

Ensuring Urban Safety and Security

Improvement of Districts With Close-Set Wooden Houses

In the event of earthquakes, districts with close-set wooden houses are expected to suffer major damage such as the outbreak of fires, due to inadequate roads, parks, and other urban infrastructure and the large number of old wooden structures.

In light of the impending threat of an earthquake directly striking the capital and the 2011 Great East Japan Earthquake, the TMG launched the Ten-Year Project to Advance Fire Resistance in Close-Set Wooden Housing Areas in January 2012 to protect the lives of residents and the urban functions of Tokyo. In collaboration with municipalities, the TMG has been implementing measures for accelerating improvements in such areas.

In March 2016, the Urban Development Plan for Disaster-Resistance was revised to incorporate the measures taken under the 10-year project. The TMG also started work on local roads to enhance disaster response, and is working hard to improve areas with close-set wooden houses.

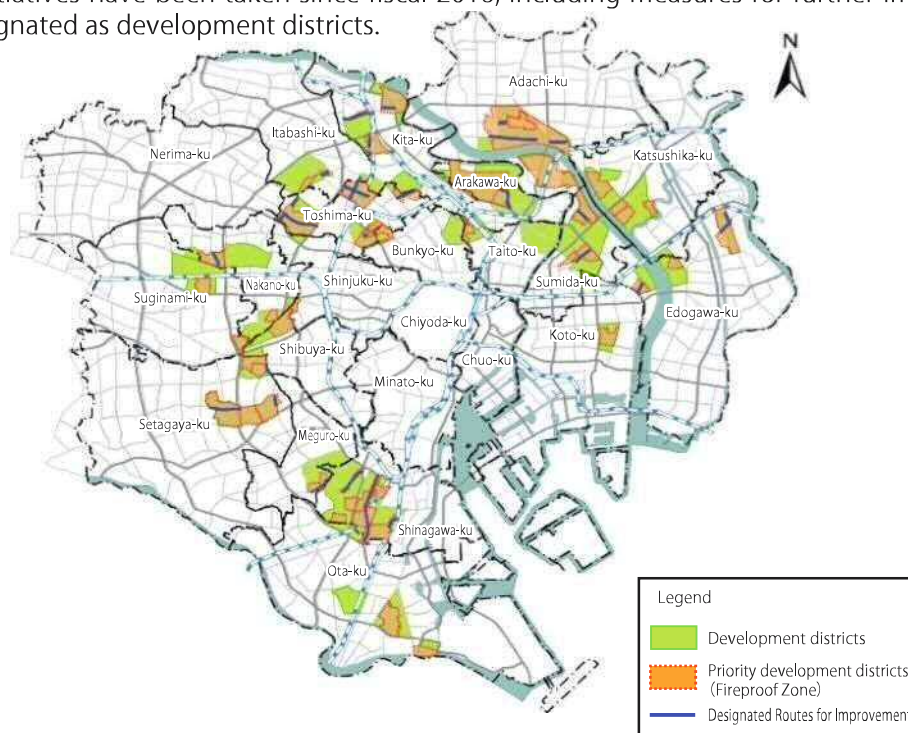
Urban Development Plan for Disaster-Resistance (Revised in March 2016)

Drawing on lessons learned from the Great Hanshin-Awaji Earthquake, the TMG formulated the Urban Development Plan for Disaster-Resistance in fiscal 1995 (revised in fiscal 2003, fiscal 2009, and fiscal 2015), and is working to improve the level of disaster resistance in built-up areas. In accordance with the Tokyo Metropolitan Earthquake Preparedness Ordinance, the plan establishes policies for creating firebreak belts, raising the level of fire resistance in districts with closely-packed wooden houses, and other initiatives.

In the plan, areas with close-set wooden houses that are likely to suffer particularly severe damage in the event of an earthquake have been designated “Development Districts” (28 districts covering approx. 6,900 hectares). Fireproof zones under the Ten-Year Project to Advance Fire Resistance in Close-Set Wooden Housing Areas, in which extensive measures are taken to further accelerate improvements in such housing areas, are designated “Priority Development Districts” (53 districts covering approx. 3,200 hectares). Various projects contributing to the creation of a disaster-resistant city are intensively carried out in these districts.

Also in these districts, development of roads, parks, and other basic infrastructure, as well as reconstruction of old wooden houses into fire/quake-resistant homes or shared residences are underway based on policies to regulate and encourage plans such as the project to develop areas with close-set wooden houses and program to develop disaster-resistant blocks.

New initiatives have been taken since fiscal 2016, including measures for further improving the areas designated as development districts.



Development Districts / Priority Development Districts / Designated Routes for Improvement (updated at the end of March 2017)

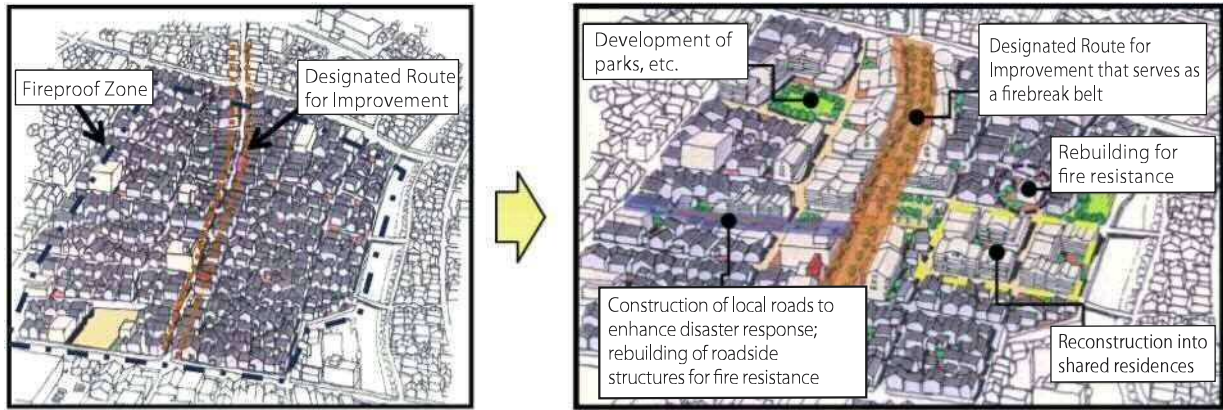


Image of Project to Improve Close-Set Wooden Housing Areas

■ Ten-Year Project to Advance Fire Resistance in Close-Set Wooden Housing Areas

To accelerate improvement of Tokyo's greatest weakness, its districts with close-set wooden houses, the TMG formulated policy for the implementation of the Ten-Year Project to Advance Fire Resistance in Close-Set Wooden Housing Areas in January 2012, and is carrying out the initiatives outlined below.

(1) Acceleration of Efforts to Make Built-Up Areas Fire Resistant in Cooperation With the Special Wards

To accelerate efforts to improve the level of fire resistance in development districts, which are likely to suffer particularly severe damage in the event of an earthquake, the program for Special Development Zones to Advance Fire Resistance (Fireproof Zones) was launched in March 2013, in which the TMG extends special support upon requests from special wards in areas that are particularly in need of improvement. In March 2017, the area was expanded in some districts, and the program is now being implemented in 53 districts (approx. 3,200ha). The TMG aims for a fire-resistant ratio* of 70 percent by fiscal 2020.

In the fireproof zones, along with building fireproofing regulations, the TMG is promoting reconstruction of buildings through a variety of efforts, including extending subsidies tailored to the situation in each community, tax reductions or exemptions (fixed asset tax, etc.), and actively paying visits to homes and businesses within the zones.

* Indicator of how fire resistant a built-up area is. This ratio of more than 70 percent means almost zero destruction from fire.

(2) Construction of Major City-Planned Roads to Form Firebreak Belts

The Bureau has selected as Designated Routes for Improvement, roads constructed by the TMG based on city planning (28 sections of road totaling approx. 25 kilometers in length) which will be highly effective in enhancing disaster resistance by blocking the spread of fire and serving as space for evacuation and rescue operations. The TMG will proceed with development of Designated Routes for Improvement while extending special support measures to property rights holders to assist them in rebuilding their lives.

■ Improvement of Development Districts Through Construction of Local Roads to Enhance Disaster Response

To improve development districts and accelerate efforts to make them fire resistant, the TMG designates streets that facilitate the passage of emergency vehicles, smooth firefighting and rescue activities, and evacuation as local roads to enhance disaster response in the Urban Development Plan for Disaster-Resistance, implements projects to widen the roads, and promotes reconstruction of roadside buildings.

Also, the TMG supports initiatives by special wards (ku) to remove utility poles to prevent them from falling down and blocking such roads following an earthquake.

■ Initiatives Taken in Areas Other Than Development Districts

In districts with close-set wooden houses, as well as areas at risk of becoming such districts, the TMG will encourage municipalities to establish district plans or take other steps to prevent land from being subdivided into smaller lots, and to advance the designation of new fire resistance regulation zones, which is designed to raise the level of fire resistance in built-up areas, so as to improve those areas and to prevent the spread of close-set wooden housing areas. Along with these measures, the TMG works to build good housing environments.



Image of a local road to enhance disaster response



Example of a project to replace old wooden houses with shared residential buildings in close-set wooden housing districts

Designation of New Fire Resistance Regulation Zones

To step up the fireproofing of buildings in areas such as districts with close-set wooden houses that pose a high risk when a disaster occurs, zones in which the fire resistance performance of buildings must be enhanced are designated according to regulations stipulated in the Tokyo Metropolitan Construction Safety Ordinance.

The regulations state that, as a rule, all buildings must meet or exceed the quasi-fireproof standard, and, of these buildings, those with a total floor space exceeding 500 sq. meters must meet the fireproof building standard.

As of the end of December 2018, a total of 6,700 hectares of land in eighteen special wards and one city (Shinjuku, Bunkyo, Taito, Sumida, Koto, Shinagawa, Meguro, Ota, Setagaya, Shibuya, Nakano, Suginami, Toshima, Kita, Arakawa, Itabashi, Adachi, Edogawa, and Mitaka City) have been designated to fall under the program. Expansion of designated areas is underway to further enhance safety in built-up areas.

Integrated Development of City-Planned Roads and Roadside Communities

City-planned roads can block the spread of fire and serve as space for evacuation and rescue operations. As part of projects to construct such roads in areas designated as priority development districts under the Urban Development Plan for Disaster-Resistance and other areas, the TMG also promotes the development of roadside communities through the redevelopment of existing buildings into shared complexes and effective land use, to further enhance the level of disaster resistance in those areas.

The Bureau is currently advancing city planning projects in the Higashi Ikebukuro district of Toshima-ku and Auxiliary Route 81 and Kanegafuchi district of Sumida-ku and Auxiliary Route 120 (approved as city planning projects in FY2005); the Jujo district of Kita-ku and Auxiliary Route 83 and the Meguro Hon-cho district of Meguro-ku and Auxiliary Route 46 (approved in FY2009); the Oyama Central district of Itabashi-ku and Auxiliary Route 26, the Haramachi-Senzoku district of Meguro-ku and Auxiliary Route 46, the Togoshi-koen Station district of Shinagawa-ku and Auxiliary Route 29, and the Shimo district of Kita-ku and Auxiliary Route 86 (approved in FY2014). Of these routes, auxiliary routes 120, 46, 26, 29, and 86 are Designated Routes for Improvement.

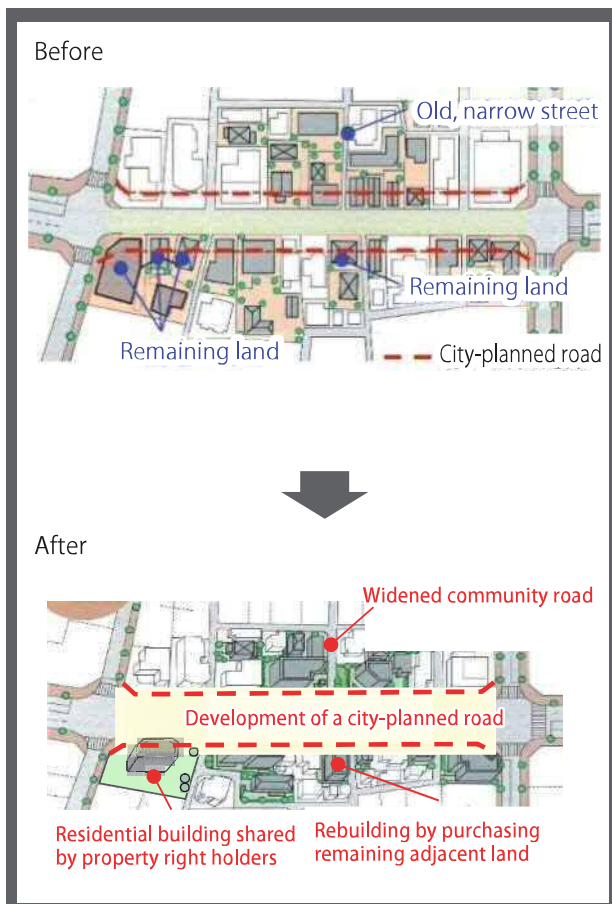


Image of Integrated Development



Community development association



Example of a shared residential building

Community Earthquake Risk Assessment Study

In accordance with the provisions of Article 12 of the Tokyo Metropolitan Earthquake Preparedness Ordinance, community risk levels are scientifically assessed and made public about once every five years with the following objectives:

- (1) To deepen the understanding of Tokyo residents with respect to earthquakes and heighten awareness of disaster preparedness.
- (2) To help select districts where measures aimed at reducing the impact of earthquakes will be implemented.

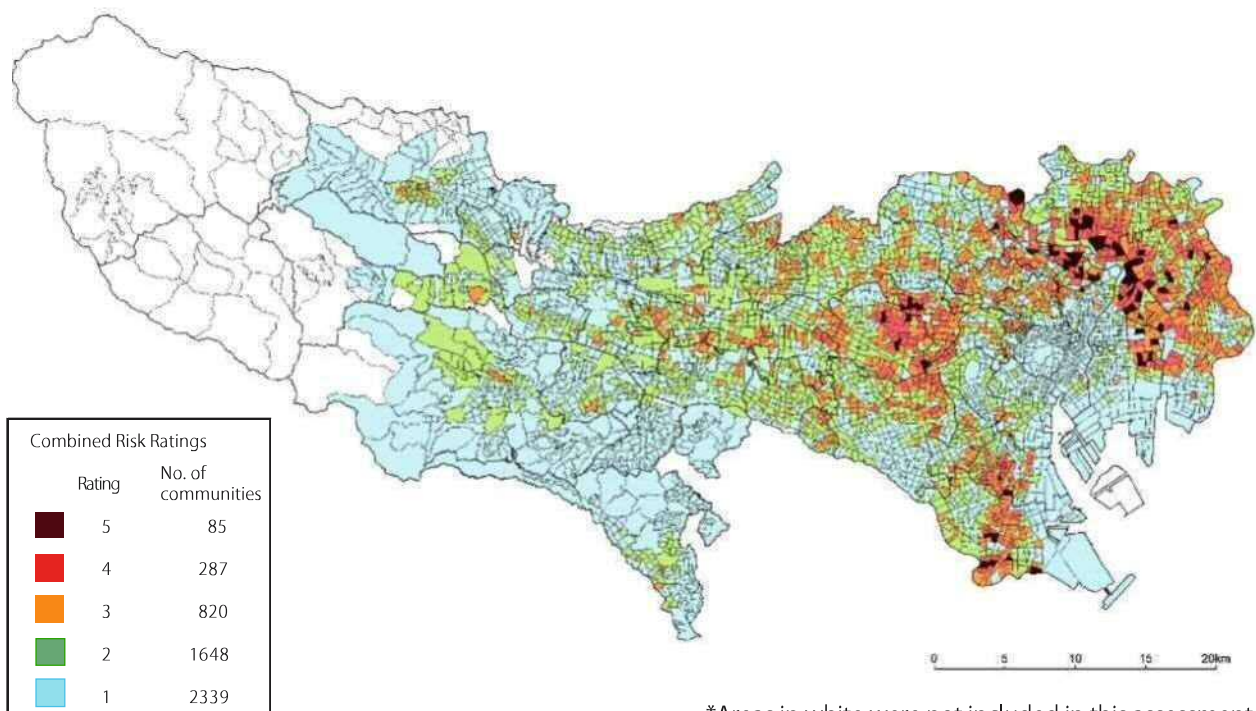
In the eighth survey, for which the results were announced by the TMG in 2018, 5,177 communities in urbanized districts were examined. Each community's risk of building collapse, risk of fire outbreak and spread, and emergency response difficulty (how difficult it is to conduct rescue activities in stricken areas) were assessed. Using the "combined risk," which combines these risk assessments, the survey rates communities on a scale of five (high risk) to one (low risk), according to the each community's vulnerability to hazards.

Designation of Evacuation Areas, Fire-safe Areas, and Evacuation Routes

In order to protect the lives of residents from major urban fires caused by earthquakes, in the special-ward area of Tokyo, the TMG has pre-designated safe locations to be used as evacuation areas based on the Tokyo Metropolitan Earthquake Preparedness Ordinance, and strives to familiarize residents with these locations. The TMG also designates areas where there is no danger of fire spreading when an earthquake strikes and no need to evacuate as Fire-safe Areas.

In evacuating to a designated evacuation area, the route a resident uses is, in principle, up to the individual. However, in areas where residents must travel long distances to reach the evacuation area, or those in which the risk of the spread of fire is particularly high, the TMG has designated evacuation routes to guide evacuees safely and smoothly, based on the ordinance.

In order to reflect changes in the city and fluctuations in the population, the designation of evacuation areas and routes are reviewed about once every five years. In the June 2018 revision, 213 locations were designated as evacuation areas, 37 locations designated as fire-safe areas, and approximately 54 kilometers of roadways designated as evacuation routes.



*Areas in white were not included in this assessment.

8th Community Earthquake Risk Assessment (Combined Risk Ratings)

Promoting the Seismic Resistance of Buildings

Amid the pressing urgency to prepare for a major earthquake directly hitting the capital, in March 2007 the TMG formulated the TMG Plan to Promote Seismic Retrofitting (latest revision: March 2016) with the aim of making Tokyo a disaster-resistant city and protecting the lives and property of its residents. In addition to outlining the current state with respect to seismic retrofitting of buildings and goals to be achieved, the plan sets forth a basic policy on seismic retrofitting and a specific direction for policy implementation. With the cooperation of the municipalities, the TMG is working to advance the seismic evaluation and seismic retrofitting of buildings in Tokyo.

Specifically, the TMG educates building owners and provides them with technical assistance so that they will take the initiative in enhancing their building's resistance to earthquakes. This includes the establishment of a consultation system; assistance with selection of seismic retrofitting methods; provision of information via pamphlets and other means; registration and introduction of firms that conduct seismic evaluations on wooden framed houses; and provision of a portal site for information on earthquake resistance. Due to their highly public nature, the TMG is also particularly working to advance seismic resistance of wooden framed houses in closely-packed housing districts, condominiums, and buildings along disaster response routes by subsidizing seismic inspection and retrofitting costs.

With respect to disaster response routes, which are the lifelines that enable evacuation, relief and rescue efforts, and the transport of emergency supplies in the event of a disaster, it is essential to prevent the blocking of roads due to the collapse of roadside buildings.

To this end, the Ordinance to Advance the Earthquake Resistance of Buildings Along Disaster Response Routes took effect in April 2011 to make it mandatory for owners of buildings located alongside specified routes* to carry out seismic inspections and submit a report on the seismic resistance of their building. In line with this, the TMG is also expanding the subsidy system that covers such costs as seismic retrofit design and retrofitting work, and is advancing seismic resistance in cooperation with the municipalities. In addition, the TMG supports efforts of building owners along specific routes to retrofit their properties by responding to technical inquiries and providing assistance with creating plans through the establishment of a dedicated consultation desk and dispatching seismic retrofit specialists. Results of seismic inspections are also made public to instill awareness among building owners and serve as information to Tokyo residents.

Furthermore, the TMG's own Seismic Certification System has been established to make information on the seismic resistance of buildings widely available so that the public can feel safe using buildings. Through this system, the TMG will heighten the awareness and sentiment of residents with respect to seismic retrofitting in order to promote efforts to make the city more resistant to earthquakes.

(*) Buildings meeting certain conditions that are located along designated disaster response routes (disaster response routes that particularly require seismic retrofitting of buildings along the road)



Tokyo Metropolitan Seismic Certification Mark



Disaster response route to be utilized in the event of a disaster for the transport of relief, etc.

Anti-Liquefaction Measures for Buildings

Following the Great East Japan Earthquake, liquefaction occurred not only in waterfront areas, but also in inland areas of Tokyo, causing damage to buildings such as making some wooden structures tilt.

In order to prepare for liquefaction, it is essential to provide information so that building owners and builders can ensure the safety of their buildings. Based on the February 2013 report compiled by a TMG committee made up of geotechnical engineers and other experts, the Guide to Preparing for Liquefaction Induced Damage to Buildings was created in cooperation with municipalities to raise awareness among residents (latest revision: March 2016). Starting in May 2013, the guide was made available for viewing online and related pamphlets were distributed. Other materials helpful in determining whether the potential for liquefaction exists in a certain area, including past topographic maps and columnar sections showing layers of rock and soil below ground, were also made available. Furthermore, a liquefaction advisor system was established to respond to inquiries from residents.

In May 2014, the TMG also established a portal site that introduces anti-liquefaction measures for buildings, enabling residents to access materials such as a guide and topographical maps from the site.

Promoting Measures for Urban Restoration and Recovery

■ Initiatives Taken Before a Disaster to Guide Recovery Efforts

With respect to urban recovery following a major earthquake that directly strikes the capital or other such disaster, initiatives taken before a disaster occurs, including having the government and residents share a common understanding of the guidelines for action and of how the community should be rebuilt after a disaster, are of great importance. The Tokyo Metropolitan Government has compiled the TMG Earthquake Recovery Manual (March 2003), which outlines actions to be taken from the outset of the disaster through to recovery.

Every year, the Bureau also holds drills pertaining to urban recovery for TMG and municipality staff to enable them to fully master the steps outlined in the manual, and also holds earthquake recovery symposiums for residents and exhibitions and other events to raise awareness of post-disaster recovery.

■ Post-Disaster Risk Assessment in Residential Areas

Post-disaster risk assessment in residential areas is a system designed to reduce and prevent secondary disasters in the event residential areas are struck by disasters such as an earthquake or torrential rains that have caused major, widespread damage, by enabling the prompt and accurate assessment of the damage and the distribution of information to residents. Based on objective nationwide standards, visible damage is given a numerical score. The results of the assessment are then indicated through three different color-coded stickers, which also list information such as points of caution and where to contact for more information.

Working with the municipalities, the TMG trains risk assessors, and is also developing a system to cooperate with other prefectures.

■ Post-Disaster Emergency Building Risk Assessment

Post-disaster emergency building risk assessment is a system in which buildings that have sustained damage in a major earthquake are inspected by an assessor and classified into three ranks: "Dangerous," "Use Caution," and "Inspection Completed," with the aim to prevent the occurrence of secondary disasters from building collapse and falling debris due to large aftershocks and other causes. Color-coded stickers corresponding to each of the three categories are affixed to buildings to alert residents and passersby of the inspection results.

In preparation for large-scale assessment activities, the TMG is registering architects from the private sector as volunteer assessors. Along with creating a system for conducting assessments in cooperation with the municipalities of Tokyo, a system making it possible for Tokyo and other prefectures to support each other in such activities is also being established.

Promotion of Comprehensive Flood Control Measures

Following a 2005 torrential downpour exceeding 100 millimeters per hour, which mainly affected Sugi-nami-ku and Nakano-ku, the TMG formulated its Basic Policy for Measures Against Heavy Rainfall in August 2007, and has been working to improve flood control measures.

However, as torrential downpours that surpassed the established maximum expected rate of rainfall at the time (50 millimeters per hour) continued to result in flooding, the TMG established a committee to study measures against heavy rainfall. Based on factors such as rainfall characteristics in recent years and the occurrence of floods, the Basic Policy for Measures Against Heavy Rainfall was revised in June 2014.

The revised plan strengthened disaster mitigation measures, including setting rainfall levels for flood protection in light of rainfall characteristics, designating river basins and districts requiring intensified measures for the development of rivers and sewerage systems, and enhancing flood control measures for large-scale underground shopping areas. In addition, the TMG is working to further strengthen measures against torrential rain by setting initiatives through the year 2025 that also cover the Tokyo 2020 Games.

Using Urban Development as an Opportunity to Promote the Creation of a Disaster Resilient City

In preparing for a major disaster such as an earthquake that directly strikes the capital, measures such as ensuring the capacity of buildings to function more independently following a disaster, making it possible for people to stay inside those buildings, are crucial to strengthening urban disaster response capabilities. Measures that contribute to enhancing the city's safety are also required, such as preventing roads from becoming obstructed following a major earthquake through the removal of utility poles along roads in development districts and other areas. To this end, the TMG is using urban development as an opportunity to create a disaster resilient city, including encouraging large-scale projects that apply various urban development schemes to create warehouses to store emergency supplies and temporary shelters for people stranded when a disaster occurs and remove utility poles.