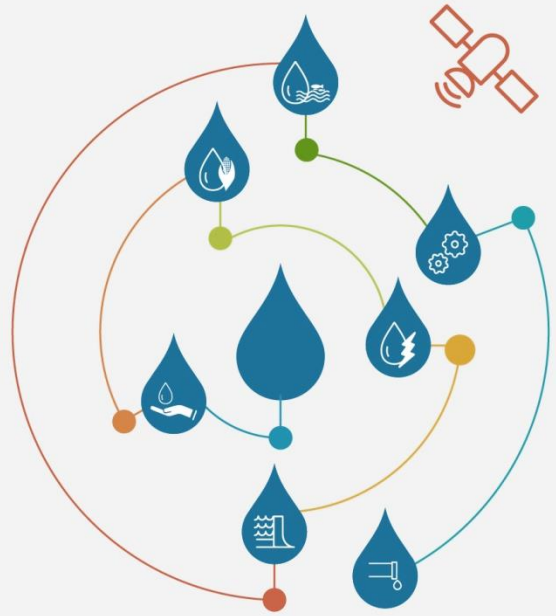
# SHENZHEN WATER: MAINSTREAMING SMART WATER IN THE PEOPLE'S REPUBLIC OF CHINA



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ADB

# Presentation Shenzhen Water Group (SZWG)

- Shenzhen: 1st Special Economic Zone & innovation hub in China.
- SZWG (2001) Concession 50 y. Shenzhen (Population 12.5 M)
- PPP in 18 other cities (20 M people).
- SOE Reform (2003): 45% private & 55% SZ Municipal Government.
- First water company with customer satisfaction certif. (ISO10002).
- R&D: 35 patents & 43 utility models & Innovation platform.
- Smart water initiatives since 2006 – NRW 13% (2016).
- 8.4 M m3/d (82 water treatment plants) & 3.5 M m3/d (28 sewage treatment plants)

# SZWG approach to Smart Water (2006-18)

## Planning and Management

- Hydraulic & WQ modeling linked to SCADA & GIS
- Business intelligence & big data analysis.
- ERP with key real-time operational data

## O&M

- Real-time leak detection algorithms.
- Preemptive, data-driven ASM.
- Advanced equipment and patents.
- Portable apps for O&M.

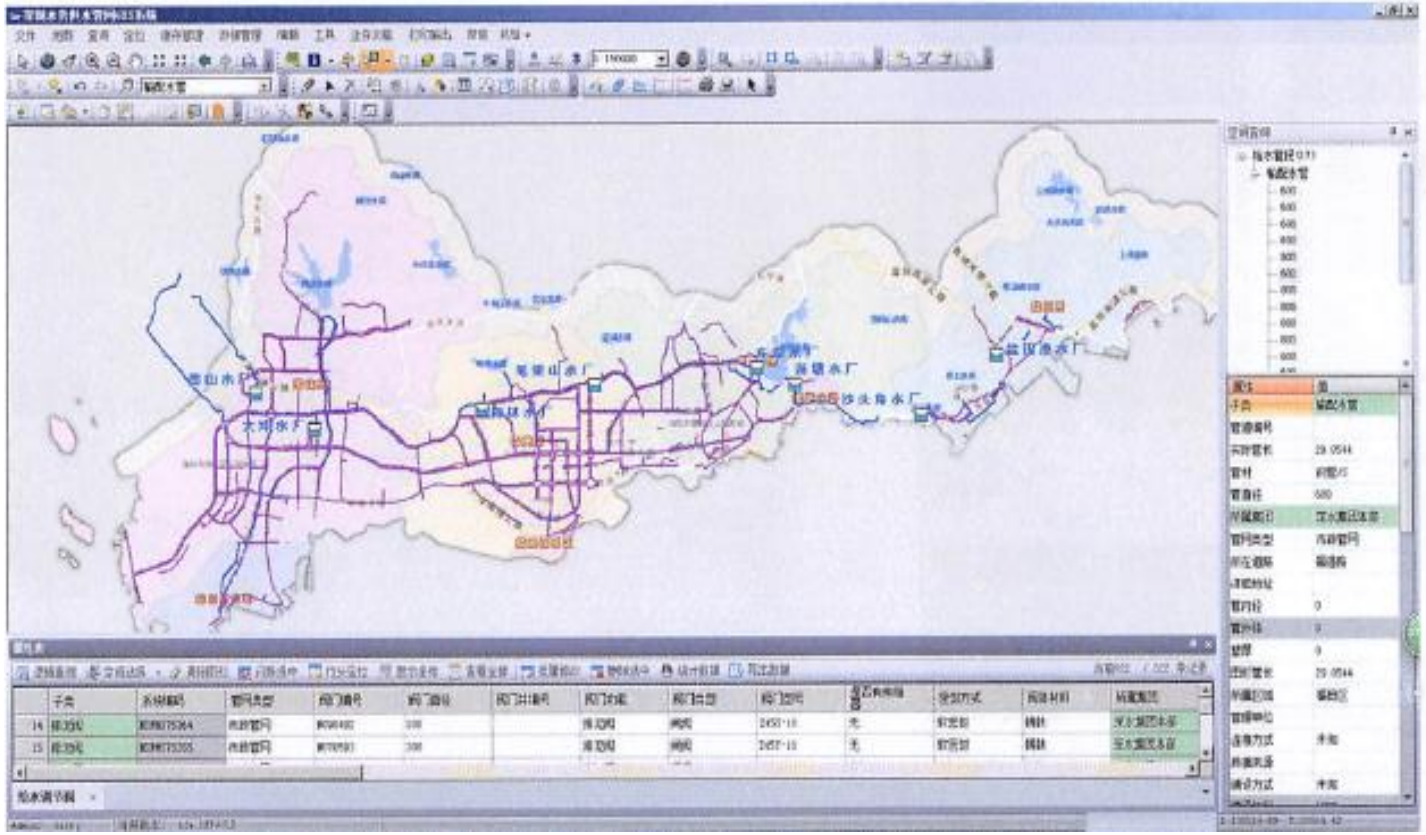
## Customer care

- Cloud-based CMS.
- Social network data analysis
- Smart meters linked to end-user apps.
- Real-time urban flood warning systems.

# GIS Development

Updated GIS (2016) for the networks linked to database (static & dynamic information)

- Characteristics pipes, valves
- Water consumption (nodes)
- Real-time network data (pressure, flows, etc.) over 12,000 km WS network & WW/Drainage



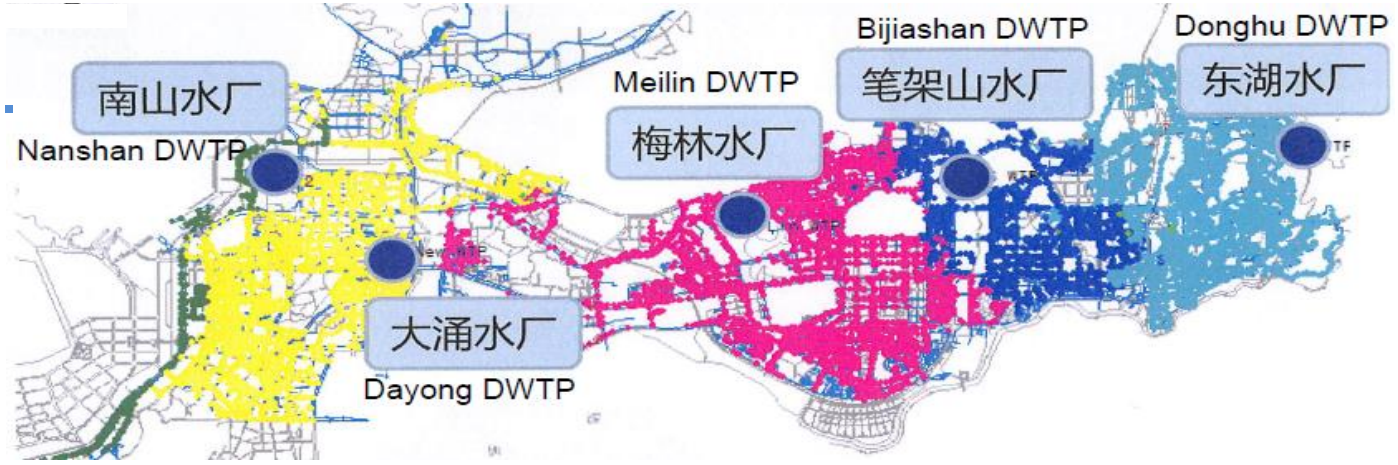
# Hydraulic modeling

**Hydraulic modeling** (quantity and quality):

- Planning: Networks' expansions, modifications, operational and contingency plans, …
- Operations: Repair, leak-detection, installation of new sensors, etc.

**Models calibrated with field data are the backbone for:**

- Leak detection algorithms
- Active pressure-management
- Real-time demand forecasting.



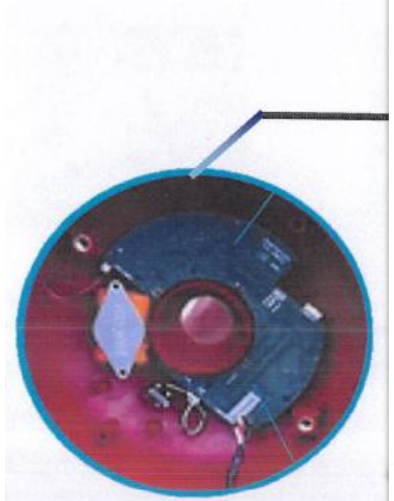
# Smart Operational Tools

## O&M MOBILE APP FOR TREATMENT PLANTS


- Standardized, paperless, mobile-assisted inspection work at the treatment plants.
- Improved efficiency: time-out inspection or non-patrol.
- Incidence reporting and fast response in O&M.

# Advanced Equipment and Patents

## Smart Fire Hydrants (8,000 units)



**Module**

Micro motion Sensor
Pressure Monitor
Anti collision
RFID
Communication

**Functions**

Real time Monitor
Data Analysis
Authorized staff ID
GIS Location
Alert Message

## Real-time Toxicity Bio-monitoring (40 sets)


**Functions**

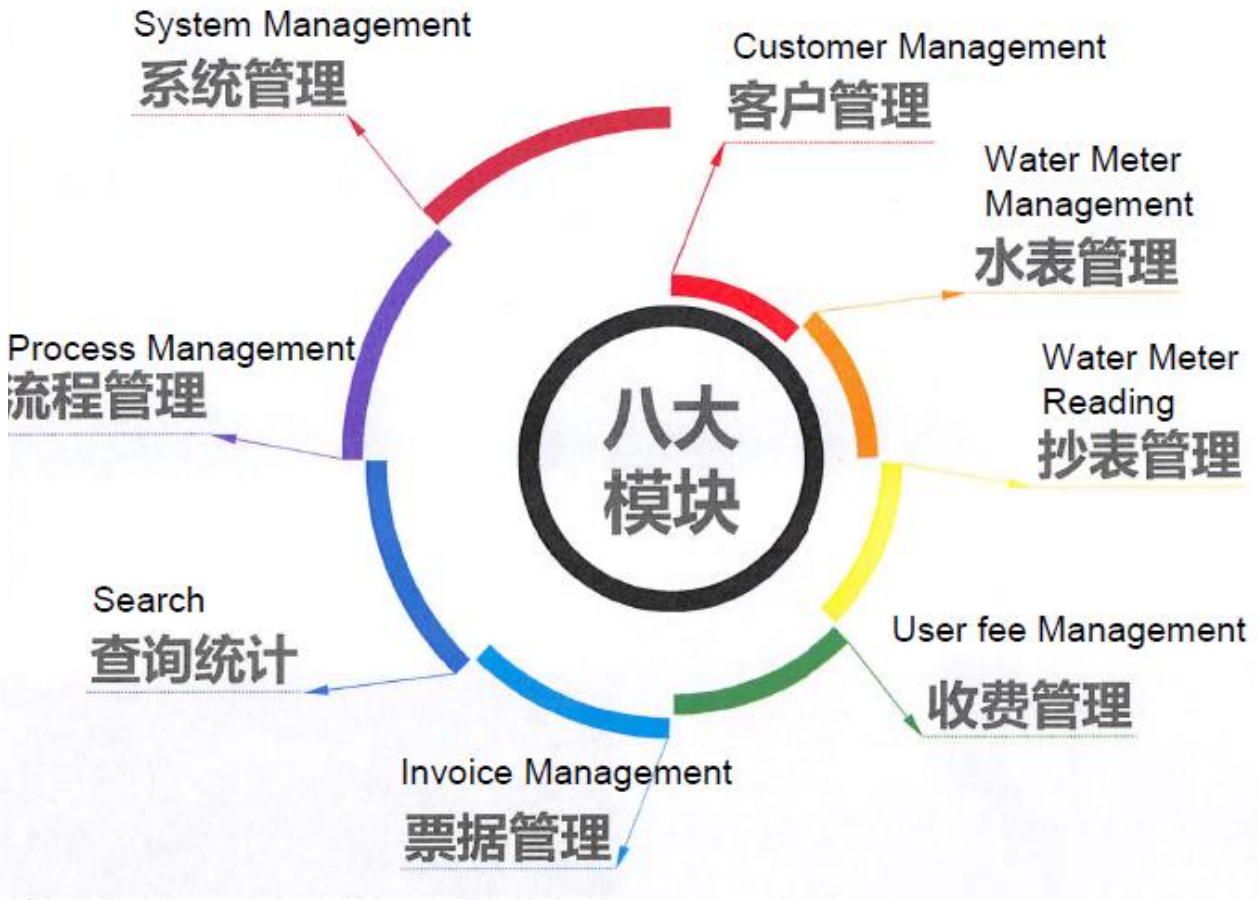
Biological indicators
Temperature: 0-40°C
Accuracy: 0.05 - 0.1 TU
Alert: 5 mins

# Customer service and smart meters

## CUSTOMER SERVICE SYSTEM

Based on 8 components

SZWG partnership with ICT firms to develop technological solutions for smart metering based on NB-IoT




# SZWG smart approach to Sponge Cities

- Government Sponge City Initiative
  => Game-changer in Urban Development

- SZWG = Leader Sponge Cities:
  => Pilot projects Shenzhen, Chizhou, …

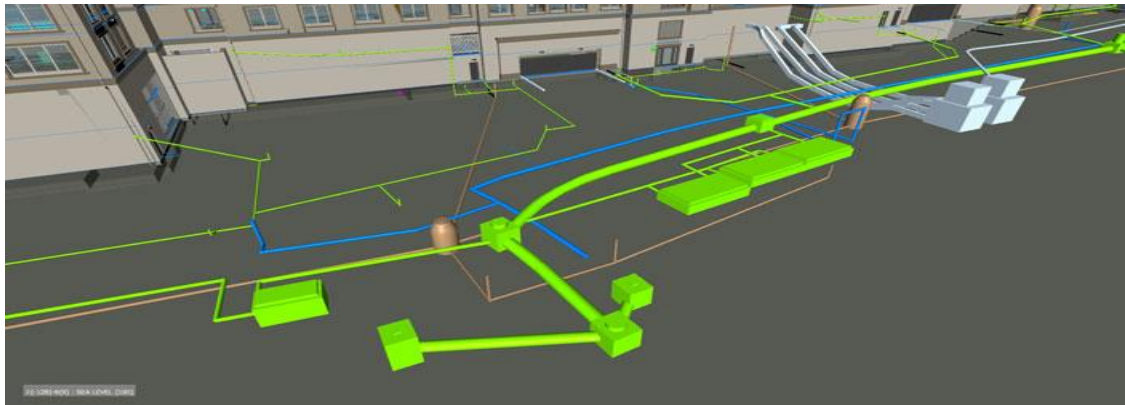
- Smart Water = KSF Sponge Cities:
  => Performance indicators with accurate real-time measurements hydro-climatic & system variables.

Shenzhen Sponge City Pilot

# Other smart water initiatives in focus

Planned initiatives in SZWG for the next 3 years:

- Develop ICT Platform: Flood control with Citizens' feedback.
- Develop ICT tools to move swiftly to on-line customer care.
- Apply Building Information Modeling technology for projects.
- Develop unmanned water and wastewater treatment plants.
- Develop optimization and big data tools to improve operations and planning of W3 network extensions.



# Expansion plans: crossing the river…

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- Experience in more than 35 PPP projects outside Shenzhen.
- Proximity and direct access to the leading IT companies in China.
- World-class public & private stakeholders supporting expansion plans.
- Modular & replicable business processes: Operations in growing market.
- Support from ADB (Ongoing NSO) & other leading financial partners.

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- Low margins due to political restriction in water pricing
- Growing competition & Cooling down PPP in China.
- Difficulty in reaping the benefits of economies of scale.

# THANK YOU !

深圳水务集团
SHENZHEN WATER GROUP

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