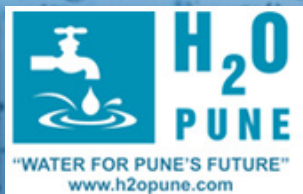


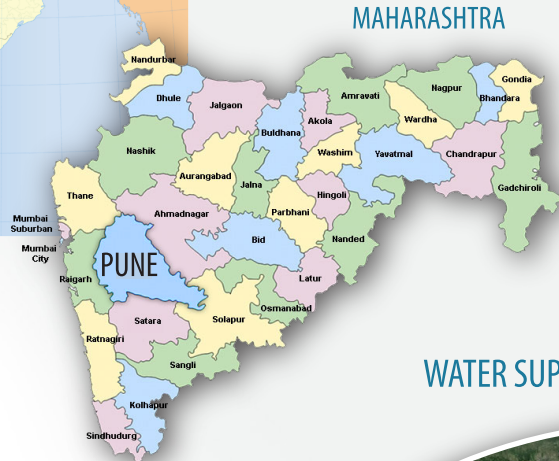
SAVE WATER, SAVE LIFE

# WATER FOR PUNE'S FUTURE

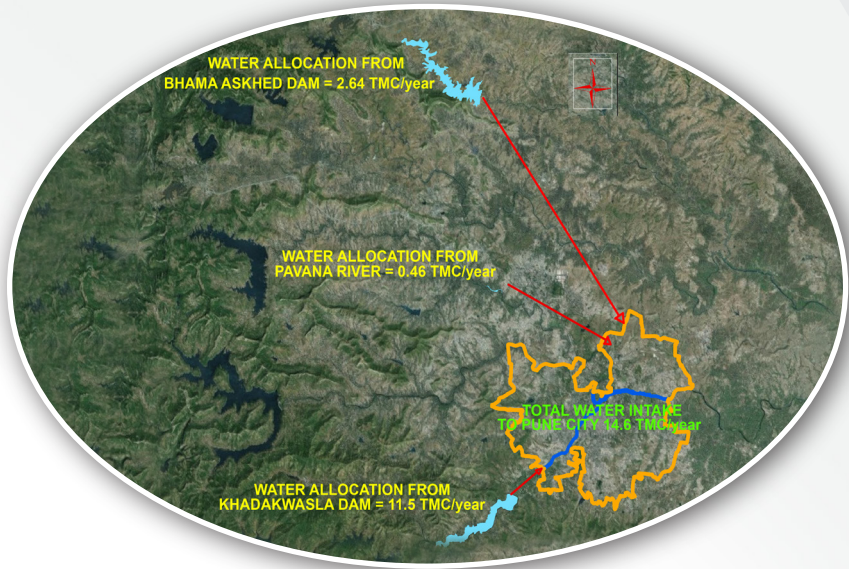
24X7 WATER SUPPLY PROJECT



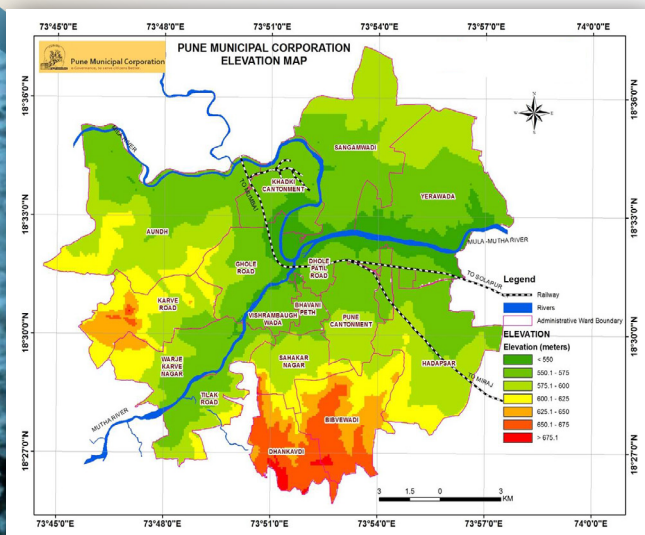
PUNE MUNICIPAL CORPORATION, PUNE



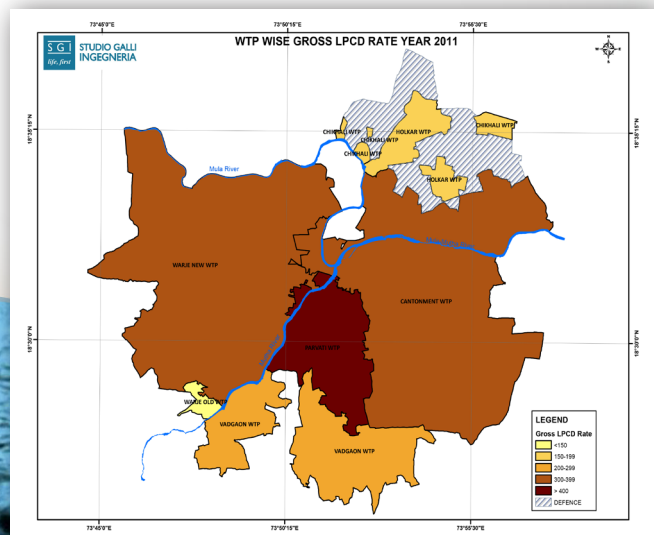
## WATER SUPPLY SOURCES FOR PUNE CITY



## TOPOLOGY DIFFERENCE



## LPCD VARIATION



# PRESENT WATER SUPPLY SYSTEM

## SOURCES

- Khadakwasla Dam-Allocation 11.5 TMC - 890 MLD
- Pavana River-30 MLD, through Chikhali WTP

## WTP CAPACITIES

- Existing: 1289 MLD
- Under Construction: 200 MLD
- Total: 1489 MLD

## SERVICE RESERVOIRS

- Numbers of Reservoir: 83
- Total storage capacity: 328 ML

## DISTRIBUTION & TRANSMISSION NETWORK

Total length of Network: 2688KM

## HOUSE SERVICE CONNECTION & LPCD

- The coverage by house service connection is over 94 %
- Average per capita water supply: 194lpcd.

# CHALLENGES OF PRESENT SYSTEM

- Intermittent supply-wide variation of supply hours
- Quantity of per capita supply varies substantially, very low in North of Mula-Mutha River
- Distribution network very old in many areas-high physical losses
- High level of Non Revenue Water (NRW)
- Inadequate storage capacity (23%)
- Reservoirs working as distribution reservoirs and also feeding other SRs using distribution mains
- Fast depletion of reservoirs, resulting in high peak factors and small number of supply hours
- High Electricity consumption



## AIMS

- Establish an equitable distribution of water
- Identify and minimize water losses
- Promote sustainable development
- Provide a fair way to allocate costs
- Improve system energy efficiency
- Improve customer service level
- Implement best management practices

## OBJECTIVES

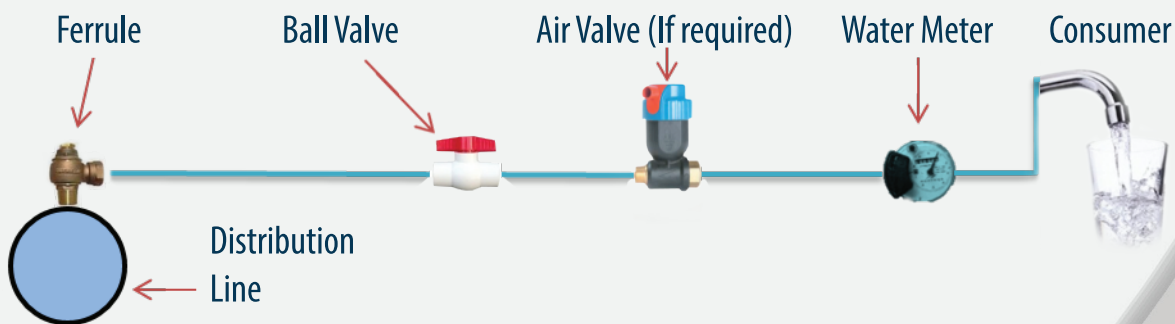
**The main objectives of the project are:**

- To ensure safe & equitable water supply to the entire population in Pune city for the next 30 years,
- To ensure the distribution of the water during the entire day (24x7 modality),
- To reduce the level of water losses and Non-Revenue Water,
- To ensure the technical and economical sustainability of the water supply service.

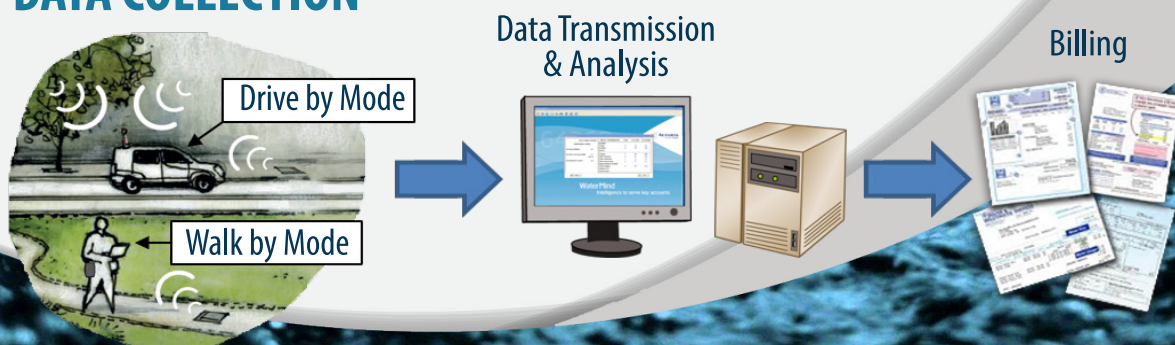
## PRESENT SYSTEM Vs SMART SYSTEM

	Present System	New "SMART" Water Supply
Distribution Infrastructure	<ul style="list-style-type: none"> <li>• No metering and volumetric measurement</li> </ul>	<ul style="list-style-type: none"> <li>• 100% consumer metering</li> <li>• Accountability for Water balance</li> <li>• Promotes transparency</li> </ul>
Tariff and incentives	<ul style="list-style-type: none"> <li>• Fixed Tariff</li> <li>• No incentive for conservation</li> </ul>	<ul style="list-style-type: none"> <li>• Volumetric Tariff</li> <li>• Promotes conservation of water</li> </ul>
Service levels to Citizens	<ul style="list-style-type: none"> <li>• Intermittent water supply</li> <li>• High proportion of NRW/UFW</li> </ul>	<ul style="list-style-type: none"> <li>• Pressurised 24x7 water supply</li> <li>• High reduction in NRW/ UFW</li> <li>• High Service Level Benchmark</li> </ul>

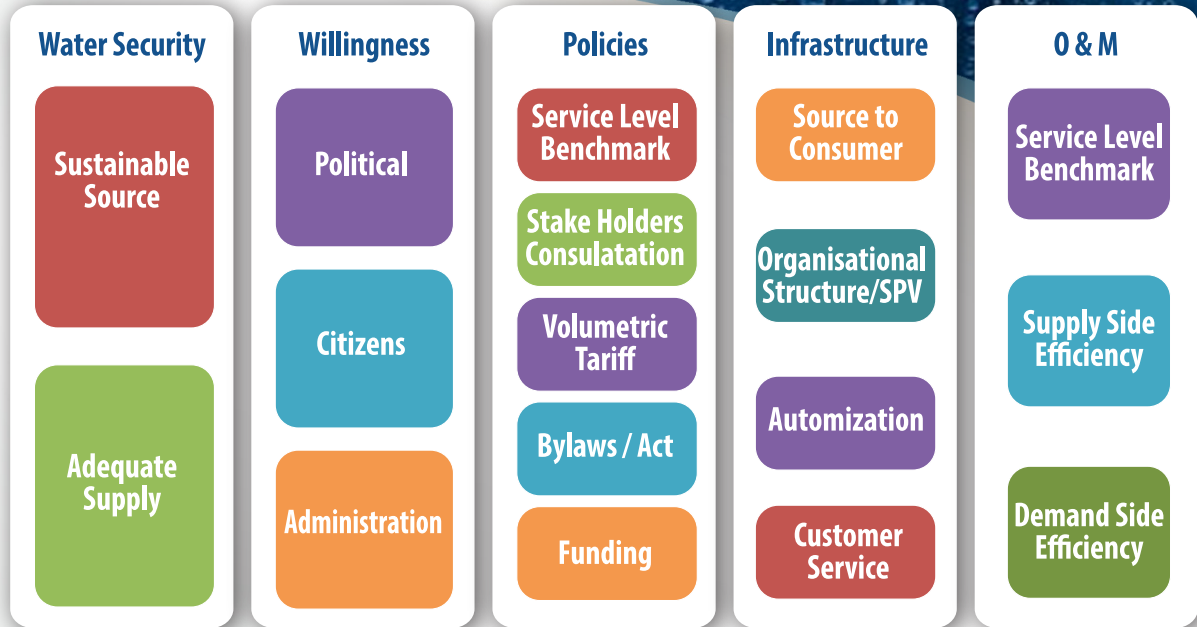
## HOUSE CONNECTION



## DATA COLLECTION



## HOLISTIC APPROACH FOR 24X7 WATER SUPPLY PROJECT

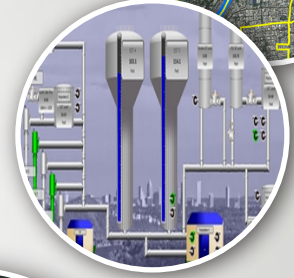
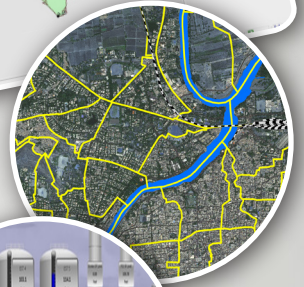
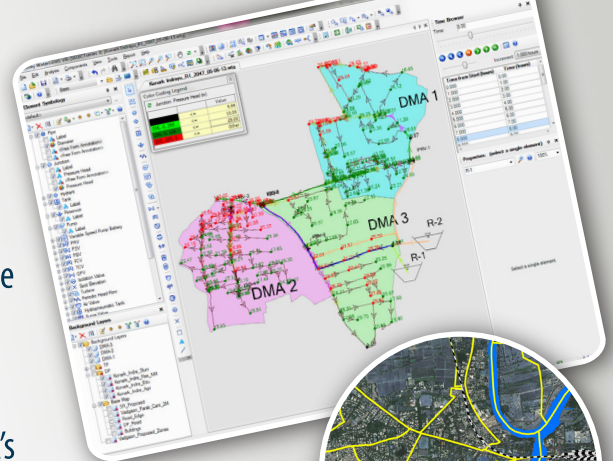


## EXISTING & PROPOSED

Sr. No.	Particulars	Existing/Under Construction	Proposed
1	Raw Water Source	1242 MLD	358 MLD
	Khadakwasla	22 MLD (Chikhali WTP)	(Mulshi Dam)
	Pavana River	200 MLD (Bhama Askhed)	85 MLD (Bhama Askhed)
2	WTP Capacities	1289 +200 MLD	552 MLD
3	Water Supply Zones	67	141
4	Service Reservoirs	58	103
5	Storage Capacity of Reservoirs	250.37 ML	384.00 ML
6	Distribution Network	2325.86 KM	1618.40 KM
7	Transmission Network	93.54 KM	139.23 KM
8	Automatic Meter Reading (AMR) System	-	3.15 Lakh

## STUDY & DESIGN

- Entire Water Supply Network on Latest Satellite Image  
243 sq.km area (GIS PLATFORM)
- Population projection & Demand calculation
- City divided in to 141 Water Supply Zones & 328 DMA's
- Consumer Survey & Water Audit for more than 10,000 connections on Pilot basis
- Hydraulic Modeling - 3500 KM pipe length
- Proposed SMART Metering for all consumers
- Leakage detection-Carried out for Bulk system for Two WTP's
- Zone wise SCADA system planned for entire city



## GIS MAPPING

- Procurement of Satellite Imagery
- Creation of Base Map
- Field survey for network & land mark updating
- Geo-Spatial data integration
- Project Report
- Use of consumer data in Hydraulic modeling, water audit, demand supply analysis



## CONSUMER SURVEY

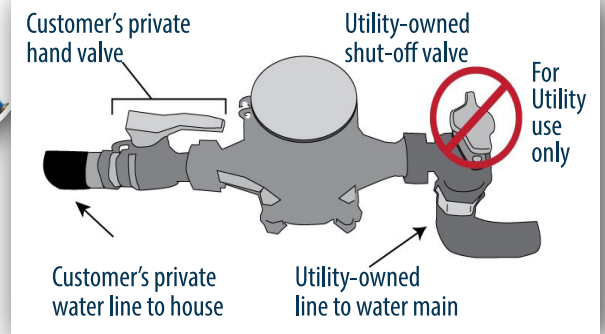
- Map each house and consumer in GIS
- Carry out house to house survey
- Collect information related to No. of inhabitants, Water requirement, Income, Connection size etc.
- Attach database of each house to GIS
- Find out the unregistered / illegal connections



## PUBLIC AWARENESS



## PILOT SMART METERING



## LEAKAGE DETECTION AND NRW MANAGEMENT

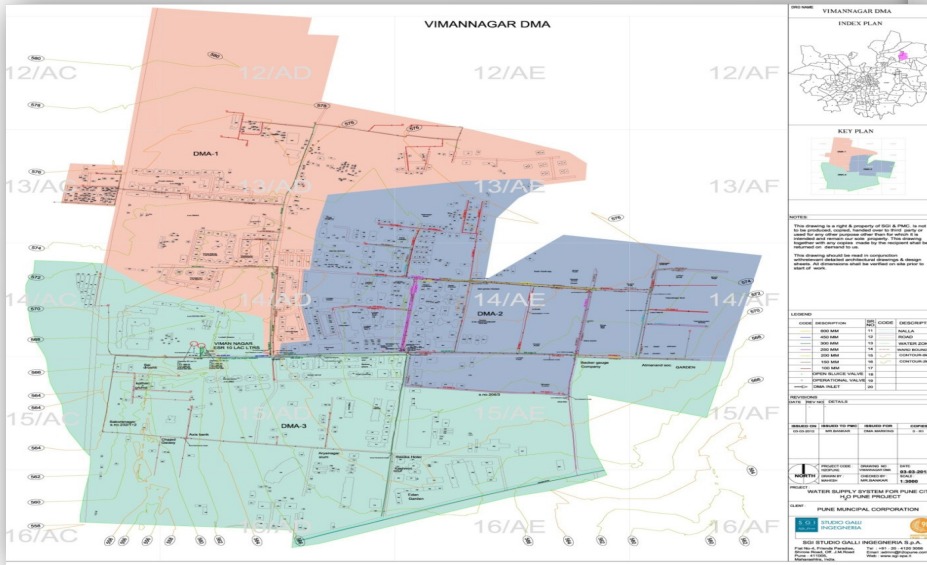
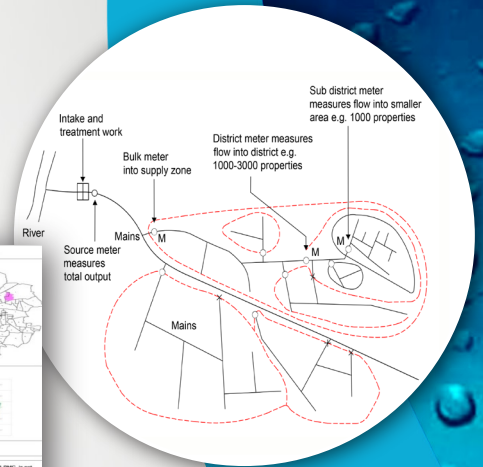
- Survey of bulk system to pinpoint visible leaks
- Plug visible leaks
- Estimation of losses by means of simultaneous inflow-outflow measurements
- Ranking of pipelines according to (Losses/Length)
- Sounding of valves and contact points
- Acoustic correlation to pinpoint leaks
- Use of ground microphone to confirm leak positions



System Input Volume	Authorised Consumption	Billed Authorised Consumption	Billed Metered Consumption	Revenue Water	
			Billed Un-Metered Consumption		
		Unbilled Authorised Consumption	Unbilled Metered Consumption		
			Unbilled Un-Metered Consumption		
	Water Losses	Apparent Losses		Unauthorised Consumption	Non Revenue Water
				Customer Metering Inaccuracies	
		Real Losses		Leakage on Transmission and/or Distribution Mains	
				Leakage and Overflows at Utility's Storage Tanks	
				Leakage on Service Connections	

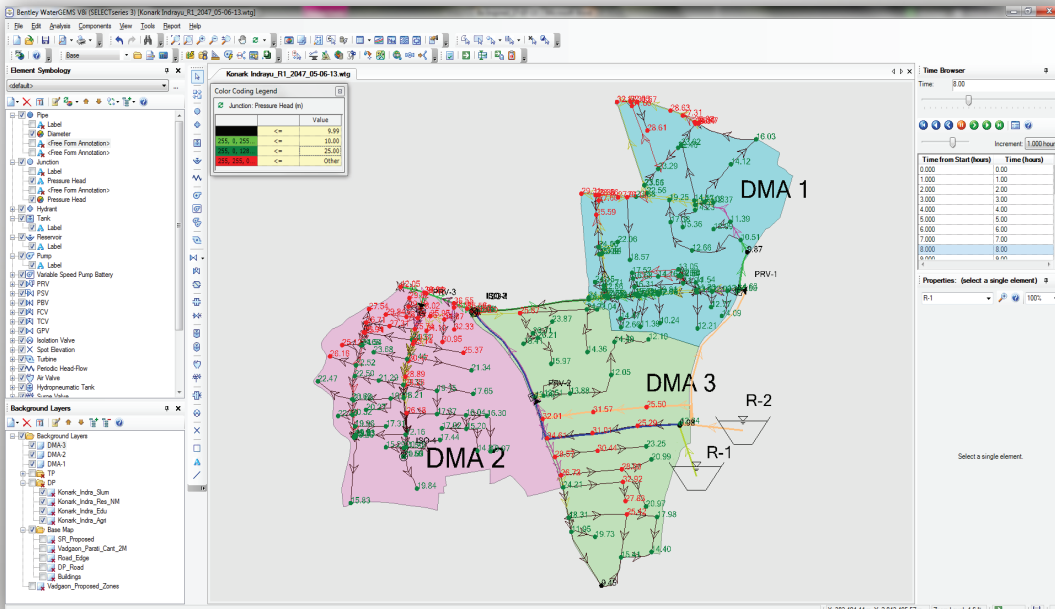
# DMA FORMATION

- Number of connections - 1000 to 2500
- Number of Closed valves to isolate the DMA - Minimum
- Number of meters to measure inflow to and outflow from the DMA – Fewer (Ideally one)
- Full Utilization of storage capacity of existing service reservoirs
- Ground level variation within the DMA – Minimum
- Pressure variation within DMA - Minimum
- Boundaries of DMA - Rivers, Drainage channels, Railways, Highways etc.



# HYDRAULIC MODELING

- Simulate existing network
- Use hydraulic modeling tools
- Model the existing network
- Find out the problems in the system
- Find out corrective measures
- Minimize Uneven Water Distribution
- Proper Planning of Distribution Network

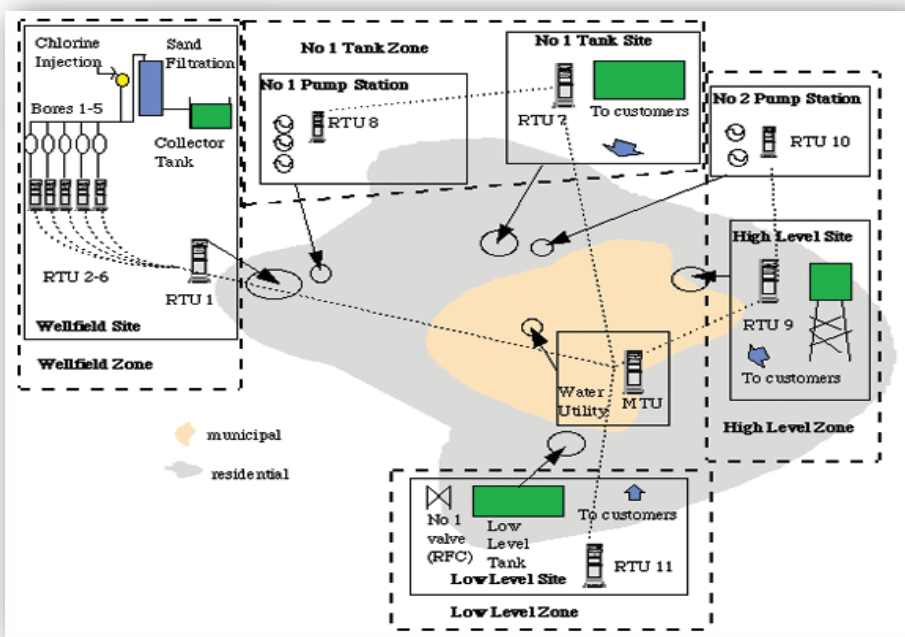


# SMART INTERVENTION FOR WTP, SR'S, TRANSMISSION & DISTRIBUTION SYSTEM

- Preliminary collection of information
- Field survey on the various WTPs included in the Diagnostic Preparation of a specific report for each plant, containing the findings obtained from the activities of Step 1 and 2, and the relevant technical comments
- Results of the acquisition of sensible data on water quality
- Issue of recommendations for the improvement of the consistency and performance of the WTPs included in the Diagnostic



## SCADA AND SYSTEM OPERATIONS CONTROL



## POPULATION AND WATER DEMAND

Population projections were elaborated based on the past Census results & adopting various statistical methods. The following values, were finally adopted for Population and demand in Pune.



Population for 2047	Gross Demand for 2047 (MLD)
7375348	1906.26

## EXISTING & PLANNED WATER TREATMENT PLANT

In the proposed project with upgradation in all the Existing WTPs as well as proposed and under constructions WTPs are considered as follows:

- Existing 9 Treatments Plants having a total treatment capacity of some 1263 MLD
- Total additional plant planned & under Construction by PMC are of total treatment capacity of 1235 MLD.
- In the proposed project the rationalization of the number of pumping stations has been achieved.
- The effort is made to use the existing pump and transmission mains capacity to an advantage.
- The new pumping systems are planned at 12 locations.



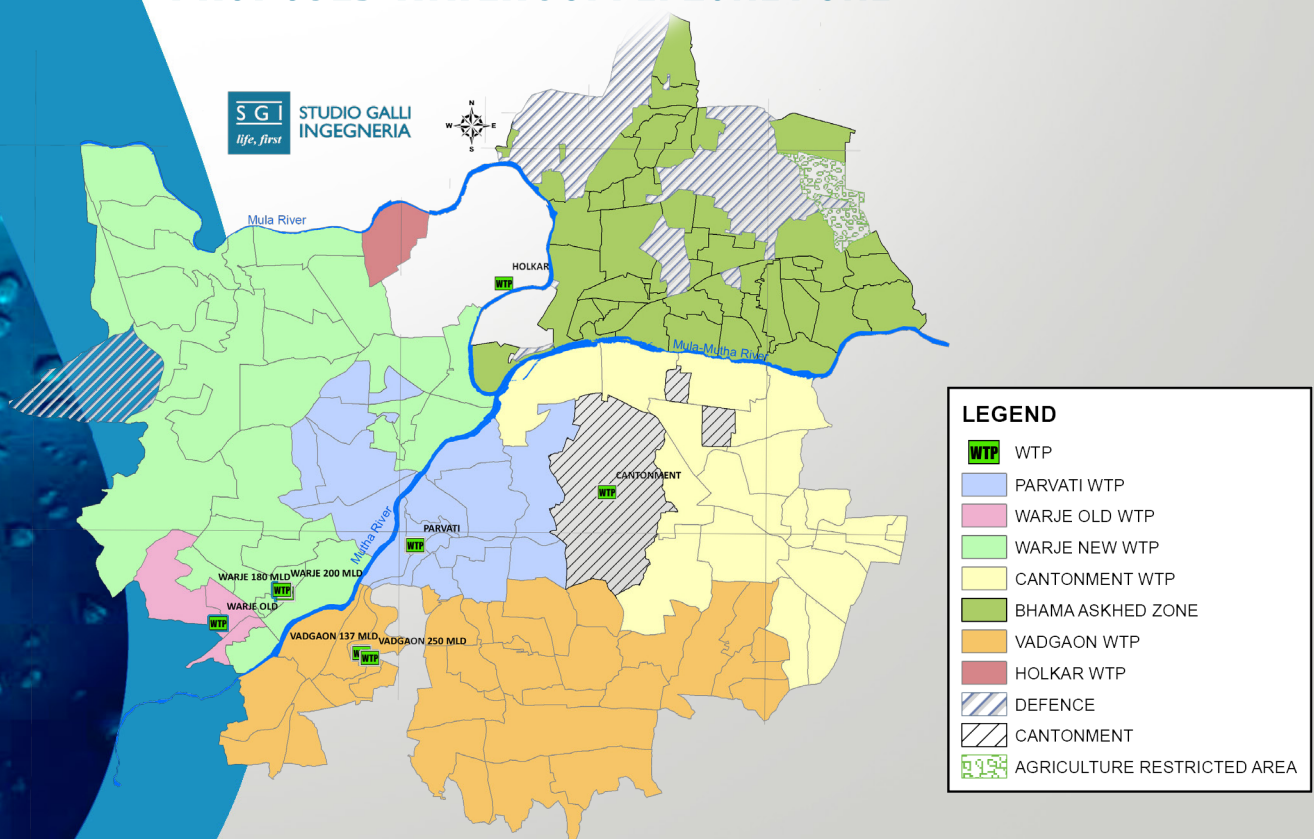
## EXISTING AND PROPOSED NEW SERVICE RESERVOIRS

The following table depicts the distribution of existing and new reservoirs within the considered WTP supply areas of the PMC.

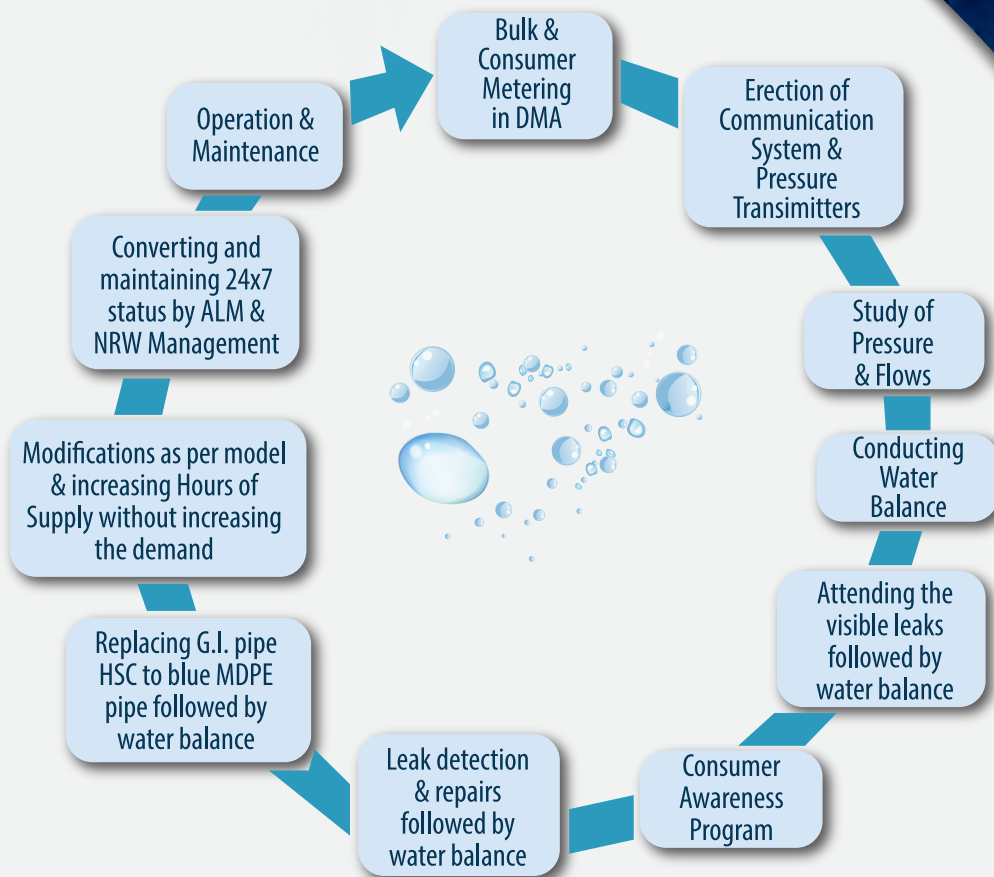


Served population in 2047	Demand in 2047 (MLD)	No. Existing SRs (retained)	Existing Storage Capacity (ML)	No. Proposed new SRs	Additional Storage Capacity (ML)
7375348	1877	58	245	103	389.00

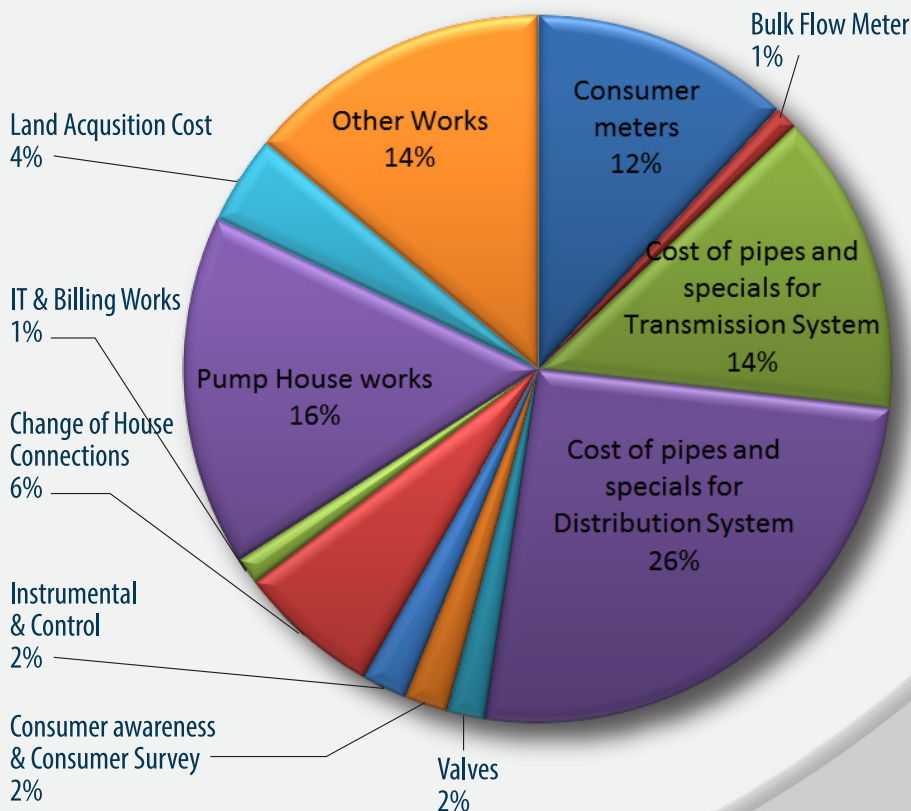
## PROPOSED WATER SUPPLY ZONE PUNE



# INTERMITTENT TO 24X7 WATER SUPPLY

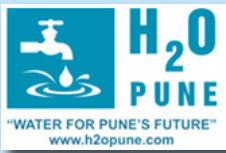


## GROSS PROJECT COST



## FINANCING OF PROJECT

DESCRIPTION	TOTAL AMOUNT (INR Crore)
<b>OUTFLOWS</b>	
Capex	2819
IDC	494
Total Outflow (A)	3312
<b>INFLOWS</b>	
<i>Government Grants</i>	
Under AMRUT Scheme	200
Under SMART City	299
Sub. Total	499
<i>PMC Contribution</i>	
Stand alone Contribution	249
Under AMRUT Scheme	200
Under SMART City	100
Sub. Total	549
Loan Amount	2266
Total Inflow (B)	3312



SGI Certifications



## PUNE MUNICIPAL CORPORATION

Pune, the Oxford of the East is a historical city in India with a glorious past, an innovative present and a promising future. Since 1950, the Pune Municipal Corporation is administrating the city and serving citizens. Pune Municipal Corporation has taken an initiative for implementing e-Governance. Success of e-governance depends on use of Information Technology in mobilization of Government resources and utilization of these scarce resources with an aim of providing a better service

Pune is the ninth-most populous city in India and the second largest in the state of Maharashtra after the state capital city of Mumbai. Pune is also the 101st largest city in the world, by population. Pune is considered the cultural capital of Maharashtra. Pune is also one of the fastest growing cities in the Asia-Pacific region. The 'Mercer 2015 Quality of Living rankings' evaluated local living conditions in more than 440 cities around the world where Pune ranked at 145, second in India after Hyderabad (138). It also highlights Pune among evolving business centers and emerging 9 cities around the world with citation "Hosts IT and automotive companies". Pune has also emerged as a new startup hub in India with tech startups like Pubmatic, Firstcry.com, Storypick.com, TastyKhana.com and Swipe setting up base in Pune.

## SGI

SGI Studio Galli Ingegneria S.p.A, Italy & fully owned subsidiary SGI Studio Galli Ingegneria India Pvt. Ltd. has been assigned consultancy job for major rehabilitation and upgrading of existing intermittent water supply system to 24 x 7 water supply system for Pune City.

SGI is an leading consultancy company specialized in the sectors of water, environment, civil engineering, transportation, landscape management and energy. Established in 1920 as a family-owned engineering firm, SGI has expanded into a joint stock company that employs over 200 staff. In order to support its major projects in Africa, Eastern Europe, Middle and Far East, SGI set up joint ventures an offices in Mauritius, Senegal, Uganda, Tanzania, Ethiopia, Botswana, Iraq, Qatar, China and India. We are also one of the founders of DESIGN ALLIANCE 250+ (<http://www.da250plus.com>), a joint venture of international firms built to provide professional architecture and engineering services around the world.

Actively involved in projects funded by international and governmental institutions (EC, WB, EBRD, UNEP, UNESCO, the Italian Ministries for the Environment and Foreign Affairs, USACE), SGI is conducting assignments in more than 30 countries.

## CONTACT DETAILS



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