

RESILIENCE INITIATIVES

 in **Tokyo**

Measures to make Tokyo more resilient



TOKYO
METROPOLITAN
GOVERNMENT

A Disaster-Resilient City : Tokyo's Model

Climate change is increasing the frequency and severity of natural disasters, making urban resilience a global priority. Safety and security are the foundation of sustainable growth, and cities must be able to adapt, recover quickly, and overcome challenges with determination.

Tokyo, the political and economic center of Japan, is home to 14.2 million people and a strong concentration of industry, academia, and research. Through steady investments in infrastructure and community-based disaster preparedness, Tokyo has worked to protect lives and maintain the vital functions of the capital. These efforts have earned international recognition, including second place in the Global Power City Index 2025.

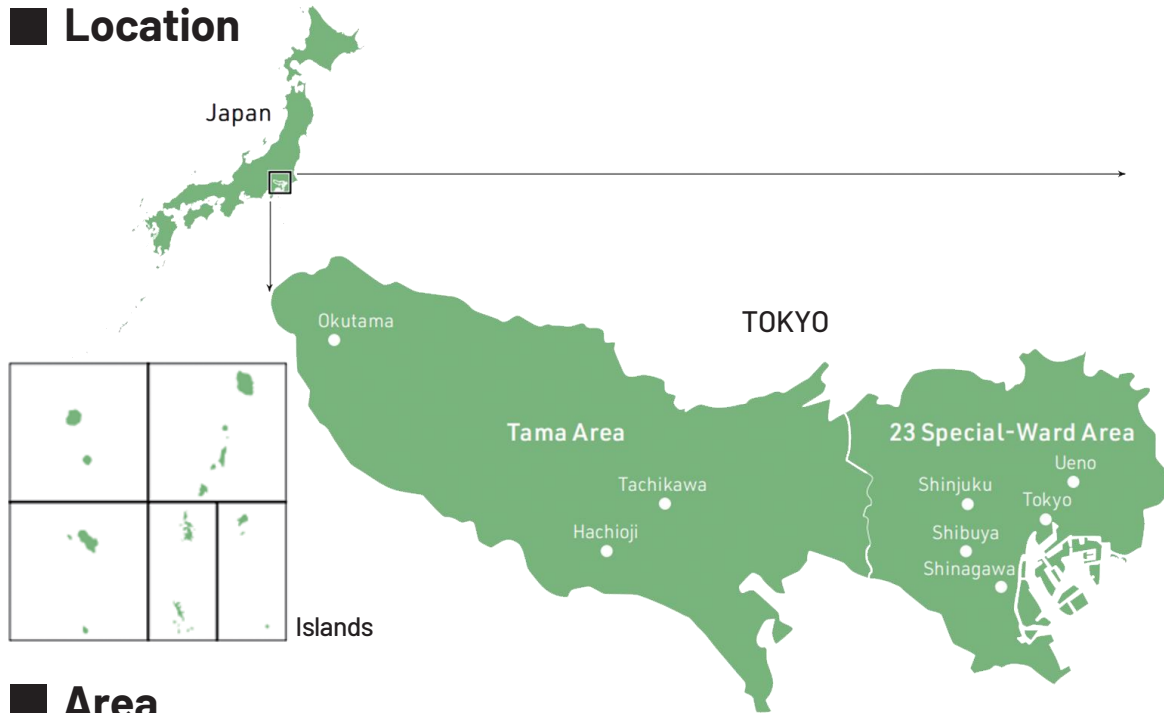
This booklet introduces selected disaster prevention technologies of the Tokyo Metropolitan Government, with the hope that Tokyo's experience will support cities worldwide in strengthening urban resilience.

Governor of Tokyo
Koike Yuriko

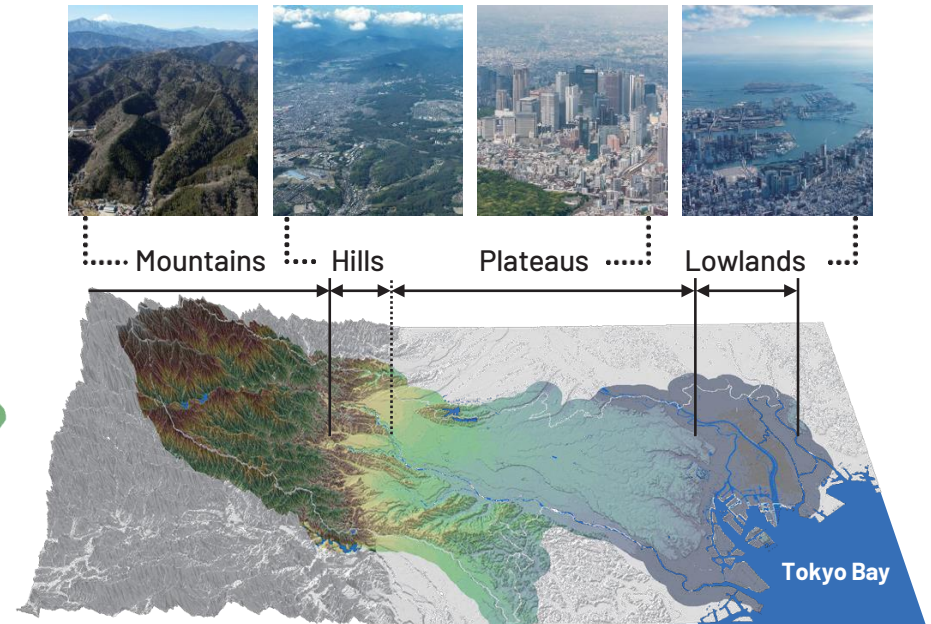


Basic Information about Tokyo

Location



Topography



Area

Area (sq km) (2025.1)

2,199.94

Population

Total Population (2025.1)

14,195,730

Foreign Residents (2025.1)

721,223

Foreign Visitors

Number of foreign visitors (2024)

24,790,000

Tokyo's GDP as a Share of Japan's GDP (FY2020)

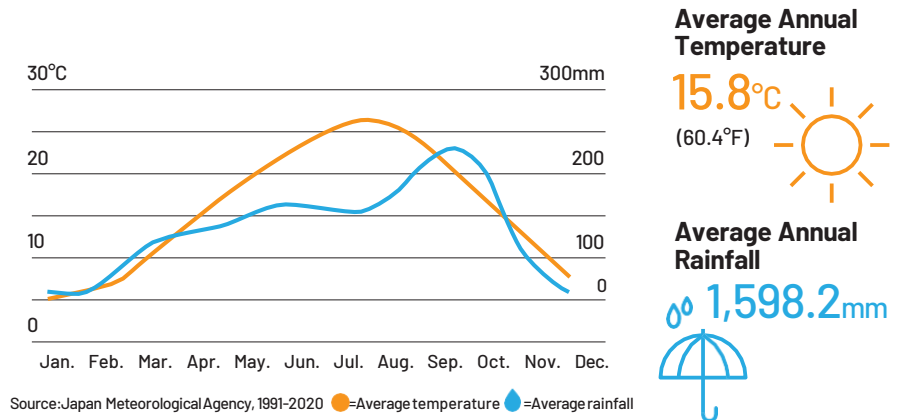
Japan ¥537.6 trillion

20.4% of Japan's GDP



* US\$1.03 trillion 2020 annual average conversion rate ¥1=US\$0.0094

Average Monthly Temperature and Rainfall



Source: Japan Meteorological Agency, 1991-2020 ●=Average temperature ●=Average rainfall

Flood and Storm Damage

Protecting the City From Underground

In recent years, precipitation has been increasing as a result of climate change. In Japan, the frequency of hourly rainfall exceeding 50 millimeters has risen by about 1.4 times since 1976.

Through decades of sustained efforts, Tokyo has significantly reduced flood damage, even as storms have grown more severe.

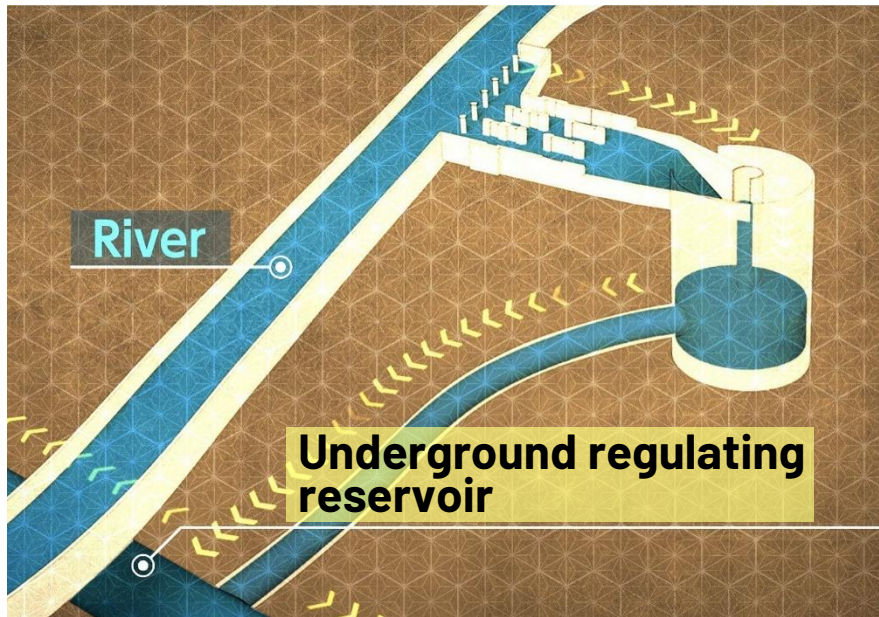
By developing underground regulating reservoirs beneath roads and other urban spaces to temporarily store floodwater, Tokyo reduced inundation from about 3,000 buildings in a 1993 typhoon to zero buildings downstream of the reservoirs in 2023.

In addition, Tokyo's subway system—the world's busiest—has installed water shutters and watertight doors at station entrances to prevent inundation. Combined with enhanced measures against urban flooding and storm surges and the use of digital technologies, Tokyo is implementing multi-layered strategies to safeguard vital urban functions.



Underground regulating reservoir constructed to prevent river flooding

Flood Control Measures

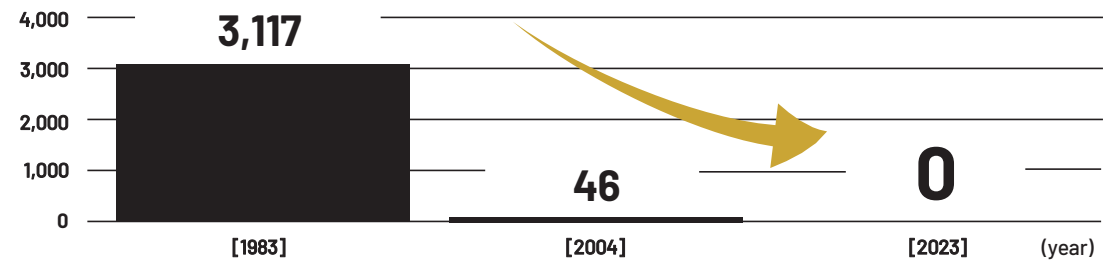


River Flooding: Developing Regulating Reservoirs

To prevent flooding from rivers, the TMG is developing facilities beneath roads, in riverside parks, and in apartment complex basements for storing water discharge.

Number of flooded buildings

(Flood reduction achieved by the Kanda River-Ring Road No. 7 underground regulating reservoir)

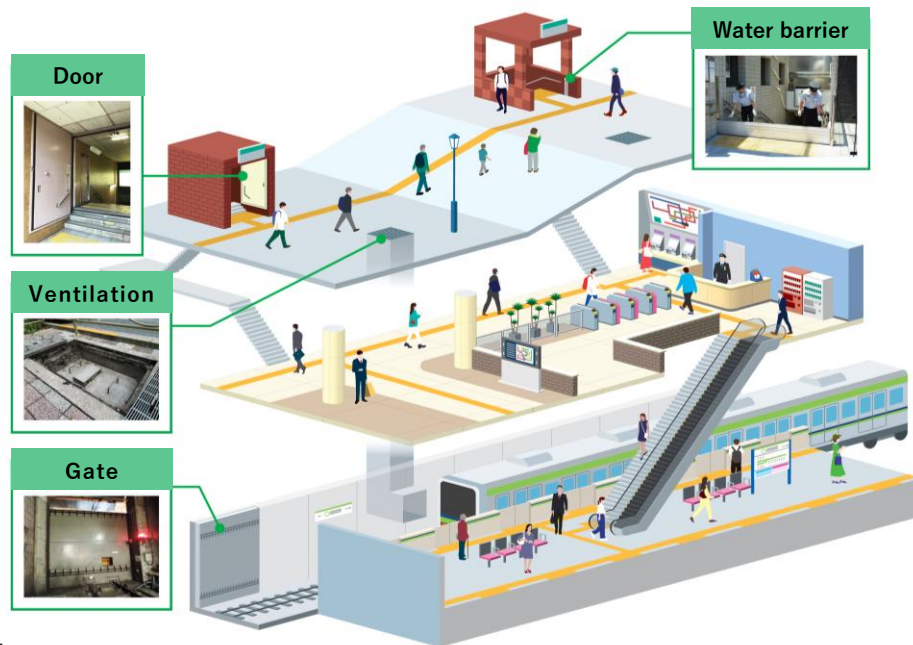


Inland Flood Countermeasure

To prevent manholes and gutters from overflowing during torrential rain, the TMG has been installing drainage systems and reinforced sewer pipes.

Rainwater storage trunk sewer

Torrential Rain Countermeasures in Urban Areas



Preventing Flooding in Subways

Flood prevention systems for underground facilities have been installed, including water barriers at entrances and water shutters. Regular drills simulating torrential rain help ensure safety and preparedness.

Fire Prevention Measures

Fire-Resilient Communities

Tokyo records around 90 fire-related deaths each year. For a dense megacity, this figure is exceptionally low and reflects the strength of the city's fire safety systems.

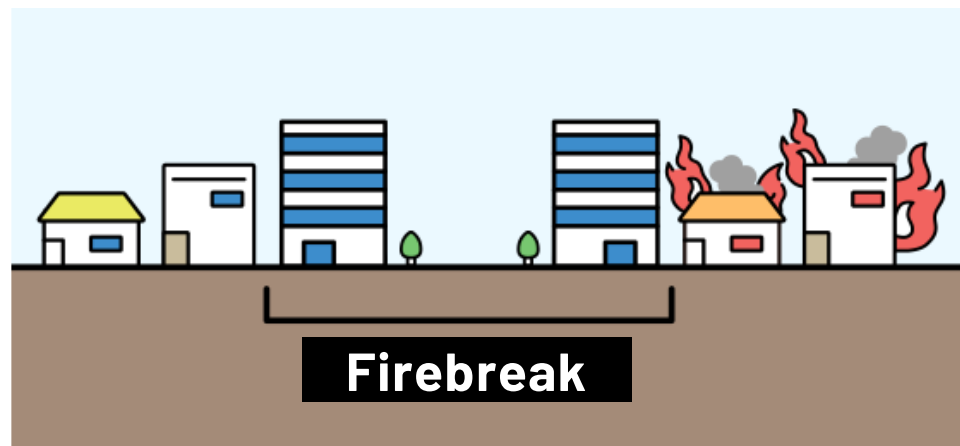
Supporting these outcomes is the Tokyo Fire Department, which has a workforce of around 18,000 personnel. To protect a city with a daytime population exceeding 16 million, it deploys advanced firefighting technologies, including multilingual emergency call services, all-weather drones, all-terrain vehicles, and remote-controlled firefighting robots.

The Tokyo Fire Department has also established a system —centered on the Hyper Rescue units — to respond to multiple hazards, including earthquakes and CBRNE incidents.

In parallel, by improving densely built-up wooden housing areas to prevent fire spread, Tokyo is curbing the occurrence and escalation of large-scale fires.



Building a Fire-Resilient City



Urban Planning for Fire Prevention

The TMG is developing parks and open spaces, as well as rebuilding aging wooden houses, to reduce the risk of fires spreading across the city. In addition, improvements to major roads and the fireproofing of buildings along these corridors are helping limit large-scale fires.

Cutting-edge Technology for Firefighting Operations

All-weather Drones

These drones rapidly assess disaster conditions immediately after a typhoon or during adverse weather, contributing to life-saving efforts.



Remote-controlled Firefighting Robots

These robots operate in hard-to-reach disaster sites, supporting firefighting and rescue operations.



Specialized Vehicles

These vehicles are deployed to conduct rescue operations in a wide range of challenging environments



Large-Scale Disaster Response Units

Tokyo has a three-dimensional disaster response system covering land, water, and air. The Rapid Response Unit serves as the advance team, paving the way for follow-up units. They utilize specialized vehicles and drones to conduct rescue operations and assess damage quickly in hard-to-reach places such as flooded areas.



The Hyper Rescue Team, guided by intelligence, employs heavy machinery and advanced rescue equipment to conduct swift search-and-rescue operations.

In the sky, leveraged by the mobility of firefighting helicopters, the Air Hyper Rescue Team conducts firefighting operations in high-rise buildings and mountainous regions with difficult access.

Also, when large-scale disasters strike other countries, our international emergency relief team dispatches personnel for search and rescue.



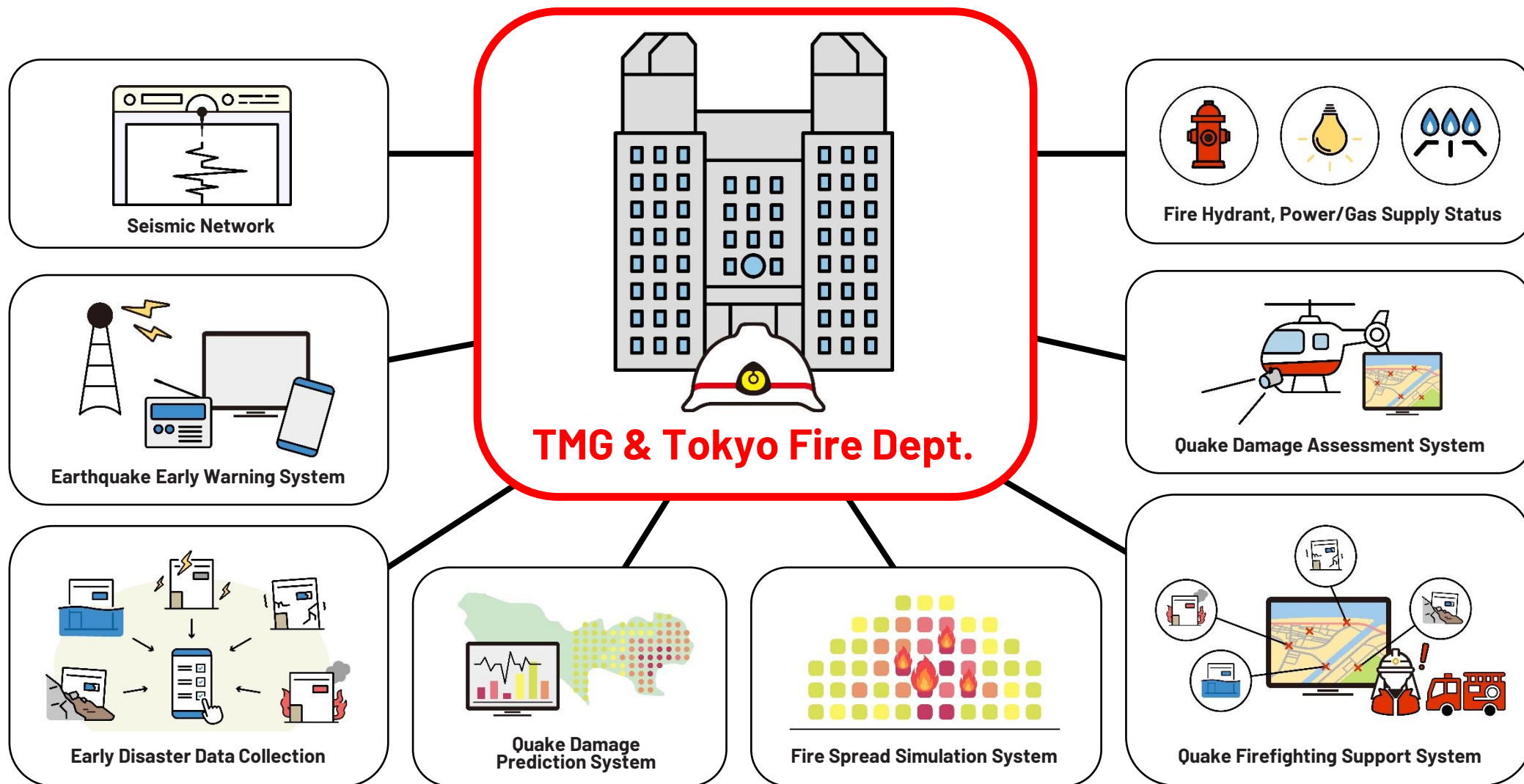
<Mexico> Searching inside collapsed building



<Indonesia> Search using rescue dogs

Centralized Disaster Information System

When large-scale disasters strike, damage can occur simultaneously in multiple locations. The Tokyo Metropolitan Government (TMG) and the Tokyo Fire Department have established a system that integrates relevant systems to accurately assess damage and disaster situations. The system contributes to efficient rescue by monitoring the operational status of lifelines and fire hydrants, and predicting the spread of fires.

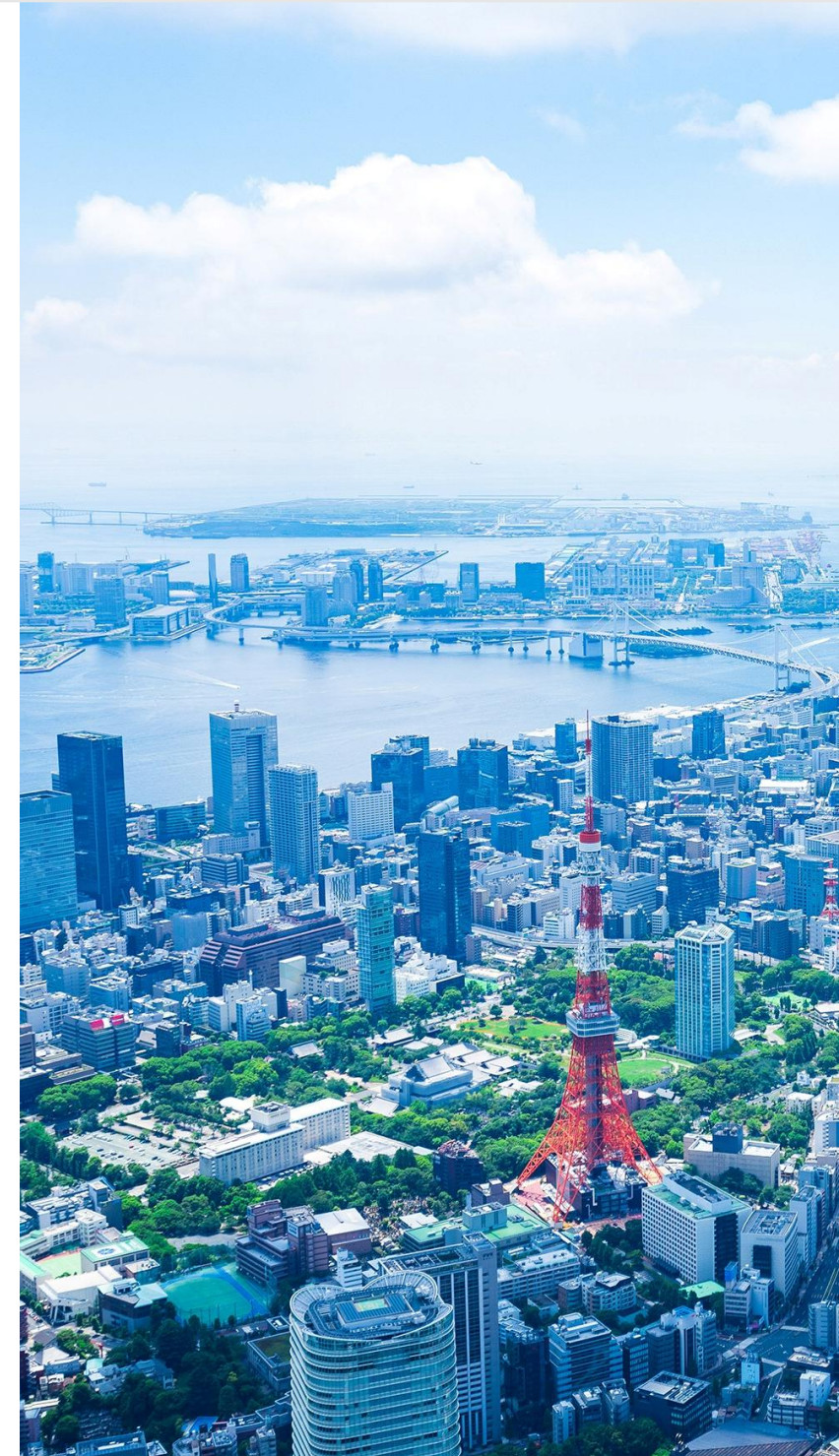


Earthquake-Resistant Tokyo

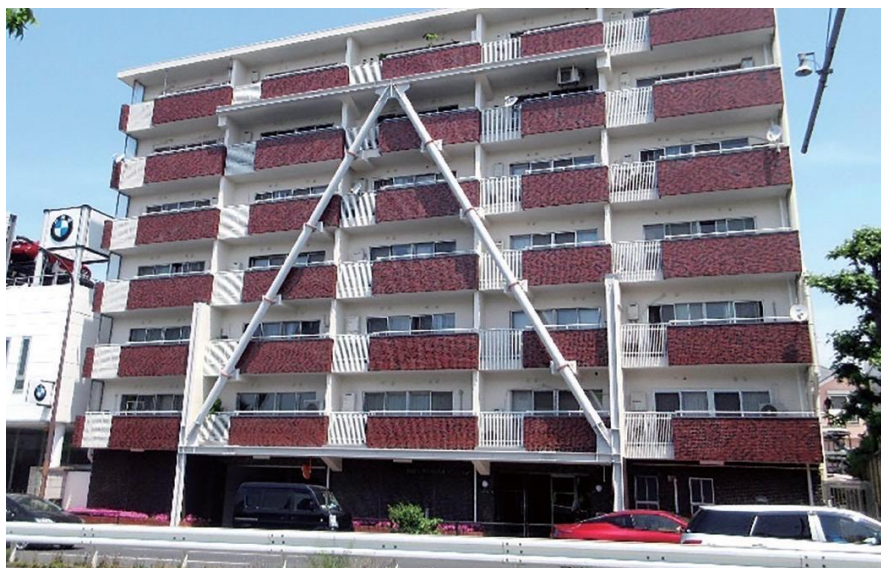
Tokyo has been working to strengthen the city's structure itself, on the premise a major earthquake will strike.

The seismic retrofitting rate for homes and buildings has exceeded 90%, reducing the risk of collapse. We now have almost zero utility poles in Tokyo's central core area, preventing road blockages during earthquakes. Through well-planned retrofitting of urban infrastructure such as water pipes and bridges, we prevent the spread of water outages, transportation disruptions, and other secondary damages.

Earthquake damage predictions published by the TMG indicate that these accumulated efforts help to reduce building damage and human casualties significantly. By advancing earthquake countermeasures that minimize damage through urban power, Tokyo has become a disaster-resilient metropolis.



Measures Against Earthquakes



Retrofitted building

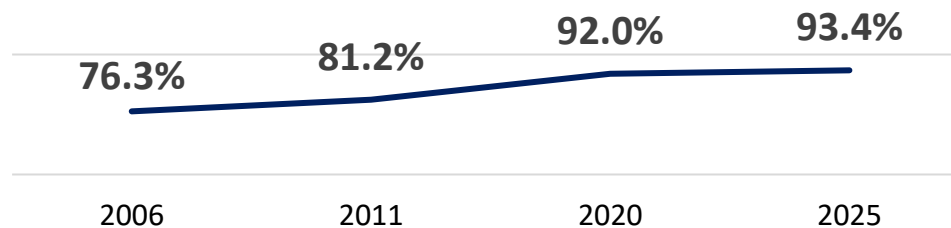


Road with zero power poles

Seismic Retrofitting of Buildings and Infrastructure

Besides support for seismic retrofitting of single-family homes and condominiums, Tokyo is working to enhance the seismic resilience of bridges, water and sewerage systems, and other urban infrastructure.

Earthquake resistance rate of houses in Tokyo

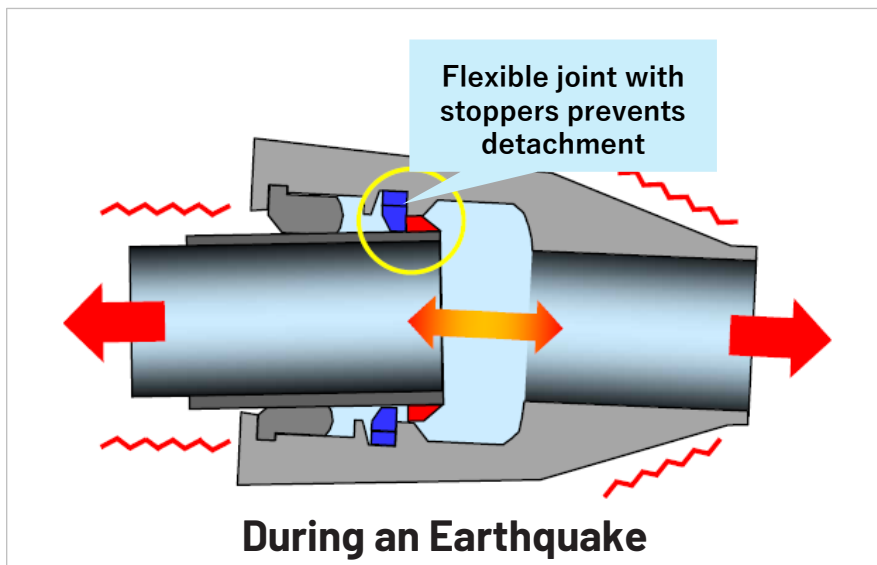


Overall Reachability Rate of Designated Emergency Transportation Routes: 94.1%

In addition to seismic retrofitting and road with zero power poles, early damage assessment helps keep transportation networks operational after major earthquakes, allowing prompt arrival of rescue teams.

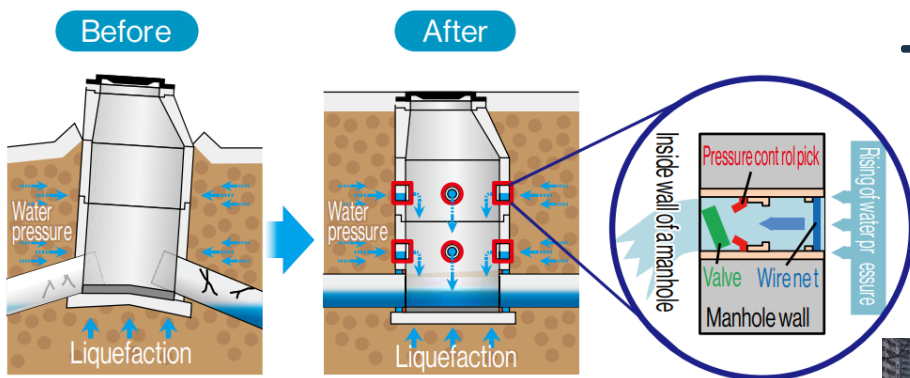
Seismic Countermeasures for Infrastructure

Retrofitting Water and Sewer Systems to Ensure Sustained Livelihood after Disasters



Earthquake-Resistant Water Pipes

To reduce the risk of water outages, we are installing earthquake-resistant pipes that do not easily detach. With the key slip-prevention feature, the stopper restrains the lock ring secured to the pipe, preventing fallouts.



Suppress uplifting of manholes by dissipating excess water pressure caused by liquefaction

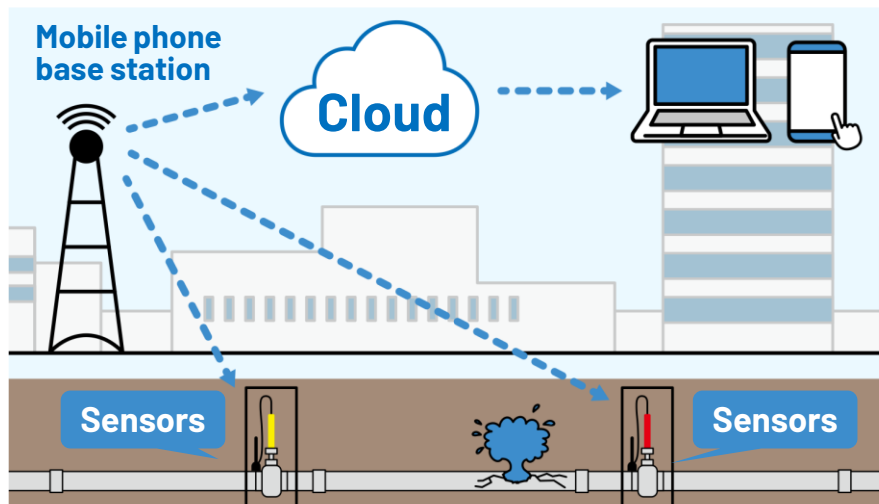
Manhole Uplift Prevention During Earthquakes

The excess water pressure generated from liquefaction is released into the manhole to keep it from floating. This ensures the flow of sewage.



Infrastructure Maintenance

The foundation for enhanced urban resilience is the continuous, safe maintenance and management of lifelines such as water supply and sewer systems.



World's Lowest Water Leakage Rate

Tokyo has kept up high standards in its daily infrastructure management too. The city boasts one of the world's lowest water leakage rates, at around 3%. We also use sensors and AI to detect leakage.

After



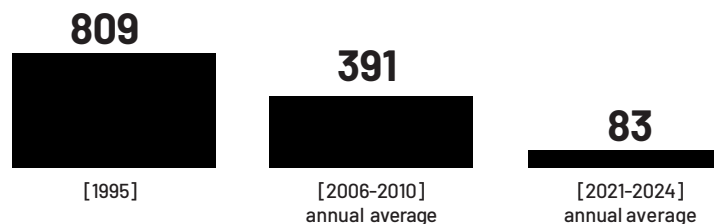
Renewal of old sewer pipes from the inside

Renewal of Sewer Pipes from Inside

Old sewer pipes are renewed by wrapping a polyvinyl chloride profile around the inner surface. This method allows sewage to keep flowing, with no need to dig up roads.

By promoting sewer pipe renewal, there are significantly less road collapses caused by degraded pipes.

Number of Road Collapses *In specific areas



Tokyo Tech Book



You can find Tokyo's advanced technology on infrastructure development, disaster prevention, and the environment in our Tech Book.

<https://www.infura.metro.tokyo.lg.jp/eng/stock.html>

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Contact Us

For inquiries regarding the technologies described in the booklet, contact:

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Tour Applications

If you wish to attend tours at Tokyo's disaster prevention facilities, contact:

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