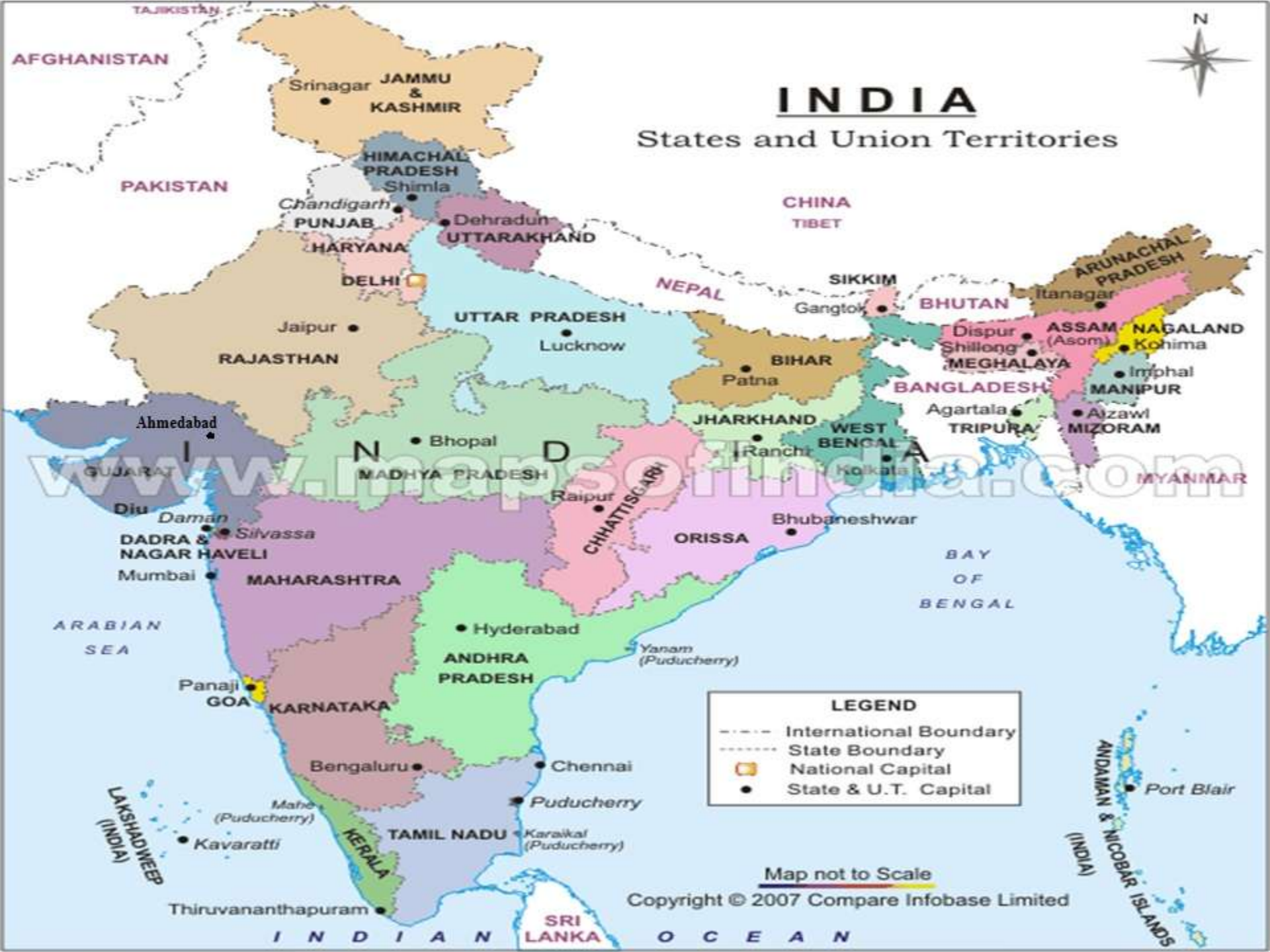




# **AHMEDABAD MUNICIPAL CORPORATION GUJARAT**

## **WATER SUPPLY & SANITATION in AHMEDABAD CITY**

**ICRIER  
PREPARING FOR THE URBAN CHALLENGES OF 21<sup>ST</sup> CENTURY  
6<sup>th</sup> February 2013**



# INDIA

## States and Union Territories



AFGHANISTAN

PAKISTAN

CHINA  
TIBET

NEPAL

BHUTAN

MYANMAR

BAY  
OF  
BENGAL

ARABIAN  
SEA

Map not to Scale  
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INDIAN OCEAN

SRI LANKA

ANDAMAN & NICOBAR ISLANDS  
(INDIA)  
Port Blair

LAKSHADWEEP  
(INDIA)  
Kavaratti

www.inmaps.com

LEGEND	
-----	International Boundary
-----	State Boundary
□	National Capital
●	State & U.T. Capital

JAMMU & KASHMIR  
Srinagar

HIMACHAL PRADESH  
Shimla

PUNJAB  
Chandigarh

HARYANA

DELHI

UTTARAKHAND  
Dehradun

RAJASTHAN  
Jaipur

UTTAR PRADESH  
Lucknow

BIHAR  
Patna

SIKKIM  
Gangtok

ARUNACHAL PRADESH  
Itanagar

MEGHALAYA  
Shillong

ASSAM (Asom)  
Dispur

NAGALAND  
Kohima

MANIPUR  
Imphal

MIZORAM  
Aizawl

BANGLADESH

TRIPURA  
Agartala

JHARKHAND  
Ranchi

WEST BENGAL  
Kolkata

CHHATTISGARH  
Raipur

ORISSA  
Bhubaneswar

GUJARAT  
Ahmedabad

Diu

Daman

Silvassa

Mumbai

DADRA & NAGAR HAVELI

MAHARASHTRA

MADHYA PRADESH  
Bhopal

Hyderabad

ANDHRA PRADESH

Panaji

GOA

KARNATAKA

Bengaluru

Chennai

TAMIL NADU

Puducherry

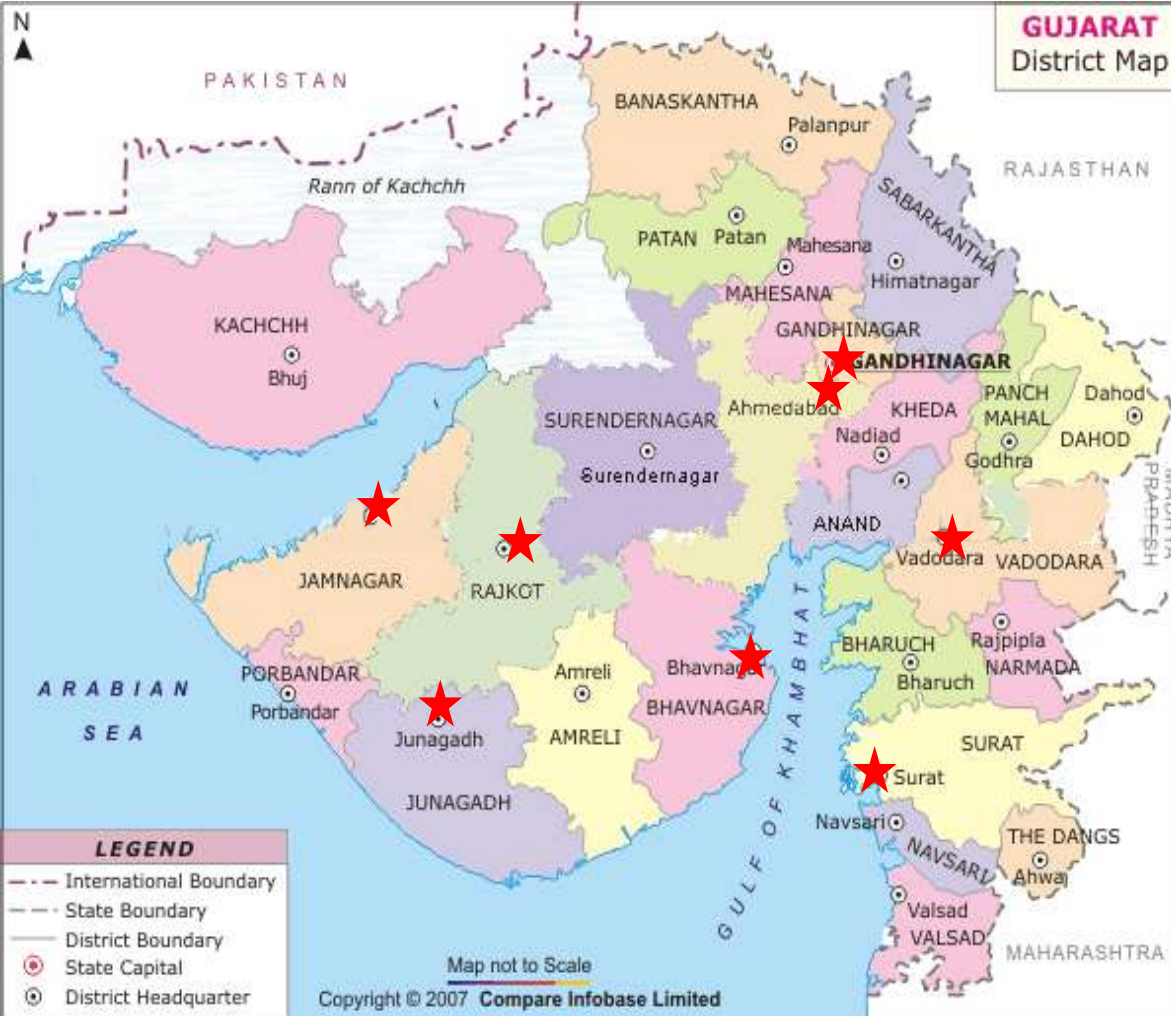
Karaikal (Puducherry)

Thiruvananthapuram

KERALA

Mahé (Puducherry)

# URBAN PROFILE



**Municipal Corporations : 8**

**Municipalities :159**

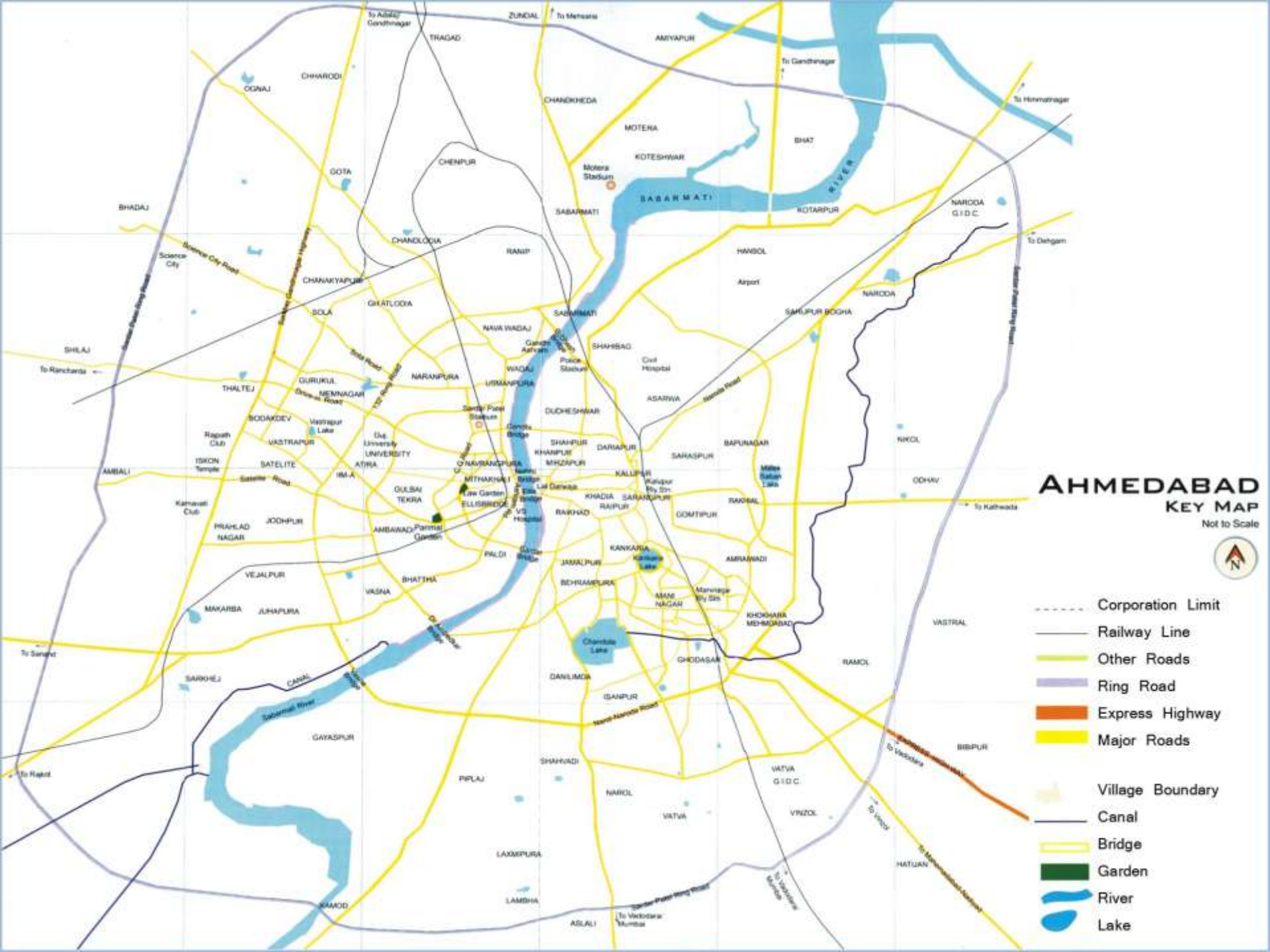
**Constituted UDAs/ADAs: 16**

**Designated ADAs :113**

- UDA - Urban Development Authority
- ADA – Area Development Authority

**★ Municipal Corporation**





# Ahmedabad: City Profile

- 7<sup>th</sup> largest city in India
- 2<sup>nd</sup> biggest trade center of Western India
- Commercial Capital & Growth Engine of Gujarat State

Population	5.6million
Area	466 Sq. km



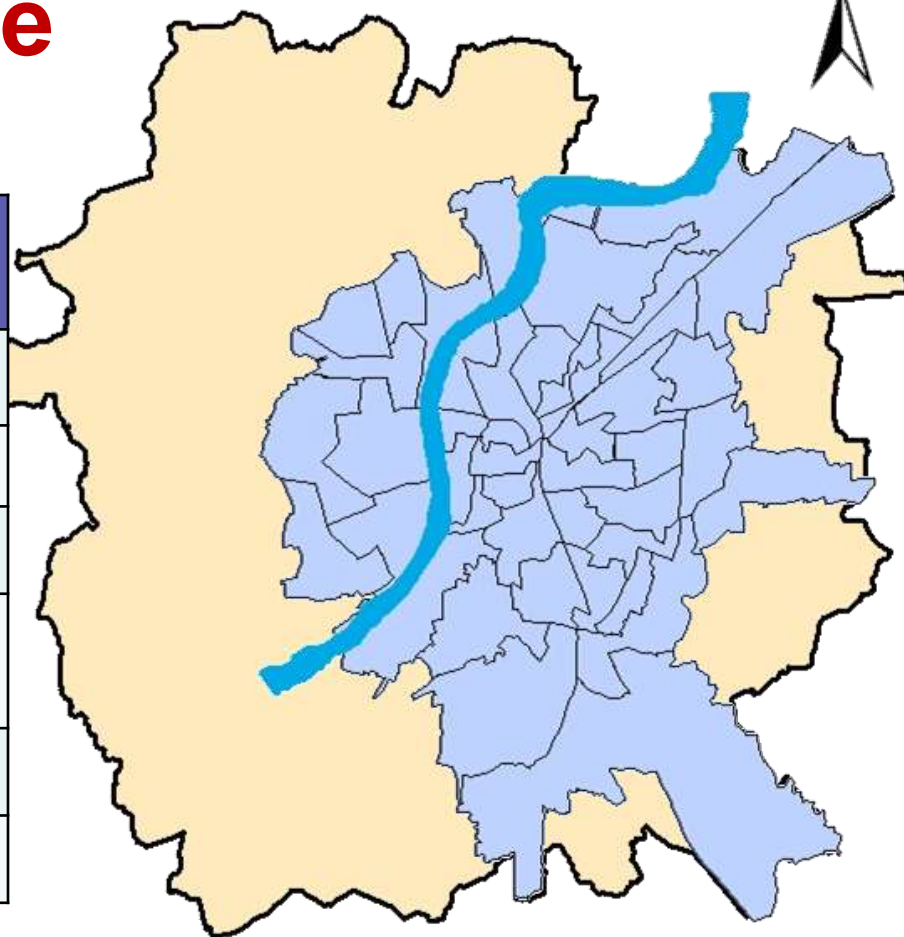


# Ahmedabad Municipal Corporation AMC

# AMC City Profile



Description	Unit	Value (2001)	Value (2011)
Population	Million Nos.	3.5	5.6
Households	Nos.	5,52,164	12,65,372
Area	Sq.kms.	190	466
Density	Persons/ sq.km	18240	12031
Zones	Nos.	5	6
Wards	Nos.	44	64



## AMC new limit.:

17 Nagarpalikas and 27 gram-panchayats were merged with AMC in 2006

New West Zone Created & Area increased in south, East & North Zone

# KEY SERVICES PROVIDED

- Water Supply
- Sewerage
- Construction & Maintenance of Roads, Bridges, Fly-overs
- Solid Waste Management
- Fire Prevention & Ambulance Service
- Health and Medical Services
- Disaster Management
- Town Planning
- Medical Education
- Primary Education
- City Transport
- Parks and Gardens
- Zoo
- Swimming Pools
- Libraries & Gymnasium
- Basic Services to Urban Poor





# Water Supply System

# WATER SUPPLY

- **Water Supply** 1060 MLD
- **Water Treatment Plants** 4 Nos.
- **Water Distribution Stations** 143 Nos.
- **Water Trunk Mains** 250 Km.
- **Water Distribution Network** 3830 Km.
- **Population coverage Water Supply:** 90 %  
(90% with Surface Source,  
10% with Ground Water)
- **U/G Tanks storage capacity (143 Nos.)** 857.40 ML
- **Overhead Tanks ( 141 Nos.)** 62.69 ML
- **Per capita water supply** 140 to 160 LPCD

# ***SAFE DRINKING WATER***

**SOURCE**



**TREATMENT PLANT**



**TRUNK MAINS**



**WATER DISTRIBUTION  
STATIONS U/G TANKS**

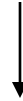


**RESIDENCE**

***Chlorination at Treatment Plant and also at Distribution stations***

# Organization Structure

City Engineer (W.R.M.)



Addl.City Engineer



Dy.City Engineer



Asst. City Engineer



Asst. Engineer



Tech. Supervisor



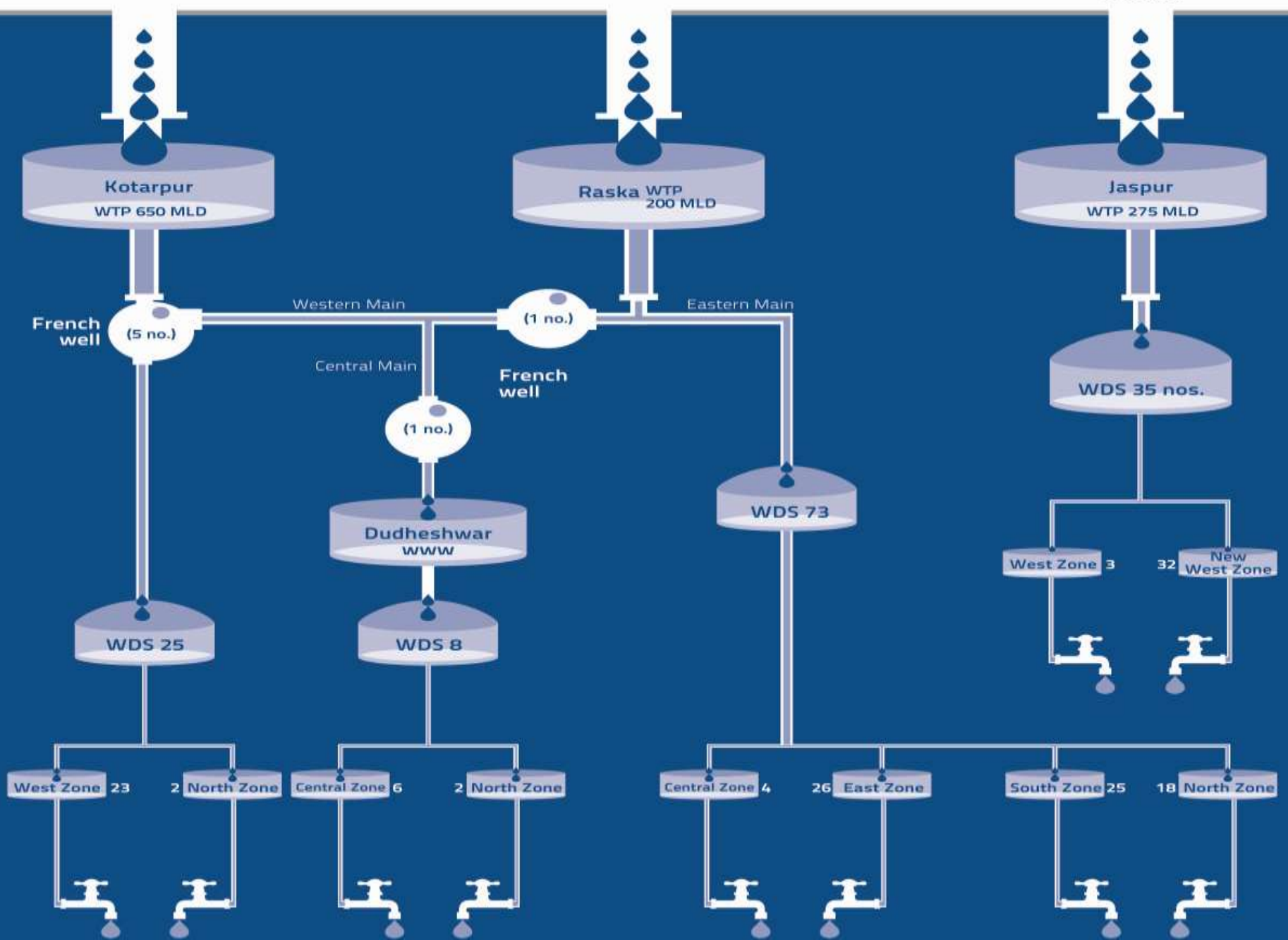
Supervisor



### Narmada Canal HR and Intake well 1 & 2

### Shedhi Branch Canal

### Narmada Branch Canal Dholka



# POTABLE WATER SOURCE



	CAPACITY	UTILIZATION
(A) KOTARPUR WTP		
• NARMADA CANAL (By Gravity Pipe Line)	330 MLD	370 MLD
• INTAKE-I	165 MLD	80 MLD
• INTAKE-II	330 MLD	150 MLD
TOTAL (A)	825 MLD	600 MLD
(B) JASPUR	275 MLD	220 MLD
(C) DWW	70 MLD	0
(D) RASKA	200 MLD	120 MLD
TOTAL (A+B+C+D)	1370 MLD	940 MLD
(E) French well – 7 Nos.	170 MLD	150 MLD
(F) Borewell (521 Nos.)	300 MLD	120 MLD
<b>TOTAL</b>	<b>1840 MLD</b>	<b>1210 MLD</b>

# Water Source (Gravity Line) From Narmada Canal





# Water Source ( Intake & French Well) From Sabarmati River





## WATER TREATMENT FACILITY

	<b>CAPACITY</b>	<b>UTILIZATION</b>
■ KOTARPUR WTP	– 715 MLD	650 MLD
■ DUDHESHWAR WTP	– 70 MLD	-
■ JASPUR WTP	– 275 MLD	220 MLD
■ RASKA WTP	– 200 MLD	110 MLD
■ <b>TOTAL</b>	<b>1260 MLD</b>	<b>980 MLD</b>
■ No. of Water Distribution Station—	111+32 Nos.	143 Nos.
■ Total Capacity of WDS	910 MLD	
■ Augmentation of 125MLD at Jaspur WTP – Work in Progress		
■ Augmentation of 100MLD at Raska WTP – Land Acquisition is under Process		

# Kotarpur WTP



# 200MLD RASKA WATER TREATMENT PLANT





# 200MLD RASKA WATER TREATMENT PLANT





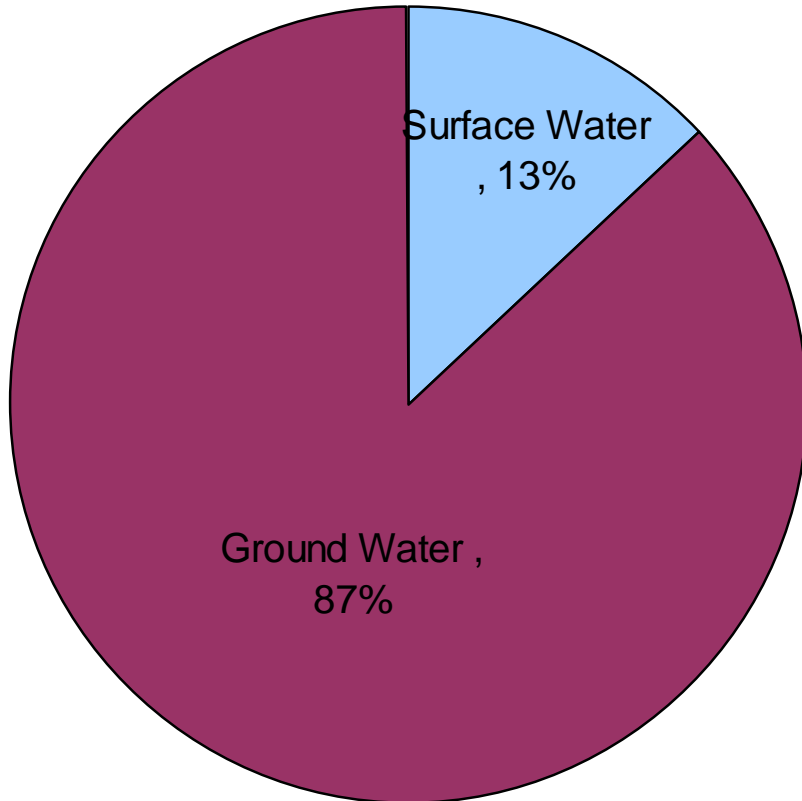
# KOTARPUR WTP



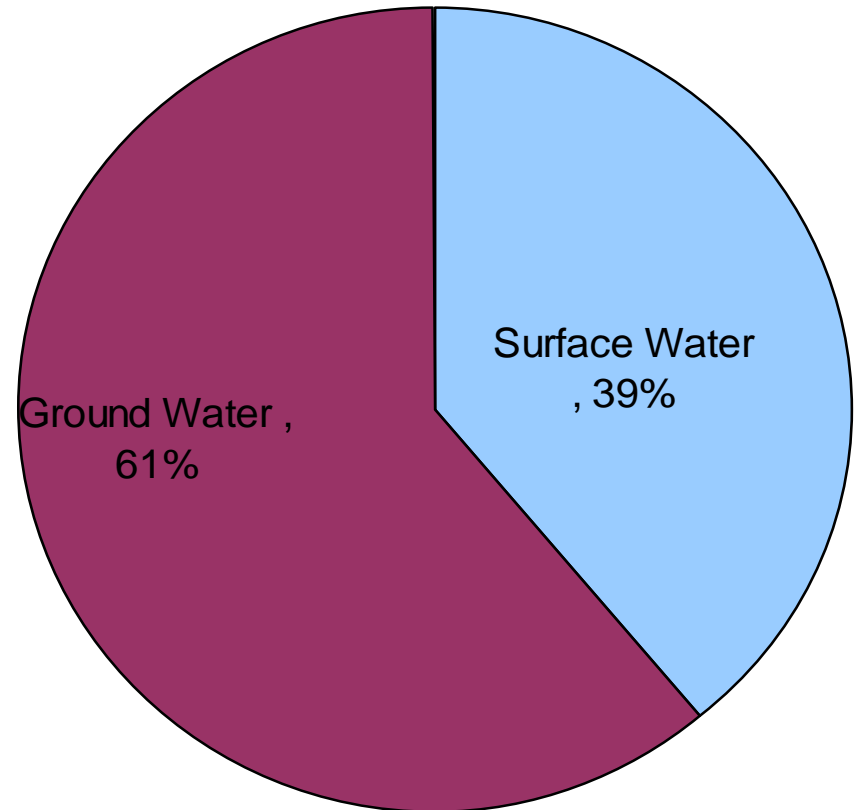
# JASPUR WTP



# Ground Water and Surface Scenario in last 30 years

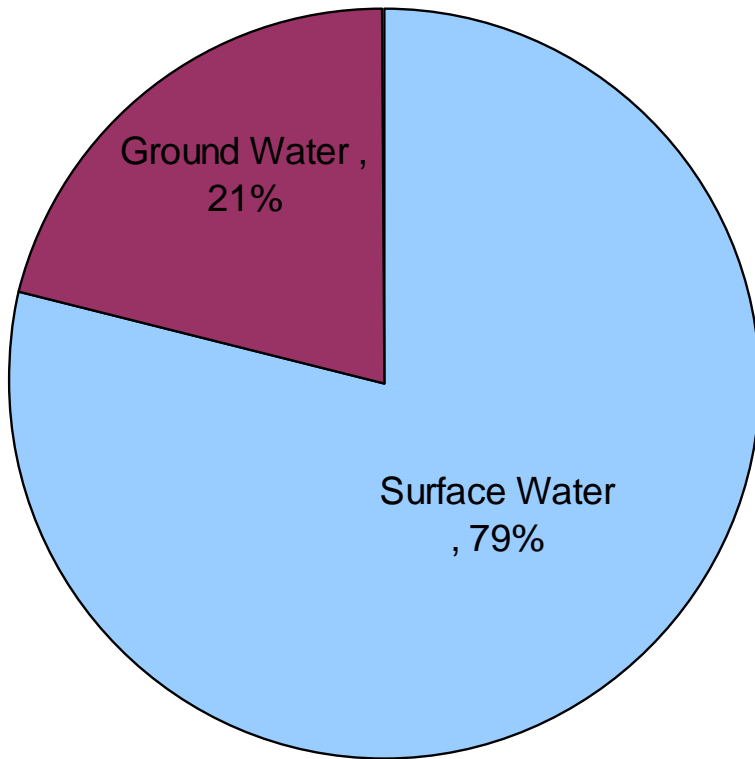


1970 - 1980

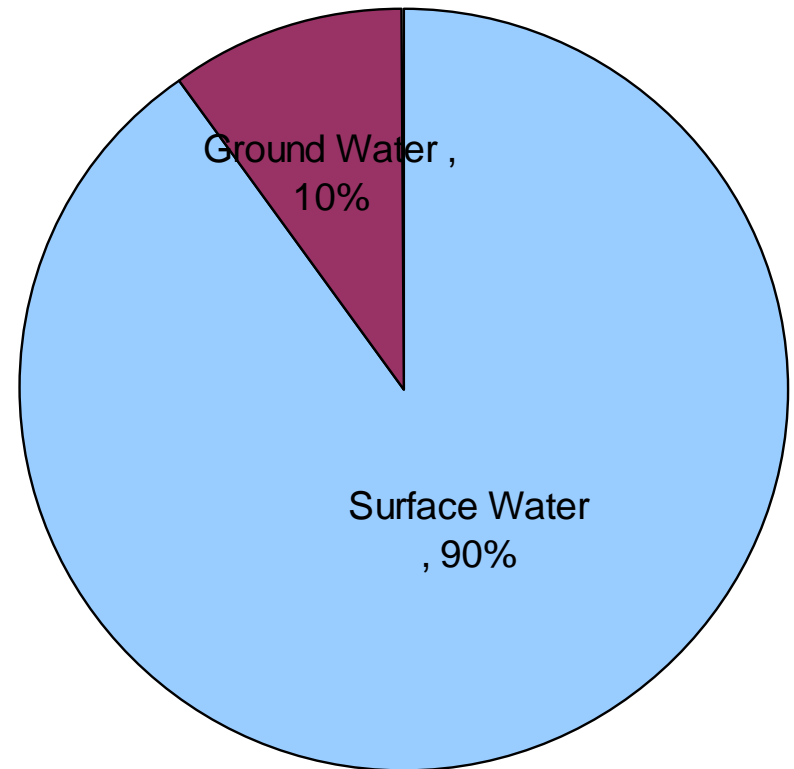


1980 - 2000

# Ground Water and Surface Scenario in last 30 years (Cont.)



2000 - 2006



2006 - 2010

# DETAILS OF WATER DISTRIBUTION INFRASTRUCTURE

No.	Zone	Dist. Stations	UGT Capacity (ML)	OHT Capacity (ML)	Networks Kms.
1	West	26	183.13	13.35	570
2	East	23	135.38	3.77	770
3	South	29	168.55	5.31	860
4	North	23	120.76	3.13	840
5	Central	10	152.09	14.53	120
6	New West	32	94.00	16.22	670
<b>TOTAL</b>		<b>143</b>	<b>853.91</b>	<b>56.31</b>	<b>3830</b>

# WATER DISTRIBUTION STATION





# Water Quality

The drinking water quality standards are maintained as per IS 10500. The analysis results are given below,

Parameters	Actual	W.H.O. Standards
pH	7.20 – 7.80	6.50 – 8.50
Turbidity, NTU	0.50 – 1.50	1 – 5
Alkalinity, mg/L	120 – 200	300 – 600
Total Hardness, mg/L	80 – 280	300 – 600
Calcium as (Ca <sup>++</sup> ), mg/L	190 – 320	70 – 200
Magnesium (Mg <sup>++</sup> ),mg/L	20 – 60	30 – 100
Chloride Cl <sup>-</sup> , mg/L	65 – 310	250 – 1000
Sulphates (SO <sub>4</sub> ), mg/L	12 – 35	200 – 400
TDS, mg/L	120 – 300	500 – 2000

- 97.80% of samples do not contain any coliform organism.
- At consumer end point Residual free chlorine AMC maintains 0.2 ppm.



## **Water Quality**

- **AMC ensures quality Water Supply to Citizens.**
- **Disinfection Treatment through Gas Chlorination Plants (141 Nos.) at water Distribution Stations and Dozers (287 Nos.) at isolated Borewells.**
- **Chlorine content and Quality of Water measured daily and data published in News Paper on quarterly basis and also available on website.**

# Good Practices

**AHMEDABAD MUNICIPAL CORPORATION**  
**PUBLIC NOTICE**  
**INSPECTION OF SAMPLE OF WATER**

THIS IS TO INFORM THROUGH THIS PUBLIC NOTICE THAT THE INSPECTION AND TESTING REPORT OF WATER TANK AND OTHER WATER RESOURCES ARE PREPARED BY THE AHMEDABAD MUNICIPAL CORPORATION. IT'S DETAILS ARE AS UNDER WHICH MAY KINDLY BE NOTED.

MONTH	DISTRIBUTION SYSTEM			MUNICIPAL RESOURCES		
	TOTAL SAMPLES (RES. TAP)	PRESENCE OF GERMS BEYOND LIMIT	AVAILABLE RESIDUAL CHLORINE	TOTAL SAMPLES (RES. TAP)	PERSENCE OF GERMS IN LIMIT	AVAILABLE RESIDUAL CHLORINE
JULY-09	3977	139	3650	310	310	310
AUG-09	3083	63	2851	348	348	348
SEP-09	3357	80	3050	401	401	401

**NOTE :** FURTHER DETAILS REGARDING THIS REPORT IS PRESENTED ON A.M.C. WEBSITE [www.egovamc.com](http://www.egovamc.com). IT IS UPDATED EVERY FORTNIGHTLY. CLEANING OF WATER DISTRIBUTION CENTRE, WATER TANK IN ALL THE ZONES OF AHMEDABAD CITY ARE CONDUCTED REGULARLY AND IT IS TAKEN CARE THAT RESIDUAL CHLORINE LEVEL IN WATER IS MAINTAINED.

DATE : 12/11/09      MUNICIPAL COMMISSIONER  
**CLEAN AHMEDABAD, CLEAN GUJARAT-2009**



## **Non Revenue Water**

- **Transportation losses, Water Theft.**
- **Free of Cost Water Supply to Slum area & other Wastages.**
- **Worldwide Average 30 % is NRW.**
- **AMC NRW is reduced 23% to 27% in Last Five Years.**
- **Leakage in Distribution System**



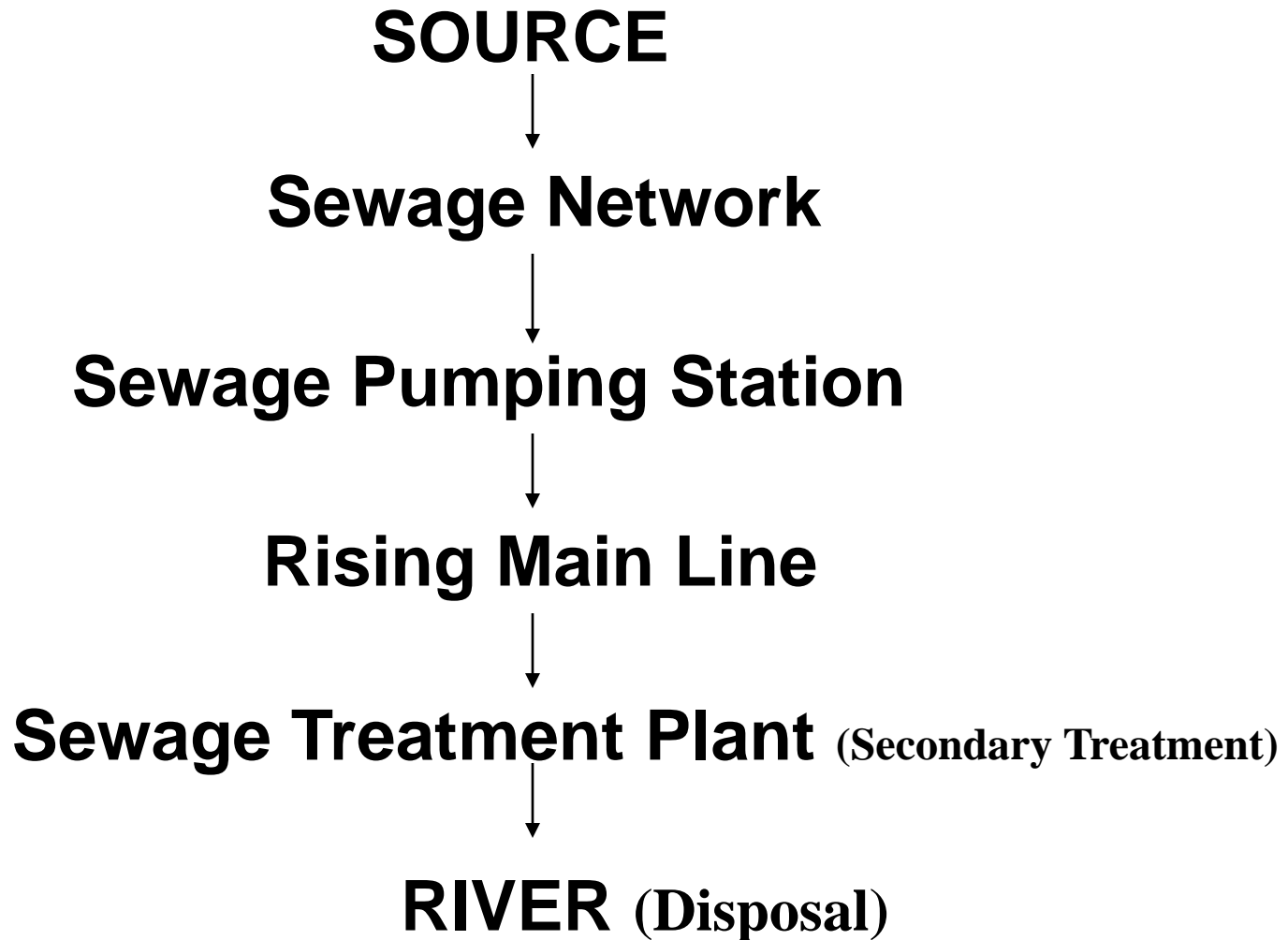
# Sewerage System



# Existing Scenario

- **Existing Sewage Generation per Day :** **800 MLD.**
- **Population Coverage :** **85%**
- **Area Covered :** **90%**
- **Sewerage Network:** **1750 Kms.**
- **Storm Water Drain Network:** **732 Kms.**
- **Total Drainage Pumping Station:** **45 Nos.**
- **Sewage Treatment Plants :** **09 Nos.**
- **Treatment Capacity :** **1075 MLD**
- **Nos. of Pumping Machinery Installed:** **222 Nos.**

# SEWAGE WATER FLOW



# Sewage Treatment Plant

## OBJECTIVES-

- To Provide Treated Effluent.
- Free From Odour.
- To Reduce Suspended Solids & BOD.
- To Reduce Organic & Inorganic Substances.
- To make effluent useful for irrigation.

# Sewerage Characteristics

Parameters	Influent	Effluent
pH	4-10	6-8
BOD (mg/l)	100-300	20
SS (mg/l)	200-400	30



# Existing Sewage Treatment Plants

## **STP Locations & Capacity:-**

### ➤ Vasna (Western Side):

(a) Facultative Lagoon Type :-	76 MLD.
(b) UASB Type :-	126 MLD.
(c) ASP Type :-	35 MLD.
(d) ASP Type :-	<u>240 MLD.</u>
<b>Total (Western Side)</b>	<b>477 MLD.</b>

### ➤ Pirana (Eastern Side):

(a) Facultative Lagoon Type:-	182 MLD.
(b) UASB Type :-	106 MLD.
(c) ASP Type :-	180 MLD.
(d) ASP Type :-	60 MLD.
(e) ASP Type :- [At Vinjol]	<u>70 MLD.</u>
<b>Total (Eastern Side)</b>	<b>598 MLD.</b>

**Total (Eastern & Western Side) 598+477 =1075 MLD.**

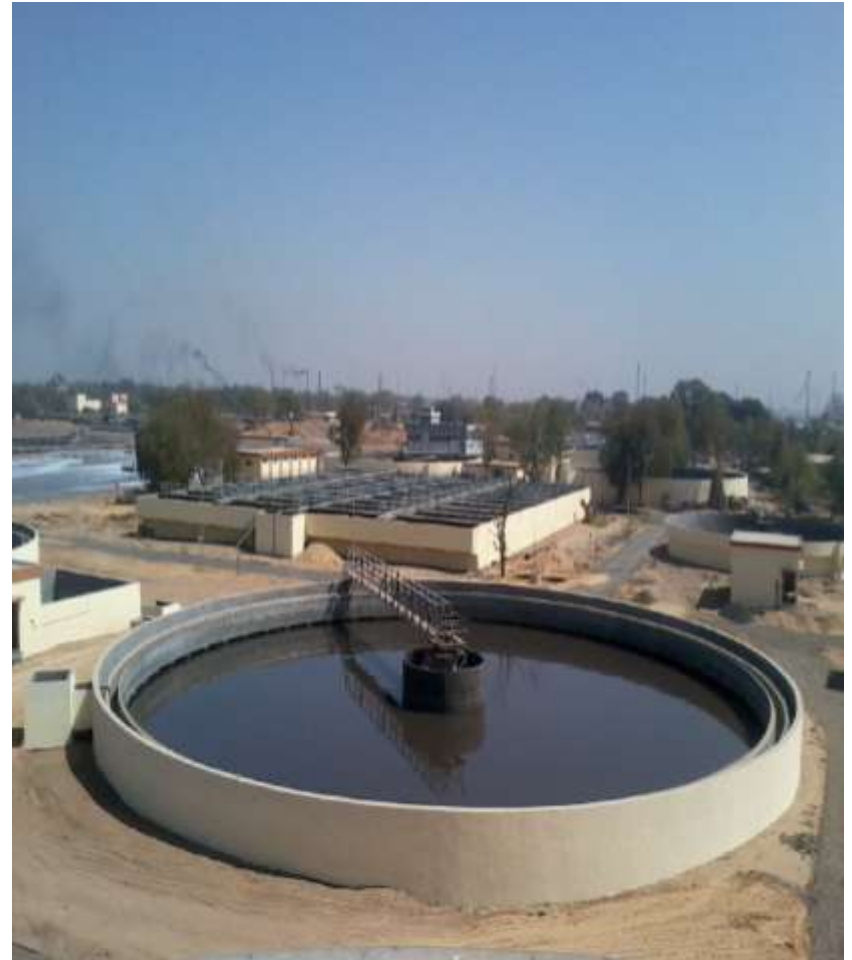
- **Projected Sewage Generation by Year 2021 = 1075 MLD. (Considering Existing & New AMC Area)**

**Note:- Existing Sewage Treatment Setups are Sufficient to Handle & Treat Projected Sewage Generated in Future by the year 2021 After Renovating/Revamping Existing Facultative Lagoons at Vasna & Pirana.**

# 180MLD Sewage Treatment Plant (Pirana)



# 60MLD Sewage Treatment Plant (old Pirana)





# 35MLD Sewage Treatment Plant (Vasna)





# Tertiary Treatment

- All the 9 existing STPs are up to Secondary Treatment.
- For Tertiary Treatment AMC has signed MOU with Four Different Agencies for 550 MLD.

## Purpose:

**Non-potable Tertiary Water Can be utilised for the following Purposes:**

- Reuse in Industries (Industrial Grade Water).
- Gardening and Developing Green belts.
- Used as cooling tower water
- To save the ground water and energy.
- Increasing Ground Water Table

# New Sewage & Storm Water Networks Under JnNURM

## ➤ **New Drainage Network Executed:**

- **Newly Laid Drainage Networks Length : 361 Kms.**
- **Expenditure Incurred:- Rs.180 Crs.**
- **Work Execution period:- 2009-2012**

## ➤ **New Storm Water Drainage Network Executed:**

- **Newly Laid Storm Water Drainage Networks Length:-256 Kms.**
- **Expenditure Incurred:- Rs.238 Crs.**
- **Work Execution period:- 2008-2012**

# Drainage Pipe Network Laying



# Storm Water Drainage work





# Storm Water Drainage work





# Pipe Testing for Sewerage Network



## **Challenge for Water Supply and Sanitation**

- **Lack of Public Awareness to save water.**
- **No Value for Water due to Minimum Charges as a Water Tax. (Rs. 0.50 per 1000 Lit)**
- **Citizen believes to get Water free of cost as Constitutional Rights**
- **Water Theft by illegal Connections and Motoring from direct Water Supply line.**
- **illegal Connection through inferior Quality of Pipes leads to Water Pollution and resulted in to Health hazards.**
- **Blindly Adoption of Water Treatment Technology from Global Technology.**
- **Traditional Habit of Non Closing of Water Tapes during different daily actives.**

## **Challenge for Water Supply and Sanitation**(Cont.)

- **Non Payment of Water Taxes to the Organization which leads to Financial crunches for Origination and delay in new development of infrastructure**
- **Direct illegal Connection from Public Tap.**
- **Unavailability records of Under Ground Utility Services**
- **Shortage of Skilled Human Resources**
- **Less importance to Human Resource Management in Public Authorities.**
- **Increased Dependency on Private Operators.**
- **Leakage Detection.**

## **Challenge for Water Supply and Sanitation (Cont.)**

- **Delay in approval of DPR from Different State & Central Government Dept. or any other granting agency leads to increases costs for ULB (in terms of premium on tender)**
- **Delay in releasing of funds by grant agencies.**
- **Capital costs are given by grant agencies, But funding for O & M of infrastructures creates problems which leads to unsustainability of Projects.**
- **Capacity Building of Organization.**
- **Less importance to recycle & reuse of sewage for non potable use.**
- **Banning on extraction of Ground Water**

## **Challenge for Water Supply and Sanitation (Cont.)**

- **Enforce industries to use only recycle sewage water or increase the charges of surface water supply.**
- **Importance to enrichment of by product of sewage treatment plant (Sludge to manure)**
- **Priority given to lake / water body inter linking and connection of storm water network with lakes.**
- **Compulsion of harvesting structure for storage of rain water in all structure by GDCR.**
- **Unofficial and unscientific cross connection of sewage network and storm water drainage network.**
- **Under developed surrounding area merging in to Municipal limit.**



## **Challenge for Water Supply and Sanitation (Cont.)**

- **Limitation of desilting machinery for drainage line cleaning.**
- **Expensive technology of rehabilitation / refurbishing of old existing drainage line.**
- **Non availability of land for individual / Community toilets in slum pockets.**
- **Mindset and Habits of citizens for open defecation.**
- **Reasons for OD include absence of toilets, habitual practices, unusable toilets, gender issues such as male in-charge for women's toilet, closing of toilets between 2300 hrs and 0500 hrs, inappropriate locations of toilets, etc.**
- **There are no public conveniences for either the differently abled users or for assisted users. Toilets have been designed insensitively ignoring the need for barrier free access to all.**

## **Challenge for Water Supply and Sanitation (Cont.)**

- **Many public taps and other fittings are either broken or stolen**
- **Toilets are unfriendly for use for children.**
- **Issues in implementation of public health bye-laws.**
- **Industrial Zone must be located outside the city Area.**
- **Design criteria for storm water drain should be changed as per current scenario.**
- **Segregation of solid waste at source is must.**
- **Lake in Scientific Disposal of Solid waste.**
- **Less importance to Solid Waste Mgmt.**

## **Efforts towards Wholesome water**

- **Increase dependency on surface water instead of ground water.**
- **Reduction in NRW through water audit.**
- **Equitable water distribution through implementation of SCADA system.**
- **Energy audit for deduction in energy cost.**
- **Training to Departmental / Organization staff for better performance.**
- **IEC activities for public awareness.**
- **Efficient and economical adoption of Global technology.**
- **Time to Time implementation for reforms is must.**
- **Implementation of 24x7 water supply system instead of intermediate water supply.**
- **Recycle & Reuse of sewage**

## Way Forward to 24X7 Water Supply Scheme

### NEED OF 24 X 7 PROJECT

- To avoid possibilities of contamination of water and thereby reducing the water borne diseases
- Un-interrupted water supply at desired pressure to all consumers within their homes (24 hours a day and 7 days a week)
- Reduction of NRW ( Non Revenue Water )
- Improvement of service level to consumer

### 24 X 7 PROJECT COMPONENT

- Water audit and identification of leakages
- Continuous audit with real time central monitoring system by installation of flowmeters
- Isolation of network as per command area of each water distribution station
- Hydraulic remodelling as per countour and water zone demand
- Creation of DMA's for leak detection program (Distric Metering Area)
- Implementation of telescopic tarrif by meterisation

### 24 X 7 PROJECT ADVANTAGE

- Minimize pollution
- Water audit and energy audit
- Sustainable water supply with better accountability towards citizen
- Better services to the citizen with customer centric approach
- Improve satisfaction for stake holders



**AHMEDABAD**

**“CITY OF QUALITY LIFE”**

**Thank You**

**Dharmendra C. Herma  
Asst. Muni. Commissioner  
Ahmedabad Municipal Corporation**