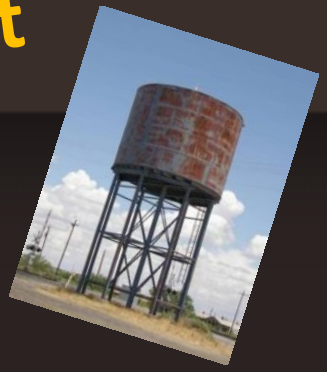
An Introduction to Strategic Water Loss Reduction

Webinar 3: Strategically Applying Water Loss Reduction Strategies

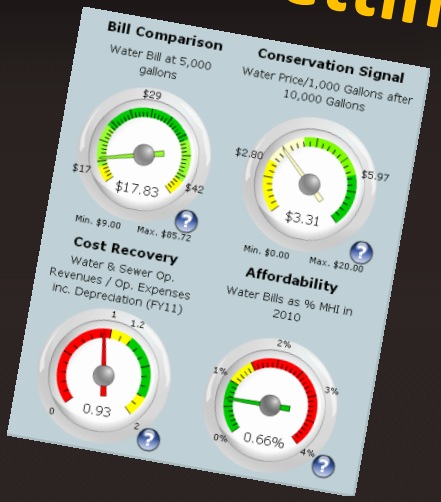
Topic Areas

Asset Management



Water Loss

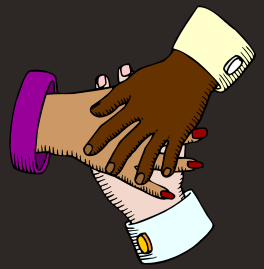
Fiscal Planning and Rate Setting



Energy Efficiency

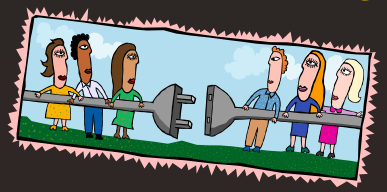
Multiple Funding

DW SRF



CDBG

Regional Collaboration



USDA RD

WELCOME TO THE EFCN WATER LOSS WEBINAR SERIES

AN INTRODUCTION TO
Strategically Applying Water Loss Reduction Strategies

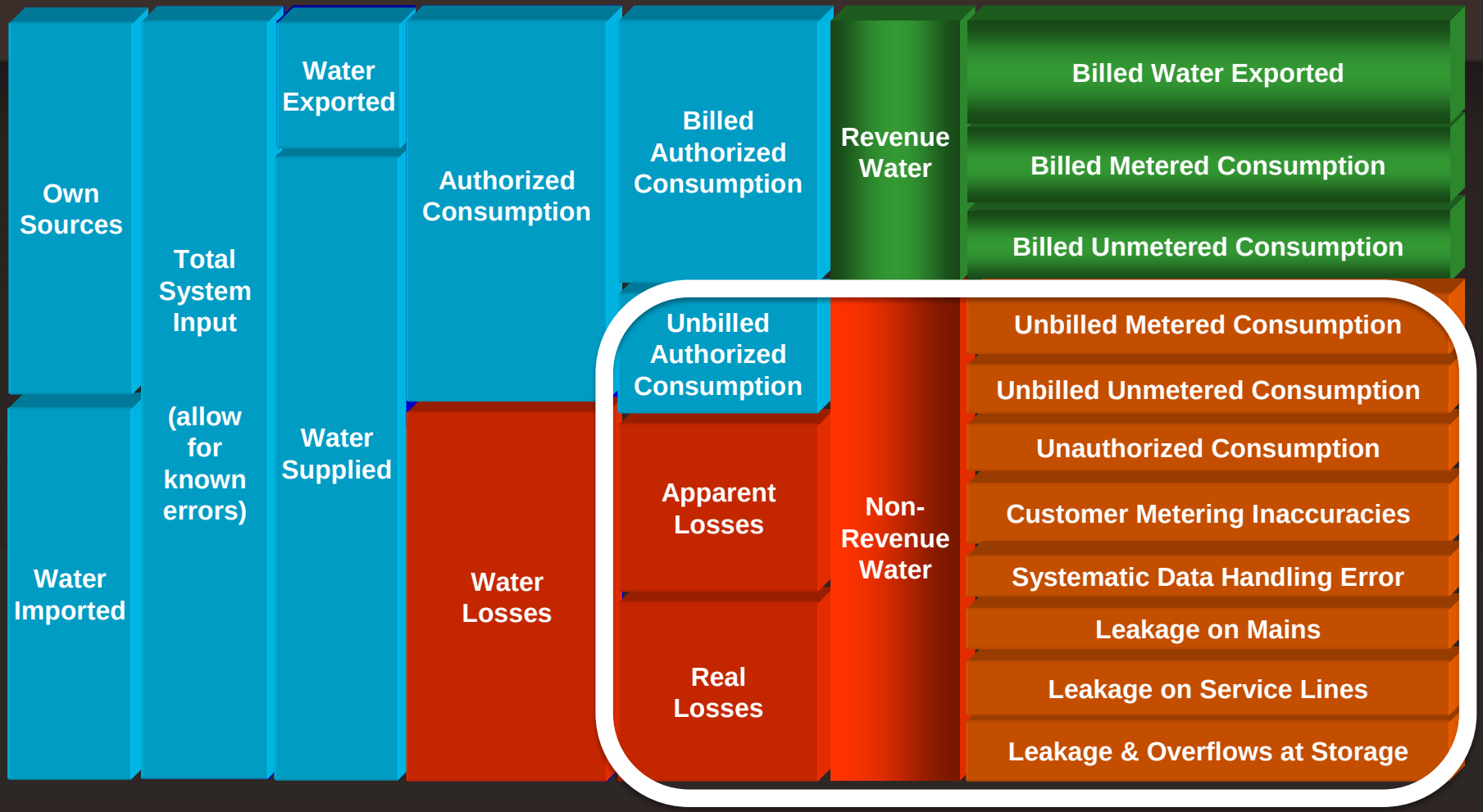
TIME FOR A QUICK REVIEW

“WATER LOSS” VALUE IS MORE THAN JUST WATER LEAKING FROM THE SYSTEM

THE VALUE REPRESENTS: NON-REVENUE WATER

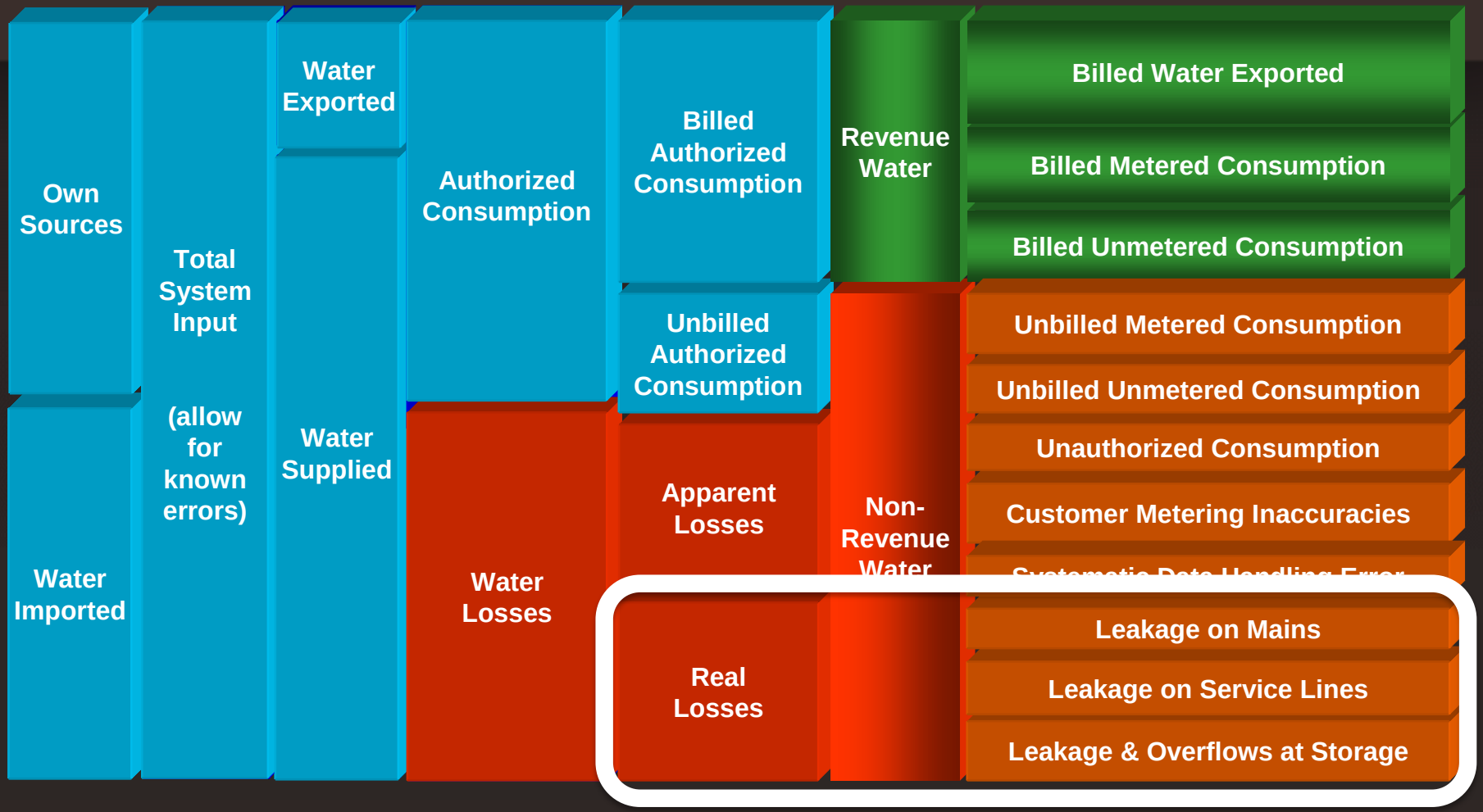
THE WAY WE WANT TO VIEW THE EQUATION

WANT TO ACCOUNT FOR OUR WATER



CATEGORIZING NON-REVENUE WATER

WANT TO ACCOUNT FOR OUR WATER



WEBINAR FOCUS: REAL WATER LOSSES

CATEGORIES OF WATER LOSS

Current Annual Real Losses Represents the total water that's being lost from the system

CATEGORIES OF WATER LOSS

Potential for Real Water Loss Reduction = Current Annual Real Losses - Unavoidable Real Losses

CATEGORIES OF WATER LOSS

Economic Level of Real Losses = Water Loss Reduction that is ECONOMICALLY justified

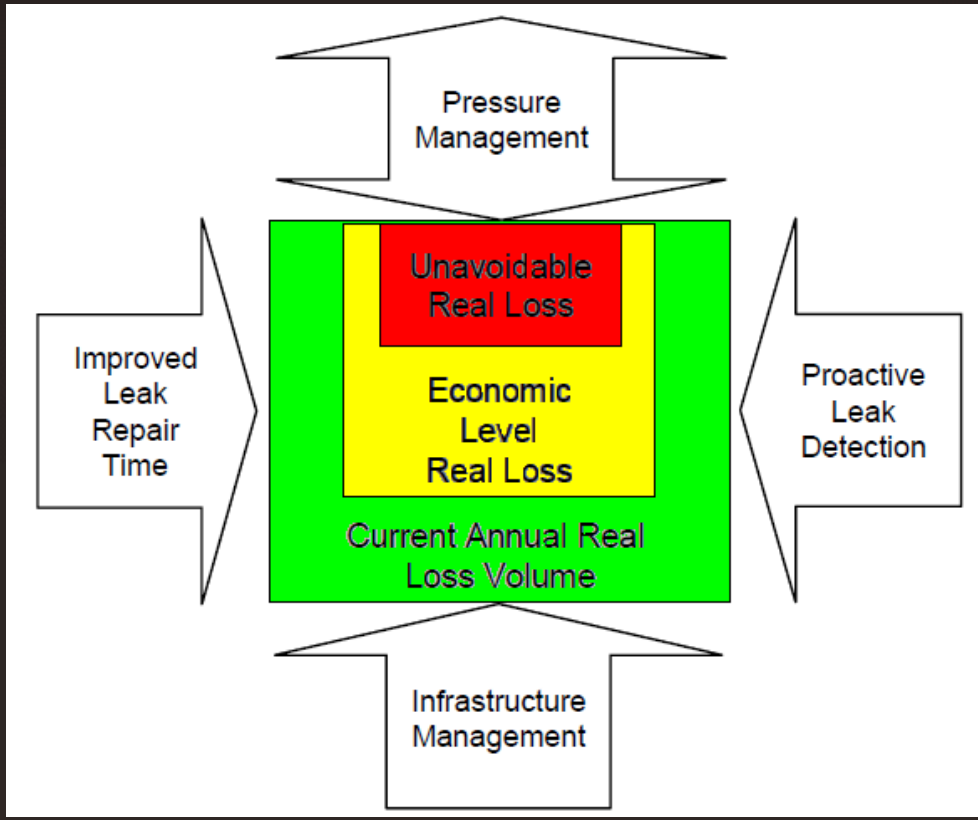
ECONOMIC LEVEL IS VERY SYSTEM SPECIFIC

ECONOMIC LEVEL IS VERY SYSTEM SPECIFIC

Addressing Real Losses

Ways to reduce losses

1. Respond faster to known leaks
2. Asset Management
3. Reduce pressure
4. Find hidden leaks



WE NEED TO STRATEGICALLY DEPLOY THE APPROACHES

APPROACHES SHOULD MATCH THE SPECIFIC ISSUES OF THE SYSTEM

THE CAPABILITIES & EQUIPMENT RESOURCES OF THE SYSTEM MUST BE CONSIDERED

THE QUANTITY OF FUNDING AVAILABLE FOR WATER LOSS REDUCTION WILL IMPACT WHAT CAN BE DONE

THE SPECIFIC SYSTEM INFRASTRUCTURE MUST BE TAKEN INTO ACCOUNT

THE SCARCITY OF WATER RESOURCES NEEDS TO BE CONSIDERED

THE GOALS OF THE SYSTEM NEED TO BE TAKEN INTO ACCOUNT

GATHER DATA TO ASSESS THE NATURE OF THE PROBLEM

- RESULTS OF WATER AUDIT
- NUMBER OF BREAKS REPAIRED EACH YEAR
- TYPE OF BREAKS
- PIPE TYPE & SIZE
- LOCATION OF BREAKS (MAP BREAKS)

USE DATA TO CALCULATE ILI

ILI = CARL/UARL

ILI = Infrastructure leakage index
CARL = Current Annual Real Losses
UARL = Unavoidable Annual Real Losses

INTERPRETING ILI VALUES

Doing well

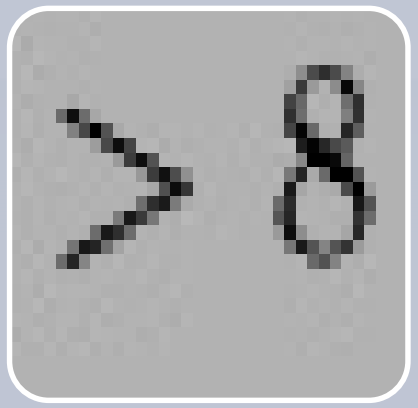
loss reduction may not be cost effective unless resource is scarce

Potential for improvements

consider which methods may be cost effective to reduce losses

Poor leakage control

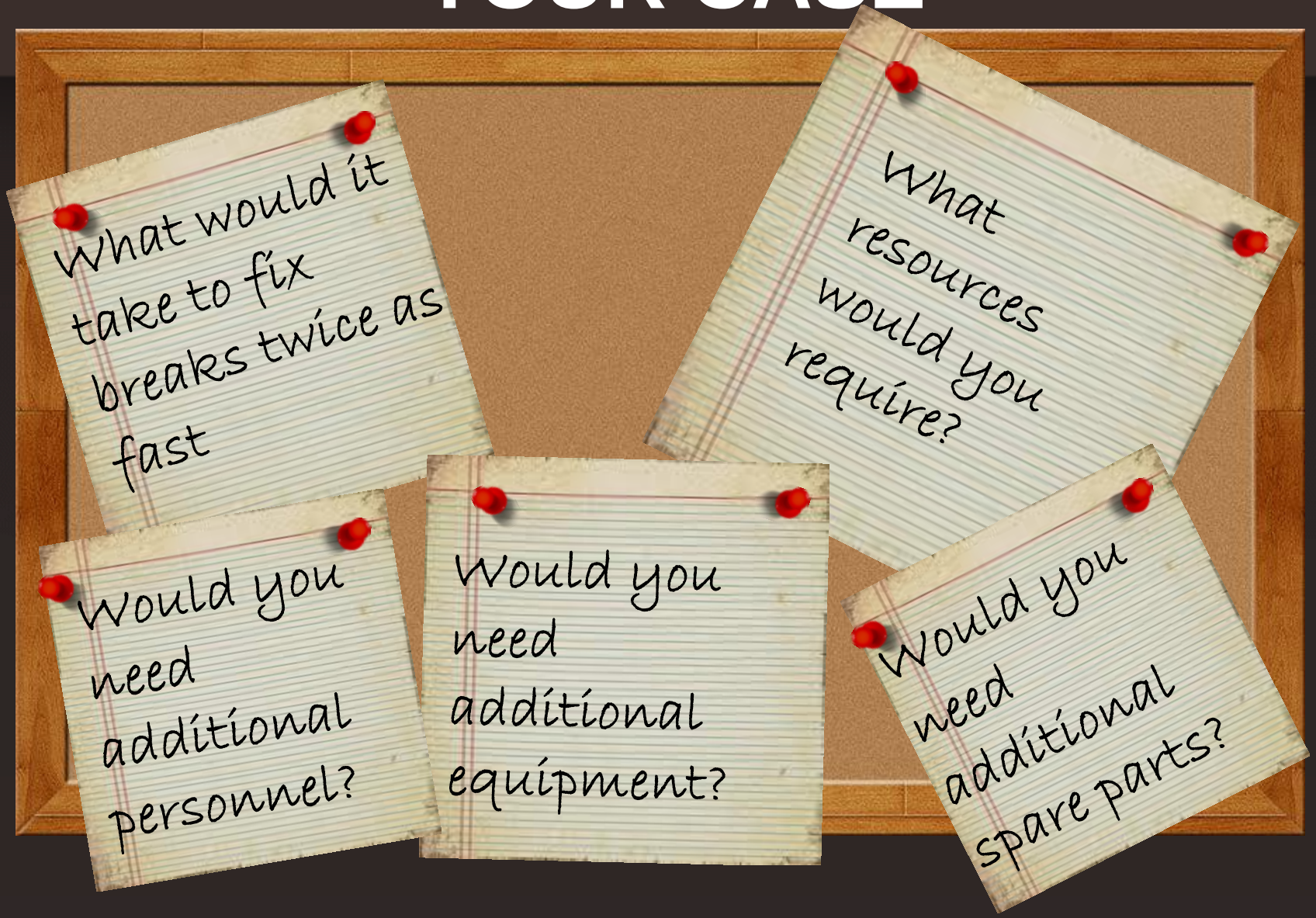
water loss reduction should be very cost effective and is necessary



Extremely inefficient use of water resources water loss reduction should be very high priority activity

1. RESPOND FASTER TO KNOWN LEAKS

COLLECT DATA TO HELP MAKE YOUR CASE



THE CASE FOR MORE RAPID RESPONSE

Costs

Cost of water production

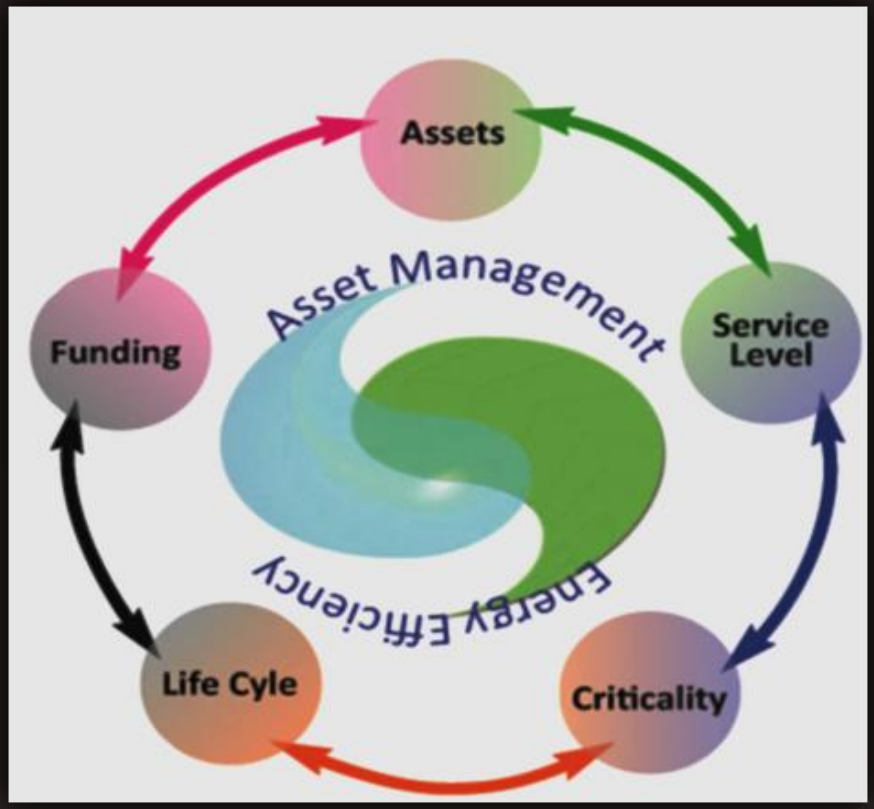
Cost of additional staff
Cost of additional equipment
Cost of any additional resources
Cost of additional spare parts

Benefits

Quantity of water saved as a result of fixing leaks sooner x cost of water production
Savings in terms of reduced catastrophic losses
Social benefits
Other non-economic benefits

THE CASE FOR MORE RAPID RESPONSE

2. ASSET MANAGEMENT



INVENTORY

Good map is best way to collect this information

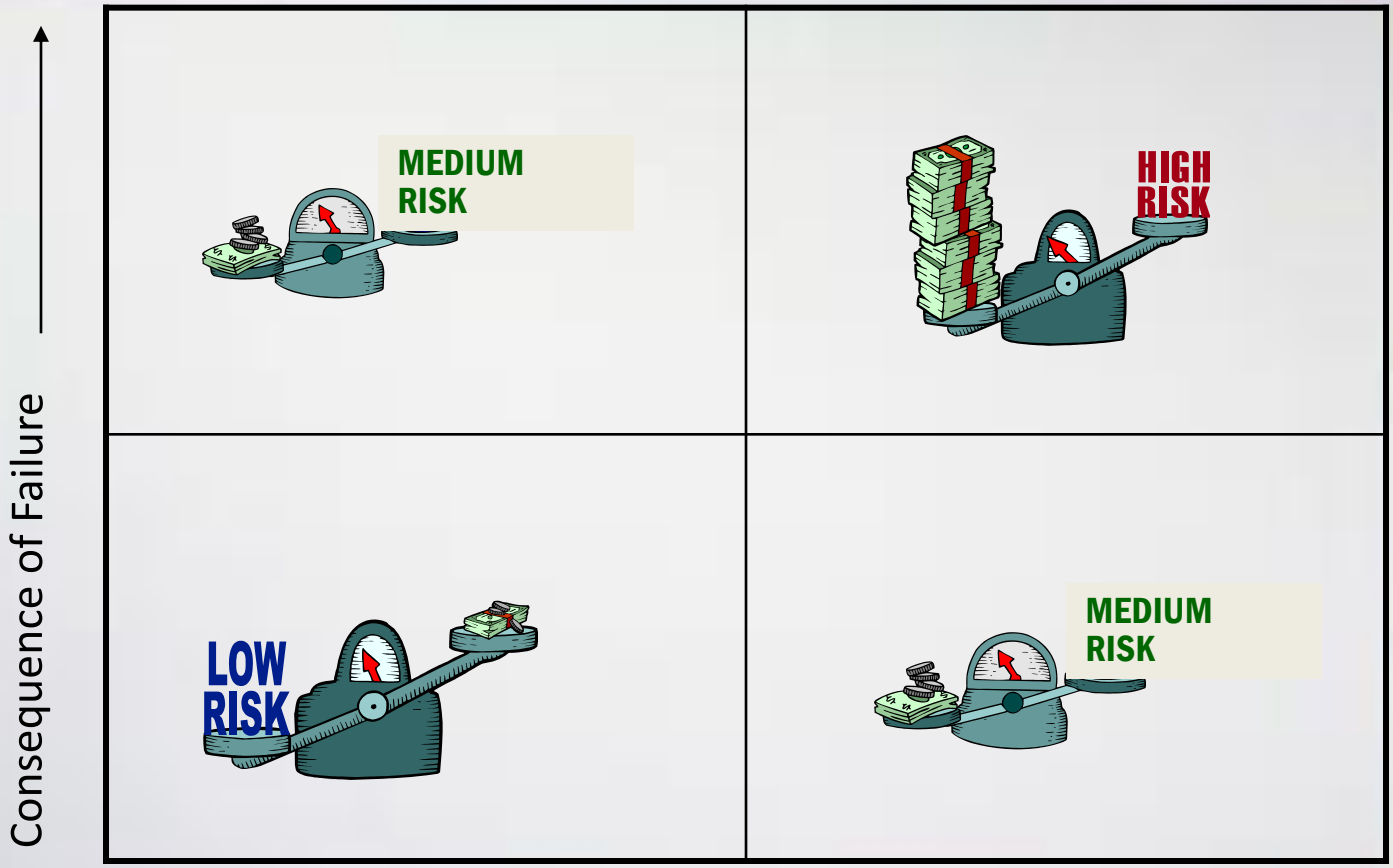
Determine location of pipes, valves, hydrants, meters

ESTABLISH WATER LOSS GOALS

What are you trying to achieve?

What is the target level for each goal?

EVALUATE CRITICALITY OF PIPES & RELATED ASSETS



MAKE DECISIONS ABOUT WHICH PIPE TO REPLACE VS. REPAIR

DEVELOP A FUNDING STRATEGY FOR THE PROGRAM

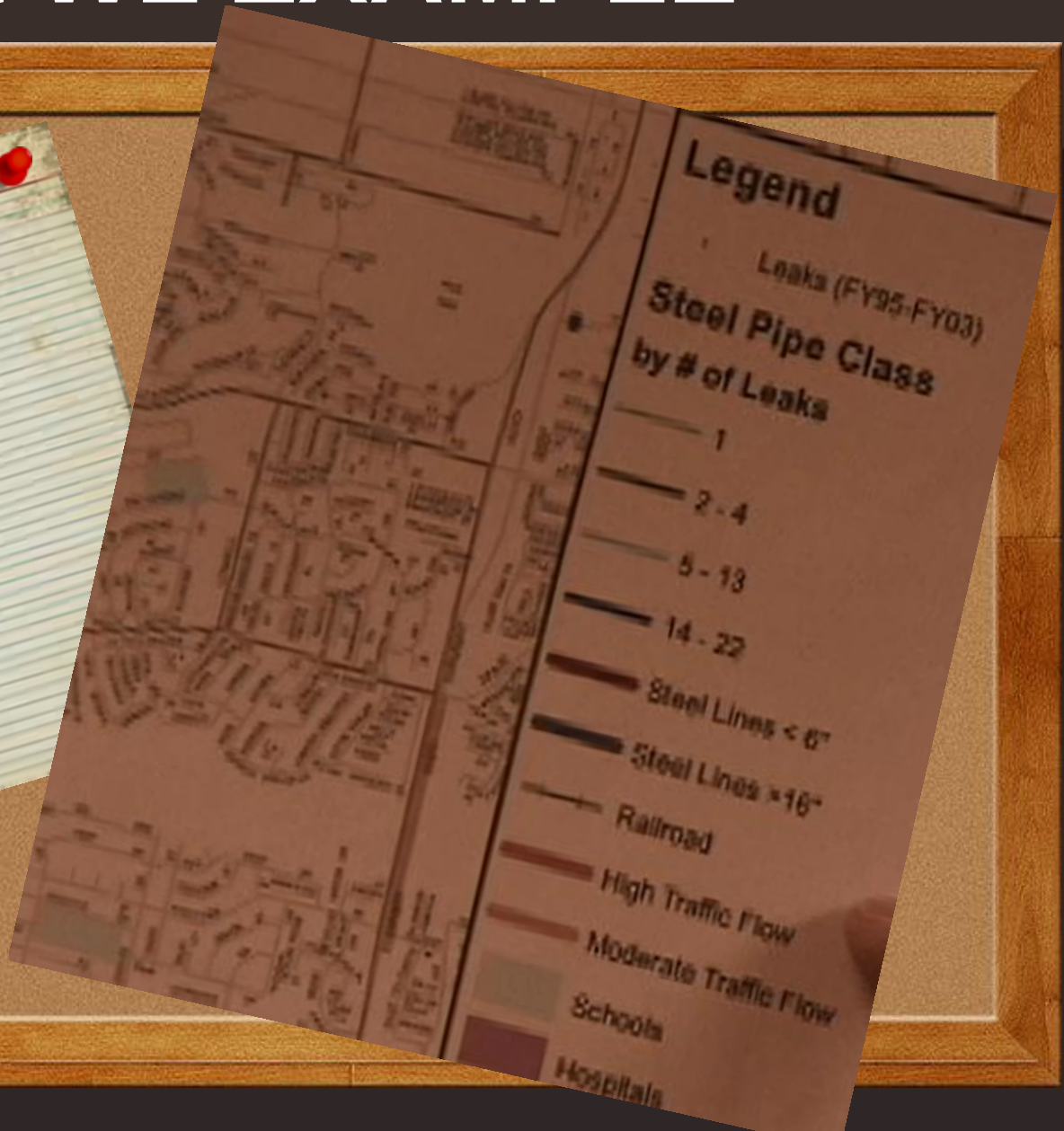
What funding do you need for pipe replacement?

How can projects be phased to fit within available funding?

Is there public support for additional funding for infrastructure replacement?

AM & WL EXAMPLE

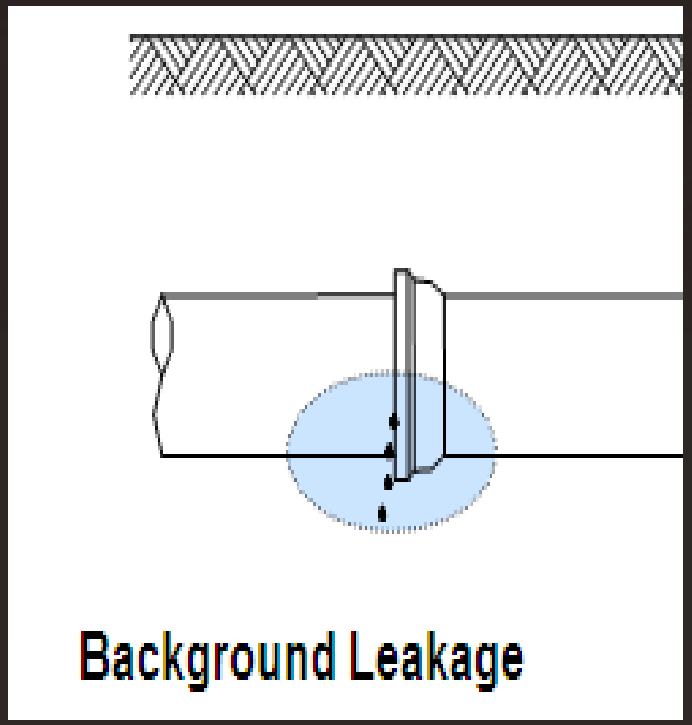
Steel water lines



3. REDUCE PRESSURE

CURRENT SITUATION

QUESTION 1: DO I HAVE A PROBLEM THAT NEEDS TO BE ADDRESSED?



QUESTION 2: IS THERE ANYTHING I CAN DO ABOUT IT?

WHAT IS MY QUANTITY OF UNAVOIDABLE OR BACKGROUND LEAKAGE (UARL)?

Can calculate based on:

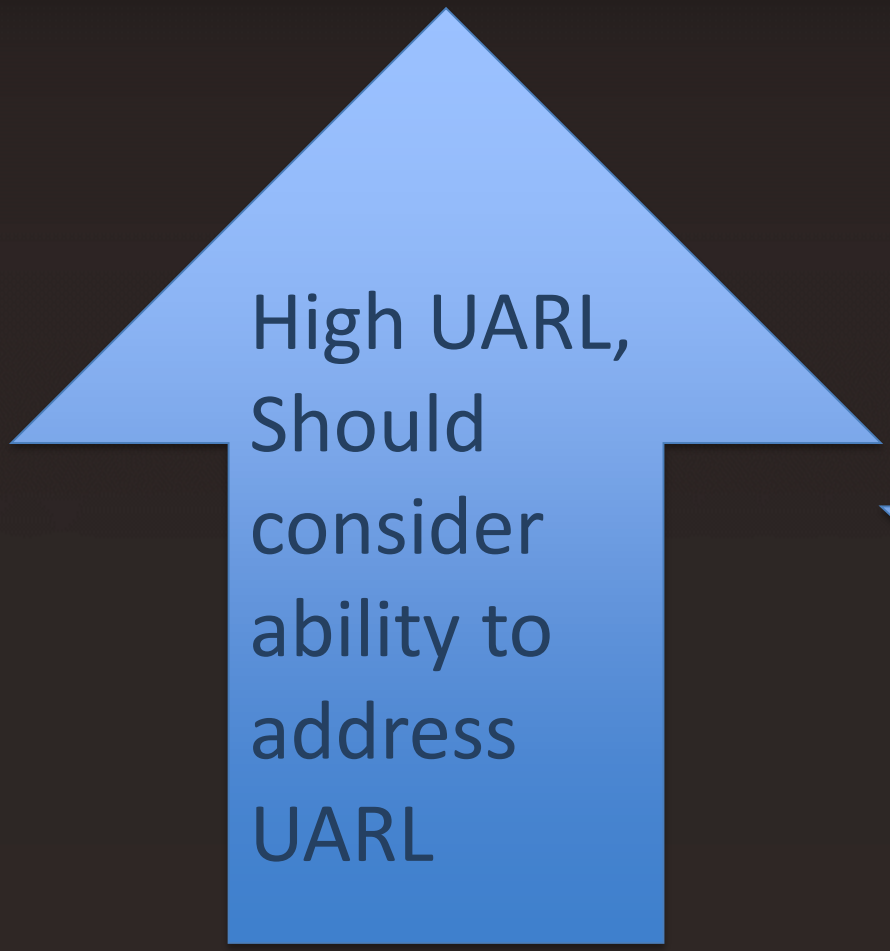
LENGTH OF MAINS

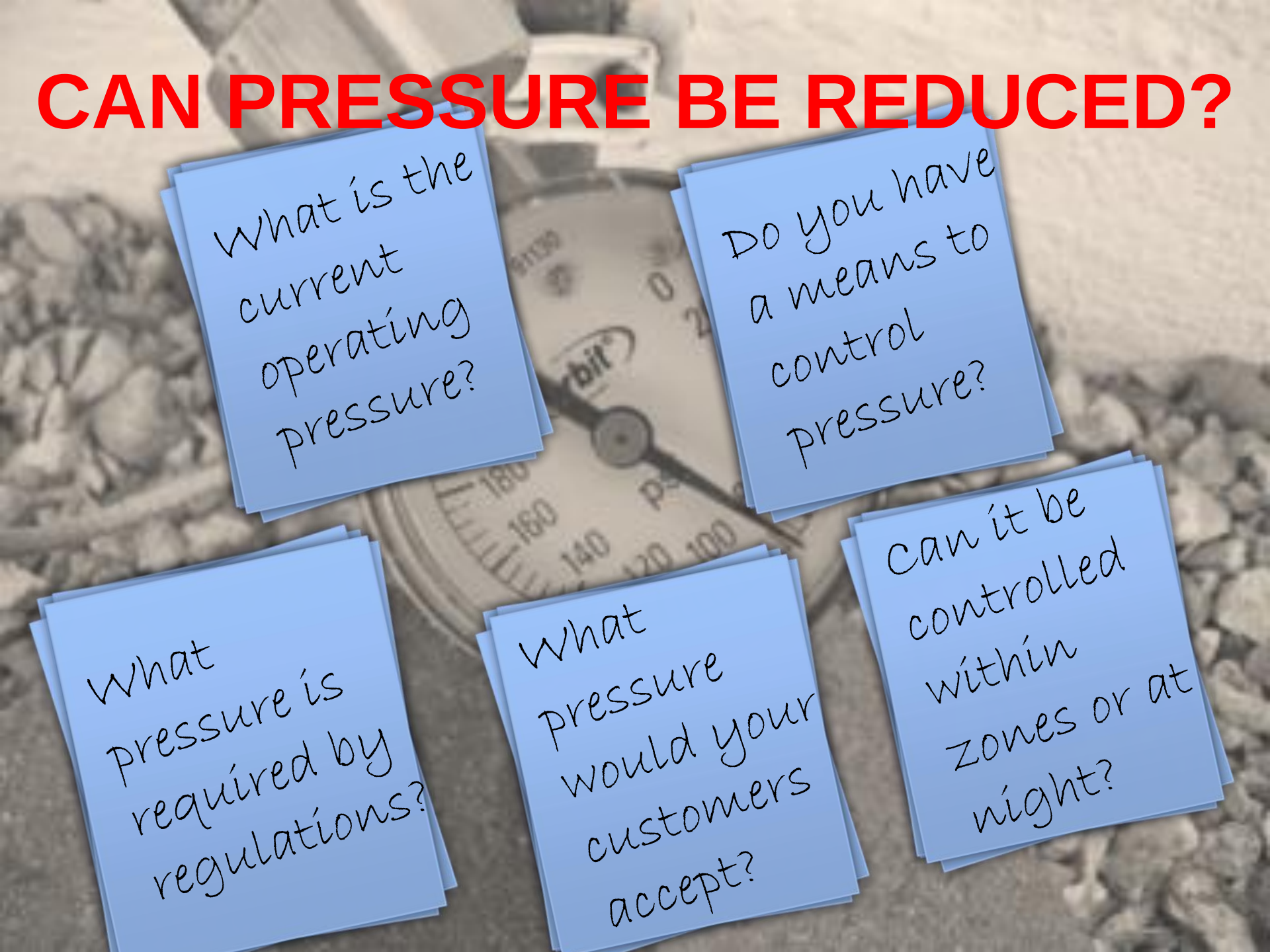
LENGTH OF SERVICE LINES

NUMBER OF CONNECTIONS

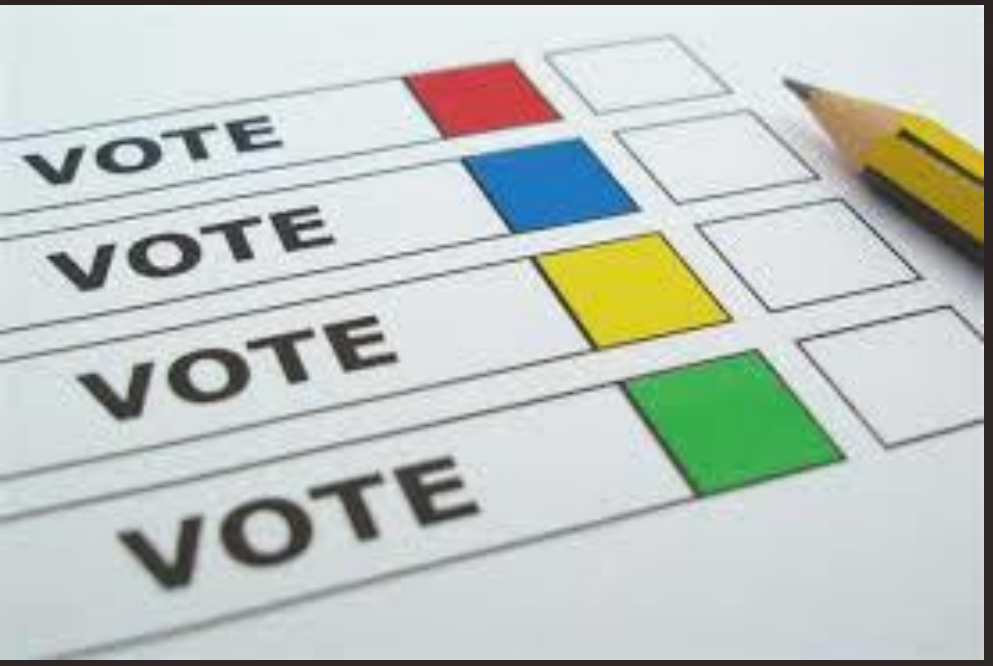
AVERAGE OPERATING PRESSURE

WHEN IS MY UNAVOIDABLE LEAKAGE (UARL) WORTH ADDRESSING?




CAN PRESSURE BE REDUCED?
What is the current operating pressure?
Do you have a means to control pressure?
What pressure is required by regulations?
What pressure would your customers accept?
Can it be controlled within zones or at night?

PRESSURE MANAGEMENT



Do you have a means to control pressure in your system?

4. FIND HIDDEN LEAKS

HIDDEN LEAKS

What are the parameters for your system?

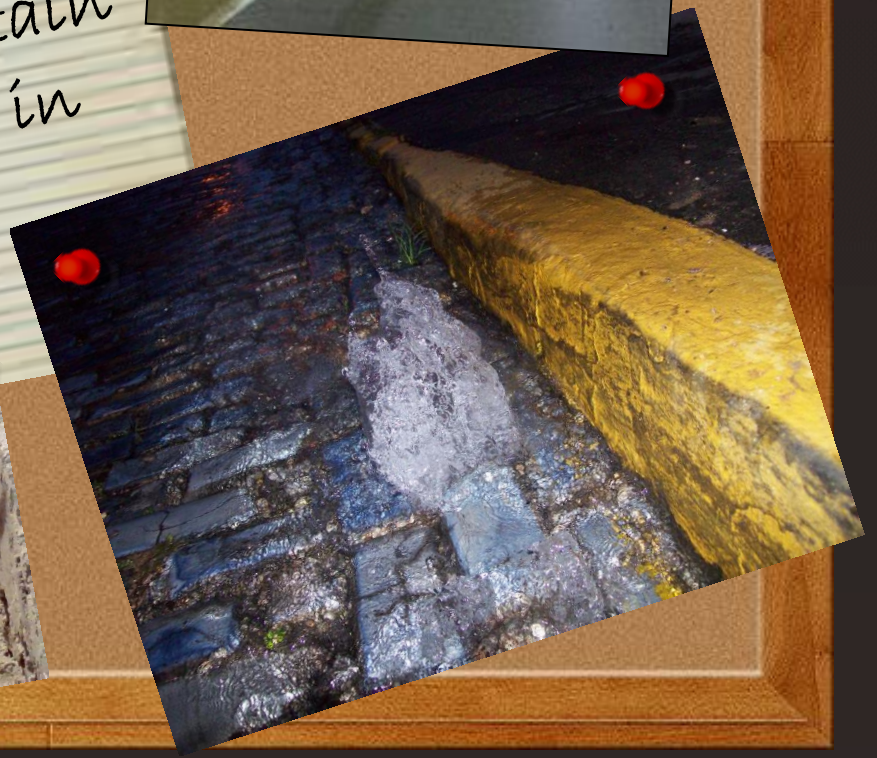
Basic Infrastructure

a) How much pipe do you have in the system?
b) What is the age and pipe condition?
c) What type and size of pipe?
d) How many contact points do you have and how far apart are they?

Current Situation

a) What is the history with visible leaks?

b) Are the visible leaks concentrated in a certain part of the system or in certain pipe?



OPTIONS FOR SURVEYS

Active Leak Survey

Passive Leak Survey

OPTIONS FOR ACTIVE SURVEYS

Survey the Entire System

Survey Part of the System

Survey a Statistical Sample of the System & Choose Where to Focus

CONSIDERATIONS: SURVEY THE ENTIRE SYSTEM

Cost

Time for Survey

Total Quantity of Pipe

Night time surveys may be necessary

Potential Benefit

CONSIDERATIONS: SURVEY PART OF THE SYSTEM

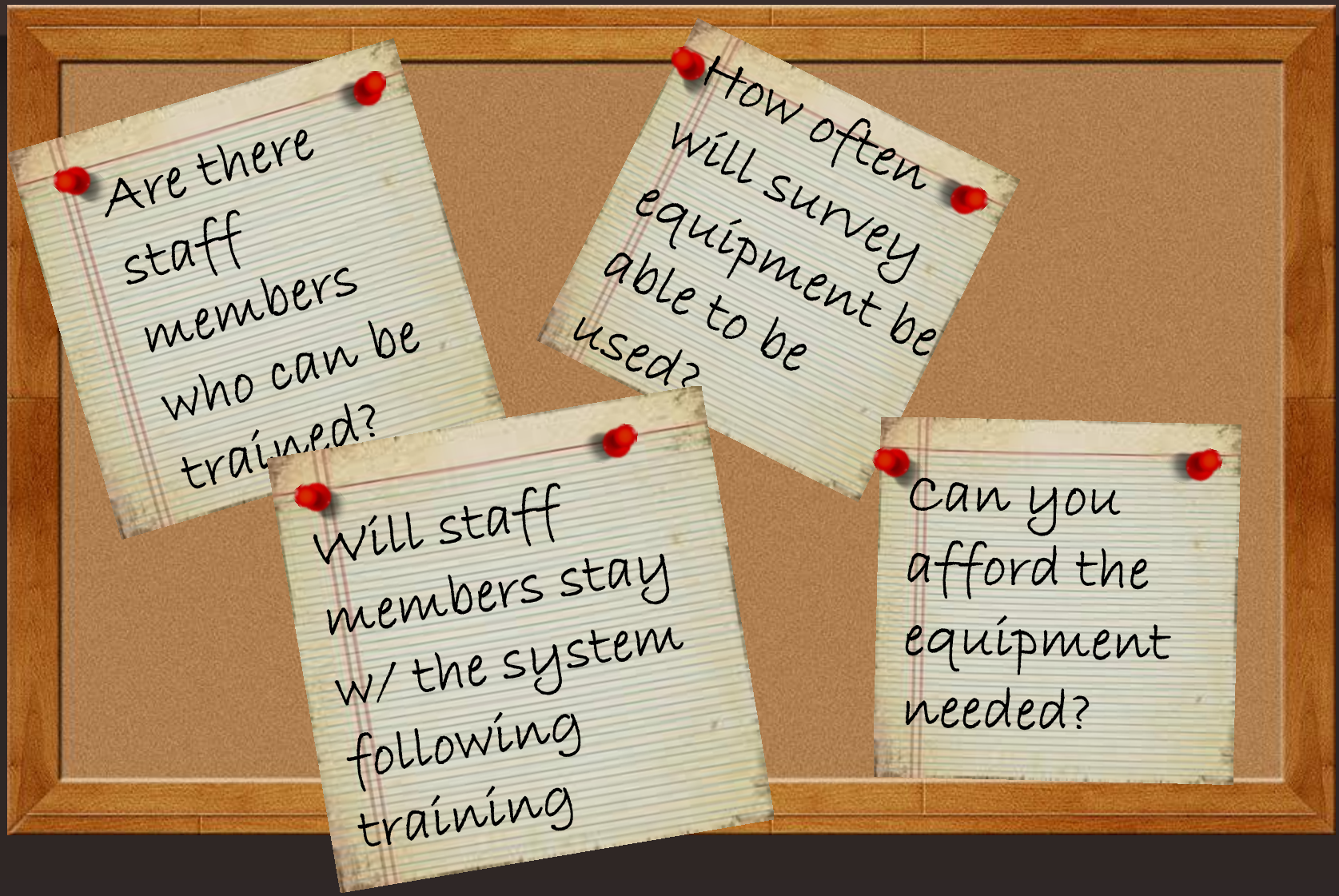
- Can you achieve most of the benefit by doing a portion of the system?
- Focus on the worst portions
- Skip newer, better pipe
- Skip areas not conducive to survey
- Huge Cost Savings Potential

CONSIDERATIONS: SAMPLE OF THE SYSTEM

When you don’t know much about the situation with the pipes

Can be less expensive than a total survey, but may be more expensive than partial survey

CONTRACTOR VS. IN-HOUSE



OPTIONS FOR PASSIVE SURVEYS

Full Permanent Deployment

Lift & Shift

Partial Permanent Deployment

Partial Permanent Deployment w/ Lift & Shift

CONSIDERATIONS: FULL DEPLOYMENT

- Cost of devices
- Number required to cover contact points
- Location of contact points

CONSIDERATIONS: LIFT & SHIFT

- Sufficient staff to move the devices
- Cheaper to obtain devices; fewer needed
- Time required to cover all or most important parts of the system

CONSIDERATIONS: PARTIAL PERMANENT DEPLOYMENT

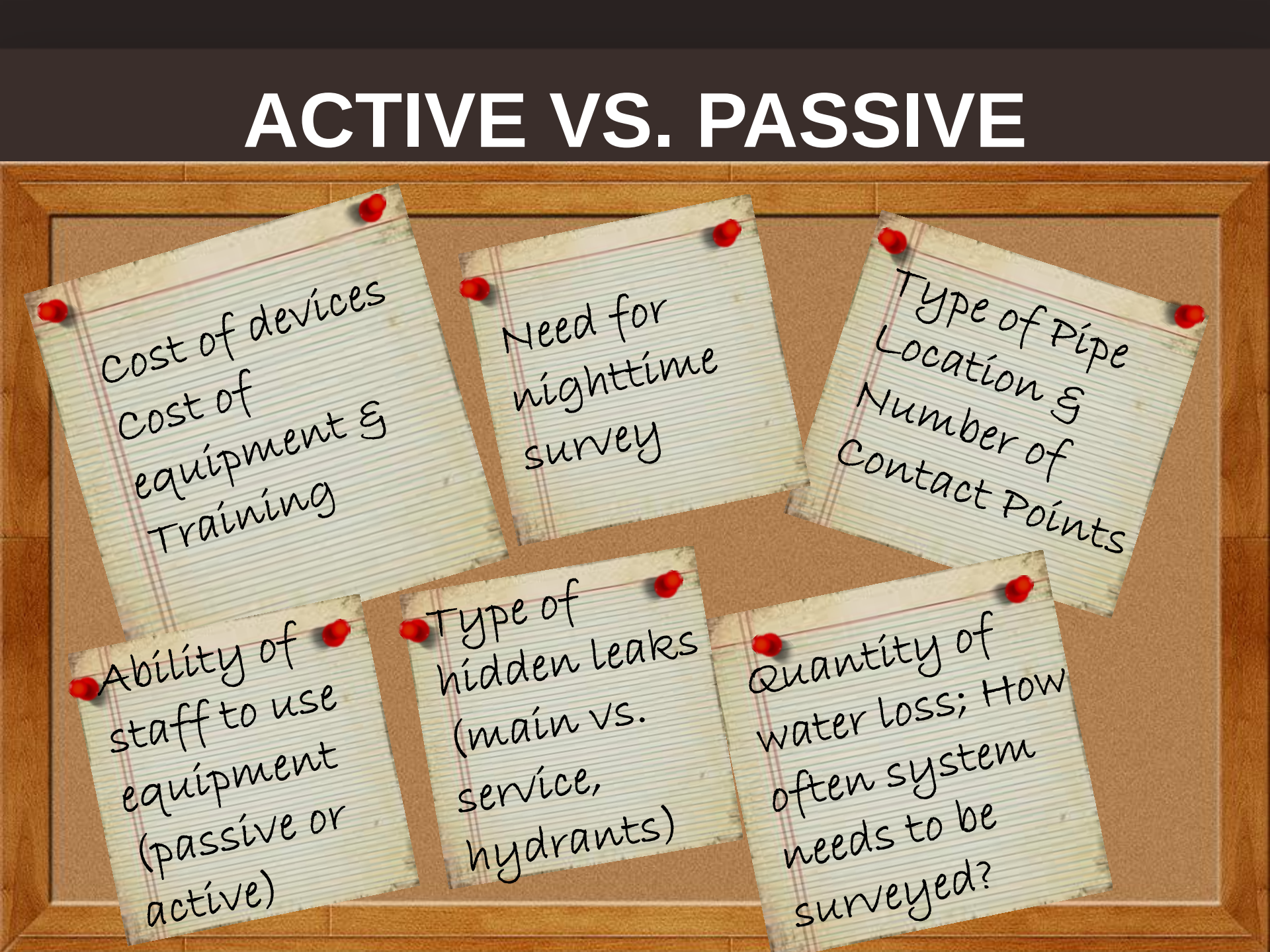
- Devices deployed on critical pipes
- Devices deployed on hard to survey areas
- Full>Cost>Lift & Shift
- Less time intensive than Lift & Shift

CONSIDERATIONS: PARTIAL PERMANENT W/ LIFT & SHIFT

Covers the whole system more cheaply than full deployment

More expensive than other partial options & more time intensive

ACTIVE VS. PASSIVE



RESULTS:
ACTIVE LEAK DETECTION

Find more service line & Hydrant leaks

Photo courtesy Texas Water Board

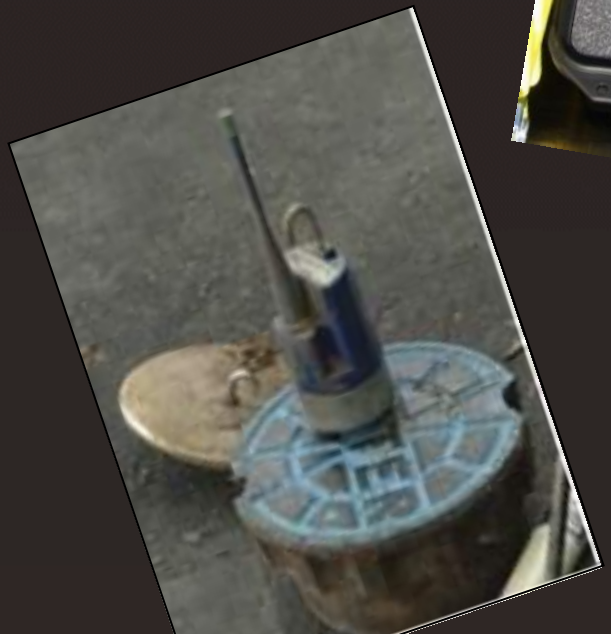
May miss some main leaks due to day vs. night listening

RESULTS:
PASSIVE LEAK DETECTION

May find main line leaks but fewer service line & hyd.

False positives can be an issue

HEAD TO HEAD EVALUATION RESULTS



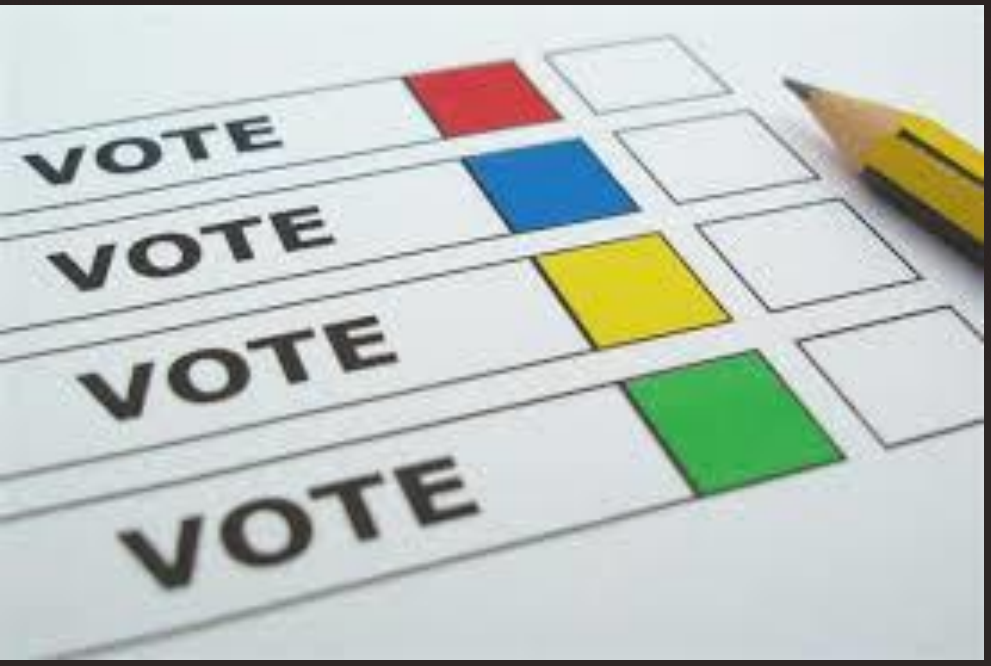
BOTTOM LINE ON LOOKING FOR LEAKS

Only look for what you can actually fix

Match activities to budget

Match technology/technique to system specifics

LEAK DETECTION



What type of leak detection have you tried?

DIFFICULTIES WITH IMPLEMENTING WATER LOSS REDUCTION

More interesting to design and build something than fix underground pipes

Selection of program based on preconceived ideas rather than actual data

Not a “sexy” program; No ribbon cutting

Failure to mobilize all necessary resources

Underestimating time, resources, and difficulties with implementation

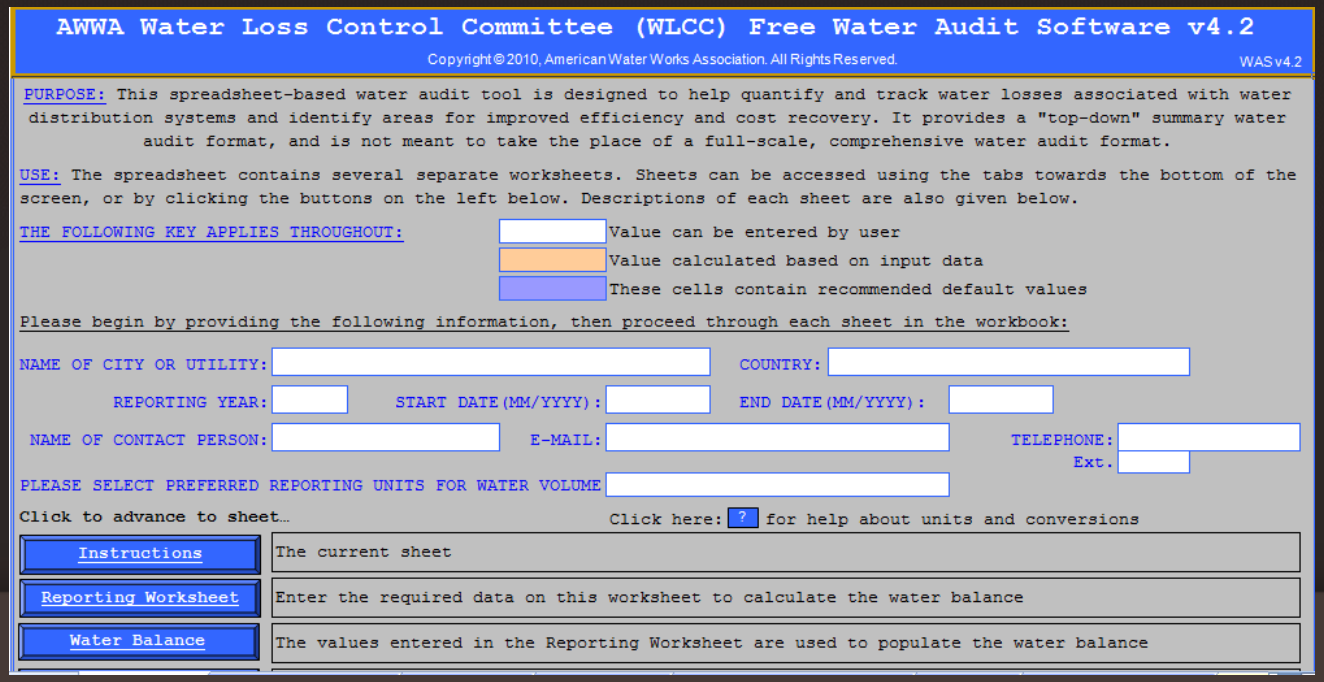
Partial implementation which leads to inability to meet goals

TAKING IT TO YOUR FACILITY

DEVELOP YOUR TEAM

TAKING IT TO YOUR FACILITY

COMPLETE AWWA WATER AUDIT



AWWA Water Loss Control Committee (WLCC) Free Water Audit Software v4.2

WAS v4.2

PURPOSE: This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

USE: The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons on the left below. Descriptions of each sheet are also given below.

THE FOLLOWING KEY APPLIES THROUGHOUT:

Value can be entered by user

Value calculated based on input data

These cells contain recommended default values

Please begin by providing the following information, then proceed through each sheet in the workbook:

NAME OF CITY OR UTILITY: COUNTRY:

REPORTING YEAR: START DATE (MM/YYYY): END DATE (MM/YYYY):

NAME OF CONTACT PERSON: E-MAIL: TELEPHONE: Ext.

PLEASE SELECT PREFERRED REPORTING UNITS FOR WATER VOLUME

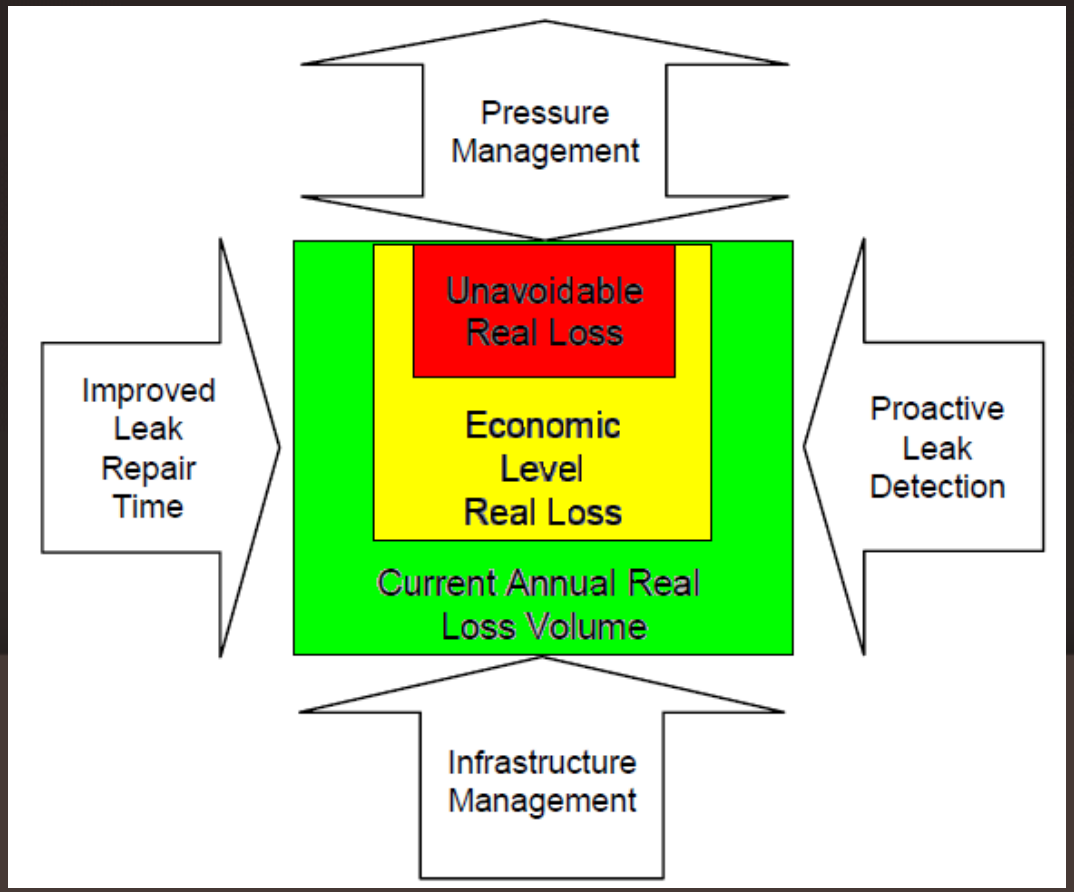
Click to advance to sheet… Click here: ? for help about units and conversions

Instructions	The current sheet
Reporting Worksheet	Enter the required data on this worksheet to calculate the water balance
Water Balance	The values entered in the Reporting Worksheet are used to populate the water balance

TAKING IT TO YOUR FACILITY

DETERMINE HOW LARGE OF A PROBLEM YOU HAVE WITH REAL WATER LOSS

TAKING IT TO YOUR FACILITY



EXAMINE EACH OF THE FOUR METHODS OF REDUCING REAL LOSS…

TAKING IT TO YOUR FACILITY

DEVELOP A CASE TO SEE IF IT MAKES SENSE TO FIX BREAKS MORE QUICKLY

TAKING IT TO YOUR FACILITY

USE ASSET MANAGEMENT TO CREATE A PLAN FOR STRATEGIC PIPE REPLACEMENT

TAKING IT TO YOUR FACILITY

DETERMINE WHETHER YOU CAN REDUCE PRESSURE – ALL THE TIME, AT NIGHT OR IN VARIOUS ZONES

TAKING IT TO YOUR FACILITY

LOOK FOR HIDDEN LEAKS IF THE ILI AND PAST EXPERIENCES INDICATES IT MAKES SENSE. CHOOSE APPROACHES THAT MATCH THE SYSTEM SPECIFICS

FOLLOW UP

We will contact attendees with:

- Answers to webinar questions
- Access to resources for water loss
- Contact us for specific assistance with water loss

WE WANT TO THANK EPA FOR PROVIDING FUNDING FOR THIS PROJECT

Smart Management for Small Water Systems

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