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WHAT LIES  
BENEATH;

PIPE RENEWAL  
RISK, ASSET  
MANAGEMENT  
IN PRACTICE

James Thorne, Senior Engineer

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# Agenda

1. Pipe renewal. What's the challenge?
2. Assessing risk
3. Likelihood of failure
4. Consequence of failure
5. Renewal risk scores





# Pipe renewal. What's the challenge?



## Expensive

The renewals gap takes up a large portion of the estimated \$120B+ over the next 30 years

## Unseen -> Uncertainty

Vast networks buried underground, patchy data and difficult to inspect

## Legacy

100+ year old assets from our first networks. And a post WW2 building boom

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## 2. Assessing risk

Why do asset managers want to know about risk?

And how is that risk understood?





Asset Managers are responsible for managing infrastructure over a long period.

Optimising and balancing customer level of service and the cost

# Understanding risk

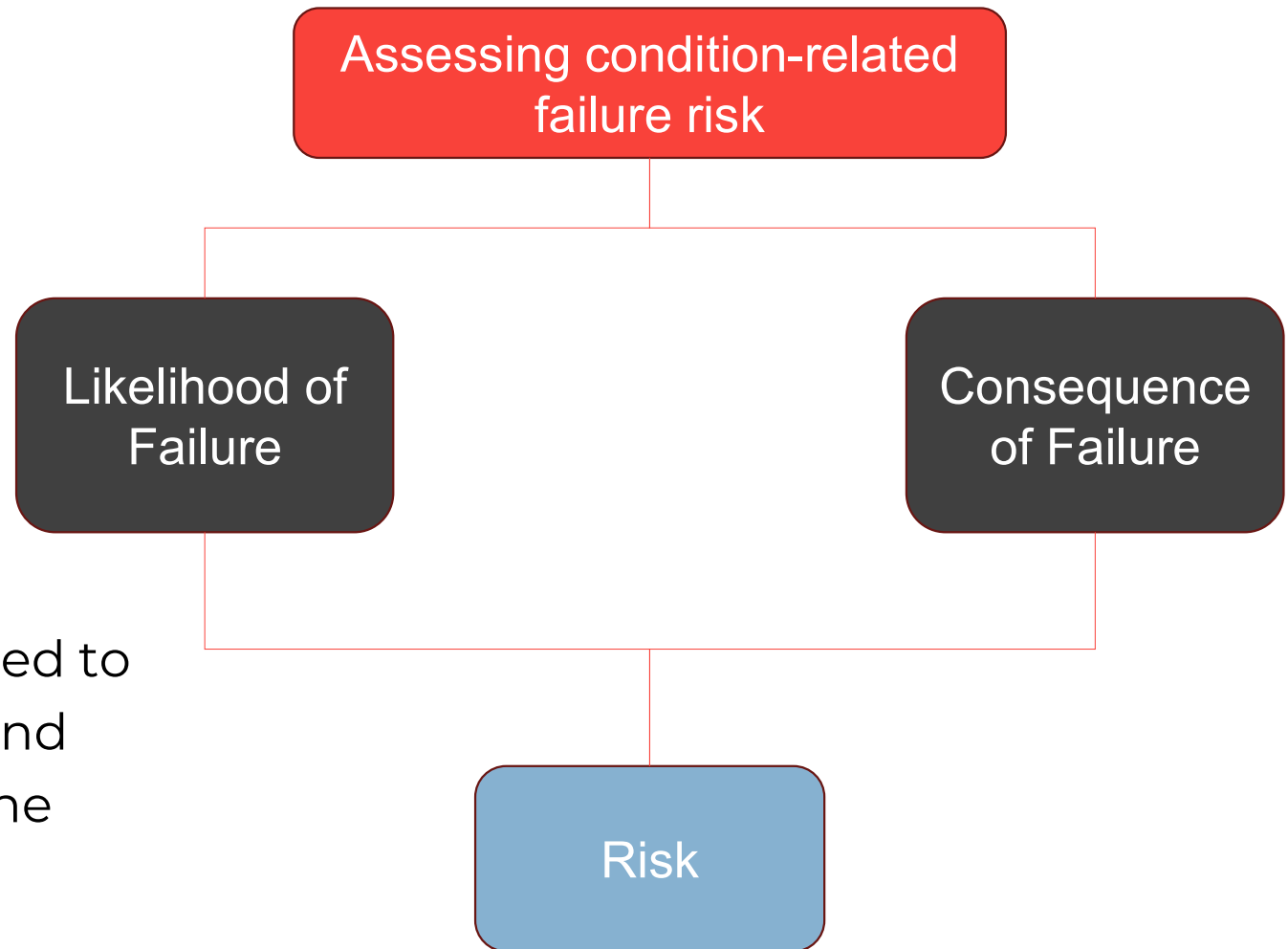


# Understanding risk

Big picture – portfolio risk  
Long term financial planning

Project level – priorities and  
best bang for buck

Targeted data collection



To get to risk, we need to separately understand the likelihood and the consequence.

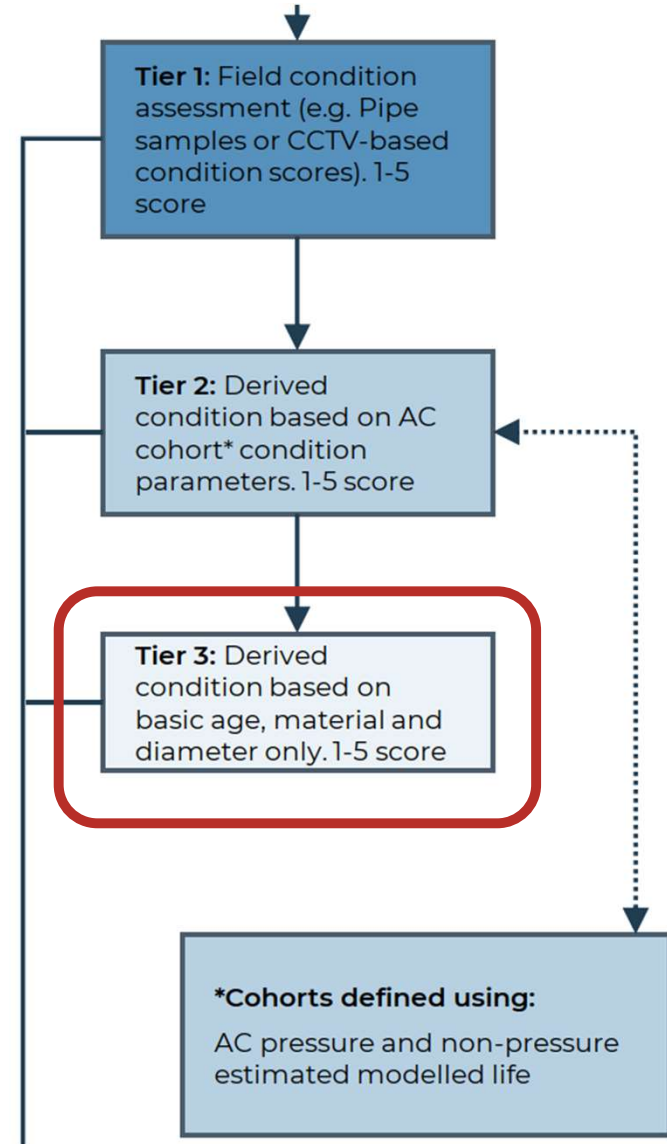
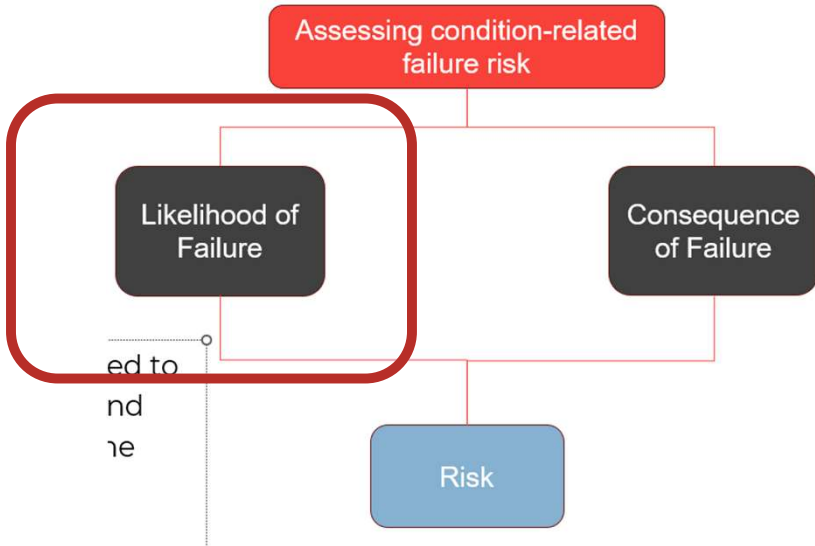
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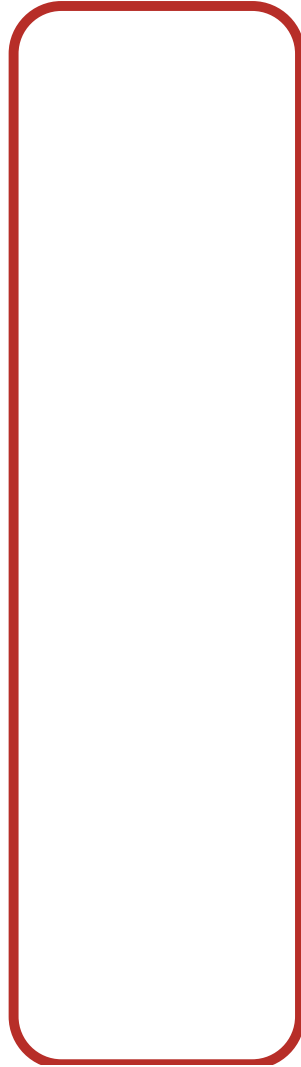
### 3. Likelihood of failure





# LoF

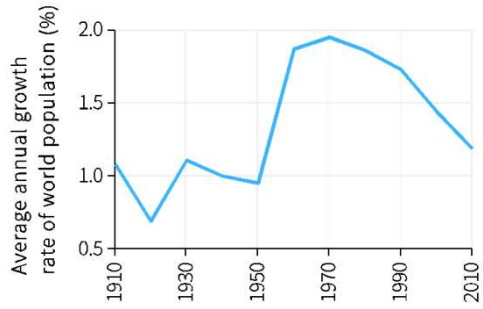




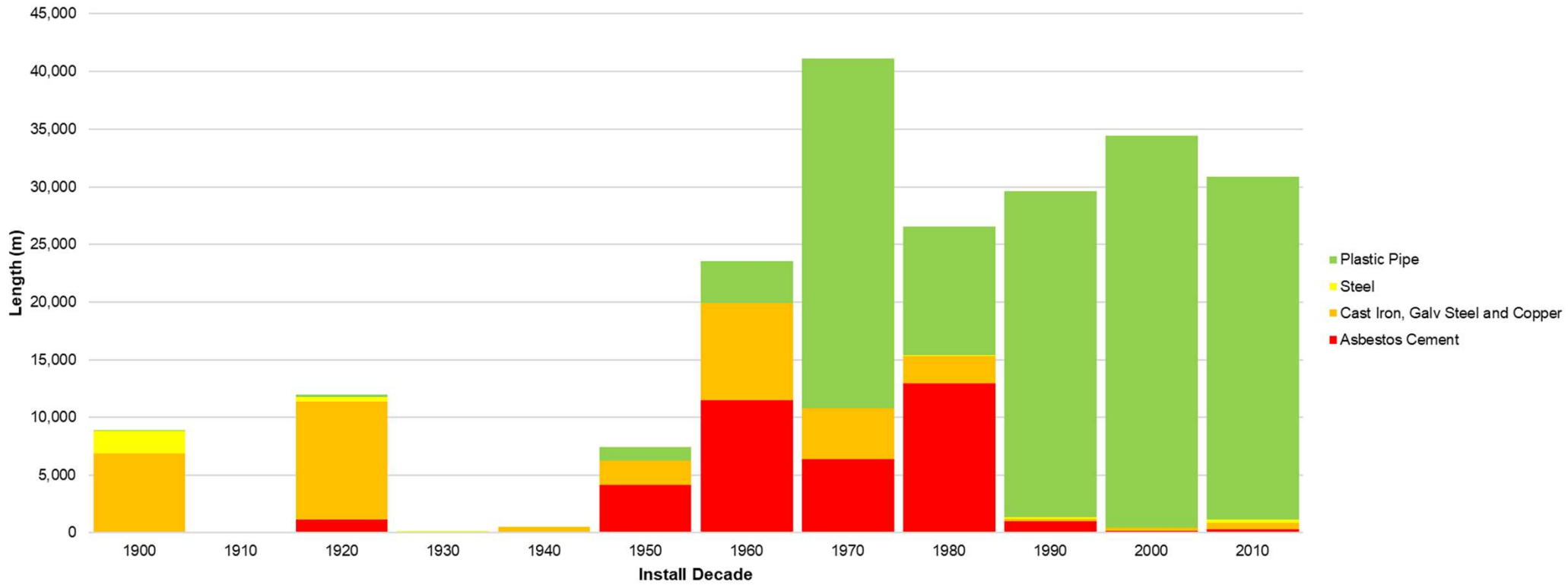
**Useful lives**

**Variety**

**All models  
are wrong,  
some are  
useful**



# What we find





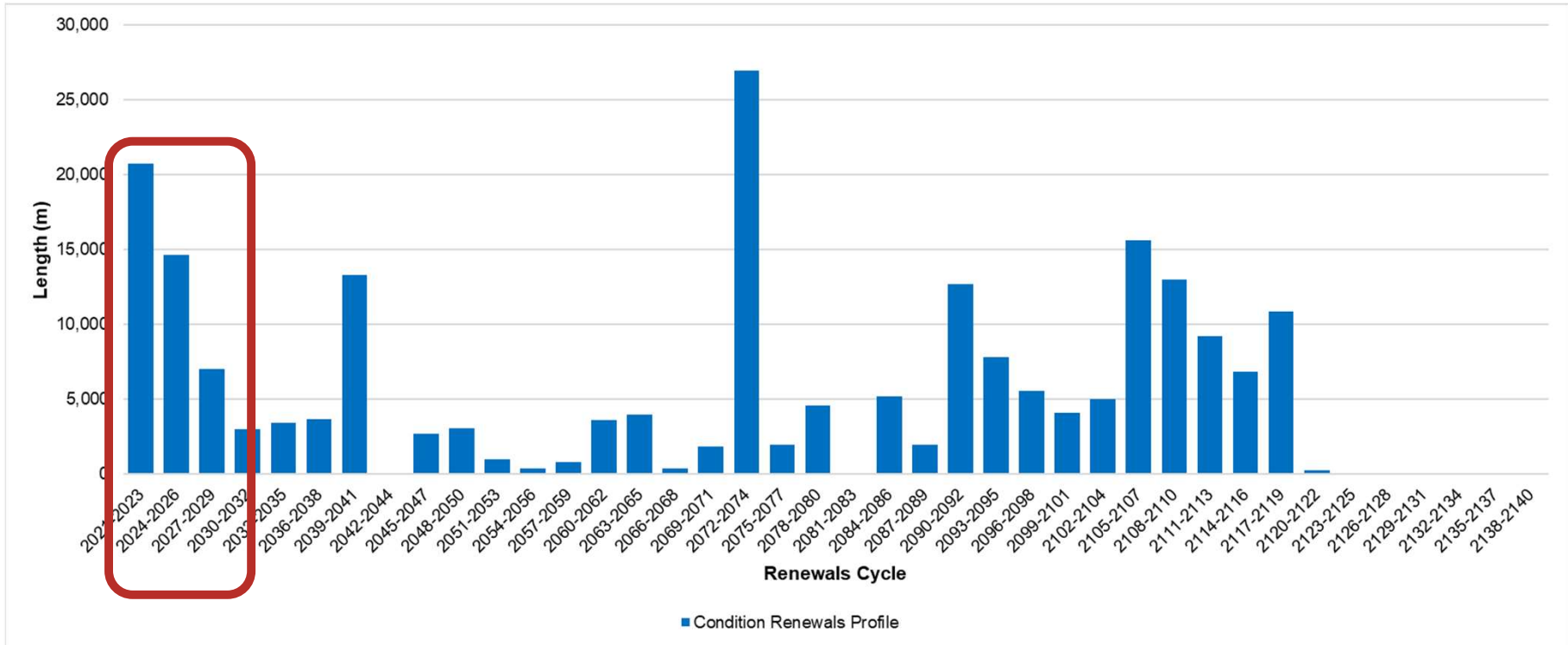
## 1-5 scores

## Variety

Table 1-1: Provisional condition gradings (desktop assessment method) and comparison to IPWEA and Metadata Standards

Provisional Condition Grade	Recommend Remaining Useful Life Range (%) <sup>1</sup>		Condition Description	IPWEA Grading	Metadata Grading <sup>2</sup>
1	≥ 75 %		Very Good	80 % to 100 %	≥ 55 %
2	50 %	74 %	Good	50 % to 80 %	41 % to 54 %
3	25 %	49 %	Moderate	20 % to 50 %	26 % to 40 %
4	3 %	24 %	Poor	5 % to 20 %	11 % to 25%
5	≤ 2 %		Very Poor	0 % – 5 %	0 % - 10 %

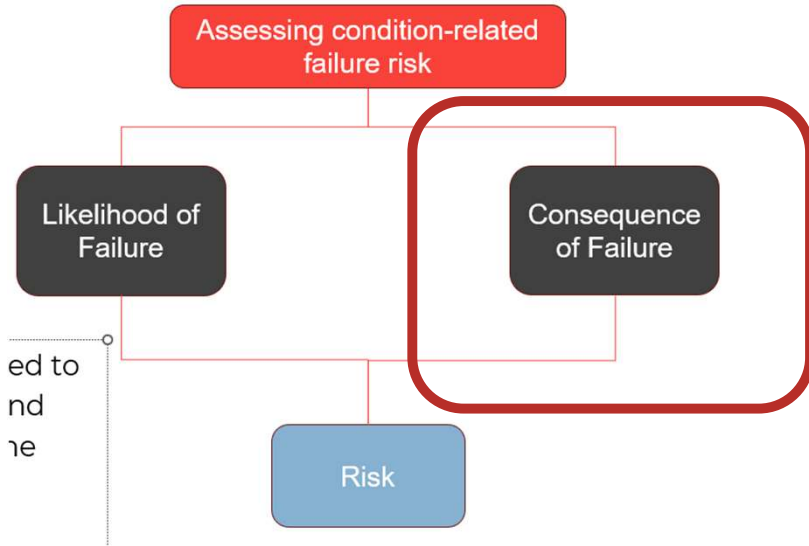
# What we find



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## 4. Consequence of failure





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Title to go here

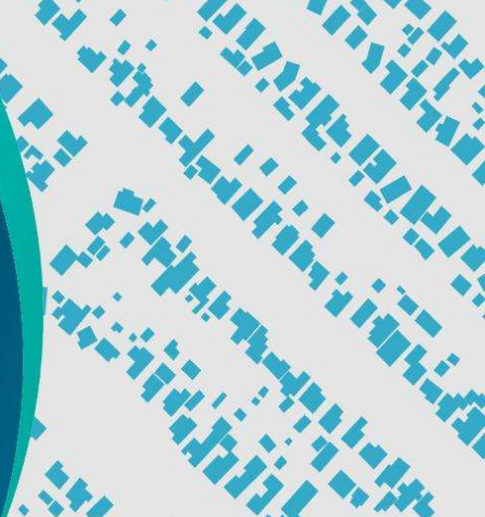
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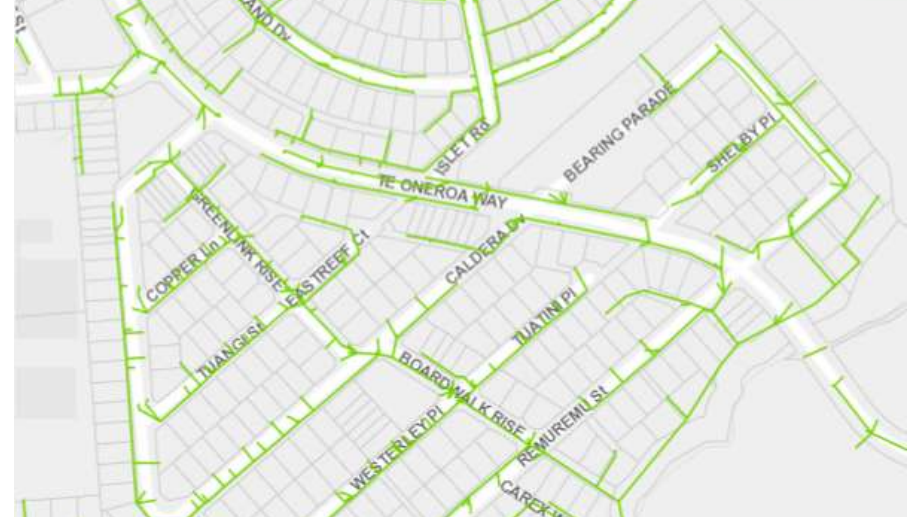
Spatial layers



LINZ NZ  
Building  
Outlines



GIS queries





**Financial Social Environment**

**Subscores**

1-5

1-5

1-5

1-5

1-5

1-5

1-5

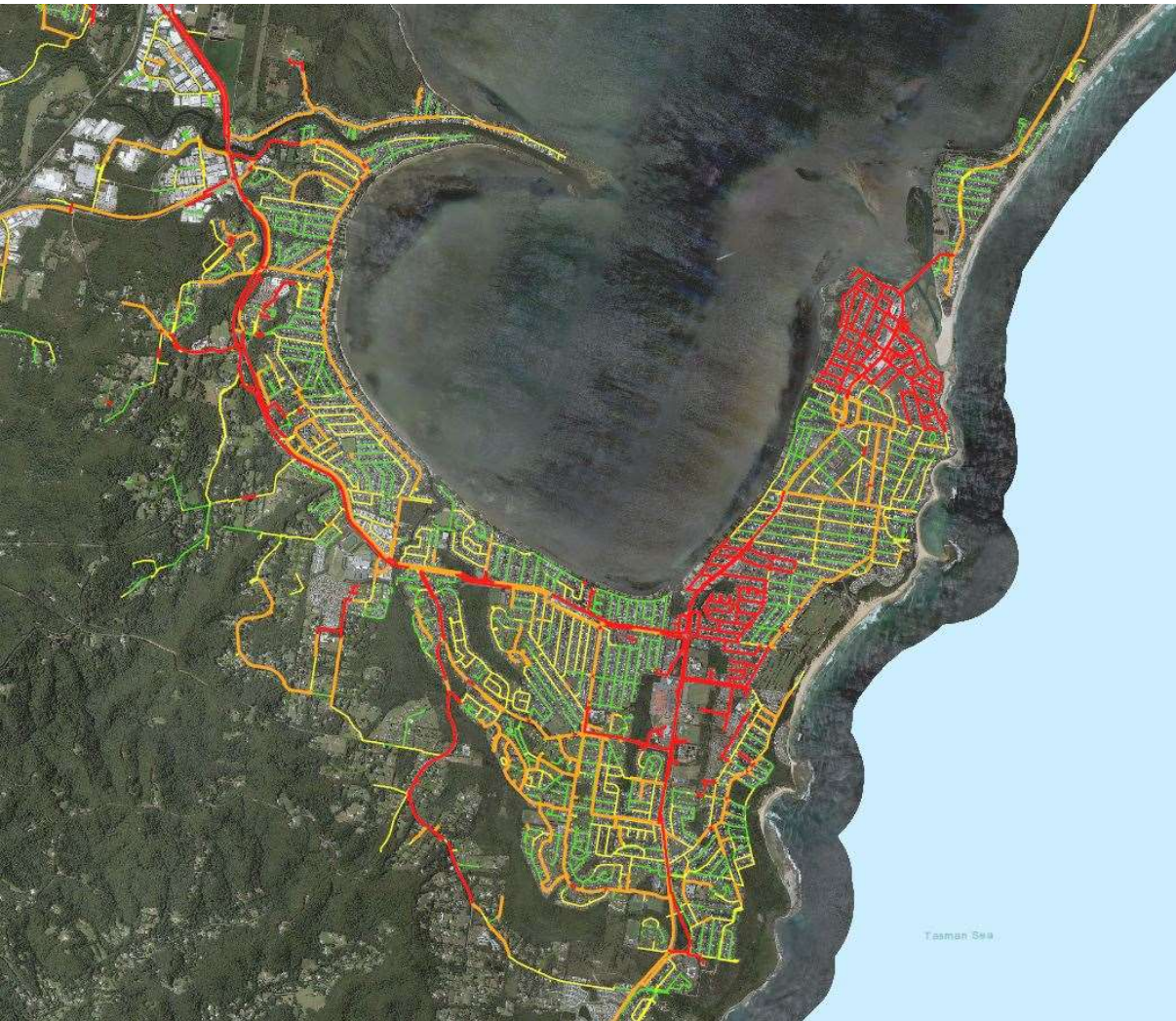
**Subscores  
example  
calculation**

**Inputs  
(spatial queries)**

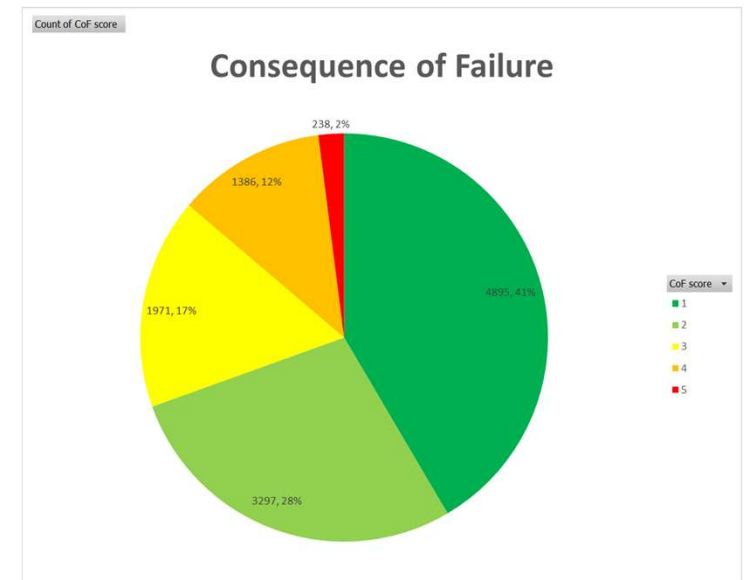
**Sub scores**

**Overall 1-5  
CoF score**

## **Full spreadsheet subscores example calculation**



## The portfolio view



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## 5. Renewal risk scores



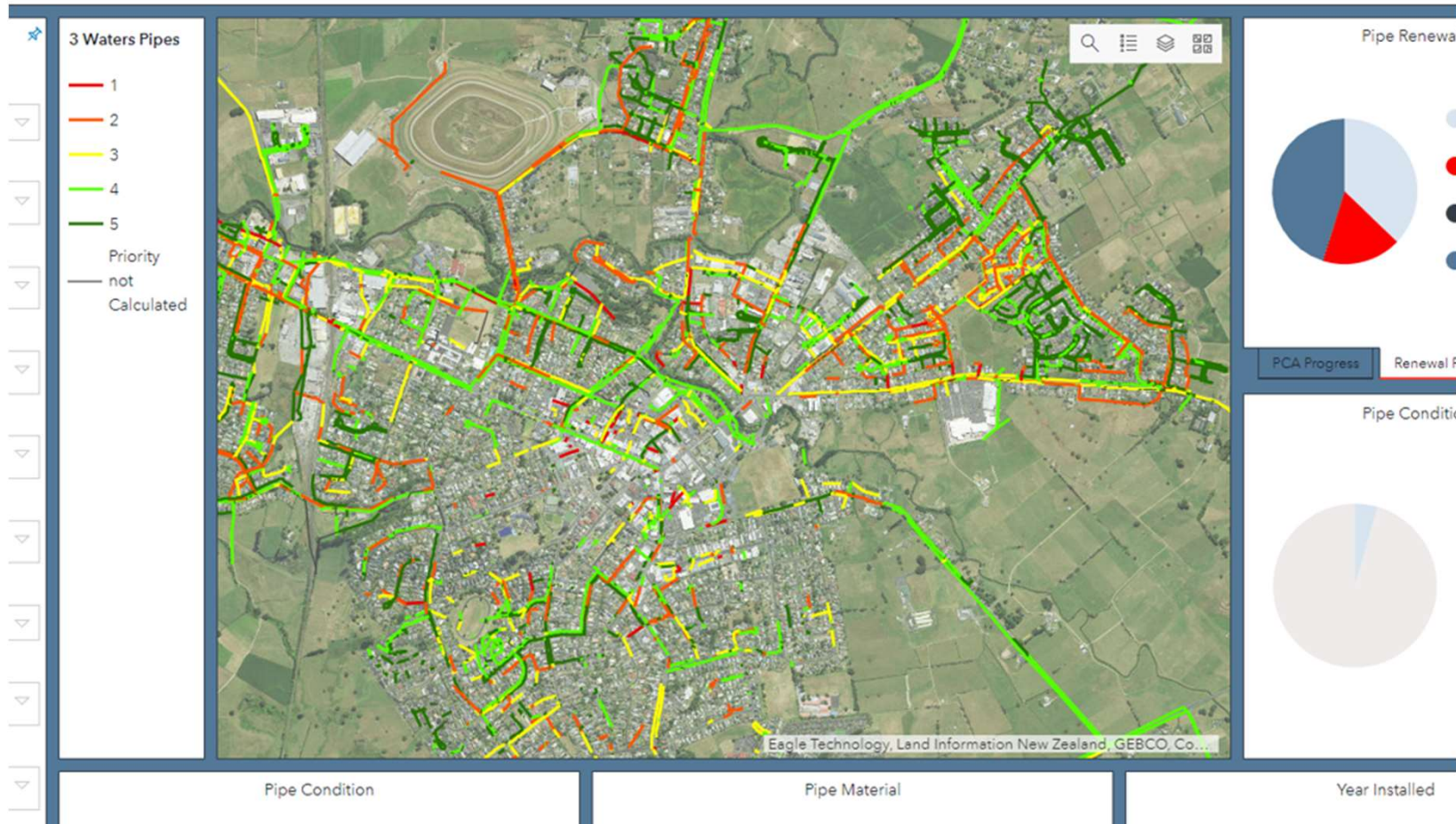
# Risk

**Likelihood X Consequence  
= Risk**

		Likelihood				
		E. Rare	D. Unlikely	C. Possible	B. Likely	A. Almost certain
Consequence	5. Extreme	Medium	High	High	Very High	Very High
	4. Major	Low	Medium	High	High	Very High
	3. Moderate	Low	Medium	Medium	High	High
	2. Minor	Low	Low	Medium	Medium	High
	1. Insignificant	Low	Low	Low	Low	Medium



# Identify project candidates



A red abstract graphic consisting of several thick, parallel lines and curves, resembling a stylized 'W' or a series of overlapping shapes, located in the top right corner of the dark blue background.

# Thank you



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