



## PROJECT SUMMARY

### Organization:

Maharashtra Jeevan Pradhikaran (MJP)

### Solution:

Water and Wastewater

### Location:

Badlapur, India

### Project Objective:

- 24-by-7 water supply to more than 140,000 residents of Badlapur, India
- Transforming the disorganized Badlapur city distribution system into a well-functioning system

### Products used:

WaterGEMS  
WaterGEMS® Darwin® Designer

## FAST FACTS

- Transformation of intermittent system to 24x7 system simultaneously reduced contamination level and non-revenue water
- A proper hydraulic model is necessary to convert old intermittent systems into 24x7 systems
- MJP used WaterGEMS and Darwin Designer to prepare a hydraulic model of existing as well as proposed pipelines in the Badlapur city

# WATERGEMS® POWERS DESIGN OF BREAK-THROUGH 24-BY-7 WATER SYSTEM IN INDIA

TECHNICAL INNOVATION SHOWCASED AS INSPIRATION FOR WATER UTILITIES IN DEVELOPING ECONOMIES

Supplying potable water to dense populations in developing countries is a perpetually daunting task for water utilities. It is estimated that 1.6 million people die each year from diseases due to poor service provided by an intermittent water supply. During non-supply hours, pipes remain empty and dirty water enters the pipeline at vulnerable spots, causing contamination and associated health risks. Therefore, transforming these supplies to 24-by-7 is a priority for developing economies.

Badlapur, India, part of metropolitan Mumbai, is trying to supply its growing population with a 24-by-7 system – a first for the country. The population is expected to reach 300,000 by 2011.

The transformation of the existing distribution system into a world-class water system required a new hydraulic model, according to Dr. Sanjay Dahasahasra, member secretary at Maharashtra Jeevan Pradhikaran (MJP).

The complex model encompassed the city's entire water distribution system and its operating pattern. It also required calibration of the network,

analysis of the consumer withdrawal patterns during system modifications, and the creation of new zones and district metering areas to further improve service. Water loss and diversion caused by leaking underground storage tanks and oversized above-ground tanks also complicated the analysis.

The project team used Bentley's WaterGEMS to design the existing and proposed pipelines in Badlapur. Features such as flow-control valves, reservoirs as source nodes, pipe junctions, pipe elements, and demand nodes helped to analyze and optimize the distribution network. The design team used the software to create a modeling process to analyze the data, describe the real-world network system, test maps, and synchronize with a GPS.

The project required management of a vast amount of data, comparison of permutations, and a combination of a large number of scenarios resulting from various alternative measures to create a comprehensive model. According to Dr. Dahasahasra, using WaterGEMS in this project



Satellite image of Badlapur

*“Improving the water supply in Badlapur would not have been possible without analyzing existing conditions using WaterGEMS,”*

### ABOUT BENTLEY

Bentley Systems, Incorporated is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Architects, engineers, constructors, and owner-operators are indispensable in improving our world and our quality of life; the company's mission is to improve the performance of their projects and of the assets they design, build, and operate. Bentley sustains the infrastructure professions by helping to leverage information technology, learning, best practices, and global collaboration – and by promoting careers devoted to this crucial work.

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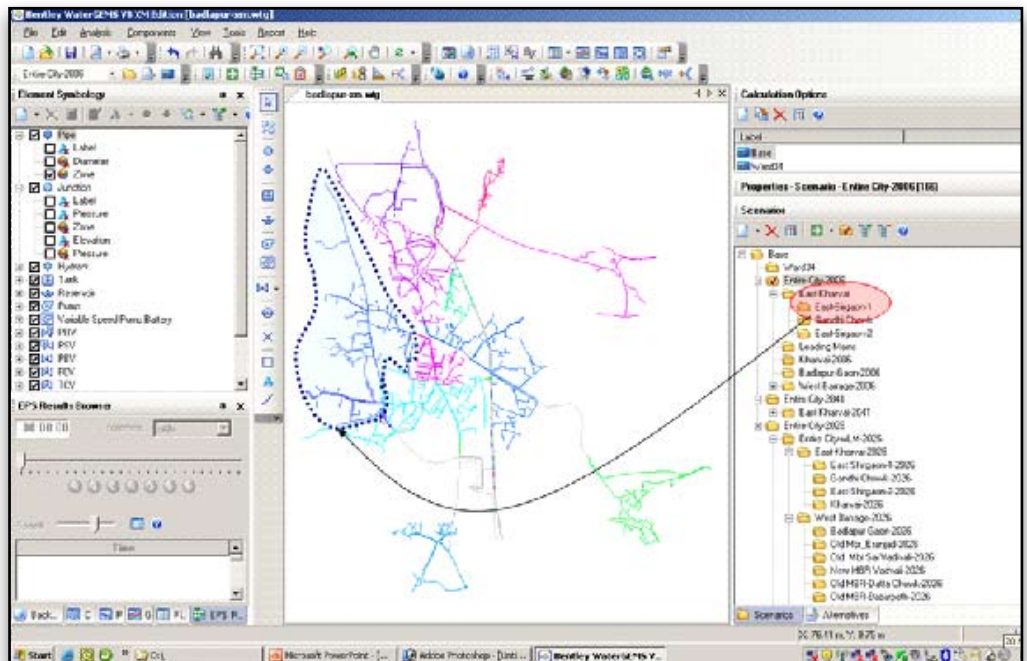
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*Scenario of the Shirgaon – 1 Operational Zone*

Parameter	From	To:
Revenue	91%	96%
Losses	29%	23%
Staff/1000	13.72	10
Complaints/1000 connections	55	5
Annual O&M expense/ 1000 connections	Rs. 34.55 Lakhs	Rs. 29 Lakhs
LPCD	171	135 (Only areas where UG tanks are not leaking)

#### Improved Performance

resulted in reducing non revenue water: 427 million liters water are additionally available annually , saving \$70,000 per year. Over the 30-year lifecycle of the project, the savings will be substantial.

“Improving the water supply in Badlapur would not have been possible without analyzing existing conditions using WaterGEMS,” said Dr. Dahasahasra.

By the early part of this year, eight of the city's 34 wards had been converted to 24-by-7 systems by hydraulically isolating operational zones. Moreover, the duration of supply in two additional wards has been increased from 3 hours to 18 hours. This progress has greatly improved drinking water quality and reduced contamination levels.

The project, which is to be completed by the end of 2009, will serve as a model solution for

other cities in developing countries to improve their potable water systems, enhance public health, and meet United Nations Millennium Development Goals.

