

Cost of Failure

What each break will actually cost, in dollars, service impact, and disruption, so prioritization accounts for consequence and not condition alone.

- DIRECT + INDIRECT COST
- LOCATION AWARE
- SCORED PER SEGMENT

Likelihood of Failure predicts which pipes are likely to break. It does not say what happens when they do. A failure under a quiet residential street and a failure on an arterial road outside a hospital are not the same event, and a replacement list that treats them the same will spend money in the wrong order. **Cost of Failure quantifies the economic and service consequence of a break on every segment in the network.**

HOW IT WORKS

01

Location-Aware Modeling

Surrounding land use, traffic volume, nearby customers, proximity to critical facilities, and environmental exposure are evaluated for each segment, not assumed from pipe attributes.

02

Direct and Indirect Cost

Repair and restoration costs are separated from the consequential costs of road closure, water loss, service interruption, and emergency response, then totaled.

03

A Score Per Segment

Every segment carries its own Cost of Failure figure, directly comparable across the system and usable as a prioritization input on its own.

IN THE PLATFORM

COST DETAIL — PER SEGMENT	
COF	SCENARIO: DEFAULT COF DEMO
	Direct \$6,700.00 ▾
	Indirect \$16,209.15 ▾
	Total Cost \$22,909.15

SAME CONDITION SCORE — VERY DIFFERENT CONSEQUENCE		
	PIPE A residential side street	PIPE B arterial near hospital
Break cost	\$9,000	\$75,000
Customers affected	12 homes	2,100 people, 1 hospital
Traffic disruption	Minimal	Major detour
Cost of Failure	Low	High

Left: direct, indirect, and total cost for a selected segment in the Fracta platform. Right: two segments that an age-based or condition-only list would rank identically.

WHAT MAKES A FAILURE COSTLY

Direct cost

- Excavation, repair, and pipe replacement
- Pavement and surface restoration
- Emergency crew mobilization and overtime
- Water lost to the break

Indirect and consequential cost

- Service interruption to customers downstream
- Traffic disruption and detour duration
- Impact on critical facilities hospitals, schools, emergency services
- Environmental exposure and discharge
- Property and third-party damage

COST VECTORS EVALUATED PER SEGMENT

Traffic impact	Proximity to critical facilities	Customer type	Population served	Environmental exposure
Pipe diameter	Land use	Surface type	Service interruption extent	

WHAT COST OF FAILURE LETS YOU DO

01 Quantify Financial and Service Risk Put a dollar figure on consequence instead of describing criticality in qualitative tiers.	02 Prioritize Beyond Age and Break History Justify replacing a sound-looking pipe because of where it sits, not because of how old it is.	03 Defend Replacement Decisions Support capital requests, rate cases, and grant applications with real-world impact metrics per segment.
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WORKING WITH LIKELIHOOD OF FAILURE

Cost of Failure is most useful next to Likelihood of Failure. A segment with moderate likelihood and severe consequence can outrank a segment that is more likely to break but costs very little when it does. Multiplying the two produces **Total Risk**, a single monetized figure that ranks the whole network by dollars at risk.

ABOUT FRACTA

Fracta applies machine learning to drinking water infrastructure, scoring every segment of the distribution network for Likelihood of Failure and Consequence of Failure so utilities can prioritize renewal against a finite capital budget.