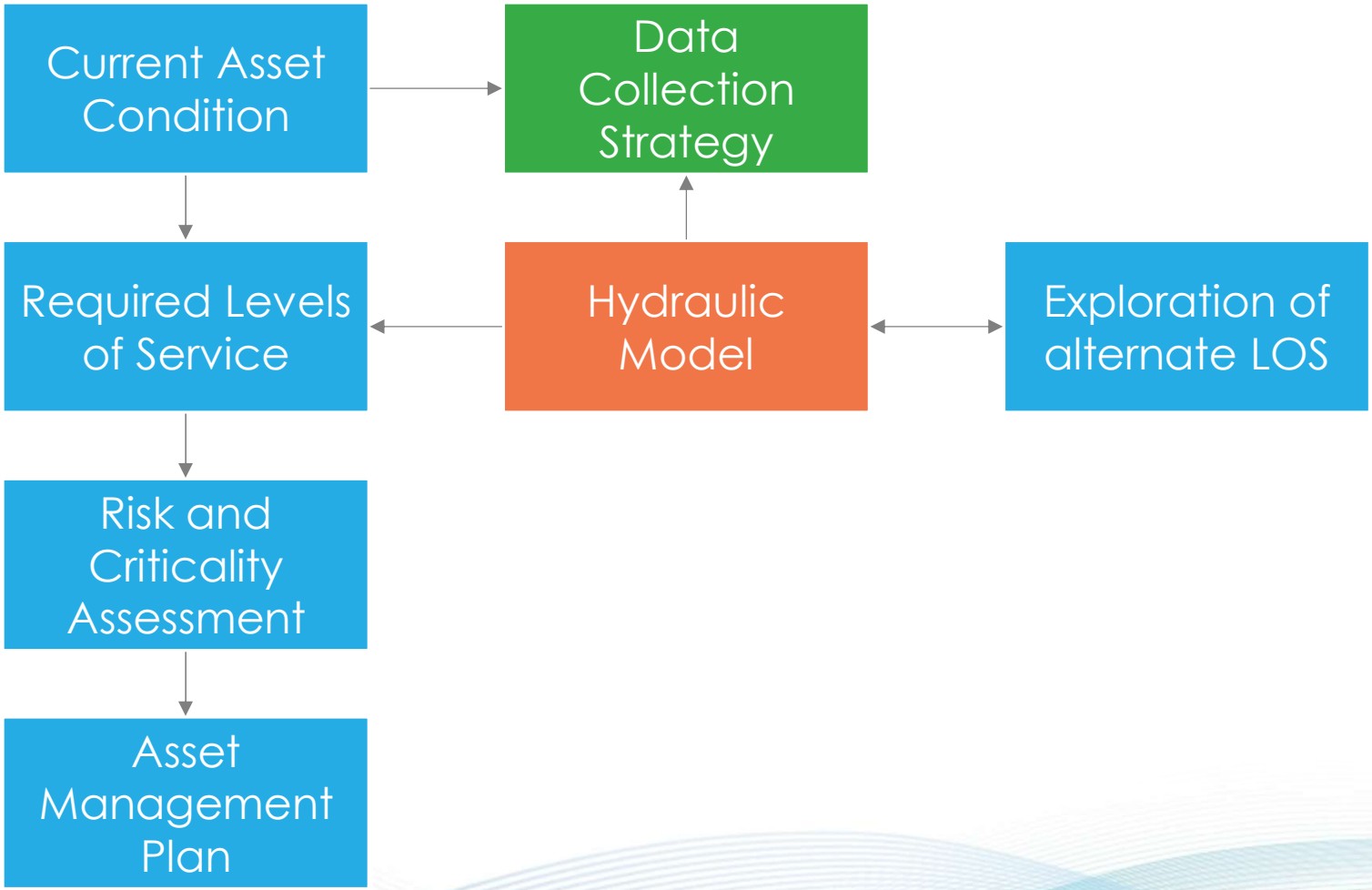
Innovyze®

# Levels of Service are a scenario




Innovyze®

# An "Asset Management Plan" plan




Innovyze®

# Risk and Criticality Assessment

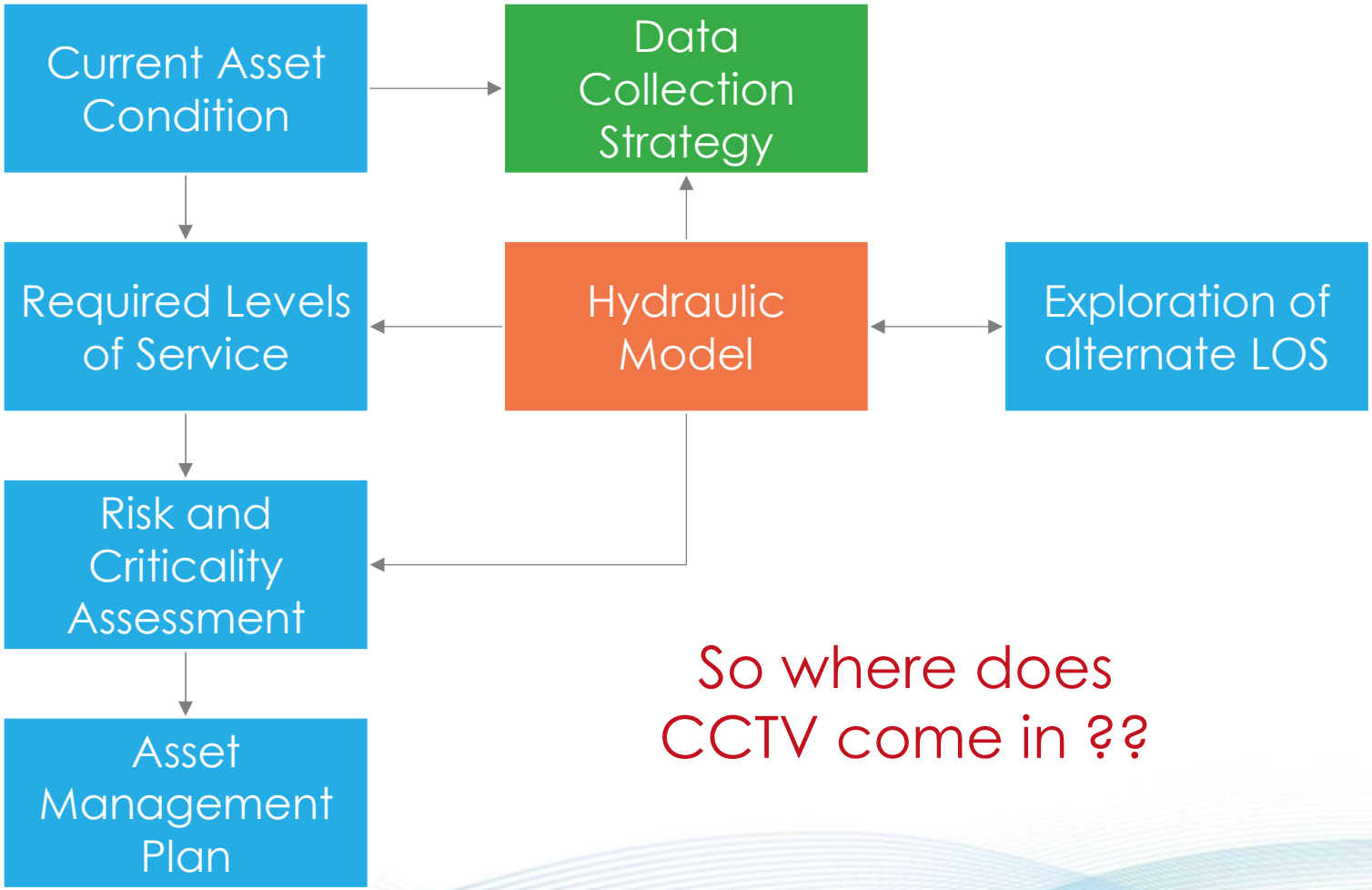
- Risk and Consequence

- Design storms have exceedence probability (RISK)
- Consequence can be predicted from a model

- Complex, multi criteria analysis is becoming more common.


Cost as a function of depth and duration of flooding

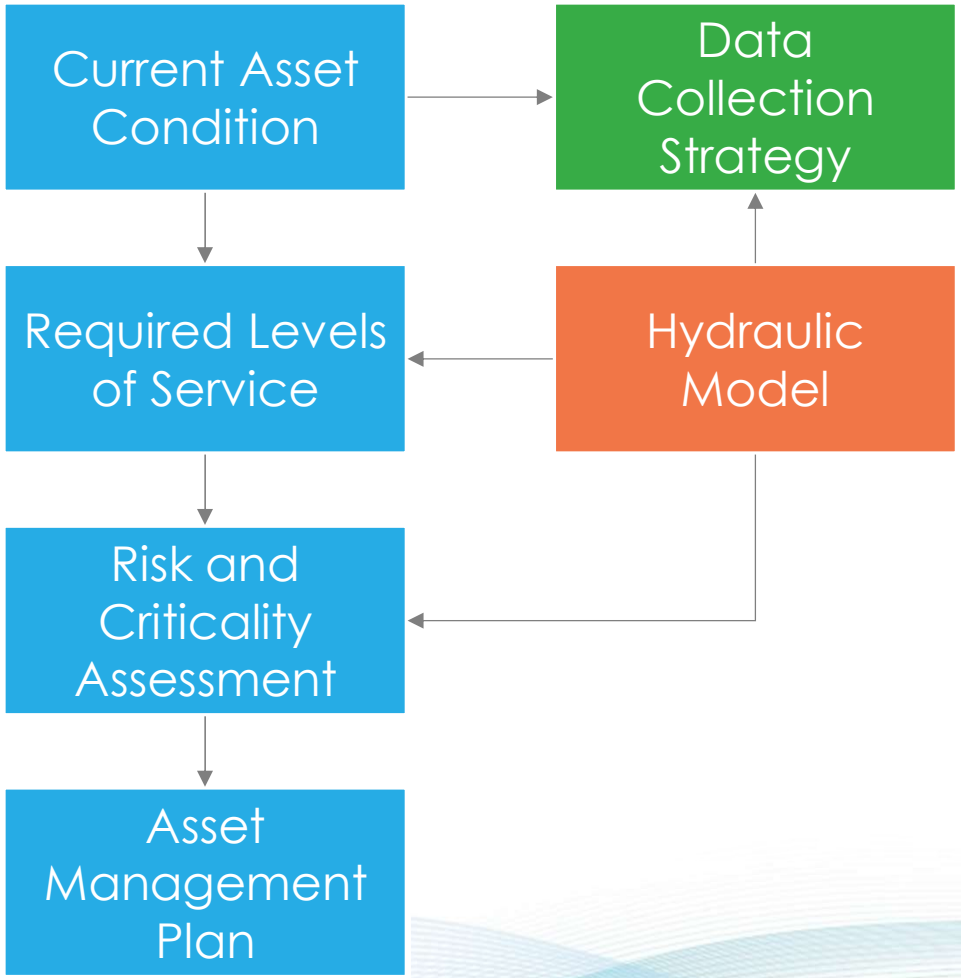
# An "Asset Management Plan" plan




So where does CCTV come in ??

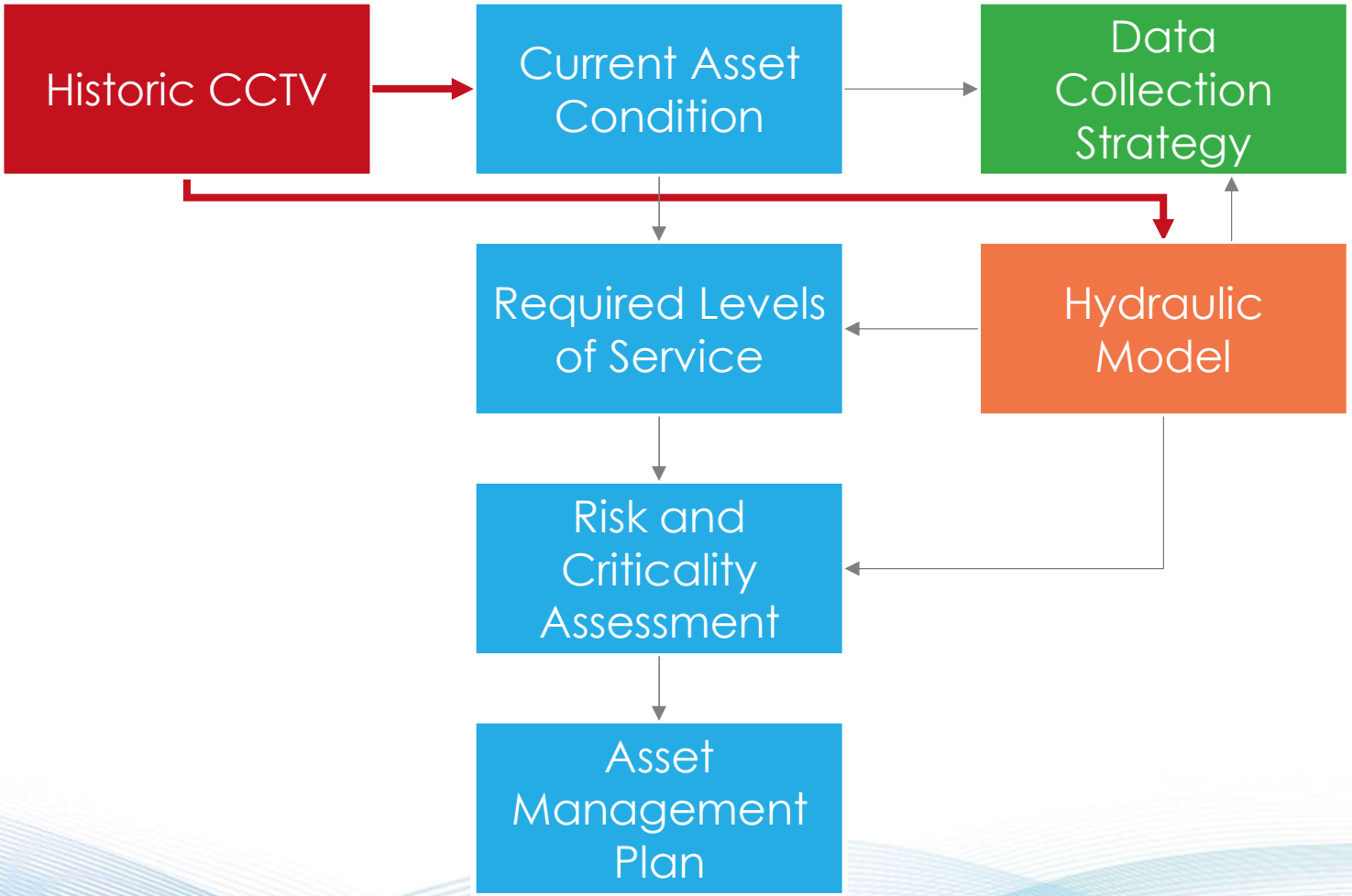
Innovyze®

# An "Asset Management Plan" plan



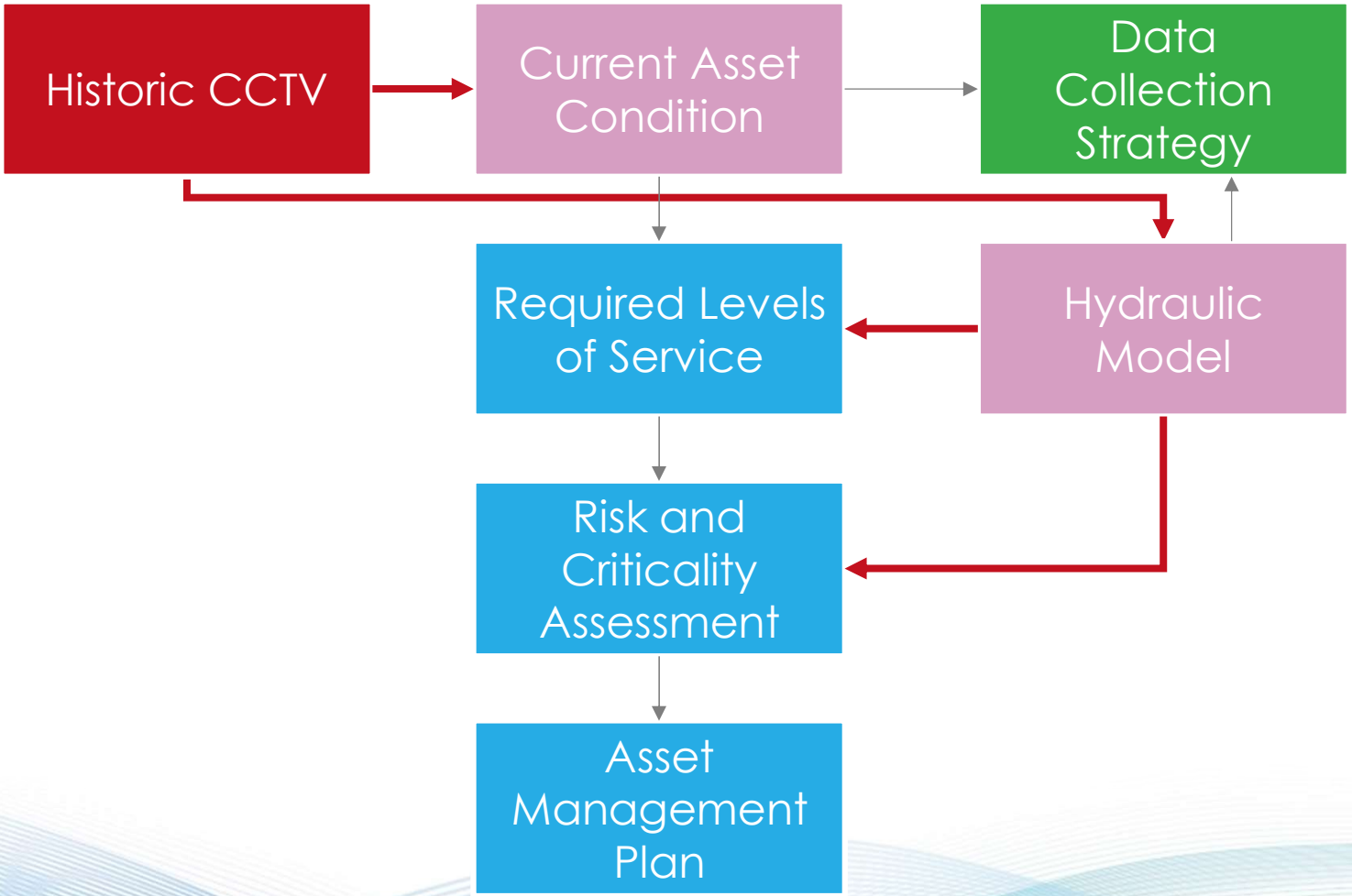

Innovyze®

# How does CCTV help?



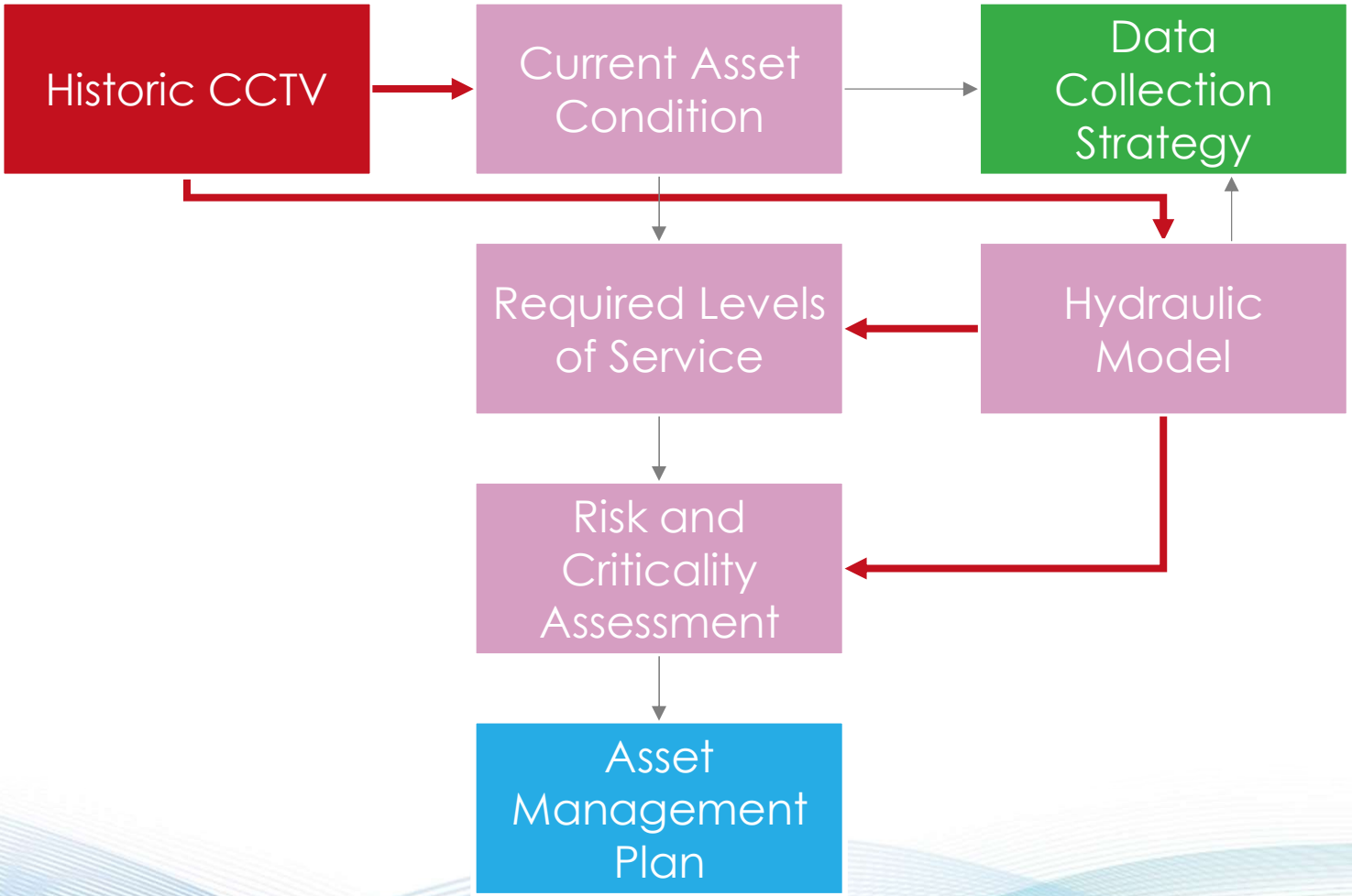

Innovyze®

# How does CCTV help?



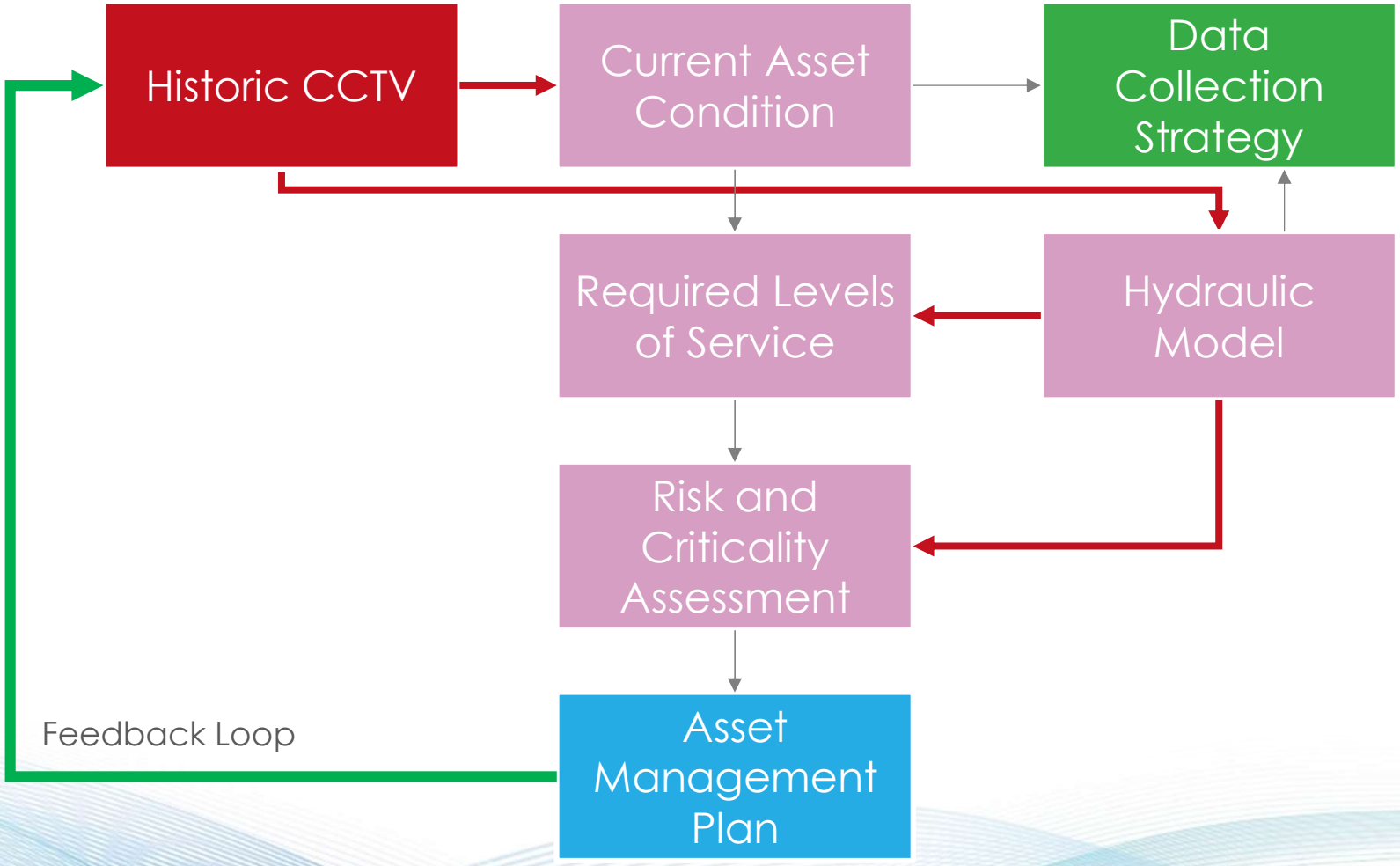

Innovyze®

# How does CCTV help?




Innovyze®

# How can CCTV help more?

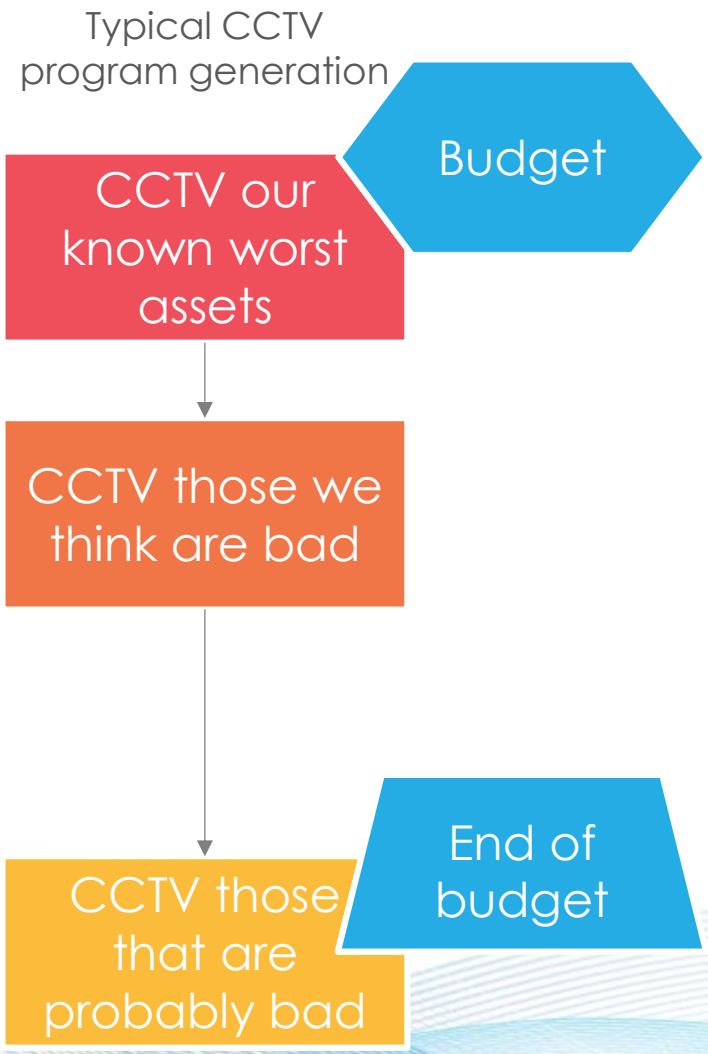



Innovyze®

# What should we CCTV next year – and why?

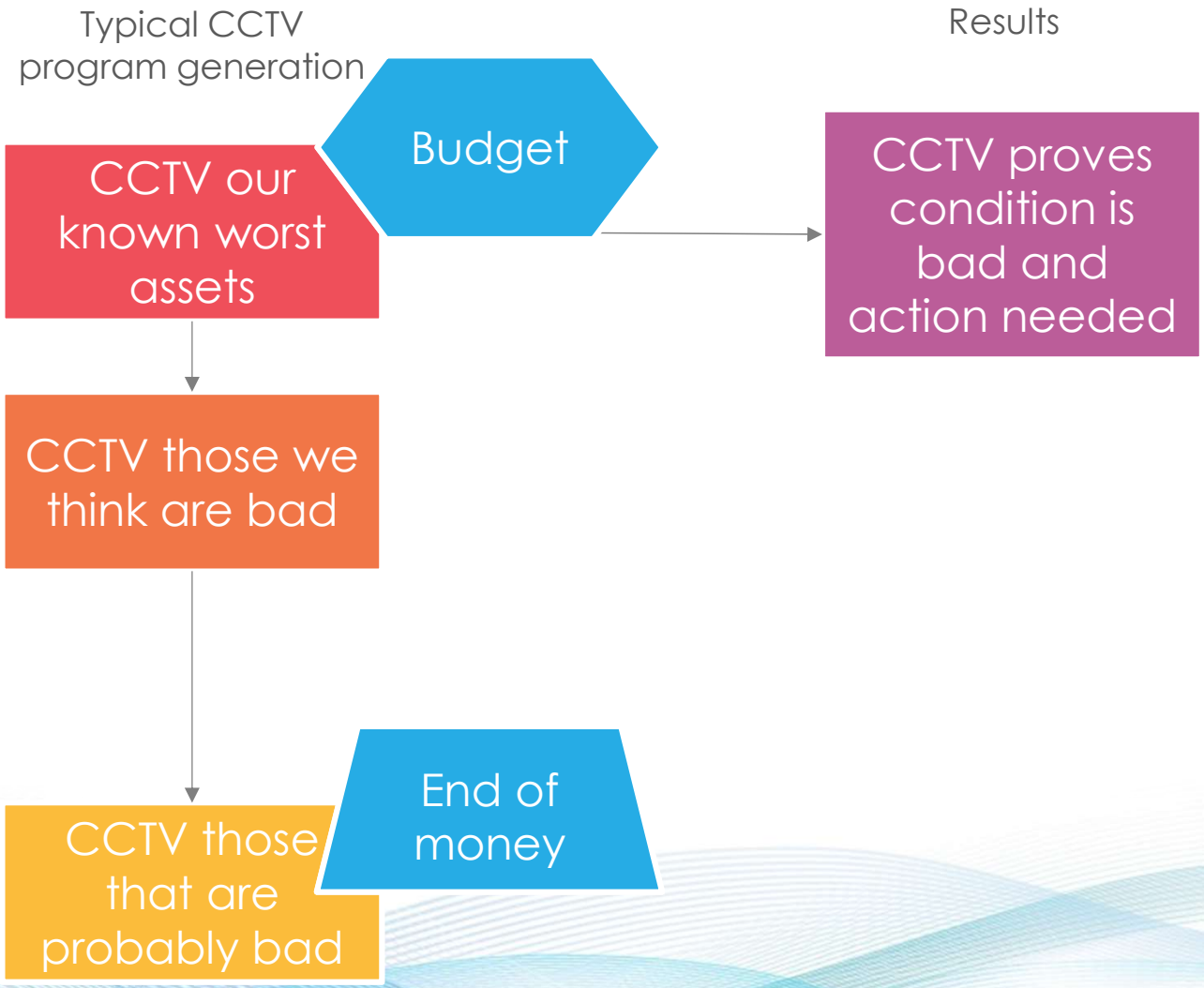
Innovyze®

# Common logic flow with CCTV expenditure




Innovyze®

# Common logic flaw with CCTV expenditure

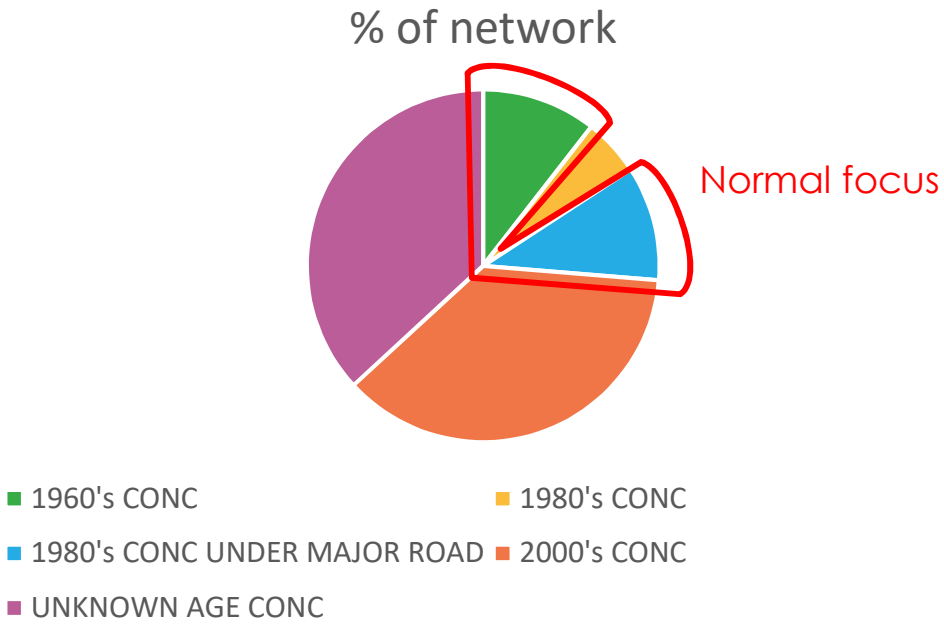



Innovyze®

# Common logic flaw with CCTV expenditure

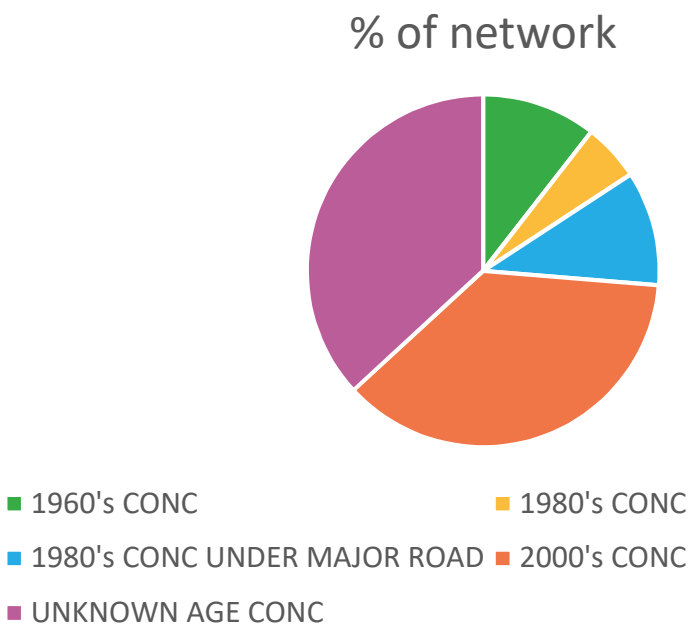

Innovyze®

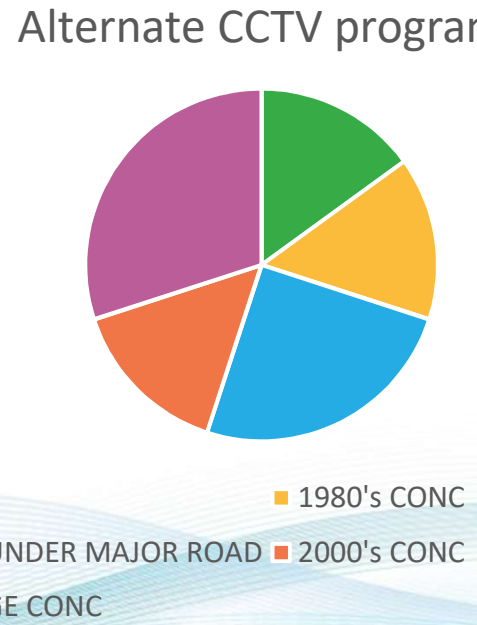
# A better approach may be to consider cohorts




Innovyze®

# A better approach may be to consider cohorts




Innovyze®

# This may return some: boring videos,

Innovyze®

# This may return some: boring videos, surprises,

Innovyze®

# This may return some:
# boring videos,
# surprises, maintenance issues

Innovyze®

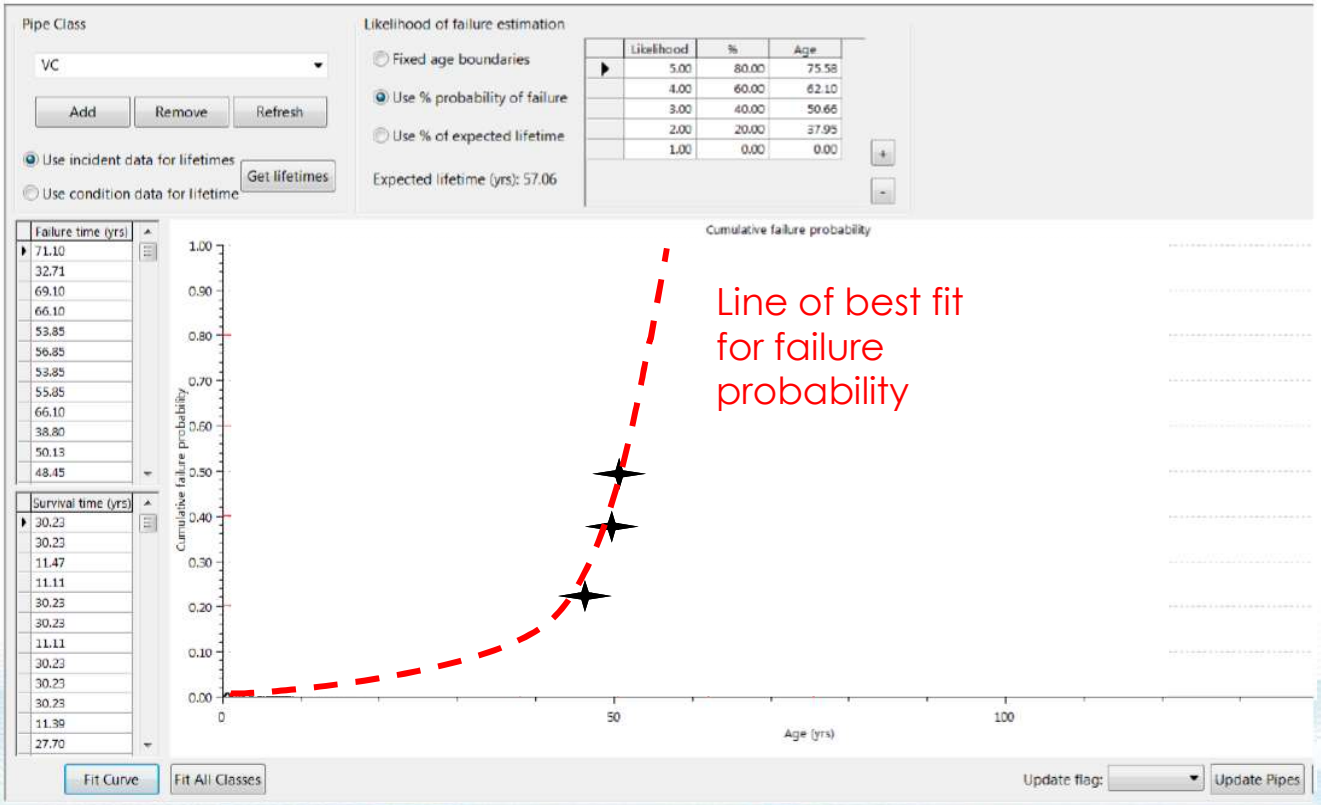
This may return some:
boring videos,
surprises, maintenance issues

Most importantly it will return
data
Which we can turn into
**information**

Innovyze®

# Create a body of evidence for a cohort

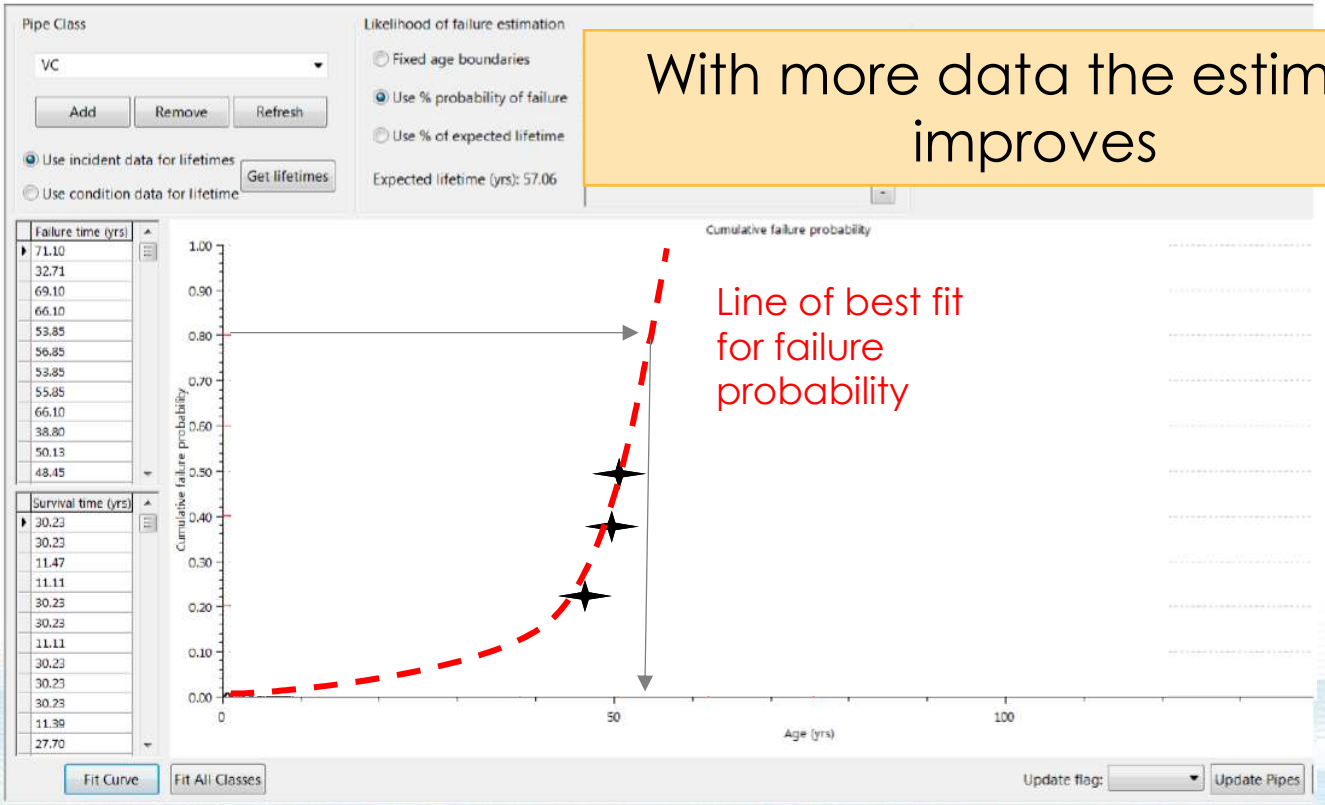
- Use observations to create a failure curve
- Use that curve to predict remaining life of other assets




Innovyze®

# Create a body of evidence for a cohort

- Use observations to create a failure curve
- Use that curve to predict remaining life of other assets

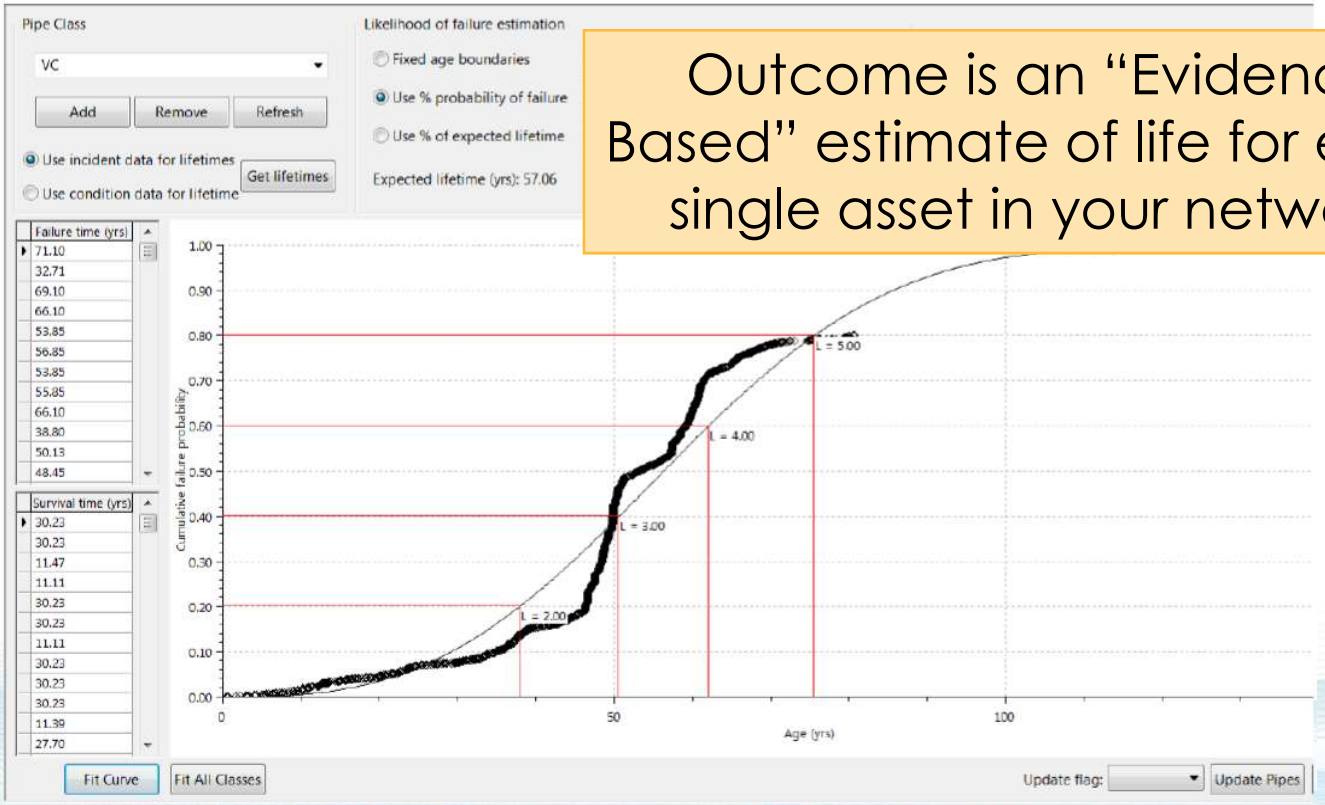



With more data the estimate improves

Innovyze®

# Create a body of evidence for a cohort

- Use observations to create a failure curve
- Use that curve to predict remaining life of other assets




Outcome is an "Evidence Based" estimate of life for every single asset in your network

Innovyze®

# But how does that help?

Innovyze®

# Complete dataset for estimate of life

Two major benefits:

- Asset Valuation and Depreciation
- Assessment of optimal replacement window

Innovyze®

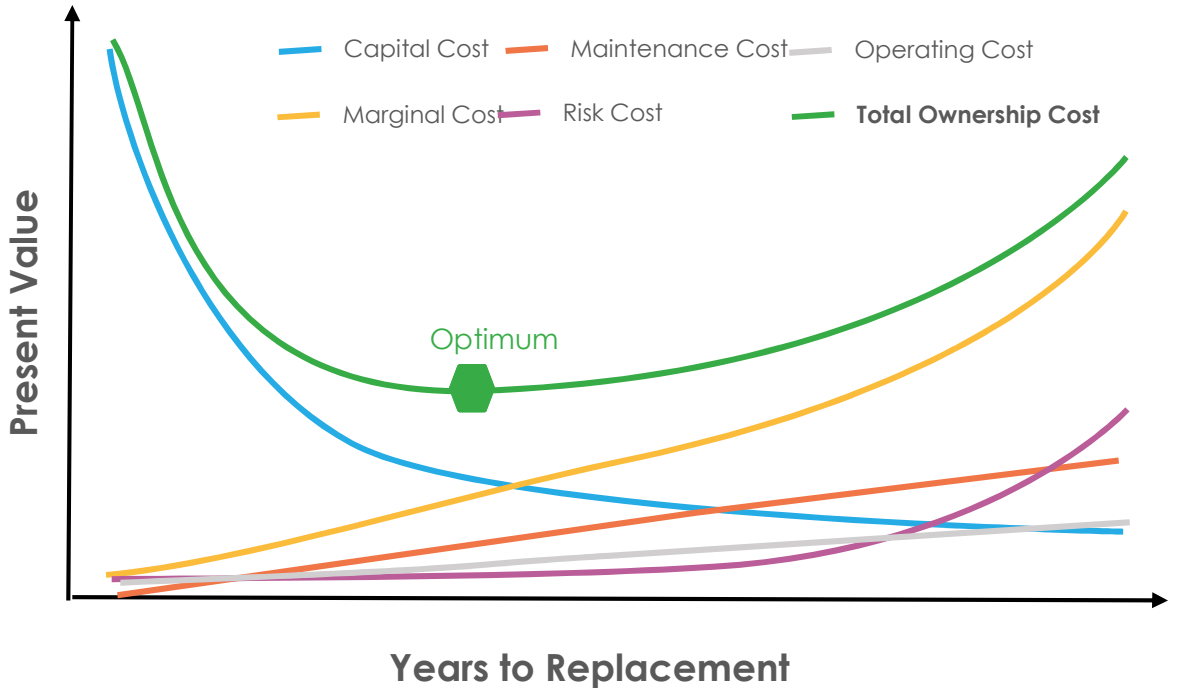
# Optimised Asset Renewals

*Based on our other assets we can:*

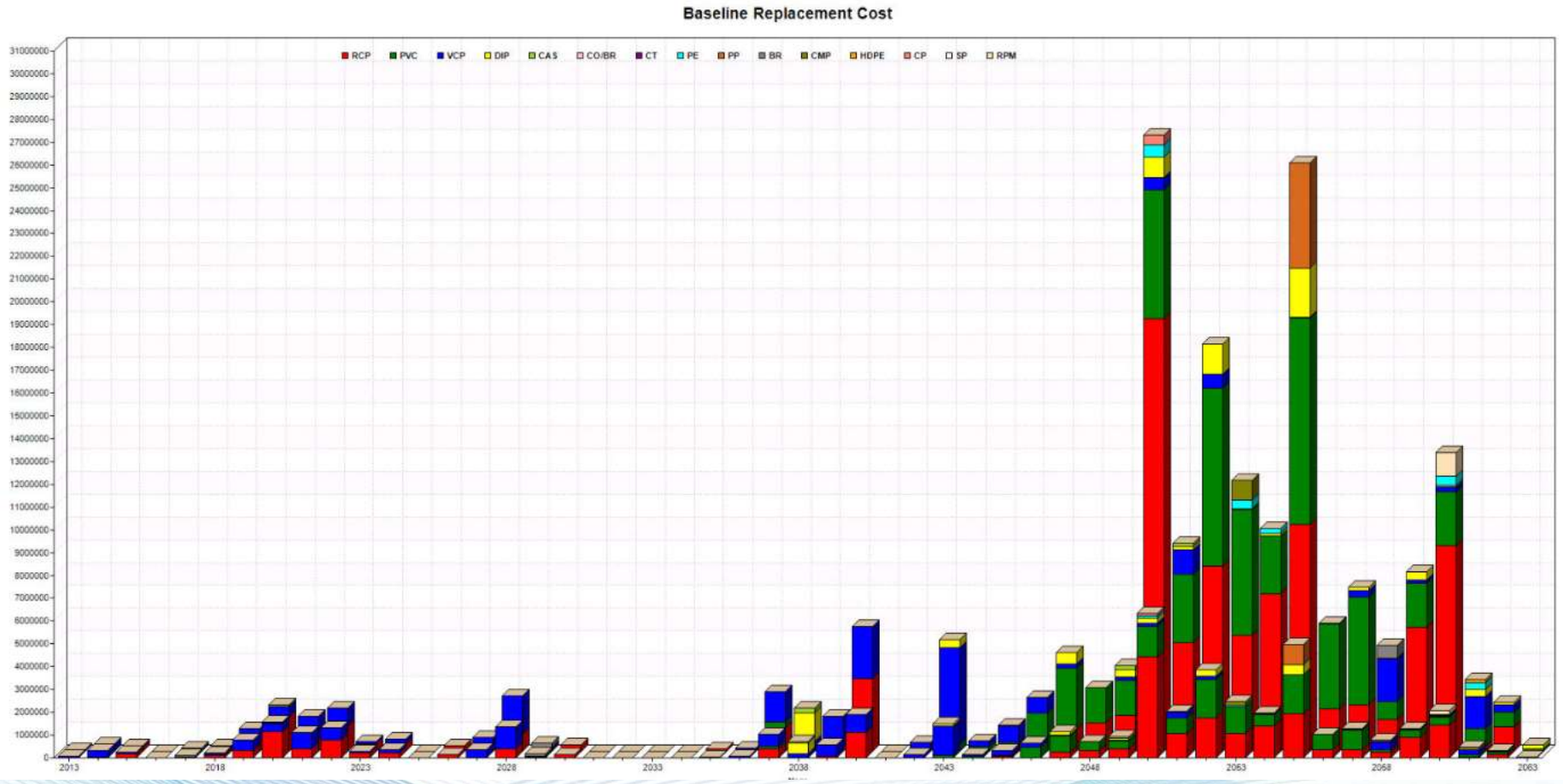
- Statistically estimate failure time for each asset
- Include the marginal cost
- Compare the maintenance requirement
- Include the Risk and Operating Costs

To derive total ownership cost for each asset

Which we can use to determine the optimal replacement time



# You can then predict the optimal life cycle cost of your network




Innovyze®

The value of CCTV can be demonstrated in:
improved long term financial forecasting and,
optimised asset management strategies,
that result in a reduction of risk.

Thank you, questions ?

Innovyze®