



WET

(WATER EFFICIENT THRISUR)

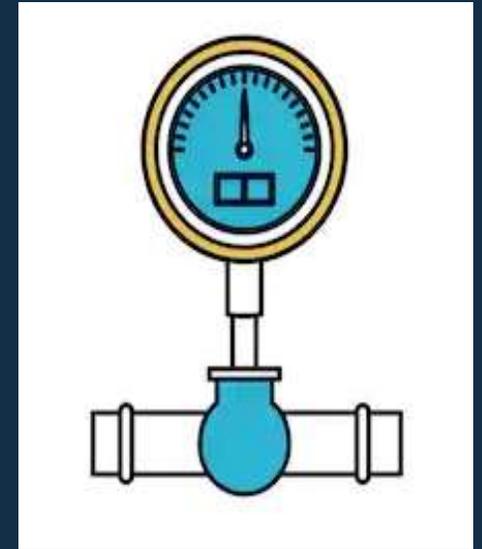
Water Audit for NRW

NRW (Non-Revenue Water) ???

NRW (non-revenue water) is the water has been produced and is **lost** before it reaches to the consumer/customer. Losses can be real losses or apparent losses.

How to identify NRW?

- 👉 To identify NRW, conduct **water audit** exercise regularly...
- 👉 Create/Develop a water metering philosophy for **water balance**...



Purpose & Approach

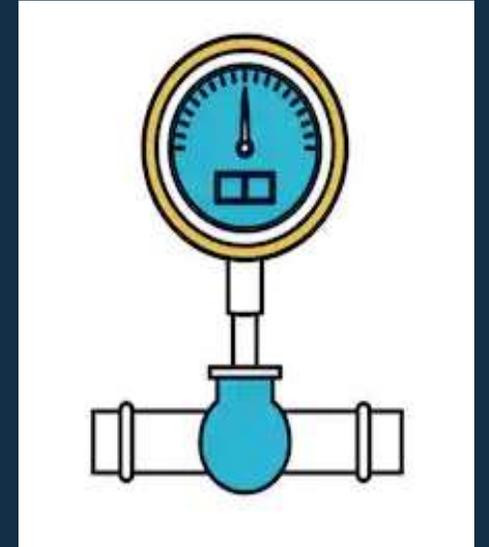
The purpose

Is to reduce the non-revenue water and improve water distribution in the project area.

The approach

What cannot be measured cannot be improved. Therefore, quantify the NRW in the source distribution water networks by establishing water balance in these networks.

Break the distribution system into subsystems (DMA) across the project area so that the study of the water balance in the subsystems helps in analyzing so also improving the distribution of water.



Key Terms in Water Balance...

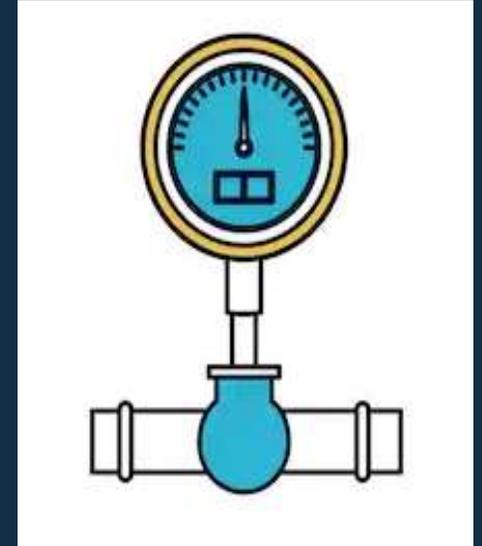
Some of the Key Variables in the Water Balance

System Input	Authorized Consumption	Billed Authorized Consumption	Billed & Metered Consumption	Revenue Water
		Unbilled Authorized Consumption	Billed & Unmetered Consumption	
	Water Losses	Apparent (Commercial) Losses	Unauthorized Consumption	Non Revenue Water
			Metering Inaccuracies & Data handling errors	
		Real (Physical) Losses	Leaks	
			Burst	
		Leakage or Overflows at storage location		

Water Audit???

Water audit is an accounting of all of the water in a water distribution system resulting a quantified understanding of the integrity of the water system and its operation.

It is the first step in formulating an economically sound plan to address water losses.



Stages of Water Audit...

The water audit is consists of 3P stages...

- ▶ **Pre-Audit**

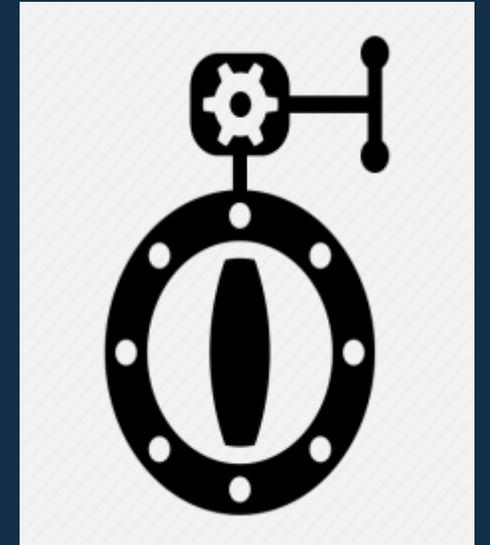
Collection of primary data regarding source and consumption.

- ▶ **Process Audit**

The examination of system to determine whether the water is being consumed efficiently and effectively.

- ▶ **Post Audit**

Awareness in system about water conservation & Documentation of Water consumption and time to time remedial measures.



Benefits of Water Audit...

- Reduced water losses
- Improved financial performance
- Improved reliability of supply system
- Enhanced knowledge of the distribution system,
- Efficient use of existing supplies
- Better safeguard to public health and property
- Improved public relations, reduced legal liability
- Reduced disruption, thereby improving level of service to customers.

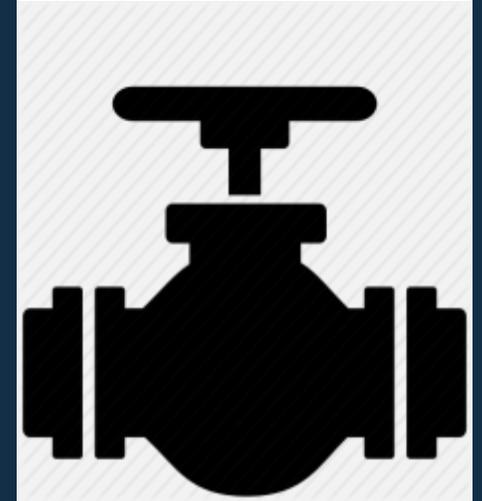


Water Balance...

Importance of Computing the Water Balance

Developing a water balance is of paramount importance for the following reasons:

- It serves as a framework for assessing a utility's water loss situation
- Calculating the water balance
 - Reveals availability/reliability of data and level of understanding
 - Creates awareness of problems/issues
 - Gives direction of improvements



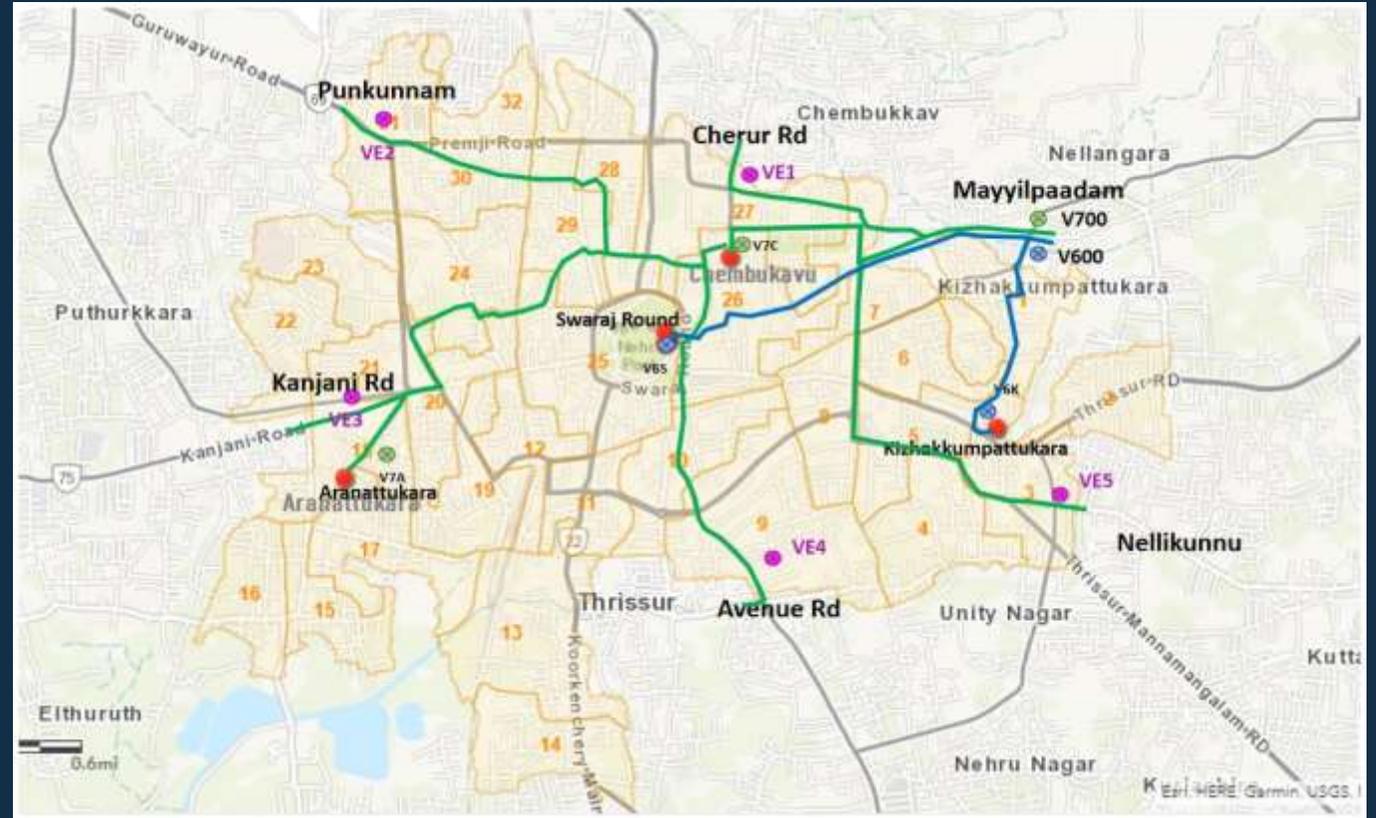
Water Balance in Thrissur... (Water Source)

Total water served to Thrissur is the **Source**

Total Storage calculated in **Volume Input**

Water releasing to adjacent Panchayat is **Volume Releasing**

The difference between Volume Input and Volume Releasing is **NRW**



$V_{DN600} + V_{DN700}$	=	$V_{7C} + V_{7A} + V_{6S} + V_{6K}$	+	$V_{E1} + V_{E2} + V_{E3} + V_{E4} + V_{E5}$	+	V_{NR}
Source		Volume Input		Volume Releasing		NRW

Water Distribution Thrissur...

Public water distribution system in Thrissur Municipal Corporation faces lot of issues based on its water distribution network, faults and damages, identification leakage, identification non-revenue water (NRW) and assessment of water consumption of each customer located within the corporation boundary.

Challenges

- No proper water distribution network diagram
- Pipelines are not layed in linear depth
- No propoer chambers and distribution valves
- Lack of proper billing system
- Dont have list of abondoned pipelines and connections

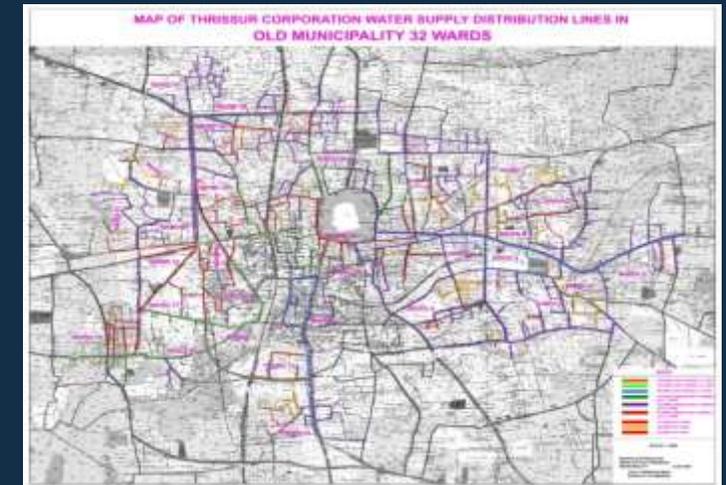
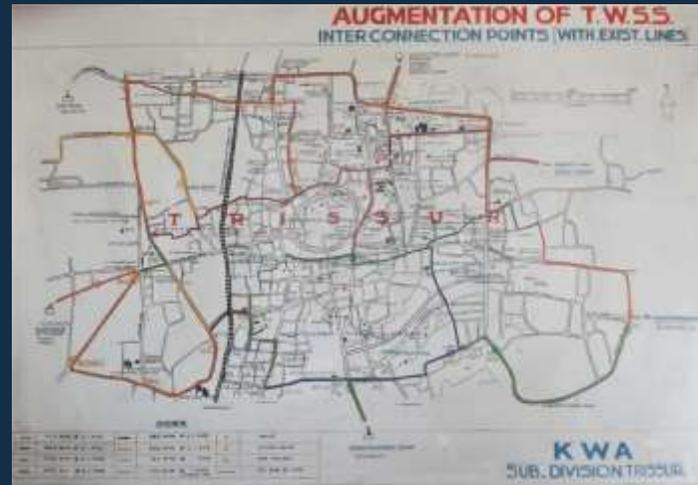
Water Distribution Thrissur...

Mitigation

- Re-draw the water distribution network using latest technologies like GIS
- Track and mark all the assets in the distribution network GPR & GIS
- Use advanced Customer Relationship Management system (CRM)
- Deploy and Automate the water meter in various segments using advanced technology (IoT)
- Integrate this water meter reading (customer) with CRM
- Provide customer oriented interactive system for complaints and redressals

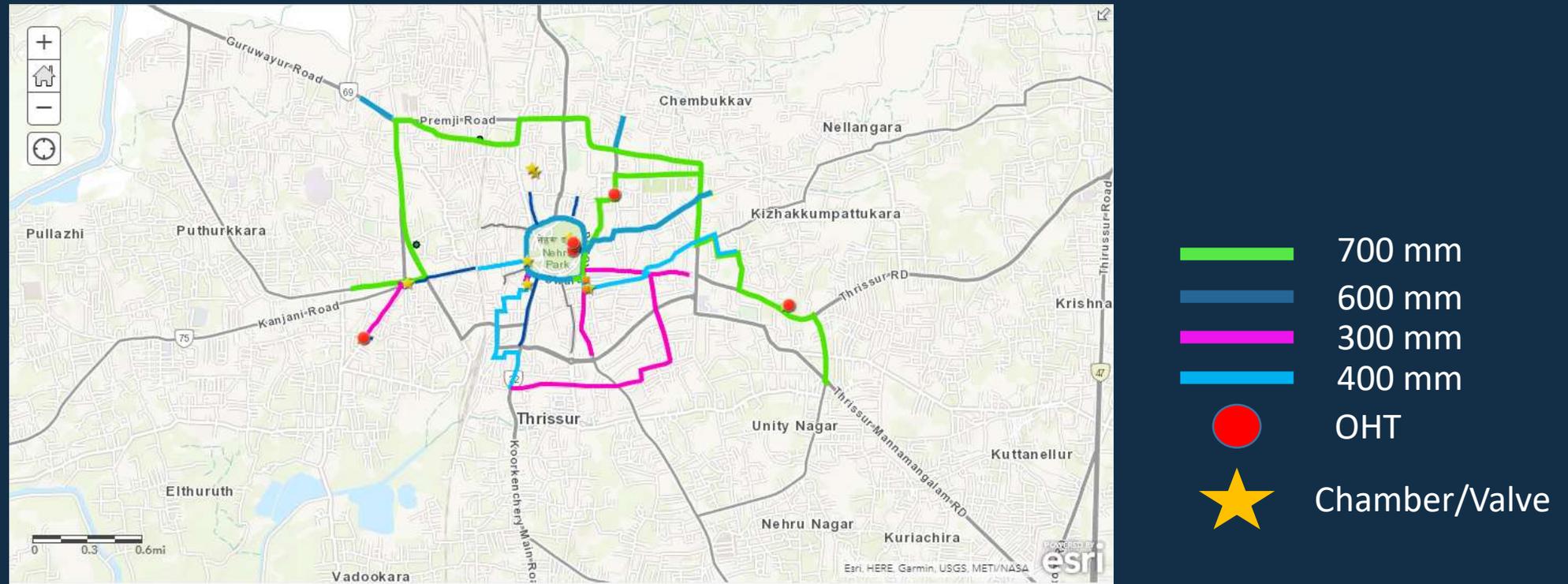
Water Distribution Network...

The below images show the water distribution network diagram according to KWA records



Water Distribution Network...

The below image shows the water distribution network diagram according to the information shared by the engineers and technical support team.



Conclusion...

Calculating NRW is a continual process, and a tool for effective conservation of water. Water Audit is the regular exercise to calculate NRW. Broadly water audit should be conducted categorically in two systems, resource audit or supply side audit and the other one as consumption audit on demand side. All efforts should be made for is to understand the distribution philosophy and improvement of not only water use efficiency and distribution system, but also on the efficient development and management of the source of water.

THANK YOU



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WET - Preliminary Water Audit