

Helps to Address	The Toolbox (Basic)	Cost Range
Data Validity, Data Results Out of Range	1 - Validation of supply & consumption volumes; Look for Data Grade Improvements	Low-Mid
Validity, Billed Unmetered Use, Unbilled Unmetered Use	2 - Estimating and tracking unmetered use	Low
Validity	3 – Master Meter Annual Testing Program	Low - Mid
Validity; Other Benefits Related to Asset Inventory & Management	4 – Mapping the System	Low - Mid
Authorized, Unbilled usage	5 – Review Policies & Procedures for unbilled customers	Low
Authorized, Unbilled Use	7 - Installing meters on unmetered connections	Mid
Unbilled unmetered	6 - Unidirectional flushing program	Low
Customer metering inaccuracy	8 - Meter testing & replacement	Mid-High
Unauthorized Use	9 - Theft Deterrence	Low - Mid
Systematic Data Handling Errors	10 - Billing system audit	Low-Mid
Real Losses	11 – Collecting & Analyzing Break Data	Low
Real Losses	12 - Improve speed/quality of repairs	Low
Real Losses	13 - Locate & eliminate pressure transients (surges, water hammer)	Low-Mid
Real Losses	14 – Night Flow Analysis	Mid
Real Losses	15 - Reduce peak and overall pressure	Mid-High
Real Losses: Leakage on Mains	16 – Main Replacement	High
Real Losses: Leakage on Services	17 – Service Replacement	Mid - High
Real Losses: Unreported Leaks	18 - Acoustic leak survey	Mid
Real Losses: Overflows and Leakage on Storage Tanks	19 – Tank Management, Data Collection, & Inspection	Low

# TOOLS FOR TYPES OF PIPE LOSSES

The Toolbox (Basic)	Type of Real Loss Addressed	Cost Range
11 – Collecting & Analyzing Break Data	Reported Leaks	Low
12 - Improve speed/quality of repairs	Hidden Leaks, Reported Leaks	Low
13 - Locate & eliminate pressure transients (surges, water hammer)	Unavoidable Leaks, Hidden Leaks, Reported Leaks	Low-Mid
14 – Night Flow Analysis	Unavoidable Leaks, Hidden Leaks	Mid
15 - Reduce peak and overall pressure	Unavoidable Leaks, Hidden Leaks, Reported Leaks	Mid-High
16 – Main Replacement	Unavoidable Leaks, Hidden Leaks, Reported Leaks	High
17 – Service Replacement	Hidden Leaks, Reported Leaks	Mid - High
18 - Acoustic leak survey	Hidden Leaks	Mid