

8. Disaster-prevention measures to tackle floods by Tokyo Metro Co. Ltd.

The number of floods that has occurred in urban areas increased due to the rises in the number of paved roads, underground structures, and torrential rainfalls. These are the biggest causes of the urban flood. Tokyo Metro Co., Ltd. has carried out measures to prevent rainwater inflows into its subway stations.

Convenient subway network of Tokyo: direct connection between stations in downtown Tokyo and suburban areas

The subway system of the downtown Tokyo is connected directly with suburban train network systems, and that people can come home to their residences at the outskirts of Tokyo by public transportations without changing trains. It is convenient and time/energy saving.

Since floods occur more often than large earthquakes do in urban areas, the series of preventive measures for floods make us feel at ease. We are proud of the high punctuality and convenience of the public transportation systems in Tokyo. The systems must be attractive to not only Tokyoites but also tourists.

Countermeasures for floods taken at the entrance of subway stations on the ground floor

Water bars (35cm × 2steps = 70cm) are installed at the station doorways (above) which can cause inundation.

There are 147 stations in Tokyo and there are 792 doorways, of which, water bars are installed in 537. Waterproof doors are set higher than a sidewalk. Water bars are set at the entrance of a subway station



① Improvement to prevent inundation by setting waterproof doors at the entrance of a subway station

In addition to water bars, waterproof doorways are installed at the subway stations that are located at the east side of the Sumida River. (all cross-section closing type). Such facilities are installed in 11 subway stations in Tokyo (54 spots).

At normal time



In an emergency (doorways closed)



② Setting a full-waterproof doorway

At normal time



In an emergency



Floods in Tokyo from a river engineering perspective: The internal inundation

Simply put, the words "internal water inundation" occurs when rainfalls do not flow into a river, while "external water inundation" occurs when water flows off from a river. In the former case, water overflows is larger than the capacity of drainages due to heavy rains. In the latter case, the water outflows from a river. The internal water inundation in Tokyo accounts for 80%.

Source: Homepage of Tokyo Metro Co., Ltd.

Reference <http://www.tokyometro.jp/index.html>