

# Urban Utilities

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### Underground Pneumatic Waste

Nowadays, some cities are adopting underground pneumatic waste systems to transport and collect garbage without any surface activity.

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### Water Supply and Storage

It has always been a basic need for mankind to secure water resources.

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### Sewage

Sewerage management is also a priority for the general public and a major worry for public authorities.

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### Flood Control Systems

#### Multi purpose gallery

In central areas of large towns, the placement of infrastructure services into tunnels is associated with the need for a comprehensive solution to the regeneration of technical infrastructure and boosting its capacity.

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### Urban Heating / Urban cooling

### Electrical and Communication Cables

Another essential use of the underground space in urban environments is the distribution of electrical and communication cables.

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With large concentrations of people in limited space, it has become necessary to utilize the subsurface for locating a growing number of services in urban environments:

- Water supply, waste water disposal and drainage of rainwater are since ancient times prevailing activities in the underground space of the main cities.
- Complex and efficient systems to regulate urban utilities and fight against challenges like floods and pollution in the urban environment.
- The development of gas in the cities also led to a need of underground use. For safety reasons, gas ducts that were before left in the open air started to be put underground, reducing the gravity and risk of explosions.
- New underground conductions being developed to cater for new services, like it is the case of pneumatic waste ducts, IT communications, etc.

These installations are designed to conform to the basic pattern of the overhead surface plan.

As an area increases in density, this space becomes cluttered with supply lines. One way to accommodate the growing demand for conduits is to place them in somewhat deeper tunnels freed from the general plan of the surface.

Excavated in soft ground or rock, these utility tunnels are not bound to the surface design. Because such tunnels are generally situated deeper than trench pipes, they are able to avoid the aged near-surface infrastructure during construction.

Therefore, as these supply lines are tunneled rather than dug directly from the surface there is no interruption of surface traffic, causing also less disruption and damage to existing installations.