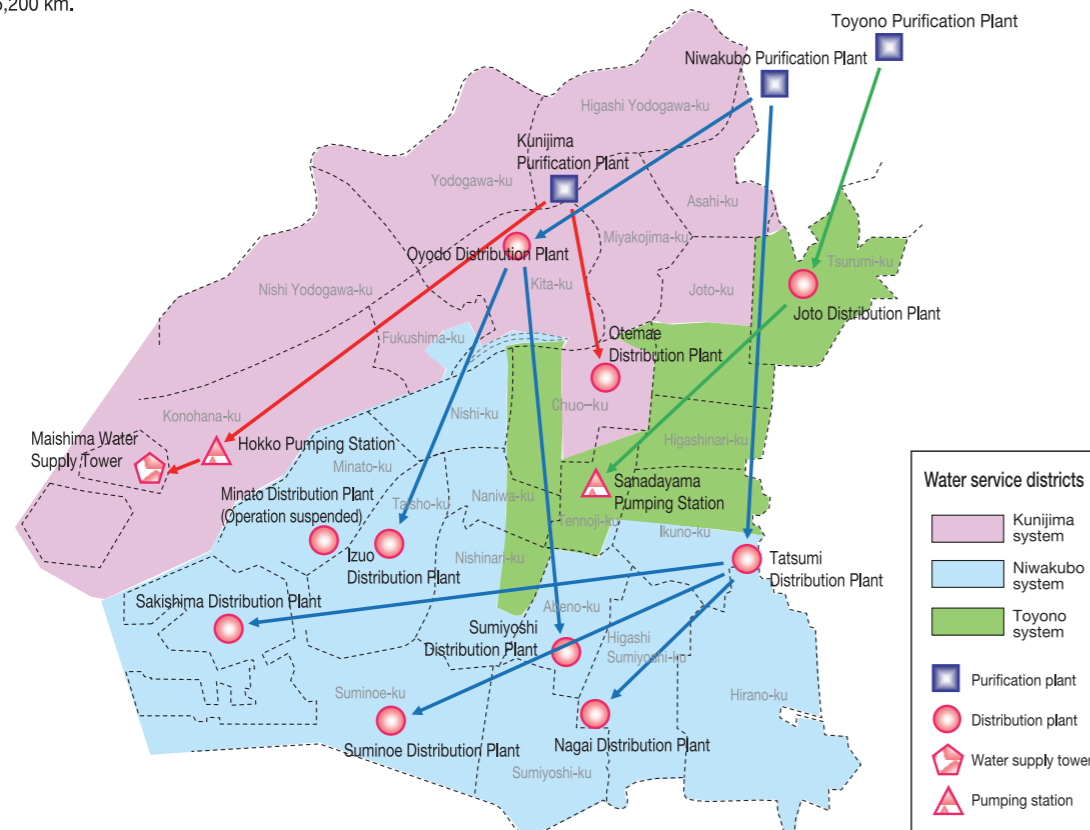


Outline of Distribution Facilities

Water Distribution Facilities

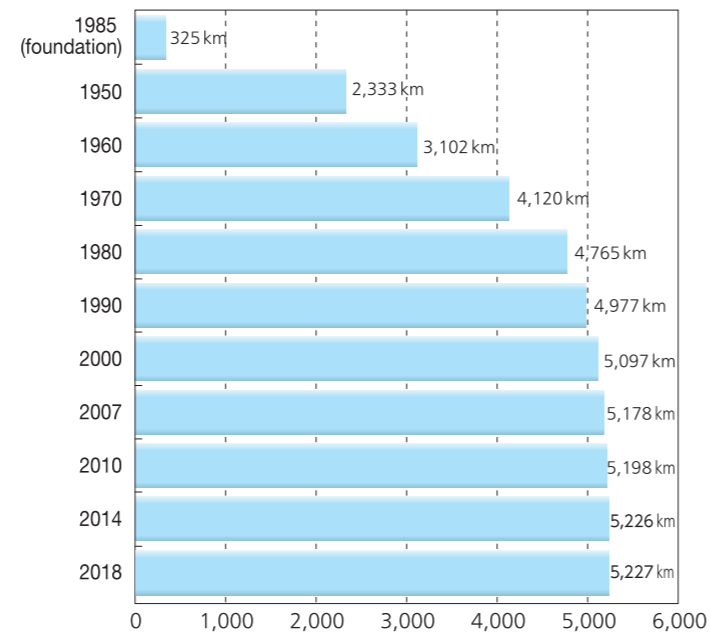
The area of Osaka City is mostly flat and therefore pressure pumps are used for water distribution. The Kunijima Water Purification Plant downstream system uses three water distribution pumping stations located inside the Plant, along with the secondary water distribution facilities of the Otemae Water Distribution Plant, the Hokko Pressure Pumping Station, and the Maishima Water Supply Tower, to distribute water. The Niwakubo Water Purification Plant downstream system uses the Tatsumi and Oyodo Water Distribution Plants, along with the secondary water distribution facilities of the Sumiyoshi, Suminoe, Sakishima, Nagai, and Izuo Water Distribution Plants, to distribute water. The Toyono Water Purification Plant downstream system uses the Joto Water Distribution Plant and the Sanadayama Pressure Pumping Station to distribute water. The total capacity of the water purification and distribution reservoirs is 789,700 m³, and the total length of the aqueducts, water supply pipes, and water distribution pipes is approximately 5,200 km.



Capacity of water purification and distribution reservoirs (as of the end of FY2018)

Kunijima Purification Plant system	Niwakubo Purification Plant system	Toyono Purification Plant System
Distribution reservoir for Kunijima Purification Plant No. 1 Distribution Pumping Station 112,400 m ³	Distribution reservoir for Niwakubo Purification Plant 33,400 m ³	Distribution reservoir for Toyono Purification Plant 75,300 m ³
Distribution reservoir for Kunijima Purification Plant No. 2 Distribution Pumping Station 55,000 m ³	Tatsumi Distribution Plant 100,900 m ³	Joto Distribution Plant 67,000 m ³
Distribution reservoir for Kunijima Purification Plant No. 3 Distribution Pumping Station 106,200 m ³	Oyodo Distribution Plant 55,000 m ³	
Otemae Distribution Plant 33,700 m ³	Sumiyoshi Distribution Plant 12,000 m ³	
Maishima Water Supply Tower 500 m ³	Suminoe Distribution Plant 27,300 m ³	
	Sakishima Distribution Plant 30,000 m ³	
	Nagai Distribution Plant 42,000 m ³	
	Minato Distribution Plant 15,000 m ³	
	Izuo Distribution Plant 24,000 m ³	
Total 307,800 m³	Total 339,600 m³	Total 142,300 m³

Total lengths of aqueducts, and water supply and distribution pipes



Maintenance and Management of Pipelines

Pipeline information management system

The pipeline information management system utilizes computer mapping for the information management of water supply and distribution pipelines, thus replacing conventional water management diagrams, ledgers, and construction drawings. The introduction of this system, which came into full-fledged operation in fiscal 2000, has enabled speedier operations, improved resident services, advanced utilization of data, homogenization of duties, and saving of space and resources. Furthermore, functions to assist various operations have been developed, with the aim of facilitating more effective use of the system.

[Major functions]

○Mapping

Function to digitalize water supply equipment information (pipeline graphic data and attribute information) to be managed on terrain data

○Filing

Function to associate construction completion drawings of water distribution pipes and water supply pipes with water supply equipment information, and save them in PDF format to be available for reference and output.

○Work assist

The mapping function is customized for the operations below:

- Receiving requests for leakage repair
- Setting priorities for aging pipes to be improved
- Management of water control valve opening and closing (valve ledgers)
- Identifying the range of water stoppage (displaying the suspending pipelines and number of affected households), etc.

Mapping screen (basic function)



Maintenance management of aqueducts, water supply pipes and distribution pipes

Regarding the maintenance management of aqueducts, water supply pipes and water distribution pipes to ensure a stable supply of high-quality water, Osaka City conducts the following:

(1) Maintenance management

○Waterworks facility repair work

Repairing leakage in aqueducts, water supply pipes and water distribution pipes, and replacing failed accessory equipment (e.g., water valves and air valves)

○Witness and patrol (to prevent accidents caused by other construction work)

Patrolling road construction sites (including sites of pipeline burial work by other companies) proactively and systematically to prevent water pipe accidents

○Planned leakage inspection

Conducting periodic leakage inspections to enable early discovery of water leakage, thereby reducing expenses on water leakage.

○Expeditious inspection and maintenance work (water leakage and accessory equipment inspections)

At each road construction site, conducting inspections for water pipe leakage and accessory equipment before the secondary pavement recovery is implemented.

- Target pipelines: Water distribution pipelines with a maximum diameter of 400 mm that were laid in 1980 or before
- Work outline: Identifying underground water leakages from distribution pipelines using water leakage detectors, etc. Checking damage and functions of accessory equipment

○Maintenance work on trunk line valves (maintenance management of accessory equipment of trunk lines)

Conducting regular inspections and maintenance for accessory equipment that will play a particularly important role (in preventing the expansion of the impact range, etc.) in the event of an accident on a trunk line or switching of the water distribution system, which always needs to be maintained in good condition.

○Trunk line patrol (to prevent trunk line accidents)

Patrolling buried water distribution trunk lines on a periodic basis and visually checking road subsidence and any abnormalities on the iron lids of accessory equipment to prevent accidents

- Target pipelines: Aqueducts, water supply pipes, basic trunk lines, branch pipes and branch lines. Water pipe bridges. Common tunnel pipelines. Other necessary pipelines.
- Work outline: Identifying water leakages and abnormalities on iron lids by patrolling and visual inspection

○Planned cleaning and drainage work (work for water conservation)

Removing precipitates and deposits by drainage work on water distribution pipes with a maximum diameter of 300 mm for the reduction of turbid water

(2) Others

○Soil investigation: Investigation of the influence of the nature of soil on drainage pipes: To be conducted (visual and detailed investigations) for soils around target pipelines for leakage repair work, etc.

○Pipe investigation: To be conducted (detailed investigations) to identify the cause of leakage accidents on target pipelines

(Reference)

Pipe investigation for the entire City (soil and pipe investigations to identify the cause of leakage accidents)

- Investigation targets: Ductile cast iron pipes
- Steel pipes
- Other serious accidents (medium- or large-diameter pipes, etc.)



Water leakage investigation



Figure: Trunk line patrol