

Pipeline Management: Is Your Data Ready for Action?

Introducing our speakers



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Pipeline Management: Is Your Data Ready for Action?

Agenda



- 1 Project Background
- 2 Pipeline Management Overview
- 3 Project Analysis
- 4 Outcomes



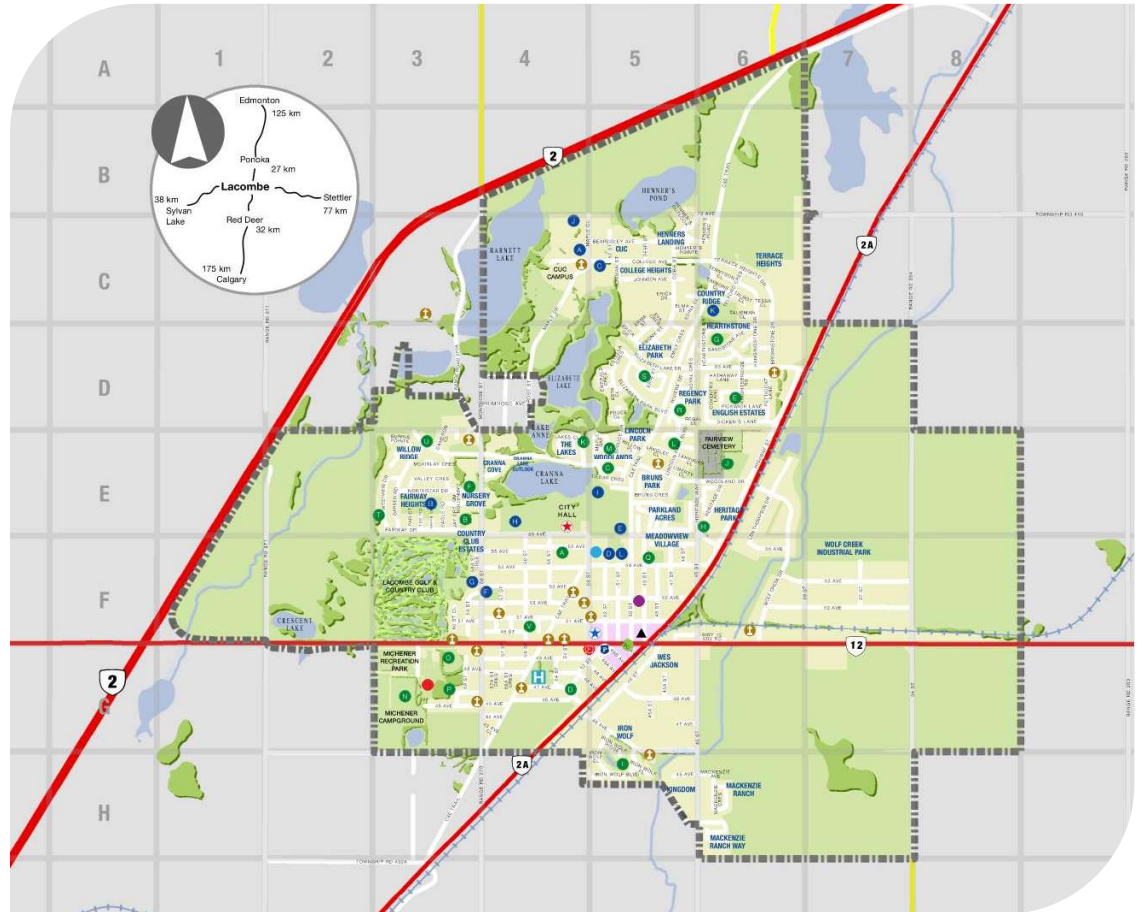
25 km north of Red Deer
14,000 residents



99 km of distribution mains
80% PVC | 13% AC | 7% other
5,000 service connections

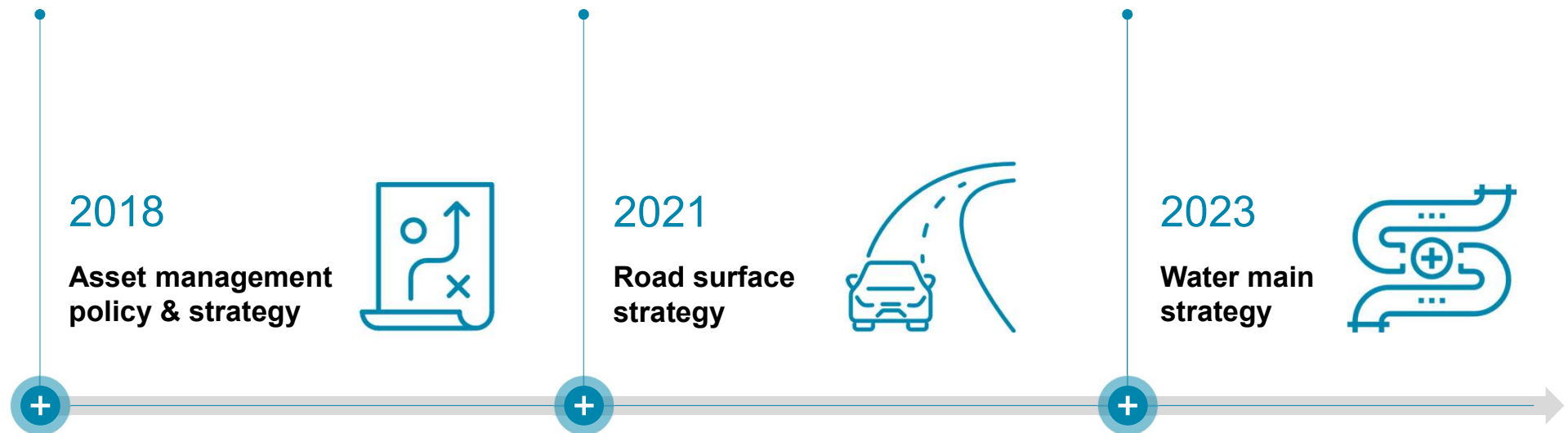


1,200+ isolation valves
473 hydrants



Asset management journey

What prompted this work?



Lacombe's asset management strategy aims to minimize long-term costs & service disruptions.

Key considerations



How can Lacombe's currently available data be leveraged for a risk-based asset prioritization?

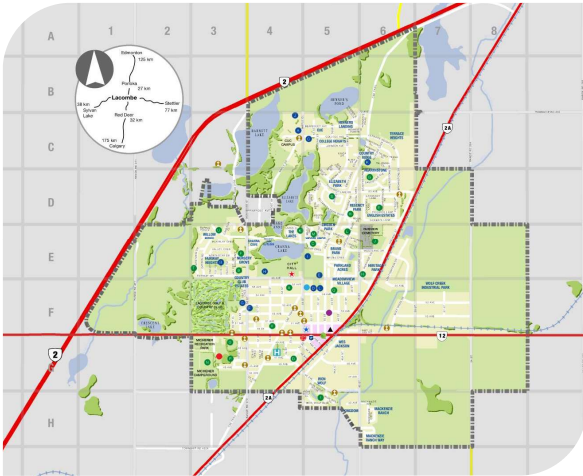


How can the risk analysis help inform a 10-year budget requirement for capital planning?



How can the City's data management procedures be improved for advanced pipeline infrastructure asset management?

What's the Data Landscape?



System-related data

- Pipe material
- Pipe diameter
- Pipe length
- Pipe installation year
- Historical leak records
- Valve location

Environmental data

- Soil properties
- Road/railroad information
- Parcel information
- Building footprint
- Critical customer locations

Where are gaps in the data?



Missing pipe attributes (up to 10% of GIS system, with pipe material having the largest gaps)



Leaks were geocoded to addresses



Valve information included only spatial location

Pipeline Management Overview

- 01 System risk analysis & planning**
Prioritize pipelines for assessment
- 02 Inspection & monitoring**
Understand current condition
- 03 Engineering & advanced analytics**
Understand structural condition & forecast future condition
- 04 Risk mitigation & asset management**
Address risk & protect the pipeline into the future



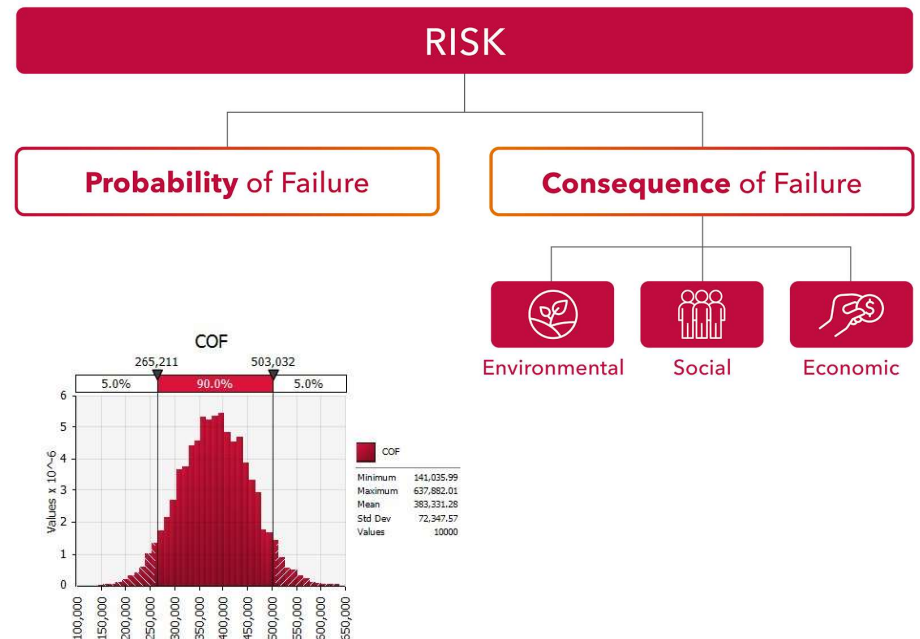
Risk Assessment Approaches

Traditional factor-based risk assessment

RISK = Likelihood of failure score x Consequence of failure score

LIKELIHOOD OF FAILURE SCORE	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		CONSEQUENCE OF FAILURE SCORE				

Quantitative risk assessment



A quantitative approach to risk better accounts for uncertainty.

Likelihood of Failure Analysis

System-related data

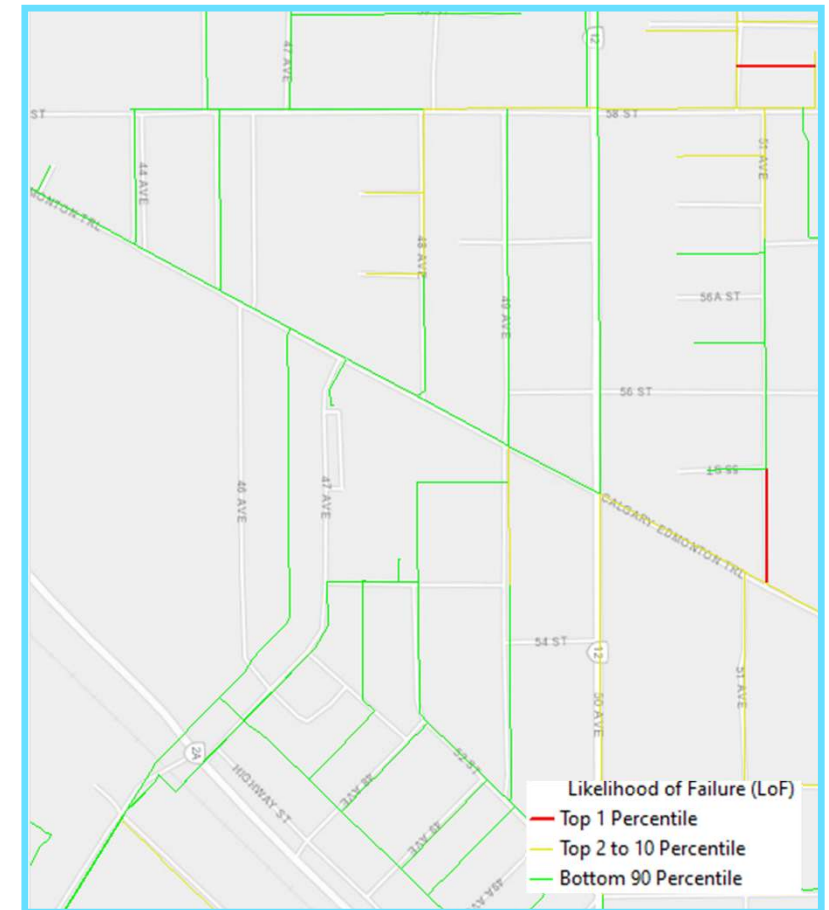
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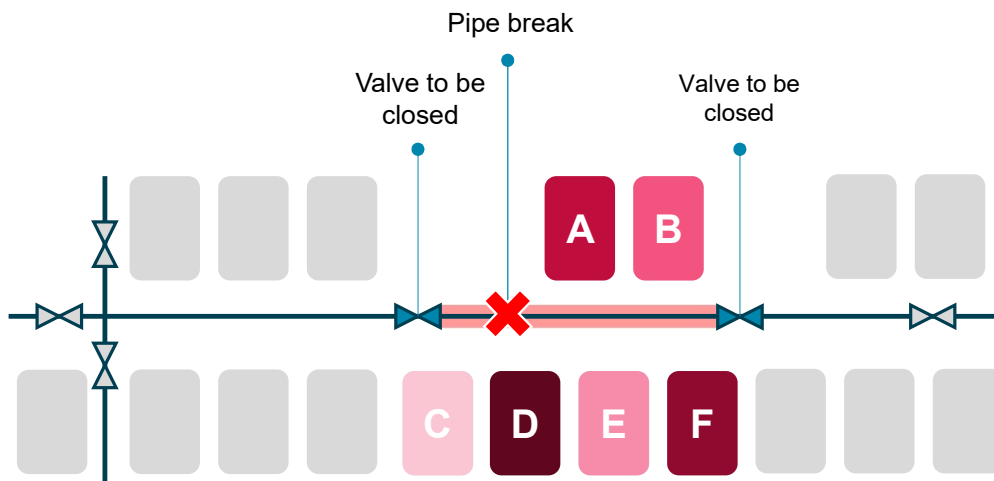
- **Soil properties**
- **Road/railroad information**
- **Parcel information**
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PREDICTIVE MODEL

Identify pipe segments more likely to fail



Consequence of Failure – Criticality Analysis



Water demands affected

- A**  Office
- B**  Hospital
- C**  Restaurant
- D**  Condominium
- E**  Manufacturing
- F**  Single-family home

Consequence of Failure Analysis

Identify pipe segments with **a high failure impact**

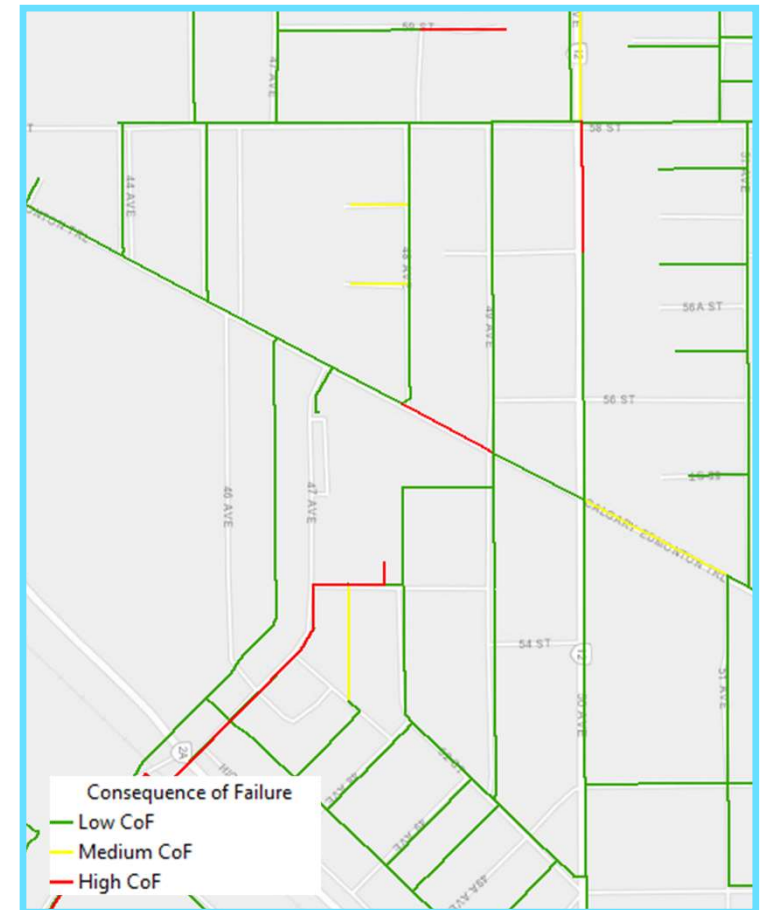
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CRITICALITY ANALYSIS



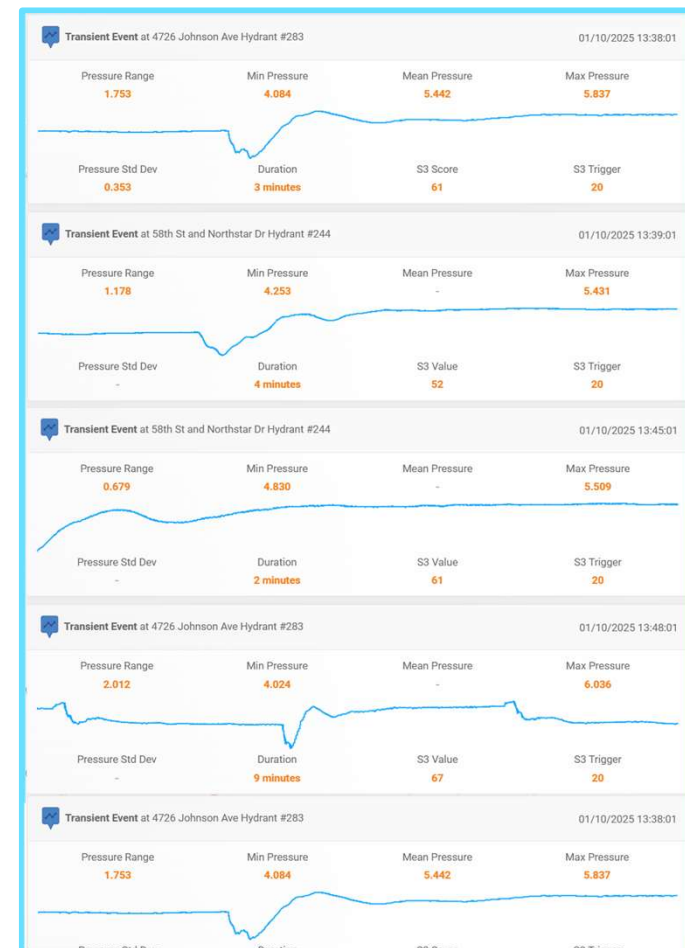
Risk Assessment Outcomes and Deliverables

Risk-based prioritized list of assets

Long-term budget forecasting

Evaluate different risk mitigation actions

Data management and improvement plan



Summer 2025 Inspections & Monitoring

Leak Detection & CC locations



- System-wide
- One Hydrant leak
- Expect to plot 70% of CCs

Isolation Valve Exercising



- 202 Valves (16% of system)
- 14 “discovered” valves (not in GIS)
- 5 malfunctioning, 15 Inaccessible
- 182 functional

Transient Pressure Monitoring



- System-wide monitoring ongoing
- Two zones; north & south
- One target for non-destructive analysis

What's next for Lacombe?

Continuous improvement

- Refine growth & financial information
- Iterate the asset management plan over time



Verify assumptions

- Transient pressure monitoring
- Active leak detection
- Valve location & exercise



Questions?



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