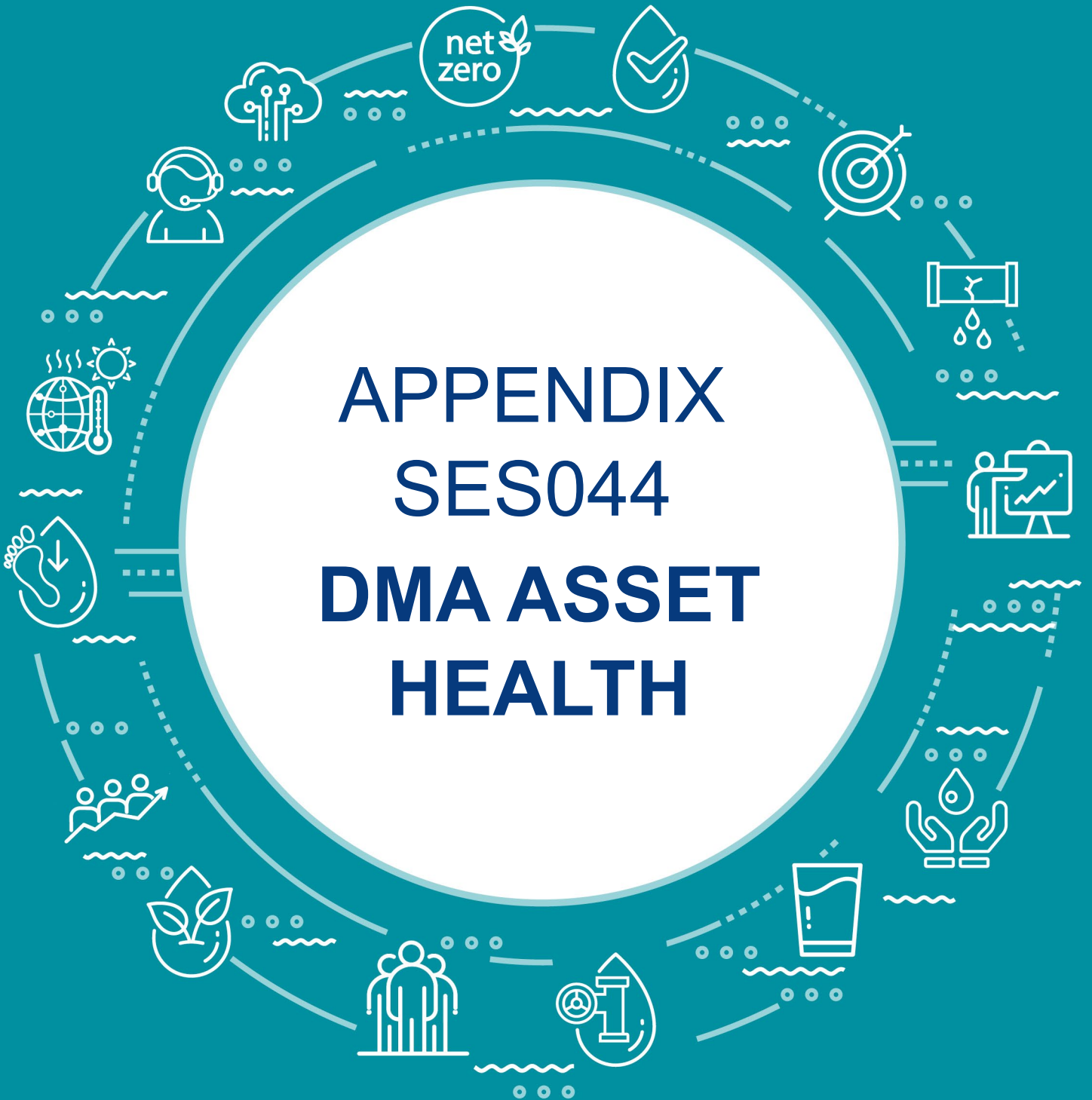


**APPENDIX  
SES044  
DMA ASSET  
HEALTH**

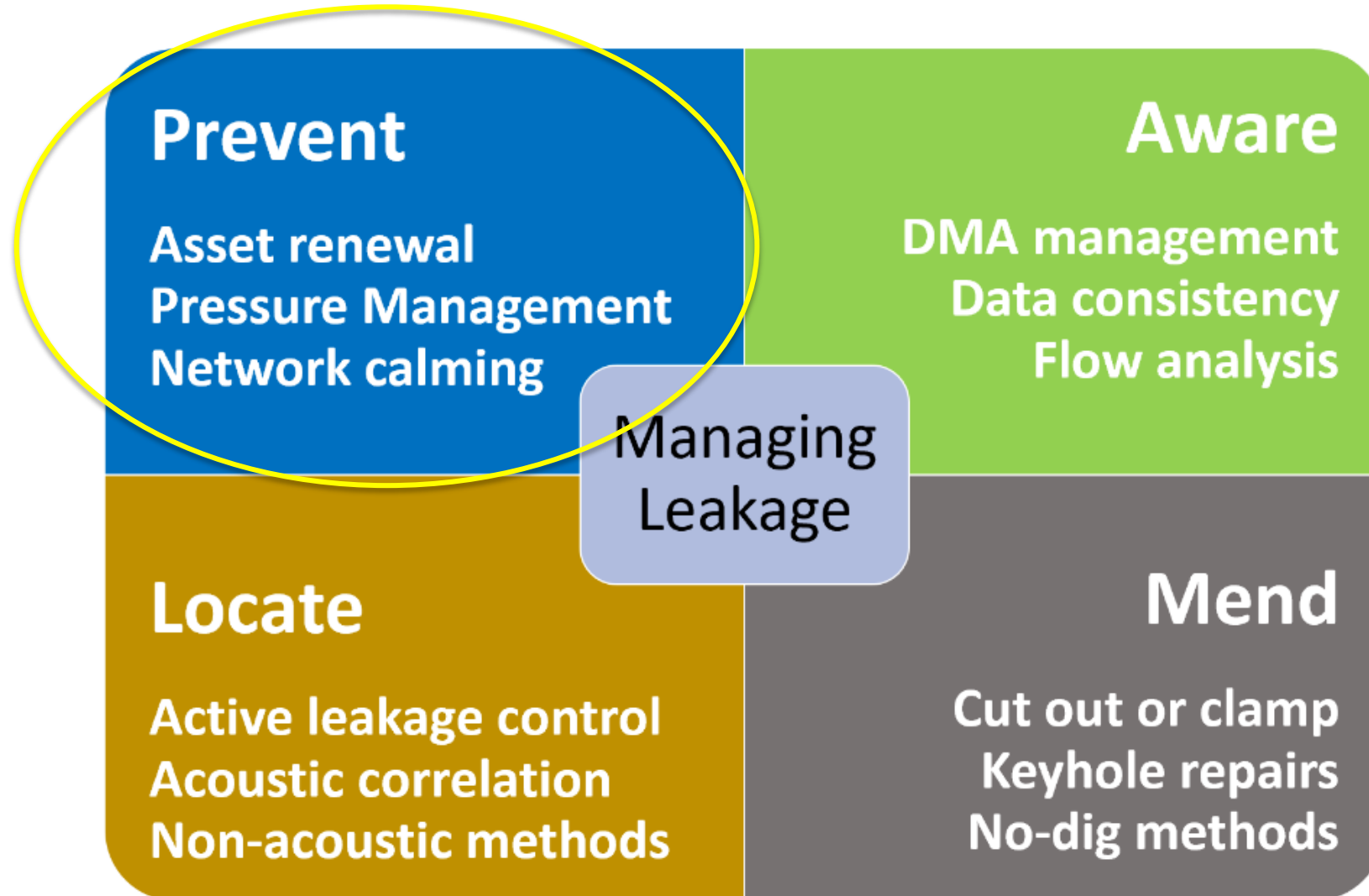




# DMA

## Asset Health

**Principles for PR24 Submission**



# Project Principles

Never renew a main  
without condition  
assessing it

Think long term

Be data-led in  
Network asset  
management

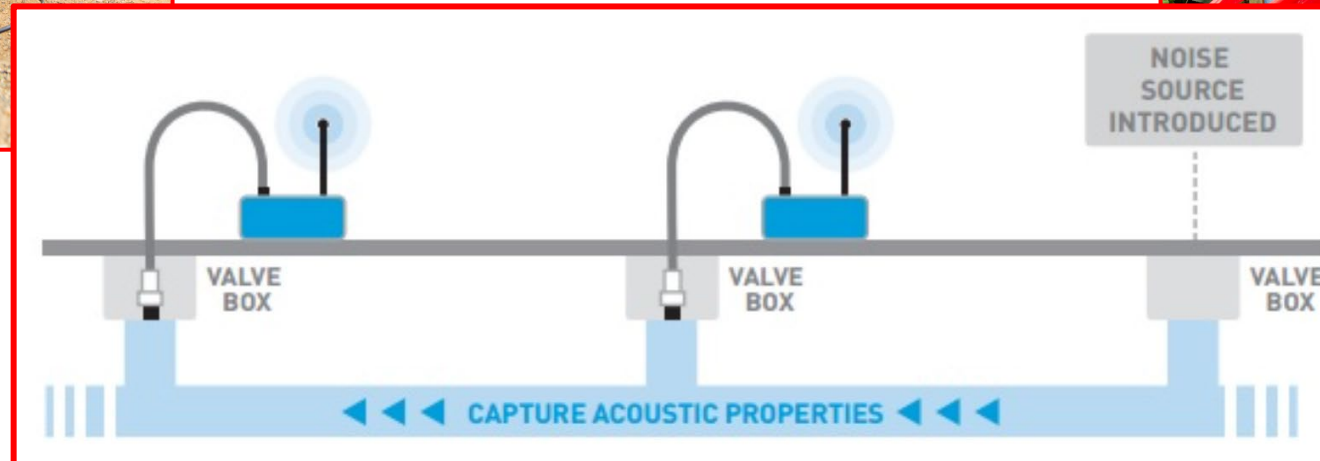
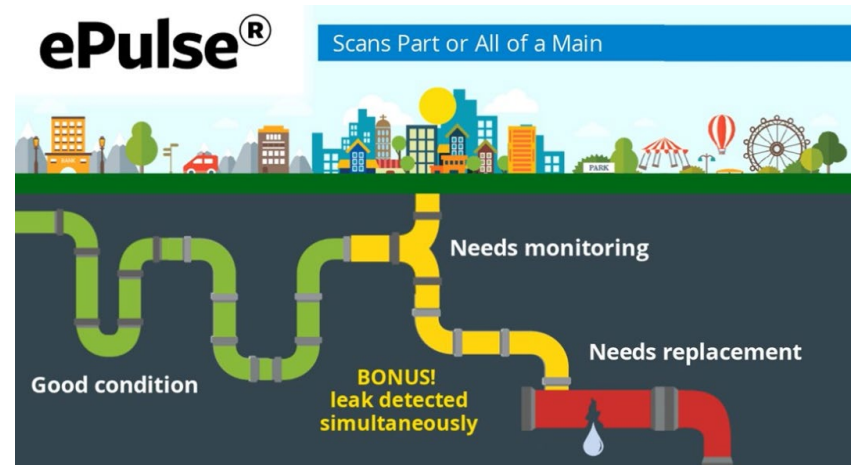
Maximise  
useable life of  
mains



**DMA**  
Asset Health

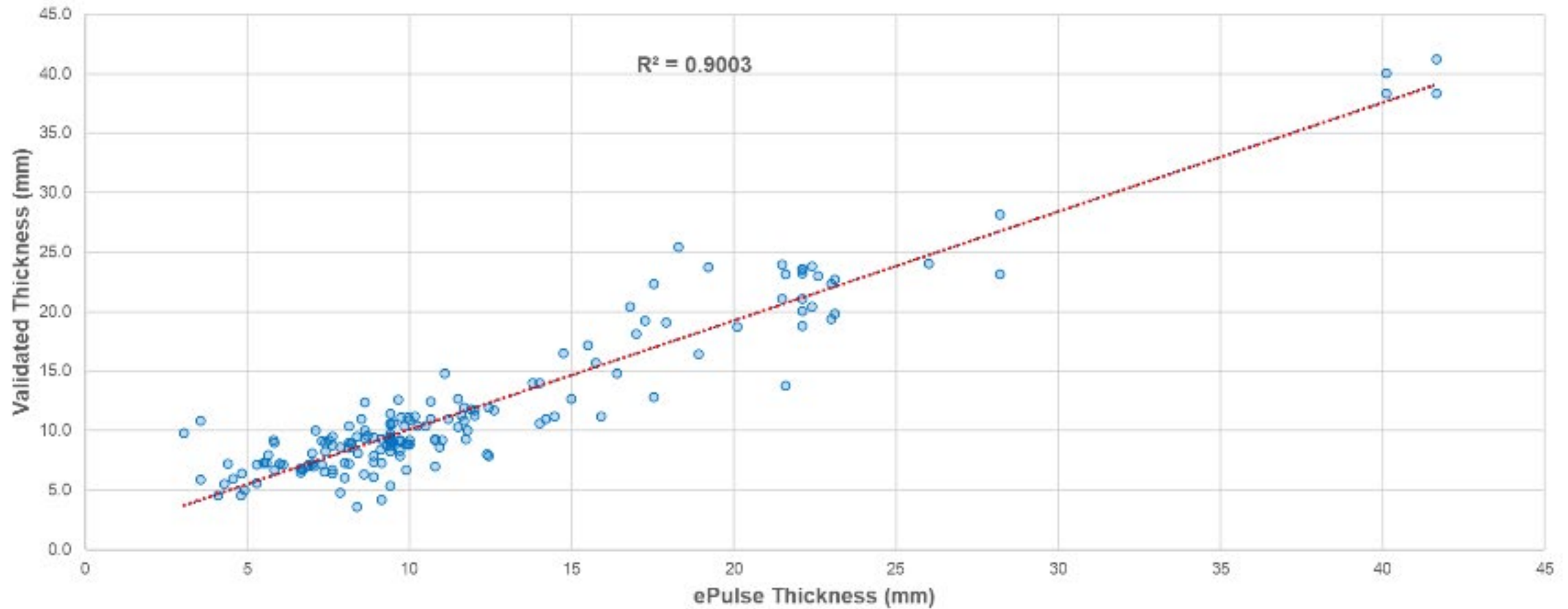
Prevent failures  
before they  
happen

# ePulse Condition Assessment

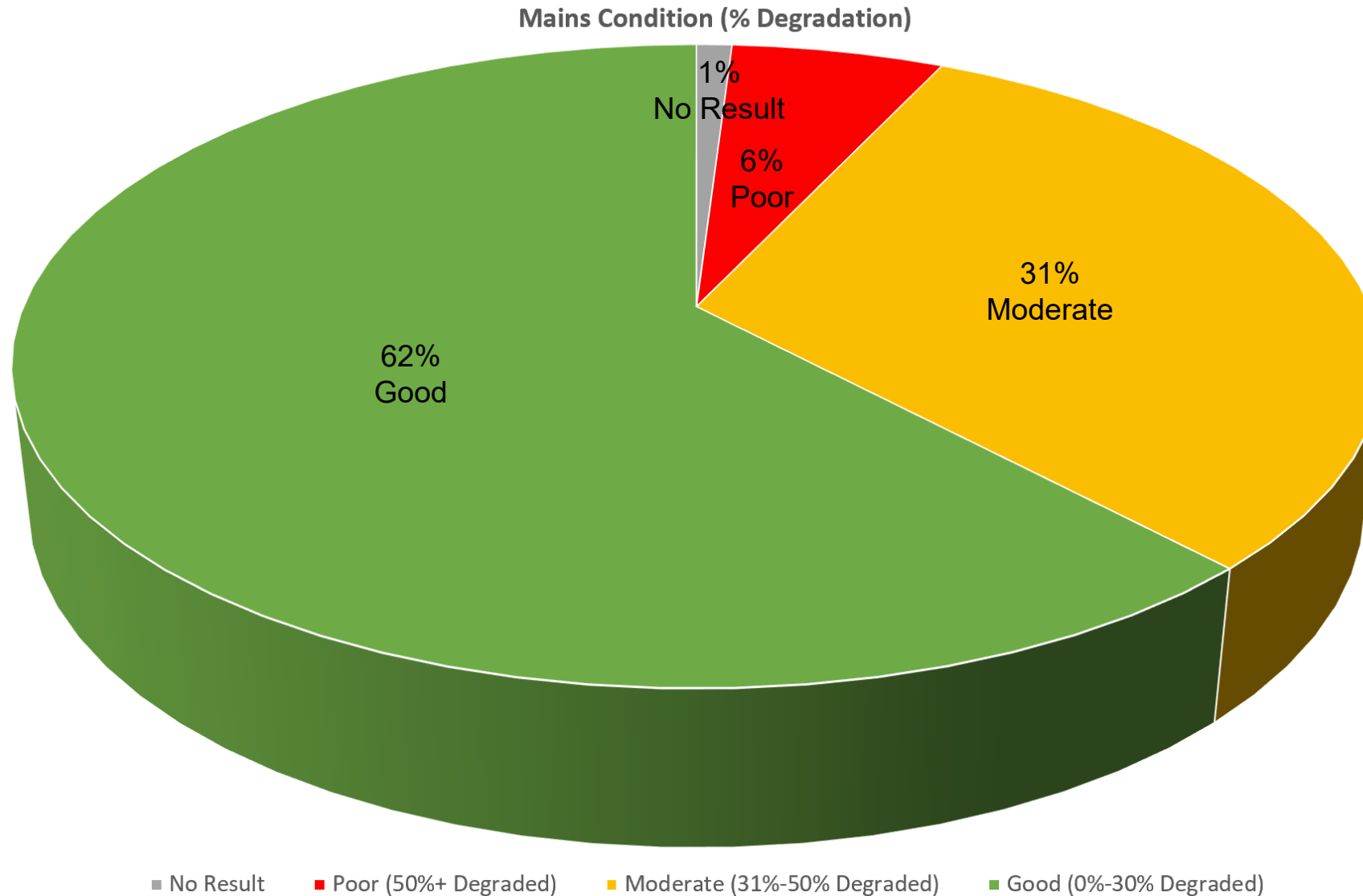


# Results Validation

ePulse Validation Results - All Materials



# Degradation & Condition



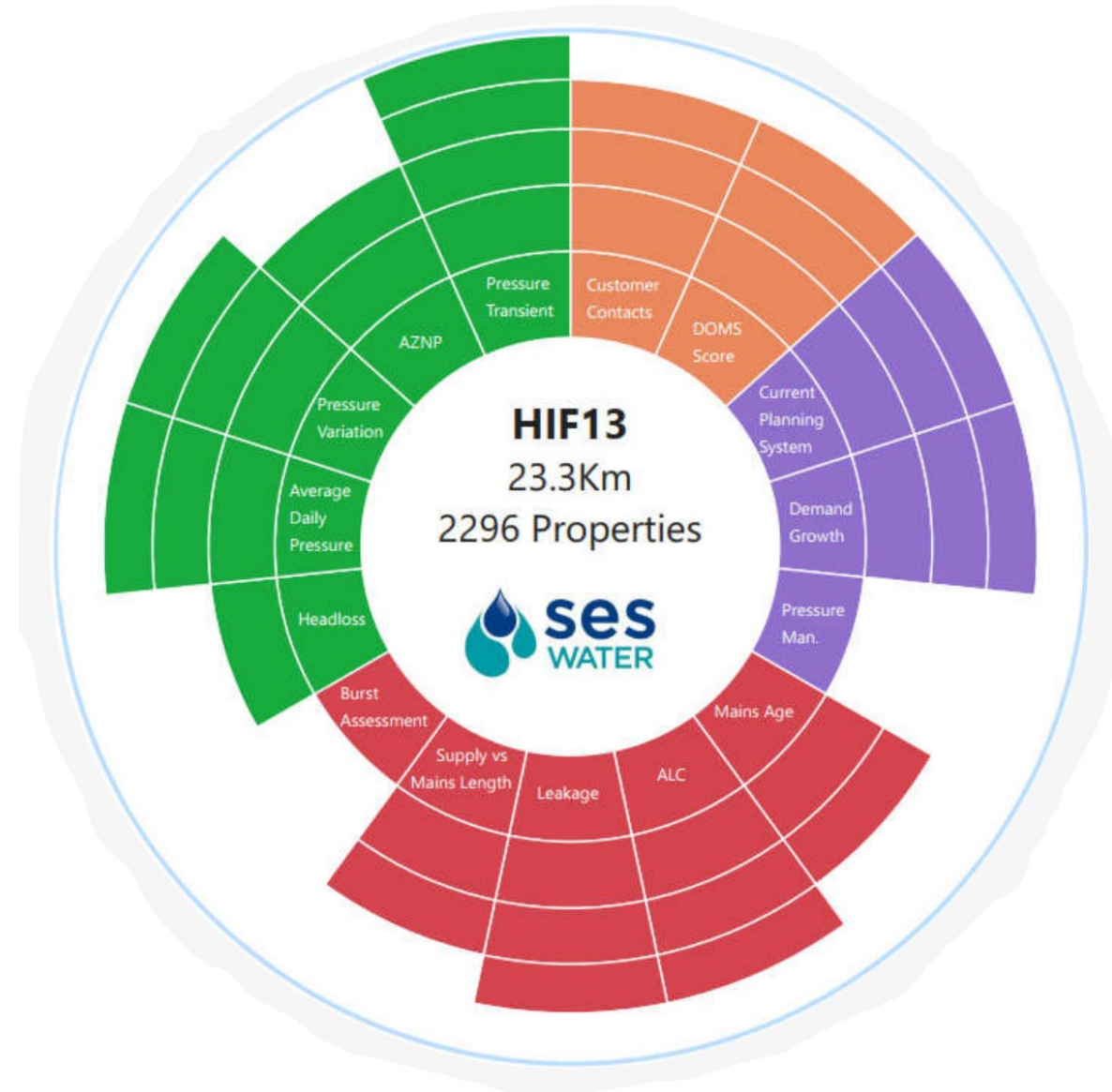
# Holistic DMA Health Check



Burst Records	Customer Contacts	Echologics Results	Mains Attributes
DMA Boundaries	WQ Sampling	DMA Flow & Pressure data	Traffic / Road Works Information
Demand Analysis	Pressure Logging	Existing Asset Performance	DOMS score
Network Model Calibration	Weather Data	Deterioration Model Outputs	Pressure Management Studio
Hydraulic Performance	Growth Assessment	Asset Maintenance & Repairs	Operational Knowledge



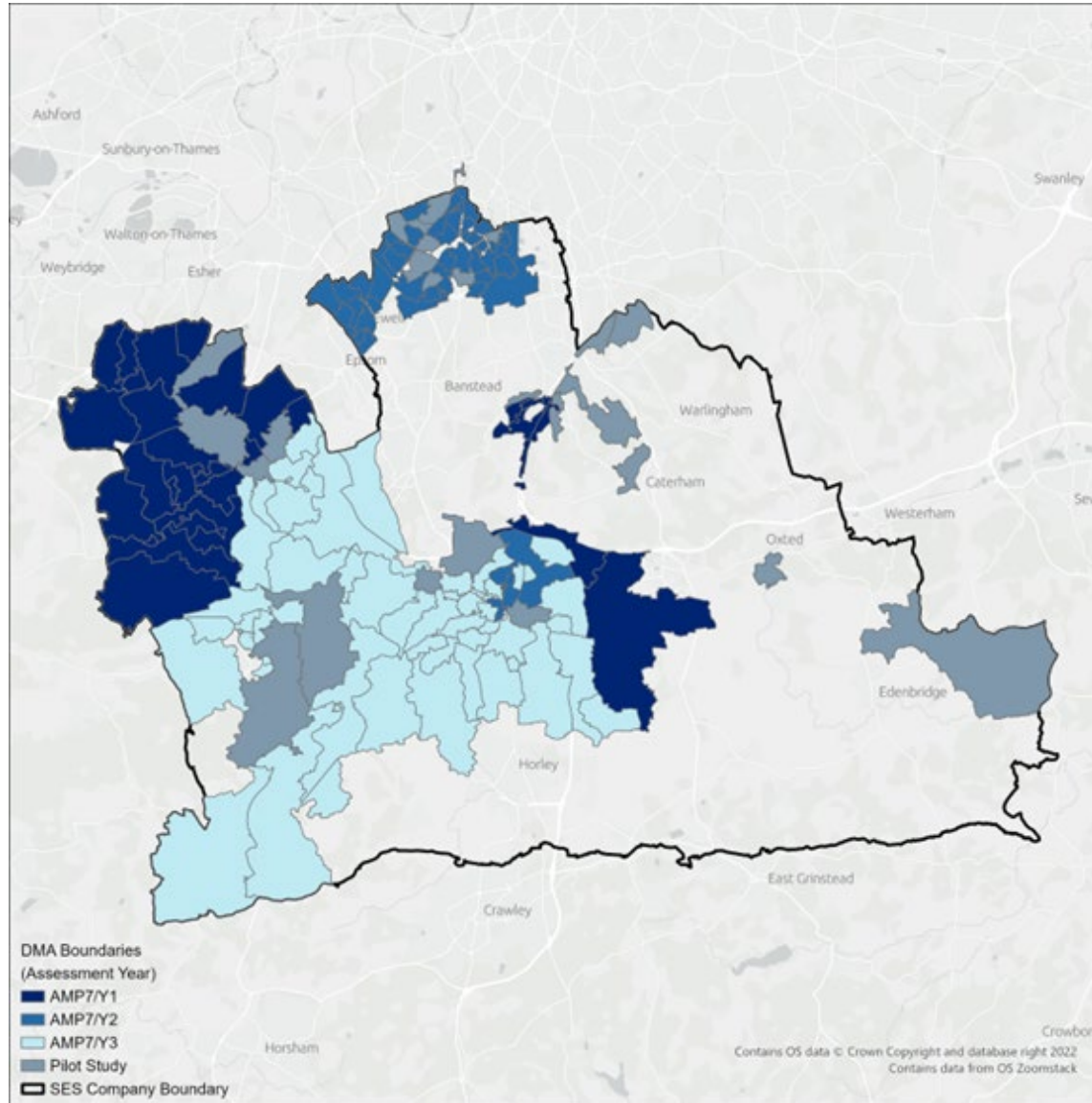
# Mains Scoring



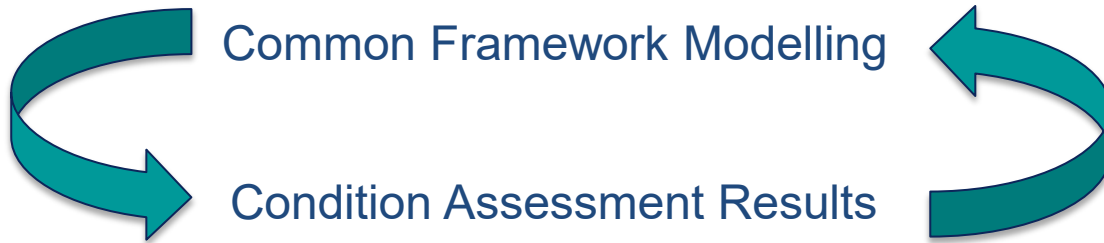
# DMA Scoring



# Completed so far



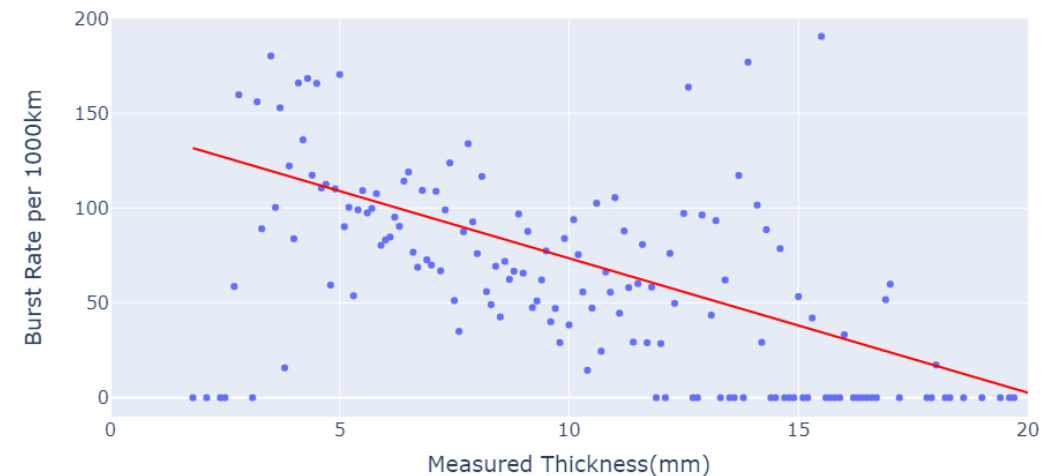
# Continual Improvement



## ENHANCED OUTPUTS

*“We compared Measured Thickness to the predicted burst rate from the existing burst models (used for PR19), to check how well the existing burst models capture failure rate. The existing burst models use pipe attributes and environmental factors to predict the failure rate for each pipe. We found that a significant part of the relationship between condition and failure rate wasn’t captured by the existing models. Therefore we expect a **significant improvement** in the model performance from the addition of the condition assessment data.” – Ovarro.*

Burst Rate by Measured Pipe Thickness



Shows a strong relationship between remaining wall thickness and historical burst rate, indicating clearly that **pipes with a greater measured thickness have a lower burst rate.**

# DMA Asset Health Progress

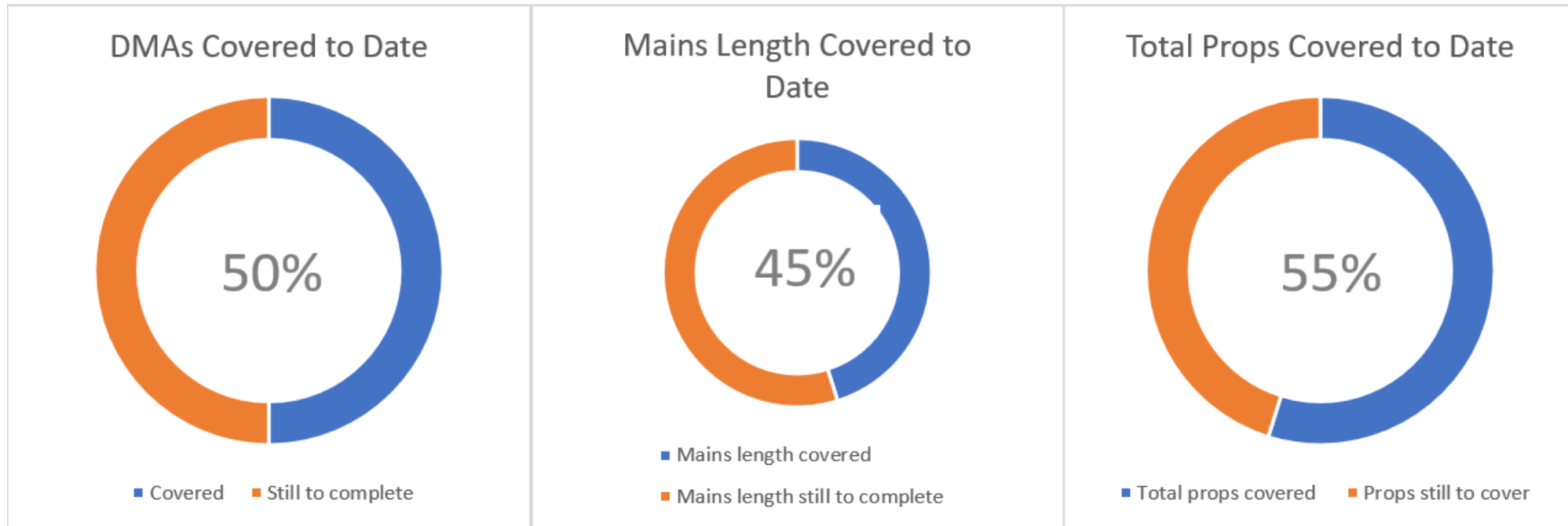


We have completed the largest study of measured condition assessment ever, worldwide. We have used this data as part of a holistic health assessment in over half of our supply network.

Year Undertaken DMAs	
Pilot Study	28
Year 1	35
Year 2	44
Year 3	48

Total Mains Length Covered (km)	
	1584.5
	45%

Total Props Covered	
	163918
	55%



# Leakage Saving Potential



Pressure Management Potential		Asset Renewal Potential	
Zone	PM Potential (MI/d)	Zone	AR Potential (MI/d)
Alderstead	0.029	Alderstead	0.012
Bookham	0.000	Bookham	0.000
Box Hill	0.017	Box Hill	0.001
Caterham	0.000	Caterham	0.005
Dunley Wood	0.000	Dunley Wood	0.000
Effingham	0.108	Effingham	0.011
Headley	0.130	Headley	0.017
Highlands Farm	0.090	Highlands Farm	0.003
How Green	0.070	How Green	0.000
Kent Hatch	0.023	Kent Hatch	0.002
Langley Park	0.713	Langley Park	0.062
Margery Tower	0.018	Margery Tower	0.001
Puddledock	0.030	Puddledock	0.005
Robbing Gate	0.000	Robbing Gate	0.009
Salfords	0.052	Salfords	0.005
Tillingdown	0.001	Tillingdown	0.002
Tower Hill	0.069	Tower Hill	0.013
Tyrells Wood	0.000	Tyrells Wood	0.000
Warlingham	0.000	Warlingham	0.003
	<b>1.349</b>		<b>0.149</b>

<b>Estimated Leakage in DMAs Covered:</b>	13.15 MI/d
<b>Pressure Management Leakage Potential:</b>	1.35 MI/d
<b>Asset Renewal Leakage Potential:</b>	0.15 MI/d*
<b>Combined Leakage Potential:</b>	1.5 MI/d



Average Leakage Saving Per DMA:

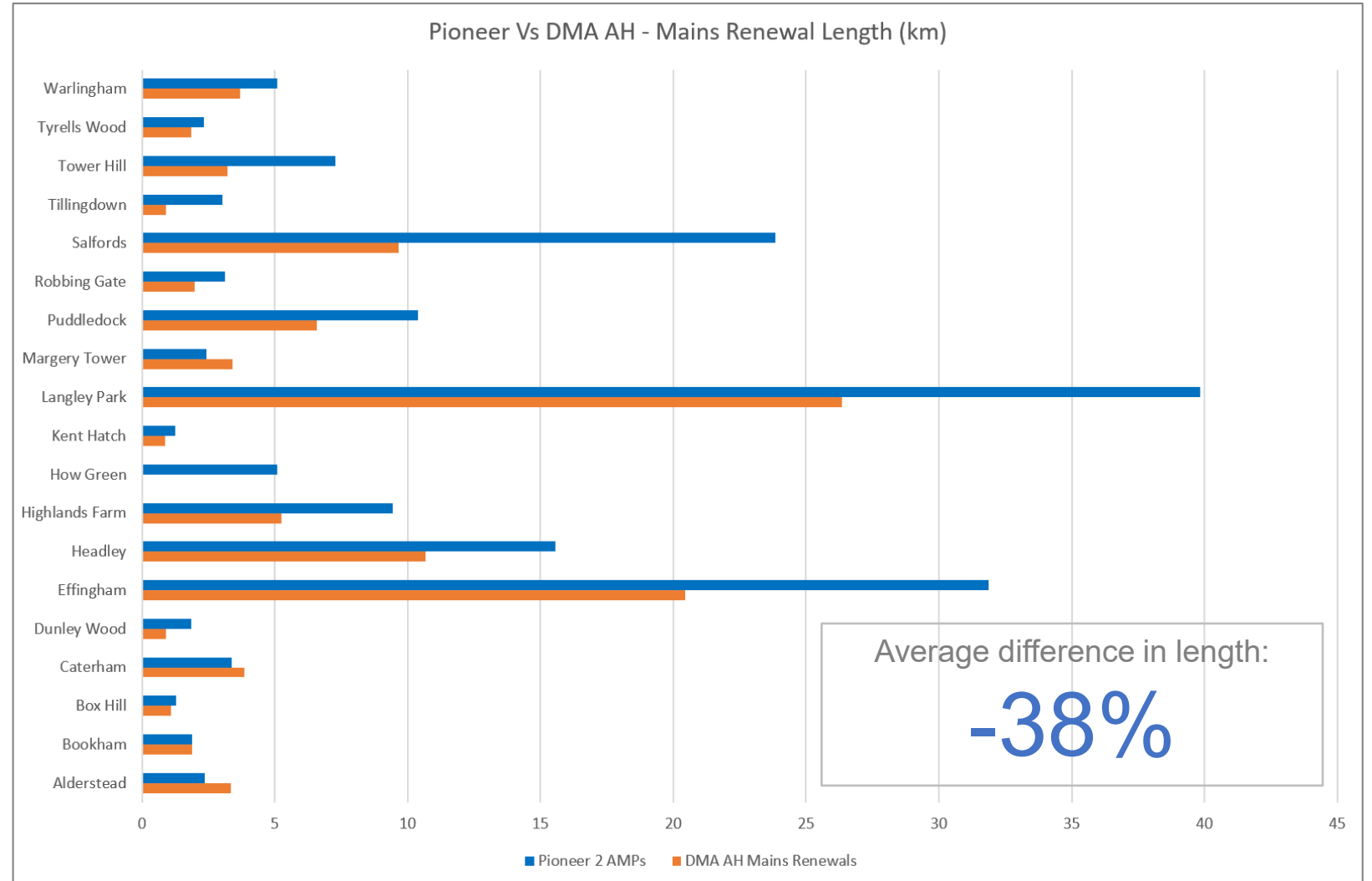
# 11%

\*Our estimates of leakage reduction from asset renewal are based on historic industry evidence. We think it is a very conservative estimate based on previous inefficiencies in scheme targeting and we feel that the efficiencies realised through the DMA AH approach will deliver far better value mains renewal schemes, delivering more leakage savings per m replaced than in previous years. We reflect this optimism in our leakage reduction plan but will use AMP8 to thoroughly track the benefits in well targeted schemes ahead of our enhanced leakage targeted renewal programme beginning in AMP9.

# Changing how we target mains for renewal

Based on over half of our network having now been surveyed:

- The length of mains recommended for replacement using the DMA Asset Health method is on average **38% less** than the Common Framework approach (Pioneer) recommends. This represents a considerable saving in cost and disruption to customers
- But this reduction is not uniform and in some zones we see increased renewal proposed. These former 'blind spots' will offer crucial benefits in leakage and network resilience, which we have factored into our plan.
- We will use this new approach, data and knowledge to better target our base level of asset renewal in AMP8 (testing the benefits to tune tune our models as we do so)
- From AMP9 we will start an enhanced leakage driven asset renewal programme as a central part of our leakage reduction plan.



# Next steps

We strongly believe that our method is an exemplar for how network supply assets should be managed in the future. We are committed to continuing to follow this path and in doing so will achieve the following:

We have built a robust and well evidenced case for an enhanced mains renewal programmes at PR24 and beyond.



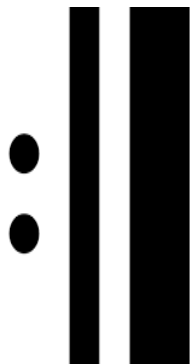
Continue to work with our partners and the wider industry on R&D and other collaborative work to better understand the mechanics of pipe deterioration.



Demonstrate smooth investment profiles - managing risk, cost & performance



Carry out repeat condition surveys to tell us the rate of deterioration and further inform intervention strategies.



Become a positive disruptor to the industry.



Improve the Common Framework Model in the short term and deduce dependency on it in the long term

