Chapter 7 Building a Safe and Comfortable Society

Section 1 Realizing a Universal Society

1 Realizing Accessibility through a Universal Design Concept

The "Act on Promotion of Smooth Transportation, etc. of Elderly Persons, Disabled Persons, etc." embodies the universal design concept of "freedom and convenience for anywhere and anyone", making it mandatory to comply with "Accessibility Standards" when newly establishing various facilities (passenger facilities, various vehicles, roads, offstreet parking facilities, city parks, buildings, etc.), mandatory best effort for existing facilities as well as defining a development target for the end of FY2020 under the "Basic Policy on Accessibility" to promote accessibility.

Also, in accordance with the local accessibility plan created by municipalities, focused and integrated promotion of accessibility is carried out in priority development district; to increase "caring for accessibility", by deepening the national public's understanding and seek cooperation for the promotion of accessibility, "accessibility workshops" are hosted in which you learn to assist as well as virtually experience being elderly, disabled, etc.; these efforts serve to accelerate accessibility measures (sustained development in stages).

Taking the opportunity of changes in the environment surrounding the "Barrier-free Law" and the 2020 Tokyo Olympics and Paralympics, in February 2018, we submitted to the Diet a bill to partially amend the "Act on Promotion of Smooth Transportation, etc. of Elderly Persons, Disabled Persons, etc." in order to further promote accessibility nationwide, with the aim of realizing an inclusive society.

Specifically, we intend to take measures such as: (1) establishment of a plan and system to promote integrated initiatives for structural and non-structural measures by public transport operators; (2) establishment of a policy and system to encourage smoother transportation, in order to strengthen initiatives in local communities aimed at accessible town planning; and (3) application of the Barrier-free Law to general chartered passenger vehicle operators, in order to enhance initiatives aimed at ensuring greater user friendliness, provision of a wide range of accessibility information, including on buildings, and creation of opportunities to evaluate the content of measures with the participation of physically-challenged people.

Figure II-7-1-1 Current Accessibility of Public Transportation

(as of March 31, 2017)

○Passenger Facilities (over 3,000 persons/day using on average)

Percentage of facilities with "elimination of steps"	Total Facilities	"Elimination of steps" complete	Percentage of total number of facilities (as of the end of FY2016)	Target value (percentage) as of the end of FY2020
Railway stations	3,559	3,098	87.0%	100%
Bus terminals	46	42	91.3%	100%
Passenger ship terminals	15	15	100.0%	100%
Airport passenger terminals	35	31	88.6%	100%

(Notes) 1 Regarding the "elimination of steps" , it is calculated in accordance with conformity to Article 4 (which covers width of the travel path, ramps, elevators, escalators, etc.) of the "Standard for Smooth Transport, Etc., with Public Transportation" based on the Barrier-Free Law.

○Vehicles

Percentage of "Vehicles compliant with smoothness of transport"	Total Number of Vehicles, etc.	Vehicles Compliant with Accessibility Standards for Public Transportation	Percentage of total number of vehicles	Target value (percentage) as of the end of FY 2020
	As of the end of FY2016	As of the end of FY2016	As of the end of FY2016	
Railway carriages	52,212	35,343	67.7%	About 70%
Low-floor buses (excluding exemption-certified vehicles)	45,467	24,241	53.3%	About 70%
Lift-equipped buses (excluding exemption-certified vehicles)	14,962	901	6.0%	About 25%
Welfare taxis	–	15,128	–	About 28,000 cars
Passenger ships	663	267	40.3%	About 50%
Airplanes	612	594	97.1%	About 90%

(Notes) 1 "Compliance with smoothness of transport vehicles" is calculated based on each vehicle's compliance with the Accessibility Standards for Public Transportation.

Source) MLIT

(1) Accessibility of Public Transportation

In accordance with the "Act on Promotion of Smooth Transportation, etc. of Elderly Persons, Disabled Persons, etc.", public transportation administrators are required to comply with "Accessibility Standards for Public Transportation" when carrying out new development of passenger facilities or large-scale improvements as well as introducing new vehicles and for existing facilities. Efforts must be made to comply with these standards and staff must be educated and trained as needed to strive for accessibility as part of the stipulated requirements for mandatory efforts. In addition, assistance measures are available to support the accessibility of passenger ships as well as train stations and other passenger terminals along with the implementation of non-step (low-floor) busses, lift-equipped busses, welfare taxis, and other initiatives. Furthermore, in March 2018, we revised the content of the Accessibility Standards. The revisions included requirements to create several accessible paths in rail stations, to shorten accessible paths in stations and other passenger facilities, and, when installing elevators, to decide their number and size in consideration of use by the elderly and physically-challenged people.

(2) Accessibility of Living and Housing Environments

(i) Accessibility of housing and architecture

In order for those such as the elderly and disabled to have secure, safe, and comfortable housing in communities, the conversion of housing to barrier-free housing is supported by measures such as reducing interest rates on the Japan Housing Finance Agency's (Incorporated Administrative Institution) Flat 35 S Loan for obtaining houses that meet a certain standard of barrier-free criteria; providing subsidies for barrier-free renovations; making new public housing and Urban Renaissance Agency rental housing constructed as part of the housing rehabilitation project barrier-free as a standard specification; and providing assistance and other options for the development of serviced housing for the elderly by private sector businesses and others.

In addition, for architectural structures used by the general public, including those such as the elderly and disabled, architecture that is greater than a certain scale is required to be accessible in accordance with the "Barrier-free Law." Specific approved buildings that meet certain requirements are eligible for support measures such as subsidy programs. For government facilities that are used by many unspecified users, development is promoted in accordance with the standards for encouraging smooth travel for buildings based on the "Barrier-free Law," thereby ensuring that all people including the elderly and disabled can use the facilities safely, comfortably and smoothly. For this, initiatives are being carried out to reflect the opinions of facility users such as the elderly and disabled in facility development.

Figure II-7-1-2 Approval of Architecture for Specified Designated Buildings in Accordance with the "Barrier-free Law"

Fiscal year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of certified plans (Fiscal year)	11	120	229	320	382	366	332	232	280	367	386	348	331	289	255	184	208	130	196	174	208	187	162
Number of certified plans (Total)	11	131	360	680	1,062	1,428	1,760	1,992	2,272	2,639	3,025	3,373	3,704	3,993	4,348	4,432	4,640	4,770	4,966	5,140	5,348	5,535	5,697

Source) MLIT

(ii) Accessibility of walking spaces

In accordance with the Barrier-free Law, areas such as roads and station squares that are connected to facilities, such as stations, government facilities, and hospitals, must allow everyone, including the elderly and disabled, to pass through comfortably. This is achieved by promoting the barrier-free design of pedestrian spaces through measures that include the following: creating wide sidewalks, reducing unevenness, slopes, and grades, eliminating utility poles, and laying down guiding blocks for the visually impaired.

(iii) Accessibility of urban parks and other areas

For the development of urban parks, there are standards and subsidies under the "Barrier-free Law" for safe and comfortable usage, such as eliminating grade disparities at entrances, exits, and passages, as well as ensuring that facilities such as restrooms are usable by the elderly and disabled, among others. In addition, to ensure that anyone can enjoy

natural spaces such as rivers and ports, development of waterfronts and renovation of passenger ship terminals for better accessibility are being promoted as an integral part of town planning.

2 Creating an Environment that Supports Child-rearing Under an Low Birthrate Society

(1) Supporting the Balance of Work and Child-rearing

(i) Supporting the supply of housing suitable for child-rearing households

In order to secure housing and living environments suitable for child-rearing households, a relocation system that allows comparatively spacious housing owned by those such as the elderly to be provided as rental housing to those such as child-rearing households and for this the Japan Trans-housing Institute's (General Incorporated Association) owned home leasing program is being promoted. Also, support is provided through local government for the development and reduced rent of rental housing (high-quality regional rental housing) for child-rearing households as well as integrated development of public rental housing with child care support and other facilities.

(ii) Promotion of teleworking

Teleworking is a flexible work style that uses information and communication technology (ICT) to make effective use of time and place. It must be promoted, as it helps ensure employment continuity for workers engaged in raising children or caregiving, contributes to the realization of the dynamic engagement of all citizens through the participation in society of such people as women, seniors, and people with disabilities, and leads to the revitalization of regional cities through the creation of new places to work as well as to improvements in productivity of corporate activities and work-life-balance.

The "Declaration to Become the World's Most Advanced IT Nation: Basic Plan for the Advancement of Public and Private Sector Data Utilization," decided by the Cabinet on May 30, 2017, as well as the "Plan for Dynamic Engagement of All Citizens," the "Future Investment Strategy 2017," and the "Basic Policy on Economic and Fiscal Management and Reform 2017," all promote teleworking. The "Action Plan for the Realization of Work Style Reform" also mentions its importance. In ways such as this, the momentum to promote teleworking has increased greatly.

Relevant ministries and agencies, in cooperation with Tokyo Metropolis, business groups, companies, and others, designated July 24, on which the opening ceremony of the 2020 Tokyo Olympics is slated to take place, as Teleworking Day. In 2017, the first year, over 60,000 people in more than 900 organizations participated in a nationwide day of teleworking.

The MLIT has quantitatively ascertained the actual conditions associated with the teleworking style of work and the population of teleworkers and conducted a study of policies for promoting the development of locations at which teleworking can be deployed.

(2) Creating a Relaxed and Safe Environment for Children to Grow

To ensure the safety and comfort of children and other park users, various facility administrators are made aware of "Guidelines for Safety of Playground Equipment at Urban Parks (Edition 2)," "Pool Safety Standards Guidelines," and "Guidelines for Safety Inspections of Park Facilities," and social capital development general subsidy provide focused support to local governments for safety and comfort measures of park facilities.

3 Ageing Society Measures

(1) Creating a Living Environment for the Elderly to Live Comfortably

The Silver Housing Project provides a package including the supply of public housing and other accessible facilities, life support advisors to counsel daily living needs, and emergency response services and as of FY2016 is implemented at 969 housing projects (24,963 housing units).

Also, in order to promote development of the "Housing and City for smart wellness" where various families with the elderly and small children can live and act actively, the promotion projects for the housing for smart wellness supports the development of housing with service for the elderly, welfare facilities etc. in housing developments etc. and pioneering living and town planning measures for the elderly.

(2) Providing Transport Services That Meet the Needs of an Aging Society

In order to respond to the demand for the transportation of disadvantaged such as the elderly and disabled to hospitals and other care facilities, the implementation of welfare taxis[Note] is being promoted, and as of the end of FY2016, 17,197 vehicles were in operation. In addition, the Investment Subsidy to Ensure the Procurement, Maintenance and Improvement Regional Public Transportation is being utilized to support the implementation of welfare taxis needed in regional areas and since FY2012, universal design taxis that are easy for the elderly and various people have been granted preferential measures regarding motor vehicle tonnage tax and vehicle excise tax if the vehicle meets standard specifications and is certified by the government. As of the end of FY2016, 3,131 organizations were providing fee-based passenger transport services to allow municipal governments and NPOs to provide fee-based transport services using private vehicles in cases in which the parties representing regional residents agree that services by bus or taxi companies are deemed difficult to provide and the private fee-based passenger transport services are required to ensure passenger transport that is necessary for local residents.

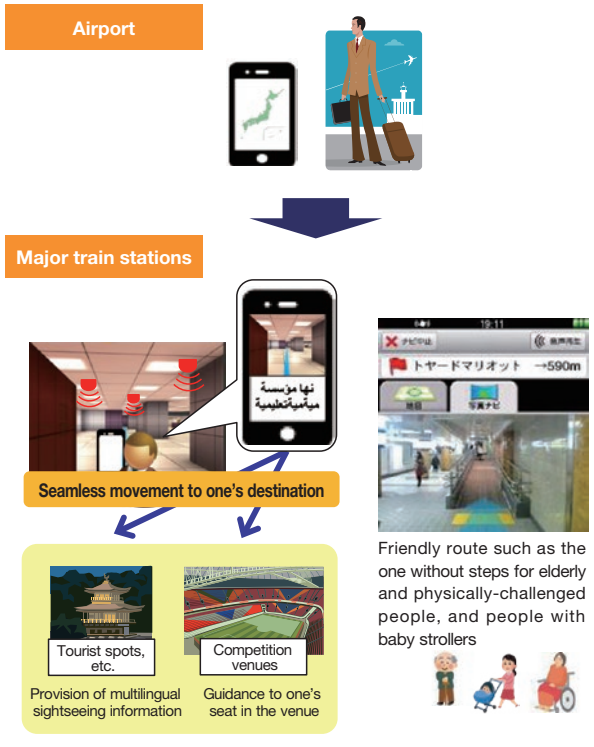
4 Promotion of the Dissemination of Pedestrian Mobility Support

We are promoting the dissemination of pedestrian mobility support services that utilize ICT to establish a society in which anyone, including foreign visitors, elderly and physically-challenged people, can participate in social activity freely and without stress both inside and outside buildings.

In light of the recommendations of the Study Committee for Promoting ICT-assisted Pedestrian Mobility Support (led by Ken Sakamura, Dean of the Faculty of Information Networking for Innovation and Design at Toyo University), we considered methods to continually gather, as well as means to efficiently maintain and update data needed for mobility, such as information on facility and route accessibility. We also provided a tool to input and digitize such information as slopes and steps in pedestrian spaces. Also, we developed a seamless indoor/outdoor digital map containing such information as slopes and steps, covering the area from Shin-Yokohama Station to International Stadium Yokohama (Nissan Stadium), and conducted a demonstration test of a navigation system that guides users along routes with no steps.

Note Taxi vehicles with lifts and other facilities so that those using wheelchairs or gurneys (stretchers) can board and disembark as is or taxi vehicles serviced by those with various qualifications, such as home care workers.

Figure II-7-1-3 Conception of Pedestrian Mobility Support Services



Source) MLIT

Section 2 Natural Disaster Measures

Japan's national land is subject to severe conditions in such terms as climate, geography, and geology. Such natural disasters as earthquakes, tsunamis, floods, and sediment disasters occur almost yearly. The year 2017 saw a series of natural disasters in different parts of the country including the Northern Kyushu Heavy Rain in July, heavy rain with the seasonal rain front from July 22, and typhoons Talim and Lan making landfall as well as eruption of Mt. Kusatsu-Shirane (Mt. Moto-Shirane) the following year. The Northern Kyushu Heavy Rain in July 2017 in particular caused enormous damage from outflows of debris and drift woods in addition to flooding of small and medium-sized rivers in Fukuoka and Oita prefectures. The importance of natural disaster measures is more urgent than ever before because there is concern over water- and sediment disasters that are occurring more frequently and seriously due to climate change as well as over the occurrence of giant earthquakes that are expected to strike, including Nankai Trough Mega Earthquake and Tokyo Inland Earthquake. To this end, disaster prevention and mitigation must be fundamentally bolstered, and structural and non-structural measures are being taken to protect lives and living standards.

1 Shifting to a Society with Higher Disaster Prevention Awareness

In light of the lessons of the many disasters that occurred recently, we are undertaking a general mobilization of structural measures with major impacts and non-structural measures from the perspective of residents, in a shift to society to raise disaster prevention awareness that all actors, including government, residents, and companies, are sharing knowledge and perspectives of disaster risks prepare for all kinds of disasters, including — flooding, earthquakes, and sediment

disasters.

Given the notion that major flooding exceeding the capacity of facilities engineering will inevitably occur, we are carrying out integrated structural and non-structural initiatives to restructure "society with higher flood prevention awareness," so that society as a whole prepares for flooding, in response to water disasters that are becoming more frequent and more serious. Based on the Small and Medium-sized River Project of emergency countermeasures, which was organized in light of issues such as the Northern Kyushu Heavy Rain in July 2017, we will urgently advance flood control measures over the next three years (aiming for completion in FY2020) in small and medium-sized rivers nationwide.

Given the concerns about the growing frequency and intensity of water disasters, sediment disasters, and droughts caused by climate change, we are making steady progress with facilities improvement and also working on measures against external forces that significantly exceed the capacity of facilities. In particular, with regard to measures to prevent catastrophic damage to society and the economy, the Kanto, Chubu, and Kinki Regional Development Bureaus published projected damage and countermeasure plans, including for areas outside flood zones, by August 2017. Building on these projections and plans, the MLIT is making an all-out effort to implement integrated structural and non-structural disaster prevention and disaster mitigation measures, in order to minimize damage to society and the economy.

In response to the projected Nankai Trough Mega Earthquake and Tokyo Inland Earthquake, which are thought to be steadily approaching, we are promoting effective measures, including the development of evacuation routes and evacuation shelters, and the strengthening of levees in zero meter areas against earthquakes, according to the specific damage features anticipated.

In particular, with around two and a half years until the 2020 Tokyo Olympic and Paralympic Games, we are expending all possible means to ensure disaster-prevention measures in the capital region based on the Roadmap of Measures Against the Tokyo Inland Earthquake Ahead of the Tokyo Olympic and Paralympic Games established in August 2017.

(1) Accelerating the Rebuilding Flood-Conscious Societies

(i) Policy Vision on Rebuilding Flood-Conscious Societies

In order to shift awareness to the notion that "major flooding exceeding the capacity of facilities engineering will inevitably occur," in light of the fact that water disasters have been becoming more frequent and more serious in recent years, we established the Policy Vision on Rebuilding Flood-Conscious Societies in December 2015. We have set up councils composed of river administrators, local governments, and others to share goals for natural disaster reduction, and are carrying out structural and non-structural measures in an integrated, systematic manner for all rivers under ministerial jurisdiction and municipalities along the rivers.

Under these circumstances, torrential rain brought by tropical cyclones that struck successively in August 2016 caused flood damage, including levee breach on small and medium-sized rivers in Hokkaido and Tohoku regions. The Omoto River, which is administered by Iwate Prefecture, especially was a scene of tragic harm, when residents of a facility for people requiring assistance became victims because they were unable to escape. In response, in January 2017, the Infrastructure Development Council reported on its recommendations for Rebuilding Flood-Conscious Societies regarding small and medium-sized rivers.

(ii) Responses based on torrential rain disasters such as the Northern Kyushu Heavy Rain in July 2017

We established an Small and Medium-sized River Project of emergency countermeasures based on the results of emergency inspections of small and medium-sized rivers nationwide conducted in light of torrential rain damage in recent years, such as the Northern Kyushu Heavy Rain in July 2017. Under the project, we will further accelerate initiatives for the Rebuilding Flood-Conscious Societies by carrying out structural and non-structural measures over the next three years or so (aiming for completion in FY2020). These will include construction of open-type Sabo dams that are highly effective at capturing debris and drift woods, excavating river channels to reduce flood damage to lots of homes and important facilities, and the installation of risk management-type water level gauges (low-cost water level gauges specialized for floods).

Figure II-7-2-1 Policy Vision on Rebuilding Flood-Conscious Societies

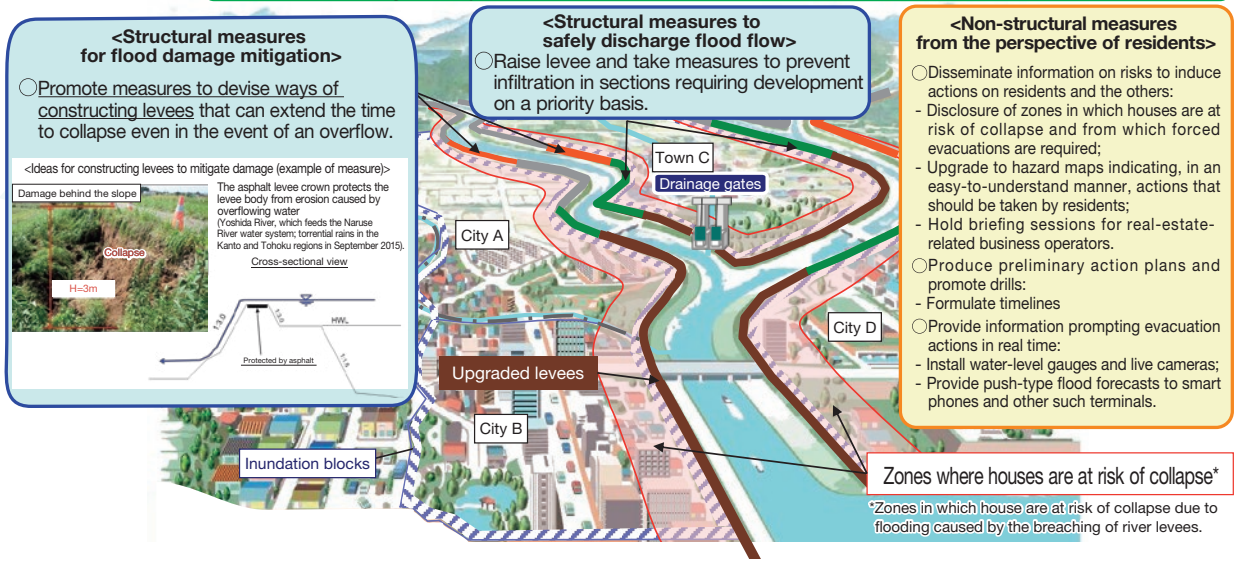
In response to torrential rains that fell in the Kanto and Tohoku regions, the Rebuilding Flood-Conscious Societies is to be newly incorporated into FY2020 targets applicable to all rivers under ministerial jurisdiction and municipalities along such rivers (109 water systems, 730 municipalities) in accordance with **the Policy Vision on Rebuilding Flood-Conscious Societies**.

<Non-structural measures> - Carry out a shift to more effective non-structural measures from the perspective of residents and implement these measures on a priority basis by the 2016 flood season in order to enable residents to detect risks themselves and evacuate autonomously.

<Structural measures> - In addition to structural measures to safely channel away floodwaters, adopt crisis management-type structural measures to mitigate damage in the event of inundation and implement these measures by FY2020.

Key measures

Set up new councils comprising river administrators, prefectural government officials, municipal officials, and other members in each region, share targets for disaster mitigation, and promote structural and non-structural measures in an integrated, systematic manner.



Source) MLIT

Column The Future of Weather Disaster Prevention Work in Regional Areas

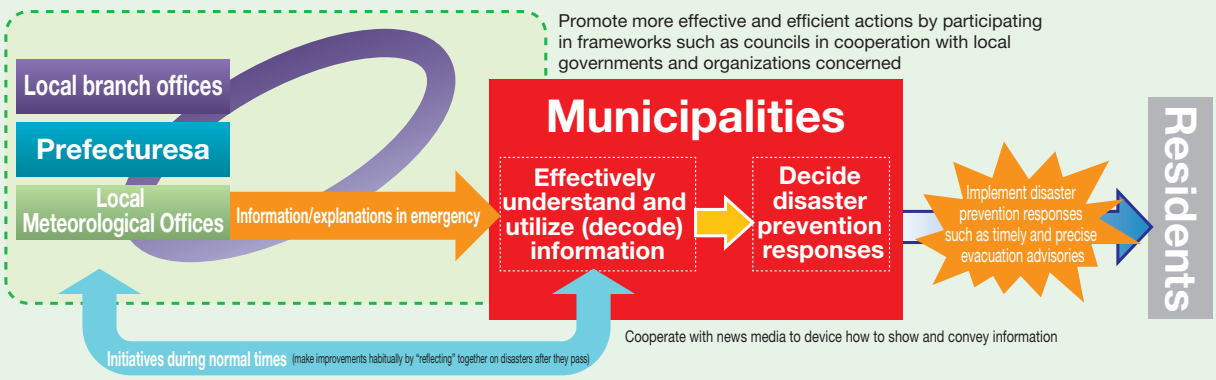
In order to contribute to the shift to a "society with higher disaster prevention awareness," the Japan Meteorological Agency gathered experts and held a Review Meeting on the Future of Weather Disaster Prevention Work in Regional Areas (chaired by Atsushi Tanaka, Professor at University of Tokyo Graduate School) to examine the direction of work at meteorological observatories that could contribute further to weather disaster prevention in regional areas. In August 2017, "The Future of Weather Disaster Prevention Work in Regional Areas" (a report) was compiled as a product of the review.

- Contribute further to weather disaster prevention in regional areas through cooperation among local governments and relevant organizations

- Advance initiatives in normal times further so as to ensure municipalities can more deeply "understand and utilize" (decode) weather information for disaster prevention in their decisions on disaster prevention responses during emergencies

In response, the Japan Meteorological Agency decided to strengthen initiatives during normal times, including establishing "face-to-face relationships" and to carry out weather disaster prevention work in regional areas in cooperation with persons concerned with weather disaster prevention, gradually advancing initiatives such as providing strong backing for municipalities' disaster prevention responses by providing timely and precise explanations during emergencies, such as through hotlines.

Image of role and initiatives of Local Meteorological Offices in weather disaster prevention in regional areas



Source) Japan Meteorological Agency

[Establishment of JMA Emergency Task Teams (JETT)]

In May 2018, the Japan Meteorological Agency established JMA Emergency Task Teams (JETT) to support local governments' disaster responses by swiftly dispatching meteorological observatory personnel as TEC-FORCE members to prefectural or municipal governments in order to provide explanations of weather conditions according to needs on the ground in disaster responses, when a disaster is predicted or has occurred. JETT are composed of personnel with a thorough knowledge of the local area around Local Meteorological Offices on-site and in the vicinity.

[Example of Hotline Utilization]

During torrential rain that fell on Akita Prefecture in July 2017, the head of the Akita Local Meteorological Office used hotlines to the mayors of municipalities expected to suffer damage to make direct phone calls and strongly urge them to go on heightened alert against heavy rain. The head of the River Office also used a hotline to provide information about river water levels and directly consult with mayors about the dispatch of personnel and pump trucks. In such ways, we supported evacuation advisory decisions and disaster prevention activities.

Column

Promotion of the "Small and Medium-sized River Project of emergency countermeasures" Including Construction of Open-type Sabo Dams and Installation of Risk Management-type Water Level Gauges

(1) Damage from the Northern Kyushu Heavy Rain in July 2017

During the Northern Kyushu Heavy Rain in July 2017, floodwaters from multiple simultaneous slope failures associated with intensive rainfall surged downstream with large amounts of debris and drift woods. This resulted in sediment clogging the river channel and the accumulation of drift woods at bridges blocking the river channel. Additionally, floodwaters exceeding the flow capacity of the river channel overflowed, together with debris and drift woods, into the surrounding area, causing the destruction of houses and human damage.

(2) Small and Medium-sized River Project of emergency countermeasures

A Chikugo River Right Bank Watershed Technical Review Committee for River and Sabo Restoration was established in response to the Northern Kyushu Heavy Rain in July 2017. Issues in the Northern Kyushu Heavy Rain identified by the committee were: (i) amplification of damage by large amounts of debris and drift woods in rivers in mountainous areas, (ii) occurrence of repeated flood damage by small and medium-sized, and (iii) inability to grasp the river's situation in real time during the flooding. It is thought that these issues are shared in common between the river that produced damage during the Northern Kyushu Heavy Rain and rivers in other regions with similar characteristics.

Accordingly, we conducted emergency inspections of small and medium-sized rivers nationwide from the above three perspectives. In light of the results, we organized measures to implement over the next three years or so (aiming for completion in FY2020) on small and medium-sized rivers nationwide into the Small and Medium-sized River Project of emergency countermeasures. Specifically, it was decided to construct open-type Sabo dams that are highly effective at capturing debris and drift woods[*1], excavate river channels and construct levees to reduce flood damage to lots of homes and important facilities, and install risk management-type water level gauges[*2].

Promotion of the Small and Medium-sized River Project of emergency countermeasures

<Issues revealed by recent torrential rain disasters>
(i) Amplification of damage by large amounts of debris and drift woods in rivers in mountainous areas
(ii) Occurrence of repeated flood damage by small and medium-sized rivers
(iii) Inability to grasp the river's situation in real time during the flooding

⇩ Emergency inspections conducted in cooperation with prefectures

<Sediment/drift woods countermeasures>
➢ Construct open-type Sabo dams on around 700 mountain streams nationwide with a high risk of damage from debris and drift woods

Example of sediment/drift woods damage (Akatani River)

<Countermeasures to prevent repeated flooding>
➢ Excavation and construction of levees along around 300 km of rivers nationwide with a high risk of repeated flooding

the Northern Kyushu Heavy Rain in July 2012

the Northern Kyushu Heavy Rain in July 2017

Repeated flood damage

<Water level monitoring during flooding>
➢ Installation of risk management-type water level gauges (low-cost water level gauges specialized for floods) at around 5,800 locations with a high need of water level monitoring during flooding

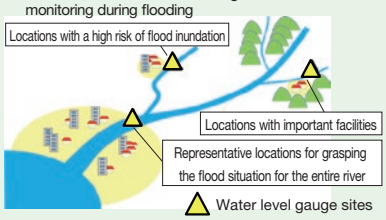


Image of countermeasure locations

[*1] Open-type Sabo dams that are highly effective at capturing debris and drift woods: Mechanism of capturing drift woods
In sediment disasters, there are many examples of damage to houses, etc., increasing due to drift woods flowing downstream together with sediment when torrential rain or an earthquake causes a mountainside to collapse. The construction of open-type Sabo dams that are highly effective at capturing debris and drift woods is an important countermeasure. Sabo dams are divided roughly into two types: closed-type Sabo dams and open-type Sabo dams. Both have the ability to capture drift woods. The open-type is especially efficient at capturing drift woods, since it can capture drift woods and sediment together without holding the water back. That is why we are promoting the construction of open-type Sabo dams in locations where there is a risk of debris flows. At the same time, at locations where sediment can flow constantly, there is a need to use closed-type Sabo dams to prevent new slope failures and sediment sliding.

Closed-type Sabo dam

Some logs float over the dam and flow downstream

Open-type Sabo dam

Logs are captured together with sediment

*2 Development and installation of management-type water level gauges through government-led open innovation
The technological development of risk management-type water level gauges (low-cost water level gauges specialized for floods) was carried out with a sense of speed, beginning with open recruitment in November 2016 for participation in open innovation. A pitch event was held in January 2017, development teams formed in March, field-testing conducted in August, and device development completed in December. What enabled the speedy development of the device in about a year were the fact that MLIT clearly defined the required standard and the fact that matching that drew on the strong points of companies (12 teams began development) was used. The characteristics of the water level gauge are a cost under 1/10 of a conventional device (less than 1 million yen per device) and long-term maintenance-free operation (five years or longer without supplying electricity). We will install the devices at high priority sites on rivers under ministerial jurisdiction within FY2018 and will encourage their installation by FY2020 on rivers managed by prefectural governments.

Column

Implemented First River Improvement through National Government Since Amendment of the Rivers Act, and Sediment Disasters Countermeasures Directly Managed by the National Government in Region Afflicted by the Northern Kyushu Heavy Rain in July 2017

Of the rivers that sustained major damage in the Northern Kyushu Heavy Rain in July 2017, the damage was especially large in the Akatani River basin. Here, new river improvement was carried out through national government agency. Also, measures were implemented to restrain the discharge of sediment through emergency construction of Sabo dams as projects directly managed by the national government. In such ways, measures were carried out that coordinated river projects with Sabo projects.

<<National government agency for disaster recovery construction on rivers managed by prefectural governments (river projects)>>

There was considerable accumulation of large amounts of debris and drift woods that were discharged in slope failures in the upper reaches of the Akatani, Oyama, and Otoishi Rivers, which are part of the drainage system of the Chikugo River managed by Fukuoka Prefecture. Emergency countermeasures were needed, as there was an extremely high risk of secondary damage with even a little rain. Moreover, as the highly fluid nature of the discharged sediment made construction difficult, a high level of technological capability was required. Accordingly, upon request from the governor of Fukuoka, the national government carried out an emergency response through national government agency beginning on July 18, 2017. This national government agency system was newly created based on the Rivers Act, which had been amended in June 2017. This was the first time it had been applied.

Also, the full-scale restoration work conducted following the emergency countermeasures also required a high level of technological capability, since, in addition to the nature of the soil, changes in the riverbed due to sediment during the stage of construction had to be monitored and adaptive responses taken. Accordingly, a request was received from the governor of Fukuoka on November 30, 2017, and on December 1 it was decided to conduct the work through national government agency.

Over the next five years or so, we will conduct full-scale restoration work, including widening the river, improving bank protection, improving flow by easing areas with sharp bends, and improving storage facilities for drift woods.

Immediately after disaster

Emergency countermeasures completed

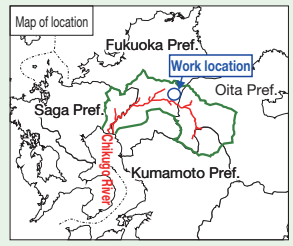
<< Sediment disasters countermeasures directly managed by the national government in the Akatani River basin (Sabo project)>>

The Northern Kyushu Heavy Rain in July 2017 caused many incidents of sediment disaster due to debris and drift woods associated with slope failures. A Sabo project directly managed by the national government was carried out in the Akatani River basin—which is part of the drainage system of the Chikugo River—where damage was especially large.

In order to prevent secondary disasters due to debris and drift woods remaining upstream moving again, in response to a request from the governor of Fukuoka, it was decided on August 10, 2017 that the national government would conduct an Urgent Sabo Project for Sediment Disaster. Construction work began on August 16. The emergency construction included building Sabo dams and sand pocket.

Also, on December 1, 2017, it was decided that, following the emergency construction, the national government would focus on improving Sabo dams over the next five years or so, in order to prevent wide-area sediment and flood damege.

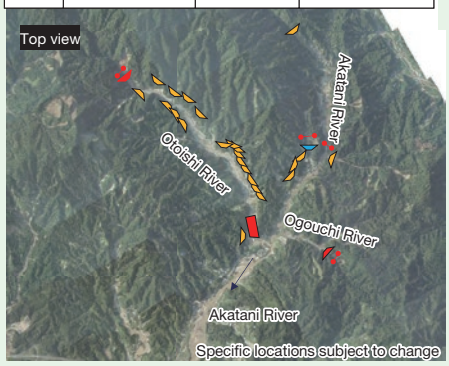
- ○Emergency Sabo construction is underway in the Akatani River basin, which is part of the drainage system of the Chikugo River, in order to prevent secondary disasters due to unstable sediment, etc. accumulated in the basin moving again. (Urgent Sabo Project for Sediment Disaster)
- ○Following the Urgent Sabo Project for Sediment Disaster, efforts are to be focused on improving Sabo dams over the next five years or so, in order to prevent wide-area sediment and flood damage. (Specified Sabo Project for Sediment Disaster)
- ○Furthermore, in order to manifest the effect of the Specified Sabo Project for Sediment Disaster as soon as possible, “emergency funds for disaster countermeasures” are to be used to quickly construct Sabo dams.



Legend	
	Sabo dam
	Strong wire net
	Sand pocket

Urgent Sabo Project for Sediment Disaster (implemented in 2017)
Specified Sabo Project for Sediment Sisaster (to be implemented from 2018)
Emergency funds for disaster countermeasures (implemented in 2017)

Project	Disaster Prevention	Special Control	Emergency funds (included in Special Control Project)
Cost	Approx. 2.7 billion yen	Approx. 17.5 billion yen	540 million yen
Content	Sabo dams: 2 Sand pocket: 1 Strong wire nets: 4	Sabo dams: 24	Sabo dams: 1
Period	FY2017	FY2017 – FY2022	FY2017



(2) Preventing and Mitigating Water Disasters

Large-scale water disasters caused by tropical cyclones or the like (for example, disasters caused by Typhoon Wipha visited Izu Oshima Island and other regions in Japan in 2013 and storm surge disasters caused by Hurricane Sandy in US in 2012) are occurring more frequently and seriously. With this situation in mind, the “Underground Mall, Subway, Etc. Working Group,” “Disaster Action Plan Working Group” and “Catastrophic Damage Prevention Working Group” have been set up under the “Water Disaster Prevention and Mitigation Headquarters, MLIT” chaired by the Minister of Land, Infrastructure, Transport and Tourism in January, 2014, to study the measures to be taken when water disasters occur.

The Underground Malls, Subways, Etc., Working Group has summarized responses to issues concerning underground settings and disseminated this summary to the relevant organizations. Accordingly, flood measures have been applied on a coordinated basis to underground malls, subways, and connected buildings in the three major metropolitan areas.

The Disaster Action Plan Working Group provides support to enable the heads of municipalities to issue evacuation instructions at appropriate times and has formulated timelines focused on the issuance of evacuation instructions for rivers under the direct jurisdiction of the national government, as well as timelines for bringing together many concerned parties, including local governments, railways, electricity power operators, telecommunications operators, and welfare facilities,

in the downstream basin of the Arakawa River. Modeled on this approach, councils have been established for Ishikari River (Hokkaido), Kuma River (Kumamoto), and other blocks throughout the country and are conducting studies on timelines for bringing together many concerned parties. In August 2016, we established and announced the first version of a Policy on Formulating and Using Timelines (Disaster Action Plan) and disseminated it to municipalities and organizations concerned with disaster prevention. We are also preparing timelines for rivers managed by prefectural governments, focusing on flood forecast rivers and water level alert rivers.

In the Catastrophic Damage Prevention Working Group, the objective is to protect lives and preventing catastrophic damage being caused to society and the economy in the context of an ideal way of engaging in disaster prevention and mitigation for the new stage, as declared in January 2015. The group aims to prevent catastrophic damage caused to society and the economy in accordance with the necessity of a collective societal response informed by a shared sense of crisis. In Tokyo, Nagoya, and Osaka, Regional Development Bureaus, in cooperation with companies and other entities, studied projected damage and countermeasure plans, including for areas outside flood zones, for things such as power outages and suspended railways. These were published by August 2017.

In August 2017, we convened the Fifth MLIT Water Disaster Prevention and Mitigation Headquarters and accelerated initiatives for the "Rebuilding Flood-Conscious Societies." We decided that MLIT would put an all-out effort into structural and non-structural disaster prevention and disaster mitigation measures, in order to minimize damage to society and the economy by avoiding catastrophic damage from large-scale floods. We also decided responses to take in light of the Northern Kyushu Heavy Rain in July 2017 and priority measures for FY2018. As specific examples of priority measures for FY2018, it was decided to: (i) study measures to lower storm surge risk in harbor land not protected by levees, and (ii) strengthen weather disaster prevention support in local communities.

(3) Responding to Climate Change

There are growing concerns about the intensified frequent occurrence of water disasters (river water flooding, inland water flooding, storm surges), sediment disasters, and drought damage caused by climate change. In August 2015, the Infrastructure Development Council issued a report entitled "Approach to Climate Change Adaptations in the Field of Water-related Disasters: Becoming a Society that Strives to Reduce Natural Disasters by Sharing Disaster Risk Information and a Sense of Crisis."

Regarding natural hazards that could occur relatively frequently, continue to steadily promote improvements that have been ongoing to date for the construction of levees, flood control structures, and sewer systems. Regarding natural hazards that exceed the capacity of facilities, endeavor to reduce risk by making improvements in facilities' operations, design and implementation procedures. For natural hazards that significantly exceed the capacity of facilities, aim for the protection of human life to the greatest extent possible and avoid catastrophic damage to the society and the economy, considering worst-case scenarios, and by developing measures with an emphasis on nonstructural measures.

In the future, we will work on measures to adapt to the effects of climate change based on the Plan for Adaptation to the Impact of Climate Change, adopted by a Cabinet decision in November 2015, and on the MLIT Climate Change Adaptation Plan of November 2015.

(4) Responding to Nankai Trough Mega Earthquake and Tokyo Inland Earthquake

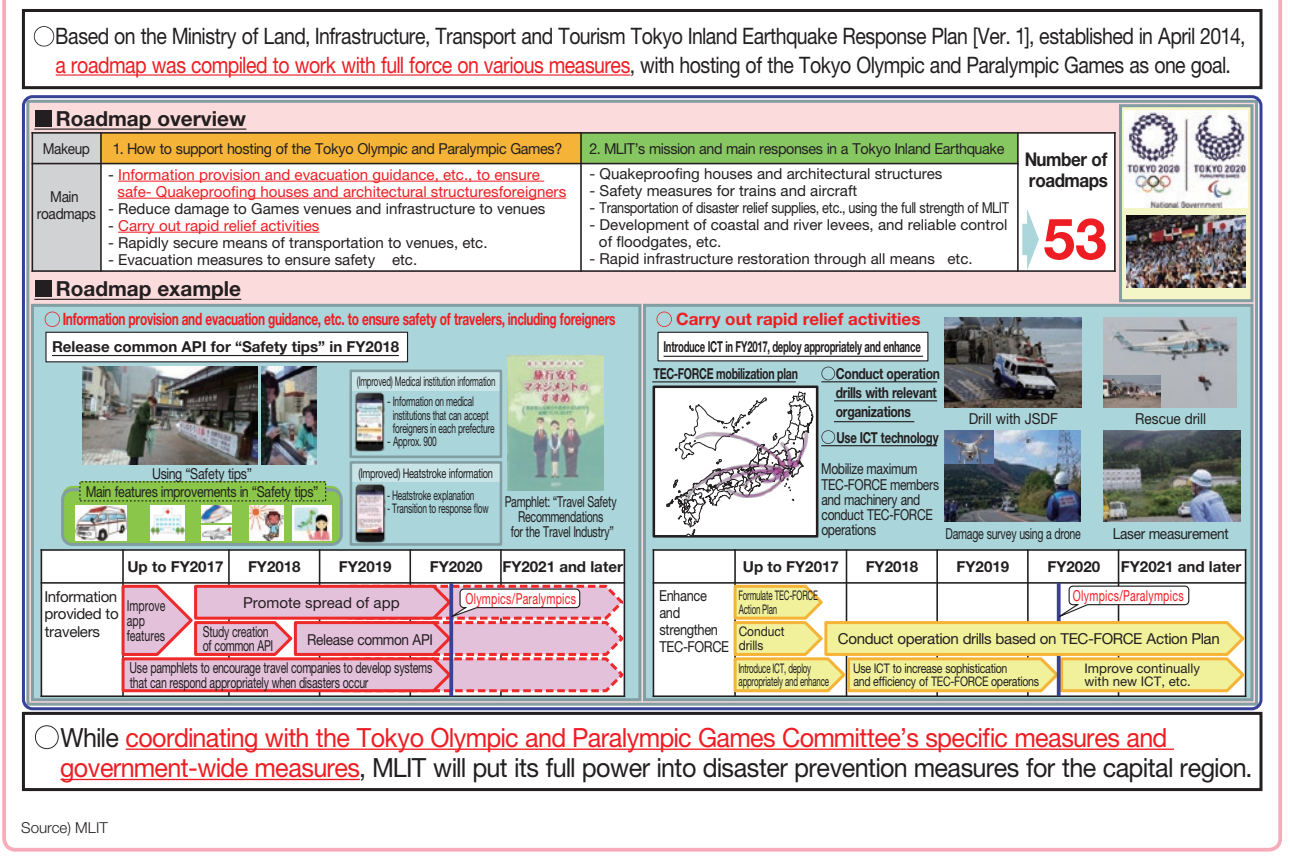
If Nankai Trough Mega Earthquake occurs, it is predicted that a wide Pacific-side area from the Kanto region to Kyushu will experience strong shaking with a seismic intensity of weak 6-7 and a huge tsunami will attack the wide Pacific-side coastal area within a short period of time. Deaths will reach a maximum of about 320,000 people, a critical situation including the interruption of transport infrastructure and paralysis of urban functions along the coast will be created, and the lives and economic activities of Japanese citizens are expected to suffer extremely serious effects all over Japan.

If the Tokyo Inland Earthquake occurs, it is expected to cause strong shaking with a seismic intensity of weak 6-7 along the entirety of the Tokyo Metropolitan area. In the Tokyo Metropolitan area, population, buildings, economic activities and others are concentrated extremely compared with other areas, and so it is expected that human, property, and economic damages become tremendous. In addition, in the Tokyo Metropolitan area, political, administrative, and economic functions of the capital are concentrated, and so it is expected that the Tokyo Inland Earthquake exerts impacts upon national economic activities and others as well as overseas countries.

In order to cope with such a national crisis, the Ministry of Land, Infrastructure, Transport and Tourism—which is in charge of the development and management of a lot of infrastructures and the protection of human lives and properties at sea and which has many field agencies all over Japan—established the Ministry of Land, Infrastructure, Transport and Tourism Nankai Trough Mega Earthquake and Tokyo Inland Earthquake Response Headquarters and a Response Plan Making Working Group in 2013, and formulated the Ministry of Land, Infrastructure, Transport and Tourism Nankai Trough Mega Earthquake Response Plan and Ministry of Land, Infrastructure, Transport and Tourism Tokyo Inland Earthquake Response Plan on April 1, 2014, in order to determine the reality-based responses to be taken by collective effort. Regarding Nankai Trough Mega Earthquake, more specific and practical Regional Response Plans were developed for each regional block along with the abovementioned plans. In August 2017, under the purview of the Seventh Nankai Trough Mega Earthquake and Tokyo Inland Earthquake Response Headquarters, we decided to accelerate initiatives to shift to a society with higher disaster prevention awareness. We also decided Ver. 1 of the Roadmap for Tokyo Inland Earthquake Responses in Preparation for Hosting the Tokyo Olympic and Paralympic Games. The roadmap reflects the Ministry of Land, Infrastructure, Transport and Tourism Tokyo Inland Earthquake Response Plan. Additionally, we decided the TEC-FORCE Action Plan for Tokyo Inland Earthquake, which plans for the prompt dispatch of TEC-FORCE and other response teams after an earthquake. Finally, priority measures were determined after taking into account the status of implementation to date of both response plans.

As specific examples of priority measures for FY2018, it was decided to: (i) establish a portal site on Tokyo Inland Earthquake responses, with a view toward the Tokyo Olympics and Paralympics (disaster prevention portal), (ii) enhance the road re-opening plan, and (iii) implement marine transport countermeasures in the deployment of regional support teams.

Figure II-7-2-2 Roadmap for Tokyo Inland Earthquake Responses in Preparation for Hosting the Tokyo Olympic and Paralympic Games [Ver. 1]



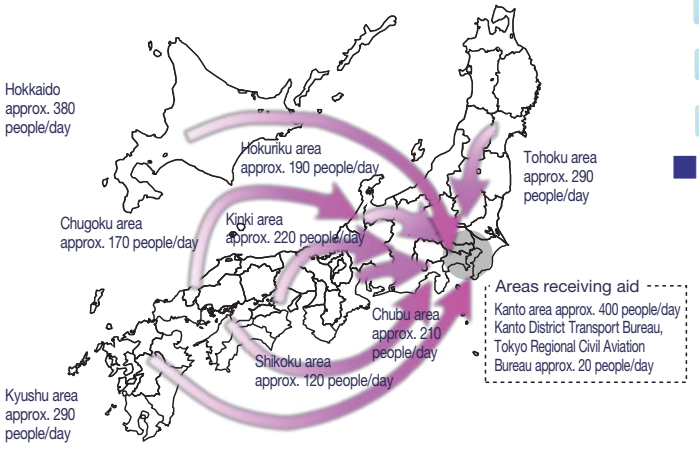
Source) MLIT

Figure II-7-2-3 Overview of the TEC-FORCE Action Plan for a Tokyo Inland Earthquake

○**A mobilization plan for TEC-FORCE and a timeline for wide area deployment** have been prescribed in order to conduct emergency response operations swiftly and smoothly in immediate response to the enormous damage of a Tokyo Inland Earthquake.
○TEC-FORCE from areas providing aid **advance to wide area staging bases**, which are the first goal to reach. Following instructions from the areas receiving aid, they move to various operations bases, **secure emergency transportation routes, perform emergency water drainage, and conduct damage surveys, etc.**

* Formulated based on the Basic Plan for Carrying Out Tokyo Inland Earthquake Emergency Measures (March 2015, Cabinet decision) and the Tokyo Inland Earthquake Response Plan (April 2014, MLIT).

TEC-FORCE mobilization plan (maximum deployment from each area)



* Additionally, District Transport Bureau to deploy approx. 70 people/day

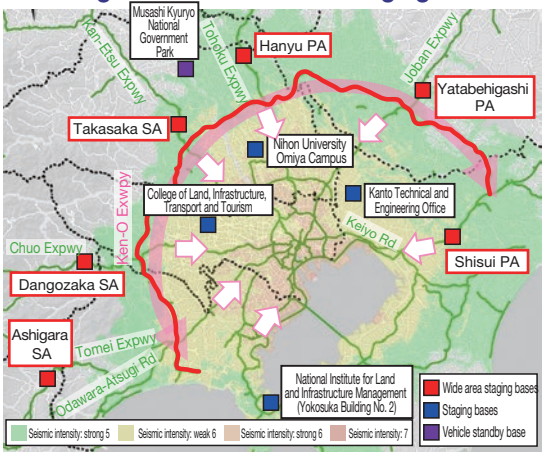
◆Maximum mobilization of TEC-FORCE people and machinery

- TEC-FORCE:	Approx. 8,900 people (max. 2,360 people/day)
- Helicopters for disaster measures:	8
- Machinery for disaster measures:	Approx. 514
- Ships for disaster measures:	26

Conception of wide area deployment timeline

Day 1: Dispatch teams to wide area staging bases immediately after the disaster occurs
↓
Day 2: TEC-FORCE from areas receiving and providing aid start unified operations
↓
Day 3: Maximum number of TEC-FORCE members and machinery in action

Arrangement of wide area staging bases



Source) MLIT

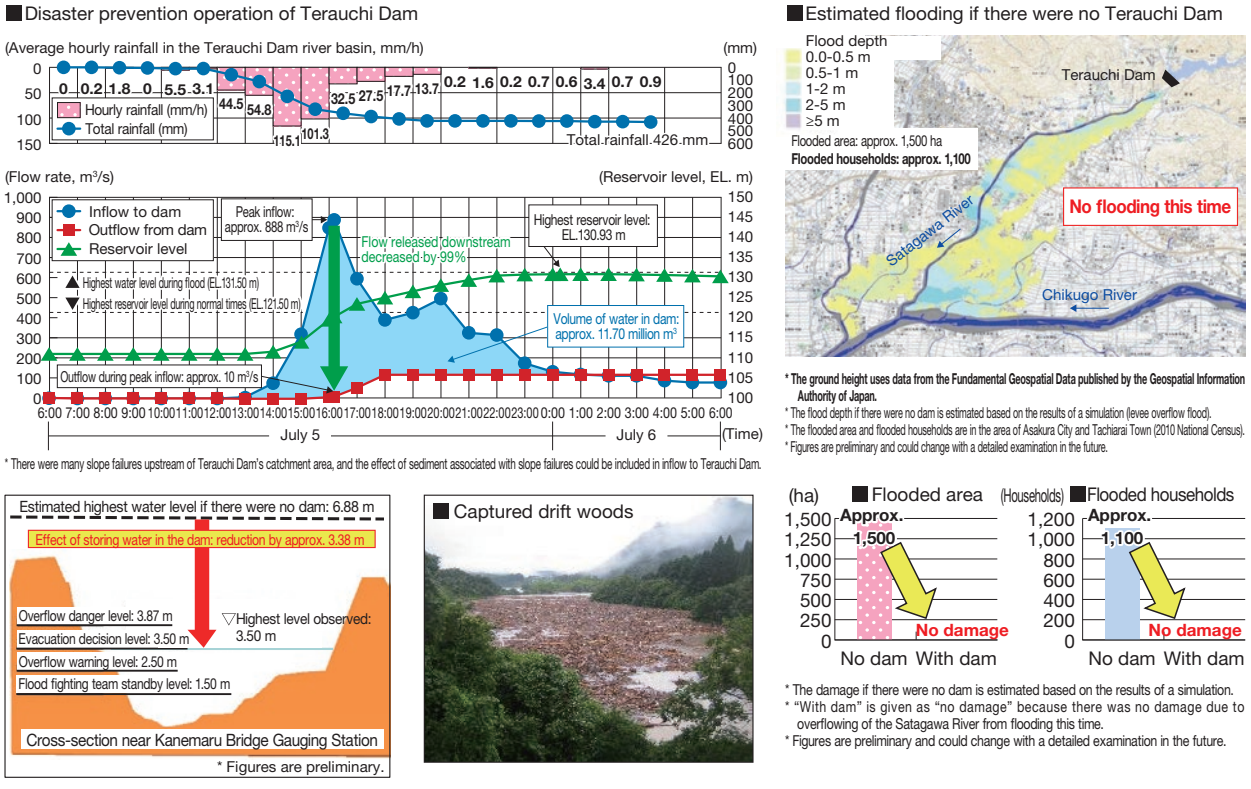
2 Shaping National Land that is Safe and Resilient to Disasters and Enhancing and Strengthening the Framework of Preparedness for Crisis Management

(1) Flood Measures

Many of Japan's major cities are positioned on low-lying districts that are lower than the river level during flooding, making the latent danger of flood inundation quite high. Water control measures, such as those involving the expansion of the river channel to safely flush away floods, embankments, the development of discharge channels, dams to temporarily hold back floods, and retarding basin, have steadily improved the degree of water control safety. However, flooding occurred in various locations throughout the country in 2017 due to the Northern Kyushu Heavy Rain in July and typhoons Talim and Lan making landfall. In order to mitigate and reduce damage caused by flood disasters which occur frequently and seriously, structural measures such as preventative flood control measures and measures to prevent re-occurrence as well as non-structural measures such as strengthening of the flood defense system and provision of river information are being promoted in a comprehensive manner taking into account the influence of climate change.

In incidents involving inundation and other forms of flooding that occurred in 2017, the value of flood control projects implemented previously was demonstrated. For example, during the Northern Kyushu Heavy Rain, there was record-breaking rainfall, exceeding 400 mm in total, in the Satagawa River Basin, and the Terauchi Dam recorded the largest volume of flow since its management began. However, through disaster prevention operation, the flow released downstream from the dam was reduced by up to 99%, reducing the water level in the downstream river by around 3.4 meters and capturing a large amount of drift woods in the dam's reservoir.

Figure II-7-2-4 Effect of Disaster Prevention Operation of Terauchi Dam (the Northern Kyushu Heavy Rain in July 2017)



Source) MLIT

(i) Preventative water control measures implemented systematically

In light of the increasing frequency and intensity of flood damage associated with climate change, it is important to systematically carry out water control measures against floods that have a comparatively high frequency of occurrence. For this reason, we are systematically promoting such measures as developing levees, excavating river channels, flood-retarding basins, discharge channels, and dams. In addition, in order to use the existing facilities effectively, we are working on dam improvement, including through such measures as raising the height to increase a dam's storage capacity and the flexible operation of dams to make use of service water capacity for flood control and making use of flood control capacity for other purposes.

Additionally, we are developing high standrad levees, in cooperation with town planning, in low-lying areas such as zero meter areas in the capital region and Kinki region, where population and assets are concentrated. The development of high standard levees will produce a variety of effects, including avoidance of severe damage caused by levee breaches, function as evacuation sites for residents living in the vicinity during disasters, and provision of good living environments and urban spaces.

Column

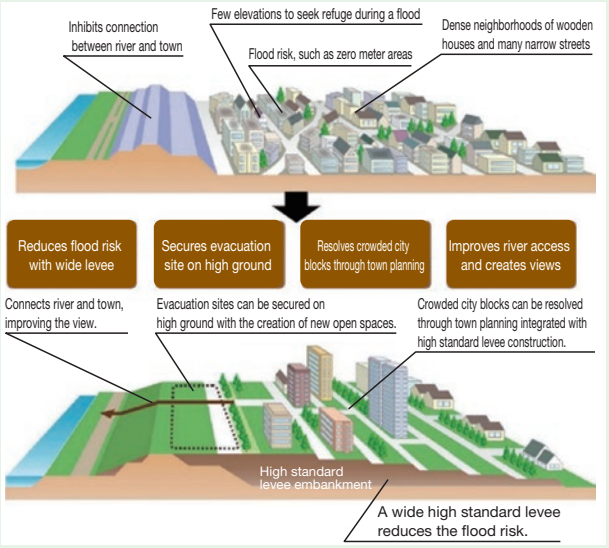
Toward Efficient High Standard Levee Promotion

The highest priority in developing high standard levees is to protect human life. They are constructed to avoid levee breaches caused by overflow, infiltration, and erosion in low-lying areas such as zero meter areas in the capital region and Kinki region. Also, where they have been developed in some sections of a series of sections or when the basic cross-sectional shape has not been completed, the safety of places where the high standard levees have been constructed improves dramatically. These places function as evacuation sites for residents living in the vicinity during flooding and as bases for various activities. They also provide good living environments. High standard levees therefore have diverse effects. In the Komatsugawa district on the right bank of the Arakawa River, for example, after a high standard levee was constructed, it has served as a park where residents can relax during normal times and a center of disaster prevention as an evacuation site for approximately 200,000 people during disasters.

A review committee for efficient development of high standard levees, composed of individuals with relevant knowledge and experience, was formed to widely discuss the current state of and issues with past high standard levees. The committee met three times, beginning in May 2017, and compiled recommendations for measures to more efficiently promote high standard levee development.

The main promotion measures recommended were for promoting the development of high standard levees through joint projects with private sector businesses. The recommendations included establishing a system to give incentives to project partners, such as utilizing the site on the reverse slope from the river, which becomes usable with the development of high standard levees, for parks and roads, and factoring it in as a site area for buildings. Another recommendation was to establish a system that would allow integrated construction of buildings and foundations together with embankment and foundation improvement for a high standard levee, with a view toward shortening the construction period and expanding the discretion of project partners.

Going forward, we will actively call for promotion of high standard levee development based on the recommendations and also flesh out promotion measures and steadily promote the development of high standard levees.

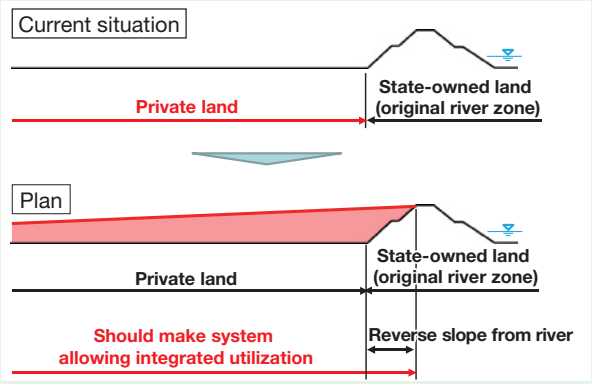


Source) MLIT

Used as a park during normal times and an evacuation site during disasters (Arakawa River, Komatsugawa district)

Source) MLIT

Utilizing the site on the reverse slope from the river



Source) MLIT

Column

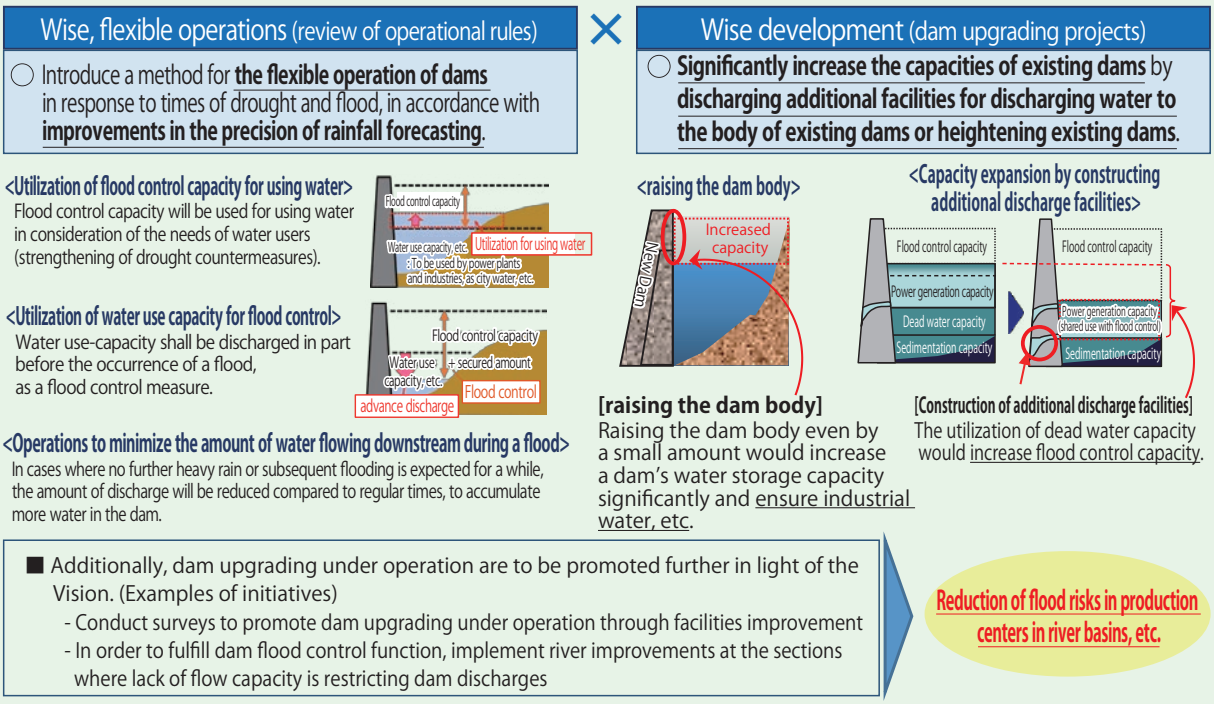
Productivity Innovation Project: dam upgrading under operation –Early Upgrading of Water Utilization and Flood Control Capacities to Support Local Economies–

Effective ways to quickly reduce the risk to corporations' production activities posed by the frequent droughts and floods seen in recent years are introducing new construction technologies and making the best possible use of the storage capacity of existing dams.

Under the Vision on Upgrading Dams under Operation (enacted June 2017), structural and non-structural measures that maximize the use of existing dams (smart and flexible operation × smart improvement) will be strategically and systematically implemented to achieve early effects in both water supply and flood control operations.

At present, we have conducted a general review of the operation rules for 123 dams nationwide managed by the national government or the Japan Water Agency and have made facilities improvements, including heightening the body of existing dams and constructing additional facilities for discharging water, at 19 dams nationwide (as of March 2018).

In FY2018, we started three projects: Uryugawa Dam Upgrading Project, Yahagi Dam Upgrading Project, and Sameura Dam Upgrading Project. We also established "A subsidy for planning of dam upgrading under operation" to support the planning of dam upgrading by prefectural governments by expanding eligibility for General Social Infrastructures Development Subsidies (dam improvement projects).



(ii) Preventing the reoccurrence of flood disasters

In regions where the frequent occurrence of flood damage and inundation above floor level have caused loss of life and serious problems in people's daily lives, river channel excavation and levee construction, among other measures, are being implemented intensively over a short time span in order to improve the flow capacity of rivers, in an effort to prevent the recurrence of disasters.

(iii) Flood control measures tailored to river basin characteristics

For rivers that experience a significant decline in flood control safety due to river basin development or existing urban areas regularly subject to flood damage, it is important to ensure the water retention and flood dissipation functions of the river basin. Rivers such as these require the promotion of river basin measures and a variety of methods that taken into consideration regional characteristics to ensure safety and comfort.

a. Comprehensive flood control measures

With factors, such as an increase in the impermeable land area following the development of urban areas and peripheral areas, as well as an increased discharge from flooding rivers, for urban rivers where flood control safety is significantly compromised, it is important to carry out comprehensive flood control measures, in addition to river development, such as securing the water retention and flood dissipation functions of the river basin, directing land use in regions at high risk of disasters occurring, and establishing a precautionary evacuation framework. As part of these efforts, we are cooperating with the relevant local authorities to promote the suppression of rainwater drainage through the development of infiltration facilities for storage of rain water, as well as measures to reduce civilian damage.

In addition, to prevent the disruption of urban functions due to flooding as well as the flooding of underground malls in accordance with the Act on Countermeasures against Flood Damage of Specified Rivers Running Across Cities, river administrators, sewage system administrators, and local government are working together to promote river basin flood damage countermeasures such as developing rainwater harvesting and infiltration facilities as well as regulations to suppress the drainage of rainwater.

b. Localized downpours measures

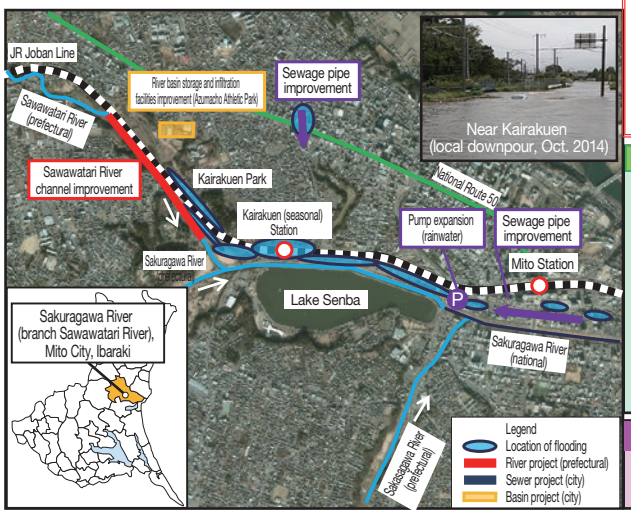
In recent years, due to inundation damage caused by phenomenon such as concentrated heavy rains in localized areas, to ensure that residents can live safely even during localized heavy rains exceeding planned levels, a plan created with the support of residents (groups), private sector companies, and others that stipulates a comprehensive approach implemented to reduce flood damages known as the "100 mm/h security plan" is registered and initiatives to promote mitigation measures against flood damages are being implemented in addition to the development of rivers and sewerage.

Figure II-7-2-5 Examples of Measures Based on a 100 mm/h Security Plan in Mito City, Ibaraki

Flood damage reduction plan in the Sakuragawa River (Sawawatari River) basin [Mito City, Ibaraki]

Outline of basin

- ○The Sakuragawa River (Sawawatari River) basin has been the site of inundation damage due to loAcalized heavy rains that have been occurring often in recent years.
- ○In recent years, torrential rain in May 2012 caused 12 cases of inundation above the floor level, 2 cases of inundation below the floor level, and interruption of operation of the JR Joban Line in the river basin.
- ○Number of events with an hourly rainfall of 50 mm or more in Ibaraki
  - 30 years from 1980 to 2009: average 1.9 times/year
  - From 2010 to 2015: average 4.7 times/year
  The number of events with an hourly rainfall of 50 mm or more is increasing.
- ○Rainfall event subject to the flood damage reduction plan Torrential rain in May 2012 with rainfall up to 56 mm/h



Main causes of inundation damage

As outside water caused inundation because rainwater that flowed suddenly into the river could not flow safely, inside water could not drain properly, resulting in expansion of inundation damage.

- ○Increase in rainfall above drainage capacity
- ○Delays in river improvement for safe flow of floodwater
- ○Increase in outflow due to progress of urbanization and changes in land usage, etc.

→ There is a need for relevant organizations in the basin to effectively combine and carry out anti-flood measures.

Comprehensive anti-flood measures for the Sakuragawa River (Sawawatari River) basin have been studied by the Sakuragawa River (Sawawatari River) Basin Comprehensive Flood Control Measures Council, composed of Ibaraki Prefecture, Mito City, companies and others, and relevant organizations have implemented measures.

Sakuragawa River (Sawawatari River) Basin Comprehensive Flood Control Measures Council

Organization	Department, etc.
MLIT	Hitachi River and National Highway Office
Ibaraki Prefecture	Civil Engineering Section Rivers Department, City Bureau Sewerage Department, Parks and Streets Division, Mito Civil Engineering Office
Mito City	Waterworks Division Sewerage Management Department, Construction Division Construction Planning Department, Rivers and Municipal Drainage Department
Companies, etc.	JR East Mito Branch Office, Ibaraki University

Overview of initiatives

- ○Rivers / sewer systems
  - Sawawatari River channel improvement
  - Sewage pipe improvement, rainwater pump increases
- ○Basin measures
  - Storage and infiltration facilities improvement (Azumacho Athletic Park, etc.)
  - Promotion of installation of rainwater storage and infiltration facilities for residents and septic tank diversion facilities
- ○Disseminating danger warnings / flood control activities
  - Providing disaster prevention information through Mito City's website, an e-mail newsletter, LINE, Twitter, emergency e-mails, Facebook, and FM radio, etc.
  - Dissemination of flood hazard maps
  - Installation of water gauges and publication of water level information

Effect (goal) of initiatives

Reduce inundation damage to houses and reduce interruption of operation of the JR Joban Line due to track flooding in event of rainfall of the same scale as the rainfall in May 2012.

Source) MLIT

c. Integrating flood control measures with land use

Land use combined with a circle levee[Note] and the regulation of land use, such as designation of disaster risk areas, is promoted with local governments when the measure is more efficient and effective than constructing levees from the viewpoint of recent damage from flooding and situation of land use.

d. Inland water measures

To prevent flooding through inner water inundation and strive for the steady development of cities, the improvement of facilities such as sewer pipes and drainage pump stations are being promoted. However, in recent years, the frequency of concentrated downpours that far exceed planned scales the increased rainwater drainage due to the advancement of urbanization, the increased complexity of the urban landscape including the concentration of population and wealth as well as the increased use of underground spaces make the risk of damage due to inner water inundation even greater. For this reason, measures such as integrated projects for the reduction of sewer flooding damages and integrated projects for

Note A levee that surrounds districts with housing and other structures

inland water emergency measures are being utilized with the cooperation of relevant parties including regional authorities and affected residents to carry out structural measures such as proactively implement rainwater drainage reduction facilities; non-structural measures such as providing rainfall information, land use regulations, and creation of inland water hazard maps; and self-help initiatives such as the placement of water stops and sandbags as well as evacuation activities in combination for the promotion of integrated inundation measures.

(iv) Strengthening the flood prevention framework

In collaboration with prefectural governments, flood prevention administrative bodies, neighborhood associations, and other stakeholders, we have been implementing joint inspections of sections at high risk of flooding prior to the arrival of flood season, carrying out information-transmission drills, holding flood-prevention technical workshops and flood-prevention drills, endeavoring to disseminate flood-prevention technologies, and otherwise providing support for the strengthening of the flood prevention framework in order to minimize damage caused by flooding.

In order to reinforce the ability of local areas to prevent floods with the participation of various key players, we are also supporting initiatives tied to plans for the securing of evacuations and the prevention of inundation in underground malls (including those slated to be constructed and those that are under construction) situated in areas expected to become inundated, facilities for people with special needs, and large-scale factories.

(v) Announcing forecasts and warnings of flooding and providing river information

The Minister of Land, Infrastructure, Transport and Tourism or the Prefectural Governor designate rivers with large river basins that are at risk of causing great damage to the nation's economy or other great losses as flood forecast rivers and announce flood forecasts indicating the water level or flood volume jointly with the Director-General of the Japan Meteorological Agency. Also, aside from flood forecast rivers, important small and medium-sized rivers are designated as water level alert rivers, and during floods, when the hazardous water level (special caution water levels of flood), this information is also released. As of the end of March 2017, there are 421 flood forecast rivers and 1,597 water level alert rivers. Additionally, the Director-General of the Japan Meteorological Agency releases flood warnings when there is a risk of flooding due to the weather conditions.

The water level, precipitation amount, flood forecasts, flood prevention warnings and other river information is collected, processed, and edited in real-time and made available to river administrators, municipalities, residents, and others on the website "River Flood Information" Note to be utilized in issuing warnings and evacuation during flooding.

The push-based flood risk information service, which began in September 2016 in Joso City, Ibaraki and Ozu City, Ehime, which are local governments in the Kinu River and Hiji River basins, was expanded in June 2017 to 412 municipalities in 68 river systems that are flood forecast rivers managed by the national government.

In addition, the data broadcast function of digital terrestrial television is being used in cooperation with broadcasters for efforts to provide river water levels and precipitation amount.

XRAIN (eXtended RAdar Information Network), which can accurately monitor concentrated heavy rainfall and localized heavy rainfall with high-resolution and high-frequency in order to help facilitate appropriate river management and disaster prevention activities, is used in rainfall observation. Rainfall information is also made available on the Internet.

(vi) Designation of expected inundation area by flooding

To reduce the flood damage by means of smooth and rapid evacuation and prevention from inundation when a flood occurs, districts that are likely to be inundated when the river floods (expected inundation area by flooding) are designated and information such as the depth of inundation is publicized in accordance with the Flood Control Act. With the 2015 amendments to the Flood Prevention Act, expected inundation area by flooding because of conceivable maximum-scale rainfall will be sequentially designated and publicly disclosed.

In order produce hazard maps that are directly tied to more effective evacuation actions in municipalities located in expected inundation area by flooding, for the benefit of users, we have revised and published guidelines for the production of flood damage hazard maps and are providing support tools that make it easy to produce hazard maps containing the

Note River Flood Information website: http://www.river.go.jp [PC version], http://www.river.go.jp/s [smartphone], http://i.river.go.jp [mobile]

minimum information required as well as technical support for their dissemination and utilization.

Expected inundation area by flooding have been designated and publicly disclosed for approximately ninety-eight percent Note of flood-forecasted rivers and rivers for which water levels are publicly disclosed. Flood hazard maps have been produced for approximately ninety-eight percent Note of municipalities included in areas that are expected to become inundated.

Additionally, with the 2017 amendments to the Flood Control Act, when the mayor of a municipality has a record of past inundations for small and medium-sized rivers that are not designated as flood-forecasted rivers and rivers for which water levels are publicly disclosed, this information is publicly disclosed as water damage risk information.

MLIT not only allows for tax subsidies for inundation prevention facilities obtained by the owner or managers of underground malls, etc. in probable inundation zones in accordance with inundation prevention plans, it also supports voluntary flood defense initiatives carried out by underground malls, facilities for people with special needs, and large-scale factories via the disaster information dissemination office established within the river-related office of Regional Development Bureaus across the nation as a contact point for businesses and others.

(vii) Strategic maintenance and management of rivers

The condition of river channels and facilities are assessed and appropriate maintenance and management is carried out in accordance with any changes to ensure that the river administration facilities function as intended during floods and other situations.

In the course of river development carried out, the number of facilities, such as levees, weirs, floodgates, and drainage pump stations, under management greatly increased, and the age degradation of these facilities is advancing. For river management facilities, a transition to condition-based maintenance is being implemented where conditions are known through inspections so that measures are taken at appropriate times. Also, lifetime extension plans have been formulated for major river infrastructure administered by the nation so as to extend facility life cycles and updating in a planned manner. In addition, necessary technological development for extending lifetime will be furthered and technical standards for middle to small rivers will be studies in cooperation with prefectures for appropriate maintenance and management. In addition, technical support is provided through permanent consultation services made available by regional development bureaus.

The River Law, which was partially revised in 2013, clarifies the need for the administrator of river management facilities or authorized structures to maintain river management facilities or permitted structures in good condition through maintenance and repair. Based on this, we have revised the Technical Criteria for River Works: Maintenance (River) and have developed various procedures such as for the inspection of levees and other river management facilities and river channels for the promotion of appropriate maintenance.

(viii) Measures against illegally moored vessels in rivers

Illegally moored vessels in rivers can impede flood control (such as by impeding river construction work, blocking the downstream flow during flooding, and damaging river management facilities) and otherwise impede the management of rivers (such as by causing water pollution through the leakage of fuel and impeding river usage). For these reasons, river administrators are providing administrative guidance to the owners of unlawfully moored vessels on relocation to lawful mooring and storage facilities and, if necessary, they remove unlawfully moored vessels themselves.

In May 2013, the Plan for Promoting Comprehensive Measures for the Proper Management of Pleasure Boats and Improvements to Their Usage Environment was formulated. In June 2015, the results of a nationwide survey on the conditions surrounding pleasure boats that was conducted on a consolidated basis for three areas of water (ports and harbors, rivers, and fishing harbors) in order to verify the effects of measures implemented under this plan were publicly disclosed. In accordance with the 2013 amendments to the Order for the Enforcement of the River Act, river administrators are strengthening prosecution of those who abandon vessels inside river areas.

(ix) Road submergence measures

Road underpasses in Tochigi and Hiroshima Prefectures were submerged in water due to the concentrated heavy rain-

Note As of the end of March 2017.

fall that occurred in August and September of 2008, causing vehicles to sink. To prevent such accidents, information concerning submergence risk locations is shared with road administrators, police agencies, fire departments, and other relevant authorities. The framework for information exchange and passage prohibition is established, and the development and installation of submergence alert systems and monitoring facilities, as well as the publication of submergence risk locations that are publicized on the website[Note], are promoted.

(2) Countermeasures Against Sediment Disasters

Japan has a steep geography and vulnerable geology over a wide area. In addition, Japan has a low number of plains and development of residential land has extended to hills and piedmont slopes along with the development of economy as well as the increase in population. As a result, there are about 520,000 areas vulnerable sediment disasters such as debris flows, landslides, and slope failures where a lot of people are forced to live cheek by jowl with a risk of sediment disasters. There have been 1,000 cases of sediment disaster caused by heavy rain and earthquake annually on average in the past 10 years (from 2008 to 2017). In 2017, there were 1,514 cases, causing great damage and leaving 24 people dead or missing.

In order to prevent and mitigate the damages by sediment disasters, combination of non-structural and structural measures, such as construction of sediment disaster prevention facilities and improvement and enhancement of early warning and evacuation systems are being promoted.

The Northern Kyushu Heavy Rain in July 2017 caused several sediment disasters in Fukuoka and Oita that resulted in significant damage, including 23 deaths and missing persons. In Asakura City, Fukuoka Prefecture, debris and drift woods logs from a slope that collapsed in the torrential rain flowed downstream, but existing Sabo dams captured much of the drift woods, demonstrating their effectiveness in mitigating damage. Additionally, sediment disaster prevention facilities already constructed in each area also demonstrated their effectiveness.

(i) Fundamental countermeasures against sediment disasters

Large-scale sediment discharge from devastated mountainous areas can cause serious damages to important community facilities such as downstream towns, roads, and railways. Construction of sediment disaster prevention facilities is being promoted to prevent large-scale sediment discharge from devastated mountain areas and riverbed rise in the downstream area, and to protect lives, property, and important community facilities from the damages by sediment discharge.

(ii) Emergency countermeasures against sediment disasters in sediment disaster-affected areas

In order to ensure safety and security, and to maintain and promote socio-economic vitality in the areas where sediment disasters caused loss of life and great damages to people's living, concentrated construction of sediment disaster prevention facilities for preventing recurrence of disasters is being promoted.

Figure II-7-2-6 Effect of Sabo Dams in the Northern Kyushu Heavy Rain in July 2017 (Asakura City, Fukuoka)

Source) MLIT

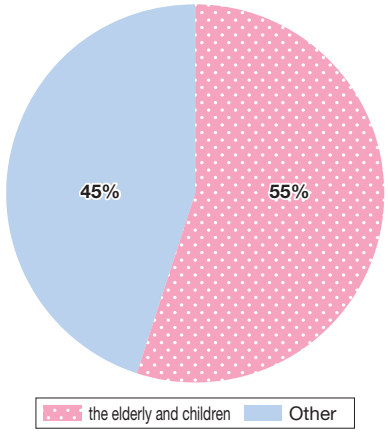
Note "Road Disaster Information Web Map" web site: http://www.mlit.go.jp/road/bosai/doro_bosaijoho_webmap/index.html

(iii) Countermeasures against sediment disasters to protect those requiring support in evacuation

The elderly and children, who cannot evacuate by themselves, are liable to fall victim to sediment disasters. Among the dead and missing of sediment disasters, the percentage of elderly and children is high. So, in order to protect the social welfare facilities, and medical facilities, etc., used by the elderly and children, construction of sediment disaster prevention facilities such as Sabo dams is promoted in a focused manner.

In accordance with the Act for Promotion of Measures to Prevent Sediment Disasters in Sediment Disaster Risk Areas, etc., (Sediment Disaster Prevention Act), measures combining structural and non-structural elements are being promoted, such as by stipulating the names and addresses of facilities for persons requiring support in evacuation and the information transmission system in sediment disaster risk areas in municipal plans for the prevention of local disasters and by restricting certain development in sediment disaster special risk areas.

Figure II-7-2-7 Percentage of People Requiring support in evacuation among Sediment Disaster Dead and Missing (1998-2017)



Source) MLIT

Furthermore, the Sediment Disaster Prevention Act, as amended in light of inundation damage to a social welfare facility caused by typhoon Lionrock in August 2016, went into effect in June 2017. The act requires the managers of facilities for persons requiring support in evacuation indicated in municipal plans for the prevention of local disasters to prepare a plan to ensure evacuation and to conduct training based on the plan. In light of this fact, we provided support to ensure smooth and rapid evacuation at facilities for persons requiring support in evacuation.

(iv) Countermeasures against sediment disasters for urban areas near mountain base slopes

For urban areas near mountain base slopes, forestry bands are fostered as green belts on the mountain base slopes adjacent to urban areas to enhance sediment disaster safety and maintain and create urban environments and landscapes with abundant greenery.

(v) Countermeasures against sediment disasters for slopes near roads

Slope disaster prevention measures are taken for the slopes which have a risk of landslide near roads.

(vi) Countermeasures against sediment disasters to promote regional disaster prevention

In hilly and mountainous areas at high risk of sediment disasters which has a large impact on community people, construction of sediment disaster prevention facilities for protecting people's lives, as well as maintaining the important facilities, such as evacuation shelters, evacuation routes, and town offices, that play an important role in regional disaster prevention is promoted for sustention and development of regional society. Also, we are providing support for initiatives to enhance and reinforce evacuation systems in sediment disaster alert areas.

(vii) Promoting countermeasures against sediment disasters based on the Sediment Disaster Prevention Act

a. Promoting sediment disaster prevention measures through designation of sediment disaster hazard areas

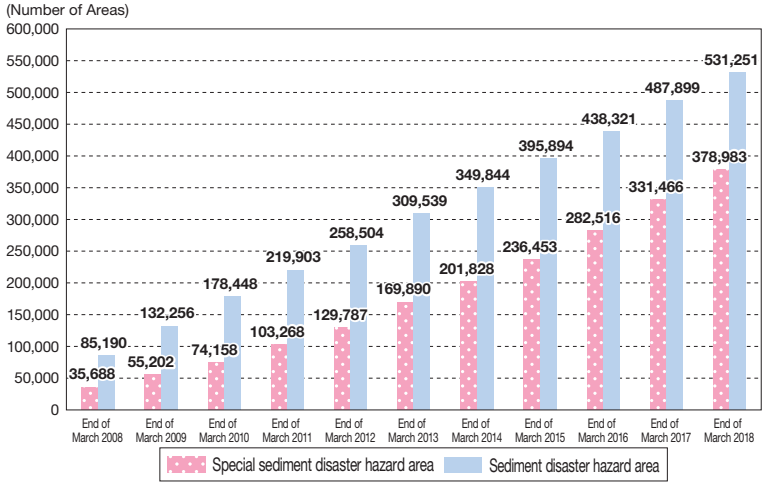
In accordance with the Sediment Disasters Prevention Act, in order to reveal areas of land where there is a risk of a sediment disaster occurring, areas where a sediment disaster could threaten the lives of residents, etc., or cause them bodily harm are designated as sediment disaster hazard areas while areas where a sediment disaster could damage architectural structures and threaten the lives of residents, etc., or cause them serious bodily harm are designated as special sediment disaster hazard areas. Furthermore, prior to area designation, the results of basic surveys are made public to inform residents, etc., of the danger of sediment disasters at an early stage.

Non-structural countermeasures taken include the development of warning and evacuation systems through the speci-

fication of evacuation shelters and evacuation routes, etc., in municipal plans for the prevention of local disasters for sediment disaster hazard areas and the restriction of certain development activities and the placement of structural controls on buildings in special sediment disaster hazard areas. Also, we release guidelines and case studies for the development of warning and evacuation systems as well as the creation of hazard maps and encourage municipalities to take initiatives.

Additionally, sediment disaster warning information has been clearly denoted as information that contributes to decisions on evacuation advisories and efforts have been made to establish an information transmission system, including obligating prefectural governors to notify relevant municipal mayors of such information and to disseminate it to the general public.

Figure II-7-2-8 Designated Sediment Disaster Hazard Areas Nationwide (End of the March, 2018)



Estimated total number of sediment disaster risk areas nationwide: 663,329

Source) MLIT

b. Promoting the relocation of housing at risk

Houses near cliffs vulnerable to slope failures are prompted to relocate using the program for relocating at-risk housing located near cliffs. In FY2017, this program decreased risky houses by 30 and 16 new houses were built to replace risky houses.

(viii) Countermeasures for large scale sediment disasters

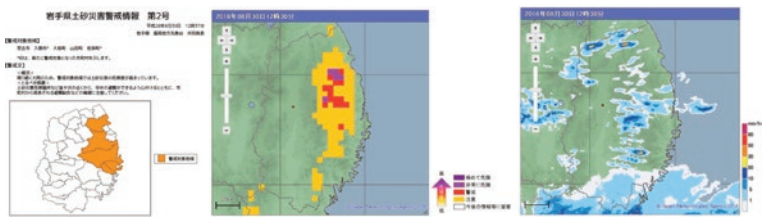
In order to reduce the damages caused by deep-seated landslide, combination of structural and nonstructural measures are taken by, for example, development of sediment disaster prevention facilities as well as strengthening of the warning and evacuation system by use of deep-seated landslide risk evaluation maps.

If there is a risk of a natural damming of a river (landslide dams) or debris flows following volcanic eruptions, Emergency Investigation are conducted in accordance with the "Sediment Disaster Prevention Act" to provide municipalities with information on the land areas vulnerable to sediment disasters as well as the timing of occurrence. In recent years, sediment disasters have occurred frequently due to localized rainfalls more concentrated and intensified and volcano getting more active. So, training for enhancing the ability to respond for implementation of Emergency Investigation and strengthening cooperation with relative organizations are promoted.

(ix) Issuing a Sediment Disaster Alert

In case that the risk of sediment disasters (or landslides*) increases due to heavy rainfall, Sediment Disaster Alert is jointly issued by prefectures and the Japan Meteorological Agency over the respective-municipalities. Issuance of the Sediment Disaster Alert is expected to lead issuance of evacuation orders announced by the municipalities and/or self-evacuation of residents. In order to support such operation, the Agency also provides Real-time Landslide Risk Map indicating the risk of landslides as well as detailed rainfall data.

Figure II-7-2-9 Sediment Disaster Alert Information, and Real-time Landslide Risk Map and "High-resolution Precipitation Nowcasts"



Source) Japan Meteorological Agency

Column

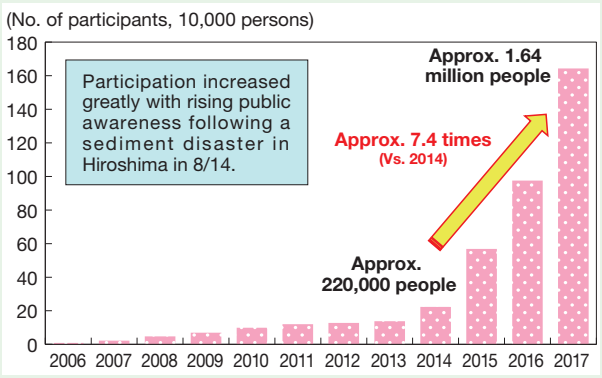
Enhancing Warning and Evacuation Systems for Sediment Disasters

The Northern Kyushu Heavy Rain in July 2017 caused tremendous damage, including over 40 people dying or going missing. However, the government and local residents had worked together to raise disaster prevention awareness, including conducting evacuation drills for sediment disasters, and informing people of evacuation shelters through production and distribution of voluntary disaster prevention maps. It is thought that this led to smooth and quick evacuation by residents, thereby reducing damage.

Specifically, Toho Village in Fukuoka Prefecture conducted drills in which nearly half the village residents participated. The drills were conducted so that residents could evacuate based on their own judgment when given the heavy rain situation and evacuation advisories. Also, an evacuation assistance plan was prepared for each district, and assistance givers decided in advance conducted confirmations of people's whereabouts and led evacuees. Thanks to such routine training, there are cases in which calling on elderly persons in the neighborhood helped with evacuation, thereby reducing damage during the Northern Kyushu Heavy Rain.

The MLIT, in cooperation with prefectural governments and others, conducts sediment disaster and nationwide disaster prevention drills with resident participation in an effort to enhance the evacuation system and increase disaster prevention awareness regarding sediment disasters. In light of the Hiroshima sediment disaster in 2014, public awareness increased and in 2017 a record 1.64 million people participated in the drills. In 2018, we will continue conducting sediment disaster and nationwide disaster prevention drills under the slogan, "Everyday preparation saves lives!"

Number of participants (per year) in sediment disaster and nationwide disaster prevention drills



Case of drills conducted in Toho Village, Fukuoka, and damage mitigation

Practical evacuation drills with participation by many residents (Toho Village, Fukuoka)

[Features of drills]

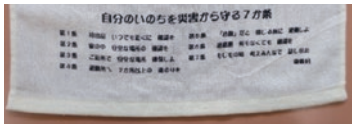
- **Evacuation drills for sediment disasters were conducted (for three years) so that residents could evacuate based on their own judgment.**
- **A list of people needing evacuation assistance was created and a system of assistance givers (residents) established.**

(i) [Participation in evacuation drills for sediment disasters]
(Toho Vil. population (as of 5/17): Approx. 2,200)
June 25, 2017: Approx. 1,050 (about half population)

- Evacuation upon hearing evacuation advisories giving heavy rain situation and warnings.
- Meetings held to consider evacuation assistance for people needing evacuation assistance in each district.


Resident evacuation drill

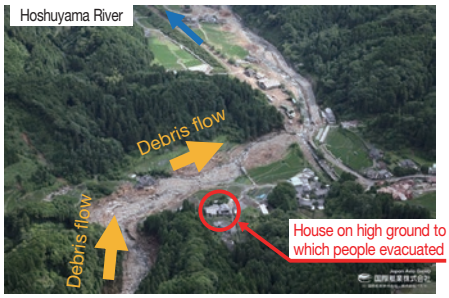

Sign that evacuation complete



"Evacuation towels" with the "seven rules of evacuation" distributed to each household

(ii) [List of people needing evacuation assistance and drills]

- A list of people needing evacuation assistance was created for each district.
- In the drills, assistance givers confirm the whereabouts and guide/help people to a shelter



[Evacuation case: Evacuation and disaster in Yashii District, Toho Vil.]
(Interview with resident during on-site survey of the Northern Kyushu Heavy Rain in 7/17)

July 5, 2017
Just past 15:00: - Rain at workplace (about 6 km downstream from Yashii District) exceeded the torrential rain in 2012, so I left work to check my house and neighborhood.

- **Neighbors had evacuated** to my house, as there is no hill behind it. **I went around to make sure no one had failed to escape and then went back home.**

Around 16:30: **Debris flow occurred**

- After the debris flow, **the water stopped flowing. I thought it could be dangerous if water collected upstream, so my neighbors and I moved to Iwaya Shrine** and escaped harm.

[Resident opinion]
The disaster prevention drills made me think to go call on my neighbors during a disaster.

(3) Volcanic Disaster Countermeasures

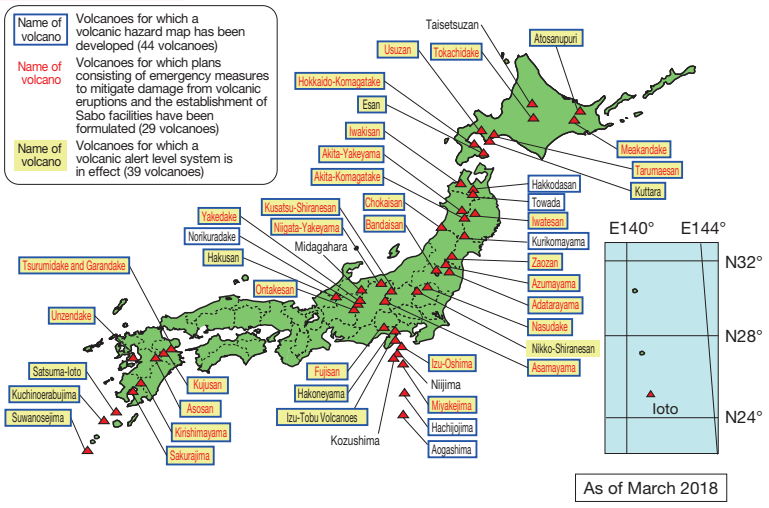
(i) Countermeasures for sediment disasters following volcanic activity

In preparation for the volcanic mudflow caused by volcanic eruptions and the debris flow caused by rainfall, Sabo dams, training dikes, and so on for preventing or reducing damage are being constructed. In addition, for facilities that are unable to properly maintain their functions due to continued and massive debris flow, removing sediment deposition and other measures are being carried out to keep effectiveness.

Sediment disasters following volcanic eruptions could lead to large-scale disasters. In addition, it is very difficult to predict the position or scale of an eruption, that causes serious damage, with good accuracy beforehand. For this reason, a Sabo plan for the emergency mitigation of the effects of a volcanic eruption is being formulated in order to mitigate damage through agile responses to volcanic conditions in combination with the development of facilities in advance; this plan targets forty-nine volcanoes that exhibit active volcanic activity and that are at risk of causing sediment disasters in the wake of an eruption. The amended Active Volcanoes Act came into force in December 2015 and prefectural governments, Regional Development Bureaus, and other Sabo departments, as members of the Volcanic Disaster Management Council, decided that they would study volcanic hazard maps from the standpoint of sediment disasters caused by eruptions. Thus, by developing volcanic Sabo hazard maps (volcanic hazard maps that relate to sediment disasters), support was provided for a series of studies on alerts and evacuation systems by the Volcanic Disaster Management Council.

Figure II-7-2-10

Development of volcanic hazard maps, formulation of volcanic eruption emergency disaster-mitigation measures and Sabo plans, and the state of the operations of eruption warning levels for fifty volcanoes that have been selected by the Coordinating Committee for the Prediction of Volcanic Eruptions as volcanoes requiring an upgraded system of monitoring and observations for the prevention of volcanic disasters



Source) MLIT

In response to the eruption of Mt. Shinmoedake in October 2017, observation of topographical changes was conducted using survey aircraft equipped with SAR equipment. Also, a survey of ash fall was conducted by helicopter and on land, and information was provided to the relevant local authorities. In response to the eruption of Mt. Kusatsu-Shirane (Mt. Moto-Shirane) in January 2018, observation of topographical changes was conducted using survey aircraft equipped with SAR equipment. Also, a survey of ash fall was conducted by helicopter, etc., new observation equipment was set up, and information was provided to the relevant local authorities.

(ii) Measures against ash falling due to active volcanoes

Since the ash falling on roads due to volcanic eruption has a great social impact, such as traffic obstruction, a framework is being developed in order to remove ash quickly and appropriately from roads using street sweepers.

(iii) Japan Meteorological Agency initiatives

To prevent and mitigate volcanic eruption disasters, domestic volcanic activity is monitored and volcanic warnings are issued in a timely manner. Especially for the fifty volcanoes in need of more intensive monitoring/observation for volcanic disaster mitigation selected by the Coordinating Committee for Prediction of Volcanic Eruption observation facilities have been deployed and volcanic activity is being monitored around the clock (volcanoes subject to continuous observations).

Also, Volcanic Alert Levels are being applied and improved through coordination of evacuation planning at local Volcanic Disaster Mitigation Councils (applied to thirty-eight volcanoes as of the end of January 2018).

In accordance with recommendations (March 2015) issued at an investigative meeting of the Coordinating Committee for Prediction of Volcanic Eruptions held in response to the disaster caused by the eruption of Ontakesan (Mt. Ontake) in September 2014, the Japan Meteorological Agency (JMA) has upgraded and strengthened systems to observe and evaluate volcanic activity and release disaster prevention information. The agency is also continuing to strengthen volcanic activity observation, evaluation systems, and information provision through an ongoing close study and publication of volcanic alert level criteria, etc.

(iv) Japan Coast Guard initiatives

Airborne observations are routinely conducted on submarine volcanoes and volcanic islands, and the information on eruptions or discolored water as a precursor phenomenon of eruptions is immediately provided to mariners. In addition, to serve as basic data to predict the eruption of submarine volcanoes and volcanic islands, comprehensive surveys are conducted to gather basic information such as seafloor topography, geological structure and so on. Continuous GNSS observations in the Izu Islands area are also conducted to monitor crustal movements.

With respect to the Nishinoshima Island Volcano, which erupted in November 2013, JMA reduced the precaution scope for the volcanic warning on August 17, 2016, and navigational warning was canceled in response to the canceling of a marine warning. The Japan Coast Guard also conducted a survey to produce a nautical chart, including land, from October to November 2016 and published the chart for Nishinoshima Island in June 2017. The volcano erupted again in April 2017, and the area of the island had increased to approximately 3.0 km^2 as of August 2017, but no volcanic activity has been observed since August 2017. Monitoring of volcanic activity and status of the island using aircraft will be continued in the future.

(v) Geospatial Information Authority of Japan initiatives

a. Improved observation and monitoring of volcanic activities

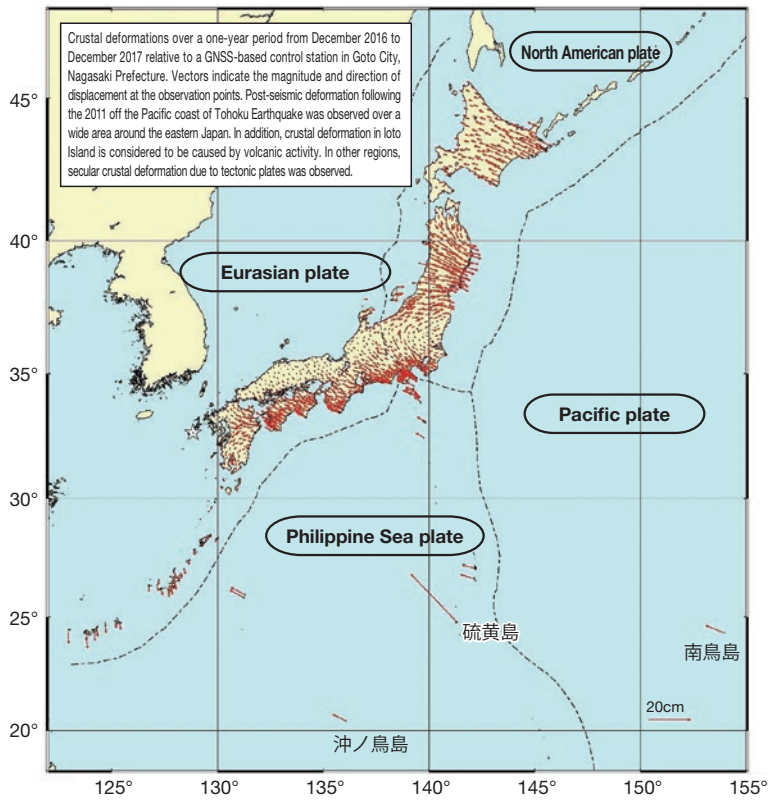
At active domestic volcanoes, continuous three dimensional crustal deformations are monitored by GNSS-based control stations (continuous GNSS Note 1 observation network called GEONET), automatic distance and angle measurement devices, and Remote GNSS Monitoring System (REGMOS). In addition, the GNSS observation data conducted by other institutions are integrated into the analysis to monitor the crustal deformation around volcanoes in more detail. Ground surface deformation of volcanoes are being monitored with SAR interferometry Note 2, by using the data of Advanced Land Observing Satellite "DAICHI-2".

b. Development of geospatial information about volcanoes

Volcanic Base Maps that show details, such as a volcano's distinctive geographical features, are being developed and updated.

With respect to Nishinoshima Island,

Figure II-7-2-11 Movements of Japan Archipelago Captured by Continuous Observation with GNSS



Source) Geospatial Information Authority of Japan

Note 1 Global Navigation Satellite System

Note 2 Technology that monitors ground surface deformation from satellites in space.

which erupted in November 2013, the first 1:25,000 topographical map and volcanic base map data since the eruption were produced based on aerial photographs taken in December 2016 and provided in June 2017.

c. Research on natural disasters following volcanic eruptions

Research and development is being conducted to improve precision of observation by use of GNSS and SAR interferometry as well as to reveal the mechanism of volcanic activities by analysis of the abovementioned observation data.

(4) Storm Surge and Coastal Erosion Measures

(i) Promoting storm surge and high wave measures

To protect human lives and assets from disasters caused by frequently occurring storm surges and high waves, we promote structural measures, such as development of coastal levees, and non-structural measures, such as the designation of coastal areas for which water levels pertaining to storm surges are publicly disclosed and areas vulnerable to inundation, in accordance with the Flood Control Act. In FY2017, areas vulnerable to inundation due to storm surge were designated in Tokyo Metropolis (Tokyo Bay) and Fukuoka Prefecture (Genkai Sea).

Also, since distribution and industrial functions are concentrated in ports, in order to protect these areas from damage caused by storm surges, we will forward the storm surge countermeasures in which port administrators and relevant persons in companies that operate in ports cooperate.

(ii) Promoting coastal erosion measures

Since a variety of factors contribute to coastal erosion across the nation, the administrators of rivers, coasts, ports, and fishing ports are coordinating to implement erosion measures such as sand bypasses Note 1 and sand recycling Note 2.

(iii) Providing disaster prevention information regarding storm surges

To enhance disaster prevention activities at municipalities, the Japan Meteorological Agency provides each municipality with storm surge warnings and advisories for individual municipalities.

Also, to assist victims and aid restoration efforts in regions that ground subsidence occurred following the Great East Japan Earthquake, an "Hourly Tide Level Calendar" consolidating astronomical tide level (forecast values for tide level) is published along with other information regarding storm surges.

(5) Tsunami Measures

(i) Promoting tsunami measures

In preparation for the large scale tsunami disasters created by earthquakes, such as Nankai Trough Mega Earthquake, region building for tsunami disaster prevention through multiple defenses that combine structural and non-structural measures against the biggest tsunami is being promoted through support extended to local governments for matters such as establishing tsunami inundation projections, designating warning areas, and drafting evacuation plans.

In the tsunami measures for coasts, we carry out structural measures such as constructing and earthquake-proofing seawalls with a tenacious structure that fulfill the function of reducing wall damage, consolidating floodgates and land locks, and enabling their automatic/remote operation. We also promote non-structural measures such as supporting the production of tsunami hazard maps and establishing safe and reliable operation systems for floodgates and land locks. With respect to floodgates and land locks, we have mandated the formulation of operating rules and through the Management System Guidelines for Floodgates and Land Locks in Tsunami and Storm Surge Measures, which we revised in April 2016, and we attempt to instill operation and retreat rules in onsite operators.

For tsunami measures for ports and harbors, in order to maintain the harbor functions when a large-scale tsunami occurs, development of breakwater with a tenacious structure, creation of plans for elimination of obstacles in sea routes (reservation of sea routes in case of emergency), and other disaster prevention and mitigation measures are promoted.

Note 1 When the transport of sand is cut off by coastal structures, this construction method takes the sediment accumulated on the upper hand side to move and supply it to the lower hand side coast to restore sands.

Note 2 This construction method takes the sand accumulated on the coast along lower hand side of the flow and restores it to the upper hand side of the coast subject to erosion to restore sands.

Also, we created the Hamaguchi Award, for individuals and/or organization that, have made significant scientific or pragmatic contributions to the enhancement of coastal resilience against tsunami, storm surge and other coastal disasters, and have conducted activities to raise awareness related to tsunami disaster prevention.

Also, specified ports (87 ports) under the Act on Port Regulations have established Councils on Tsunami Measures for Ships to further improve tsunami measures for ships at each of the ports with the cooperation of relevant organizations.

With respect to tsunami measures applicable to roads, agreements have been concluded with local governments in tsunami-prone areas. To provide embankment as temporal evaluation locations, stairs and open spaces are developed for the evacuation purpose. Efforts to reinforce disaster prevention functions have also been made by developing a system of signs providing evacuation guidance and by providing user training to local residents.

Regarding tsunami measures for airports, at airports likely to experience tsunami disasters, tsunami evacuation plans that determine evacuation methods and other matters for airport users and others to protect human life has been drafted, and tsunami evacuation training and other matters will be carried out in accordance with these plans. In addition, a plan was formulated for rapid recovery of airport functions following a tsunami disaster and initiatives to establish a cooperative framework with relevant organizations based on the plan is being promoted.

Regarding tsunami measures of railways, policies and concrete examples for ensuring the railway passenger safety when tsunami occurs were compiled based on the basic idea of evacuation from the largest class tsunami caused by the Nankai Trough Mega Earthquake etc. (speedy evacuation is the most effective and important measure, etc.), and the efforts of railway operators are prompted.

Additionally, the raising of river levees and liquefaction countermeasures are being advanced in areas at significant risk of flooding from a tsunami in order to prepare for the imminent arrival of a massive earthquake or tsunami.

(ii) Providing disaster prevention information regarding tsunamis

To prevent and mitigate disasters caused by tsunamis, the Japan Meteorological Agency (JMA) monitors seismic activities across the nation around the clock in order to make prompt and appropriate issuance for tsunami warnings/advisories and information. Based on the lessons learned from the tsunami disaster caused by the 2011 Great East Japan Earthquake, JMA started new tsunami warning system operation in March 2013, in which, for example, the word of "huge" for Major Tsunami Warnings was introduced as an expression of estimated tsunami height in the case of large earthquakes with magnitude 8 or more to emphasize that it is an emergency situation.

As of the end of March 2018, JMA monitors tsunamis with 216 Ocean-bottom tsunami meters, 18 GPS wave gauges, and 173 coastal tsunami gauges for issuance of tsunami information and update of tsunami warnings/advisories.

To facilitate tsunami measures for vessels, the Japan Coast Guard creates and publishes 143 tsunami information maps, as of the end of March 2018, depicting the behavior of a maximum level tsunami caused a Nankai Trough Megathrust Earthquake and the tsunami caused by a Tokyo Inland Earthquake.

(iii) Tsunami evacuation measures

Given concerns over tsunami damage occurring in the wake of Nankai Trough Mega Earthquake or any other massive earthquake that is expected to arrive sometime in the future, technical guidelines summarizing ways of properly allocating evacuation facilities based on the use of basic urban planning data were formulated and publicly disclosed in June 2013.

In ports, we are promoting to establish a tsunami evacuation plan and construct tsunami evacuation facilities by local governments or manager of port. Also, the Organization for Promoting Urban Development is assisting private enterprises develop distribution facilities that can be used for evacuation from tsunamis and other disasters. In 2016, our support was used to improve a distribution facility with an evacuation function in Yokkaichi Port—the first such instance in the country—creating expectations for a higher evacuation function of the port.

(iv) Development of parks and greenery that effectively function to reduce tsunami damage

Taking the lessons learned from the Great East Japan Earthquake, "The Technical Guidelines for Development of Urban Parks Towards Reconstruction from the Great East Japan Earthquake" was put together in March 2012 for utilization by local government in evaluating town building for reconstruction in which parks and greenery is considered to have four functions, that of multi-layered defense; evacuation path and evacuation space; assisting restoration and reconstruction;

and disaster prevention education, so the concept of planning and designing parks and greenery to realize disaster mitigation effects is presented.

(v) Tsunami measures for government facilities

Government facilities act as the central facility for disaster emergency measure activities as well as temporary evacuation space and is something that contributes to the rescue of human lives, therefore securing necessary functions when tsunamis and other disasters occur is important.

In February 2013, the combination of structural and non-structural measures for tsunami measures indicated by the "Basics of Ensuring the Function of Government Facilities in Preparation for Tsunamis, etc." prepared by the Council for Social Infrastructure will be used in coordination with the organizations that operate and maintain government facilities to promote integrated and effective tsunami measures.

(6) Earthquake Measures

(i) Improving the earthquake resistance and safety of housing and architecture

Based on the Act on Promotion of Seismic Retrofitting of Buildings to achieve goals of making at least 95 percent of housing and architecture used by many people earthquake-resistant by 2020 and to generally resolve housing with inadequate earthquake resistance by 2025, the reporting of earthquake-resistance diagnosis results for large-scale architectural structures and others used by an unspecified number of people has been mandatory, and the creation of display requirements for the earthquake-resistance has been implemented among other measures in its aim to promote earthquake-resistance.

Regarding the earthquake proofing of housing and buildings, Social Capital Development Integrated Grant and other measures are implemented for support but from FY2013, for architectural structures requiring mandatory seismic diagnosis, intensive and emergency assistance is being implemented in addition to usual subsidies.

(ii) Promoting the earthquake resistance of housing land

In order to prevent damage caused to existing residential areas by landslides and ground liquefaction in the wake of a large earthquake, we are providing support for the conducting of change-prediction surveys and prevention measures carried out by local governments.

(iii) Implementing danger assessments for housing land in disaster-stricken areas

To prevent secondary disasters and ensure the safety of residents, frameworks are being developed in cooperation with the Disaster Stricken Housing Land Danger Assessment Liaison Council consisting of prefectures and designated cities to evaluate the degree of danger of housing land swiftly and accurately after disaster strikes.

(iv) Development to improve crowded areas

Development activity to rapidly improve crowded areas that are problematic in terms of disaster prevention and the residential environment is a pressing matter to be generally resolved by ensuring a minimum level of safety for crowded urban areas that extremely dangerous in the event of an earthquake (4,450 hectares as of the end of FY2015) by FY2020 (densely built-up areas that are highly vulnerable in the event of an earthquake as of the end of FY2017: 3,422 hectares).

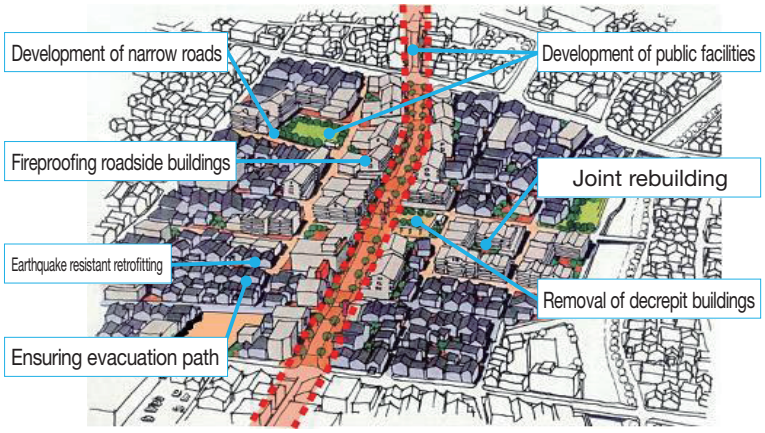
To realize this, fireproofing architectural structures along trunk roads to cut off fire paths and serve as evacuation paths in combination to form a skeletal disaster prevention axis (disaster prevention axis) and the development of disaster prevention parks to serve as evacuation areas, disaster prevention block improvement projects, and comprehensive urban residential projects will be used to eliminate decrepit architecture and joint rebuilding of fireproof architecture, expansion of narrow roads to improve evacuation and firefighting efforts.

(v) Securing open space

To improve disaster prevention functions and strive for safer and more comfortable town buildings, the development of disaster prevention parks is being promoted to serve as the center of restoration and reconstruction when earthquake disasters occur, center of disaster prevention as a relay hub for supplies, and as an evacuation area to protect the lives

of evacuees form urban fires. A project for developing disaster-prevention parks and urban areas is being carried out to develop and upgrade disaster-prevention parks and urban areas in an integrated manner.

Figure II-7-2-12 Development Illustration of Densely Built-Up Areas



Source) MLIT

(vi) Promoting construction and improvement of government buildings as disaster prevention centers, etc.

It must be possible to secure the functions of government buildings as centers for disaster emergency response activities and to ensure the safety of people's lives. Accordingly, government buildings that do not meet the required seismic performance are being renovated for earthquake resistance, with the goal of making at least 95% of government buildings satisfy quake-resistance standards by 2020. We are also promoting the construction and improvement of government buildings as disaster prevention centers, etc., in preparation for large-scale disasters, in cooperation with many parties concerned, including local governments.

(vii) Improving the earthquake resistance of public works facilities

For river works, earthquake resistance inspections are carried out and necessary measures are implemented so that levees, floodgates, and other river structures remain functional even under what is referred to as level 2 seismic movement.

For coastal works, earthquake resistance measures are promoted taking into account facility functions, degrees of importance of areas behind levees and other factors to prevent large-scale submergence of zero-meter areas due to damage to levees caused by earthquakes and to prevent the functions of levees and other protective facilities from being impaired before arrival of tsunamis when earthquakes such as Nankai Trough Mega Earthquake occurs.

For road works, to ensure smooth emergency and rescue activities, transportation of emergency supplies, and deployment of emergency transport essential to recovery efforts when earthquake disasters occur, we are conducting seismic strengthening of overpasses over emergency transport roads, bridges, including those supported by rocking columns, over these roads, and also removing utility poles by burying cables.

For port and harbor works, we are endeavoring to enhance the quake and tsunami resistance of port facilities and fortify industrial ports and harbors to encourage the formation of coastal disaster prevention bases that can serve as base for the transport of emergency supplies and deployment of support teams during a disaster, as we prepare for Nankai Trough Mega Earthquake, a Tokyo Inland Earthquake, or any other large-scale earthquake.

For airport works, in addition to serving as the base of emergency transport when earthquakes and other disasters occur, seismic strengthening of government facilities to ensure necessary control functions and basic facilities that are absolutely essential is being implemented for airports considered important for maintaining air transport as well as the aviation network and ensuring the continuity of hinterland economic activity.

For railway works, in preparation for a Tokyo Inland Earthquake and Nankai Trough Mega Earthquake, we are promoting quakeproofing measures for major stations, elevated bridges, and other railway facilities, in order to maintain the railway network and ensure functioning as temporary shelters during earthquakes.

For sewage works, to ensure the functions required of sewers during earthquakes, disaster prevention, such as strengthening the earthquake and tsunami resistance of water pipeline infrastructure and water treatment facilities that connect disaster prevention bases with treatment plants and disaster mitigation that aims to minimize damage in anticipation of disasters striking are being combined for the promotion of integrated earthquake measures.

(viii) Countermeasures against sediment disasters to large-scale earthquakes

In preparation for large-scale earthquakes such as Nankai Trough Mega Earthquake, implementation of effective sed-

iment disaster countermeasures with combination of structural and non-structural measures are being promoted for the areas at risk of sediment disasters where important facilities and important transportation networks will be damaged and communities will be isolated by the landslides.

In the wake of a major earthquake, it will be important for us to collaborate with relevant organizations and entities, promptly ascertain disaster conditions, and properly carry out emergency measures. For this purpose, we are reinforcing ties to relevant organizations, carrying out practical training, and otherwise promoting the development of a crisis-management system.

(ix) Japan Meteorological Agency initiatives

To prevent and mitigate disasters caused by earthquakes, the Japan Meteorological Agency (JMA) monitors seismic activities in and around Japan, as well as crustal deformation in the Areas under Intensified Measures against Earthquake Disaster (Tokai Region), around the clock to provide Earthquake Early Warnings and other earthquake information as promptly and accurately as possible.

With respect to Earthquake Early Warnings, in March 2018, JMA began using techniques to estimate seismic intensity correctly even for a large earthquake in which strong tremors cover an extremely wide area.

With regard to long-period ground motion, information on observation of long-period ground motion has been issued on a trial basis on JMA's website since March 2013. In addition, JMA is carrying out studies, including demonstration experiments, aimed at putting forecast information to practical use.

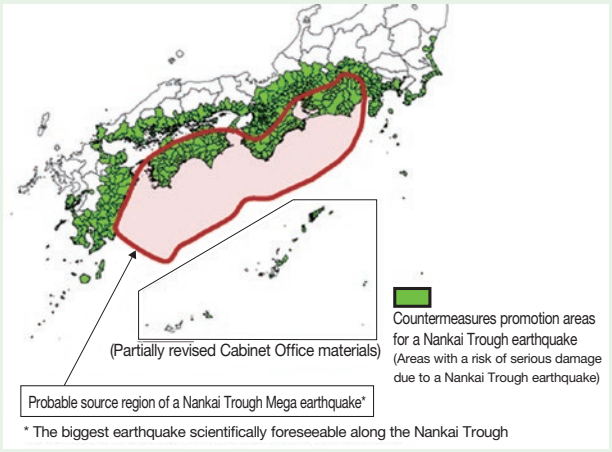
Column Releasing Information related to a Nankai Trough Earthquake

A Nankai Trough earthquake is a massive earthquake with a hypocenter on the plate boundary along the Nankai Trough running from Suruga Bay to the sea off the Kii Peninsula / Shikoku. Nankai Trough earthquakes occur roughly every 100 to 150 years while showing diversity in the spread of the rupture zone. It has been over 70 years since the 1944 Tonankai Earthquake and the 1946 Nankai Earthquake, and so the occurrence of the next massive earthquake in the Nankai Trough is growing imminent.

The study results of the Working Group for Studying Disaster Response Measures Based on Seismic Observation/Assessment Along the Nankai Trough (hereinafter "WG") were reported in a meeting of the Central Disaster Prevention Council's Disaster Management Implementation Committee held on September 26, 2017. The WG found that: (1) although it is difficult to predict an occurrence with a degree of certainty, it can be estimated that the potential for earthquake occurrence is higher than normal; (2) it is important to make an effort to release timely and accurate information so that analyses and assessment results of observations of phenomena that could lead to a Nankai Trough earthquake can be utilized in disaster response measures; and (3) the national and local governments need to establish provisional disaster prevention systems in advance.

In response to this study, the Japan Meteorological Agency decided to release "information related to a Nankai Trough earthquake" when abnormal phenomena are observed along the Nankai Trough and when it assesses that the potential for an earthquake occurrence is relatively higher than normal. It put this policy into effect on November 1, 2017. When releasing this information, an "Assessment Review Meeting related to an Earthquake along the Nankai Trough" will be convened to review the potential of earthquake occurrence somewhere in the Nankai Trough region.

About the Nankai Trough



Source) Japan Meteorological Agency

Kinds of information related to a Nankai Trough earthquake and their release conditions

Information	Release conditions
Information related to a Nankai Trough earthquake (extraordinary)	Released when abnormal phenomena* have been observed along the Nankai Trough or when there is a relatively heightened potential for earthquake occurrence
Information related to a Nankai Trough earthquake (regular)	Release of study results assessed at regular meetings of the Assessment Review Meeting related to an Earthquake along the Nankai Trough

* Phenomena that will trigger an investigation by the Japan Meteorological Agency, such as occurrence of a magnitude 7 or higher earthquake along the Nankai Trough or observation of significant change in strain meters installed in the Tokai region

Source) Japan Meteorological Agency

(x) Japan Coast Guard initiatives

To elucidate the physical mechanism of huge earthquakes, observations of seafloor crustal movements are conducted under Japan's Pacific waters, such as along the Nankai Trough, where massive ocean trench earthquakes are forecast to occur in the future. The Japan Coast Guard is also striving to understand the coupling at plate boundaries in the presumed source region of such earthquakes. It also uses GNSS observations to monitor crustal movements in coastal areas and the Izu Islands.

(xi) Geospatial Information Authority of Japan initiatives

a. Observing crustal movements and strengthening monitoring frameworks

Across the nation and earthquake disaster prevention measure regions, the monitoring of crustal movements is boosted by continuous GNSS observations at about 1,300 GNSS-based control stations (GEONET) and leveling. Also, analysis of data from the Advanced Land Observing Satellite "DAICHI-2" and monitoring of ground surface deformation using interferometric SAR are taking place.

b. Development of basic disaster prevention information

We are developing and updating location information of active faults as well as basic disaster prevention information related to the natural conditions of the land. This work is being conducted in the regions with the main active faults and in the regions where population and social infrastructure are concentrated.

c. Research on natural disasters resulting from earthquakes

From the results of geodetic observations, such as GNSS, SAR interferometry and geodetic leveling, the mechanism of earthquake occurrence is being elucidated and research is being conducted to improve observations and analysis. We are conducting research and development work and evaluations as concerns the rapid provision of information during disasters through analytical processes that combine basic geospatial information corresponding to Japanese territory and earthquake intensity. Additionally, for exchanging information on surveys, observations and research outcomes regarding earthquake prediction between relevant government organizations and universities, as well as to conduct academic delib-

erations based on this, the Coordinating Committee for Earthquake Prediction is operated. Moreover and for research on crustal movements, the Coastal Movements Data Center is being operated in order to gather, archive, and provide tidal records observed by relevant government organizations.

(xii) Measures for stranded commuters

If a major earthquake were to strike a major metropolitan area, it is expected that urban functions would become paralyzed and that there would be more stranded commuters than when the Great East Japan Earthquake happened. Thus, in order to ensure the safety of people in areas where there is a concentration of people and urban functions, plans for promoting urban reconstruction and ensuring safety was established in 2012. In areas subject to Urban Renaissance Emergency Development Areas (fifty-three areas nationwide as of the end of March 2018), efforts are being undertaken to improve urban disaster preparedness through public-private partnerships by way of the production of plans for promoting urban reconstruction and ensuring safety, the conclusion of agreements concerning facilities for promoting urban reconstruction and ensuring safety, and the easing of various regulatory constraints. Comprehensive support for the production of plans for promoting urban reconstruction and ensuring safety and for both structural and non-structural elements based on such plans is being provided through projects for ensuring and promoting urban safety for which areas around key stations are also regarded as areas subject to aid. In addition, in order to secure beforehand the capacity to handle stranded commuters as an urban function, we are supporting the development of disaster prevention bases through a program for urgent promotion of reinforcement of disaster bases, with areas around major stations as those subject to a subsidy.

(xiii) Ensuring business-continuity functions in the event of a disaster

A shortage of energy in areas that serve as hubs for disaster responses, and that are also where urban functions are concentrated and energy is consumed at high density, would hinder business continuity and disaster responses, producing a big socioeconomic impact on this country.

That is why there is a need to overcome vulnerability to disasters, which is a weakness of our cities, and so we are promoting the development of area-wide energy networks to ensure business continuity during disasters.

(xiv) Safety and security measures for the underground malls

Underground malls serve as important public spaces within the city, but there are concerns that evacuees will be disordered when a large-scale earthquake occurs along with the fact that facilities are aging, therefore, a guideline was created on safe evacuation measures for underground malls to promote disaster prevention measures for the safe evacuation of users and others.

(7) Snow Damage Measures

(i) Securing winter road transportation (snow and cold weather works)

In accordance with the Act on Special Measures concerning Maintenance of Road Traffic in Specified Snow Coverage and Cold Districts, to support safe and comfortable living, strengthen exchanges and cooperation between regions, the Five Year Plan to Secure Road Transport in Special Snow and Low Temperature Regions was established in November 2013. The Cabinet made this decision, along with promoting projects for removing snow, preventing snow, snow and frost damage on roads (snow and winter works). In addition, the Hokuriku Snow Damage Measures Technology Center was established in July 2012 and is promoting research and development, human resources development, assistance to local governments, as well as providing information and raising public awareness related to snow damage measures across the country. We are reinforcing clearing snow systems, such as by establishing clearing snow priority zones, removing snow rapidly by imposing road closures, and promoting collaborations among road administrators and with relevant organizations. In the event that vehicles become stuck in traffic, the Basic Act on Disaster Control Measures (amended on November 2014) will be applied and measures to move the vehicles that block the road will be promptly taken to quickly restore the flow of traffic.

(ii) Avalanche disaster measures in heavy snowfall regions

In Japan, 21,000 areas are prone to snow avalanche and the development of avalanche prevention facilities is being

promoted to protect human lives from avalanche disasters in settlements.

(8) Sophistication of Disaster Prevention Information

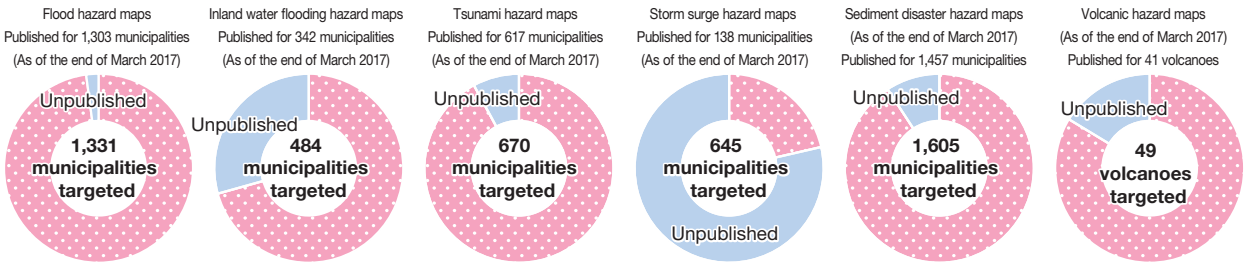
(i) Aggregation of disaster prevention information

The "MLIT Disaster Prevent Information Center"[Note 1] enables citizens to easily obtain and utilize disaster prevention information by aggregating and providing information available such as rainfall as well as provide a comprehensive array of information on disaster responses and disaster prevention from a single source.

(ii) Development of hazard maps

In order to enable residents to take appropriate evacuation actions when a disaster strikes, we are promoting the production of hazard maps by municipalities and their dissemination and use by residents, as well as opening an Internet portal site that allows users to browse hazard maps developed by municipalities across the country[Note 2].

Figure II-7-2-13 Present Status of Hazard Map Development



Source) MLIT

(iii) Improvement of disaster prevention weather information

In order to prevent and mitigate weather disasters, the Japan Meteorological Agency issues precautionary information in stages such as Emergency Warnings, Warnings, Advisories, and Bulletins related to weather conditions. The Agency also provides Real-time Landslide Risk Map and Real-time Flood Risk Map, which can be used to forecast and actually check on a map where risks are heightened in real time. Landslide Alert Information and flood forecasts for designated rivers are jointly issued by the MLIT, prefectural governments and the Agency.

In response to recommendations received in July 2015 from the Meteorological Subcommittee of the Council of Transport Policy, in May 2017 the Agency started providing Probability of warnings and, in July 2017, it started providing Real-time Risk Map for heavy rain and flood warnings.

(9) Strengthening the Crisis Management System

Initial response systems have been established to respond to natural disasters, including forecasting natural phenomena that could lead to a disaster, rapid collecting of information, conducting inspections and emergency rehabilitation of facilities during disasters, rescue operations at sea, and supporting affected local governments. In order to increase disaster response capabilities, further expedite and enhance disaster responses, such as strengthening the system for collecting and sharing information during the initial response to a disaster by Integrated Disaster Information Mapping System (DiMAPS).

(i) Disaster response by TEC-FORCE (Technical Emergency Control Force)

In order to respond to the occurrence or likelihood of large-scale natural disasters, the TEC-FORCE was established in FY2008 and is available for deployment to smoothly and rapidly implement technical support in carrying out various emergency disaster measures such as assessing the extent of the disaster, preventing expansion of damage, and rapid recovery of affected areas. In FY2017, TEC-FORCE dispatched approximately 1,300 members, who rendered around

Note 1 "MLIT Disaster Prevention Information Center" web site: http://www.mlit.go.jp/saigai/bosaijoho/
Note 2 "MLIT Hazard Map Portal Site": http://disaportal.gsi.go.jp/

5,000 man-days of service to 72 municipalities and 26 prefectures that sustained damage as a result of numerous natural disasters, including the Northern Kyushu Heavy Rain in July, torrential with the seasonal rain front from July 22, and typhoons Talim, Lan, and Severe Tropical Storm Saola.

(ii) Initial response in the Northern Kyushu heavy rain in July 2017

From July 5, MLIT dispatched liaisons to the affected local governments in Fukuoka and Oita prefectures to ascertain the status of damage at the site and assistance needs and coordinate the dispatch of TEC-FORCE and other personnel. TEC-FORCE started arriving on-site on July 5 and from the following day TEC-FORCE from Regional Development Bureaus around the country started operations (providing a total of 3,648 man-days of service to 11 municipalities in 2 prefectures up through August 16). TEC-FORCE surveyed the status of damage caused to around 1,800 facilities under the jurisdiction of local governments in Fukuoka and Oita, gave local governments plans/proposals on recovery construction methods, gave technical advice on approach routes to search and rescue organizations, and helped to move up announcement of plans to designate the event as a major disaster. TEC-FORCE also contributed to the prevention of secondary disasters by assisting emergency inspections of around 570 of 1,300 sites at risk of suffering sediment disasters and helped clear the way for emergency vehicles by eliminating obstacles from National Route 211 and Prefectural Route 52, which are managed by the prefectures.

(iii) Strengthening business continuity systems

In order to implement disaster prevention services immediately in the case of Tokyo Inland Earthquake, the Ministry of Land, Infrastructure, Transport and Tourism Business Continuity Plan (Third Edition) was compiled on April 1, 2014. Furthermore, the operational continuity framework is being strengthened through such measures as annual emergency staff assembly drills based on the scenario of a Tokyo Inland Earthquake. Also, in August 2017, we established a TEC-FORCE Action Plan for a Tokyo Inland Earthquake and strengthened the wide-area support structure for a Tokyo Inland Earthquake.

(iv) Deploying information and telecommunication systems and machinery in preparation for disasters

To secure information communication systems in the case of a disaster, the MLIT headquarters, Regional Development Bureau, and related organizations are connected with a highly reliable information communication network consisting of microwave networks and optical fibers, in addition to satellite communication channels to strengthen the system for gathering information from the disaster site, are used to create a high mobility system. Also, in order to respond disasters rapidly, the development of helicopters, satellite communication vehicles, pump vehicles, lighting vehicles, and other disaster response machinery are being developed at Regional Development Bureaus across the nation, so that in the event of a large-scale disaster, the framework will be able to execute rapid development. During the disasters that occurred in FY2017, this disaster response machinery was dispatched to afflicted areas and helped with recovery operations.

(v) Implementing practical and wide-area disaster prevention drills

In order to increase capabilities to cope with flood disasters in cooperation with relevant organization such as flood fighting teams, Regional Development Bureaus implement practical drills in Flood Fighting Drill, including conducting flood fighting operations according to the situation, information transmission, and emergency rehabilitation while considering the timeline in a large-scale flood disaster. We also conducted operational drills of the emergency disaster measures headquarters based on the scenario of a Tokyo Inland Earthquake and conducted road obstacle elimination drills at Regional Development Bureaus based on the scenarios of a Tokyo Inland Earthquake and Nankai Trough Mega Earthquake, in an effort to strengthen the ability to respond to a large-scale earthquake. Furthermore, in comprehensive drills for large-scale tsunami disaster, we conducted evacuation drills and emergency drainage drills by TEC-FORCE based on the scenario of a tsunami caused by Nankai Trough Mega Earthquake in an effort to strengthen the ability to respond to a tsunami. In light of the fact that Japan's Tsunami Preparedness Day (November 5) is also World Tsunami Awareness Day, we obtained the participation of international students and foreign government officials in these drills, as well as observation by consulates, in order to disseminate Japan's disaster prevention knowledge and techniques to the world.

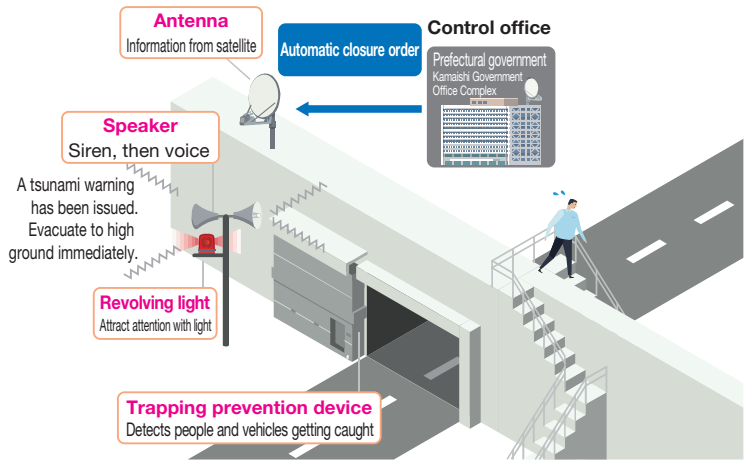
(vi) Disaster responses by the Japan Coast Guard

The Japan Coast Guard operates patrol vessels and aircraft around the clock to allow for rapid responses and rescue operations in the event of a disaster. During the Kumamoto Earthquake in FY2016, the Japan Coast Guard conducted coastal damage assessment surveys immediately after the earthquake struck. It also conducted emergency transport for injured people and hospitalized patients, among others, and provided resident assistance such as supplying water and food. In FY2017, during the Northern Kyushu Heavy Rain in July, it conducted coastal damage assessment surveys using patrol vessels and aircraft and rescued 40 people who were isolated.

(10) Management of Existing Stock with ICT (Information and Communications Technology)

An optical fiber network is being used to enable the management of public facilities and the sophistication of crisis management by taking advantage of ICT (Information and Communications Technology). Specifically, measures are being promoted for safe road use, such as sophisticated management of optical fibers for continuous monitoring of the road slope and providing disaster information through the Internet. Also, in addition to remote control of floodgates and the remote monitoring of river flow conditions and volcanic regions, sewage treatment plants and pump stations are connected with optical fibers for remote monitoring and control as well to make management more sophisticated.

Figure II-7-2-14 Conception of Automatic Closure System for Floodgates and Land Locks, etc. (Iwate Prefecture)



Source) Iwate Prefecture

In addition, in order to safely, quickly, and reliably close floodgates and land locks using satellite communications in response to a disaster caused by a tsunami, we provide support through subsidies for disaster preparedness and safety for enabling automation and remote control of floodgates and land locks that need to remain in place.

(11) Disaster Recovery of Public Works Facilities

Damage caused to public civil-engineering facilities under the jurisdiction of the MLIT (including rivers, Sabo structures, roads, coastal areas, sewage systems, parks, and ports) in 2017 is reported to have totaled approximately 423.7 billion yen (at 13,855 sites) due to the frequent occurrence of disasters nationwide, including heavy rain with the seasonal rain front, especially the Northern Kyushu Heavy Rain, and torrential rain brought by Severe Tropical Storm Nanmadol in July, Typhoon Noru in August, Typhoon Talim and torrential rain in September, and Typhoon Lan and Severe Tropical Storm Saola in October.

In response to the damage caused by these natural disasters, technical advice, including recovery policies and construction methods, as well as other forms of support for affected local governments were provided, such as dispatching TEC-FORCE to local areas immediately after each area was hit by a disaster to eliminate obstacles from roads and conduct damage surveys, etc., and dispatching Senior Deputy Directors for Disaster Assessment from MLIT, in order to support the formulation of disaster recovery and rehabilitation plans.

Previously, in order to help local governments dealing with especially heavy damage recover quickly, we would consult with the relevant organizations for each disaster individually about improving the efficiency of various disaster assessments (such as raising the maximum amount for paper-based assessments, raising the limit on money immediately available for disaster recovery, and simplification of design documentation) and about implementing those measures in order to accelerate disaster recovery. In addition, in order to prepare for quicker recovery and reconstruction of afflicted regions following the large-scale disasters that are anticipated to occur in the future, we predetermined how to streamline disaster assessments and, in 2017, we put into effect a policy that will start the streamlining immediately after the government

decides that it anticipates designating an event as a major disaster.

Furthermore, in response to the Northern Kyushu Heavy Rain, in areas buried by large-scale landslides over a wide area, we decided to treat public works facilities as a "total loss" (completely destroyed) without excavating them, thereby enabling affected local governments to receive disaster assessments quickly and begin full-scale disaster recovery work as soon as possible. Regarding serious disasters with considerable burying by a landslide, we expanded the handling of what is called the "prescribed disaster" scheme so that it can be used for improvement recovery construction projects such as the widening of rivers and decided to ease the paperwork, such as the production of assessment design specifications, and financial burden on affected local governments. In addition, for rivers in northern Kyushu that received serious damage, we established the Northern Kyushu Project of emergency countermeasures to urgently carry out structural and non-structural measures in an integrated manner. Through the project, rehabilitation construction will be carried out to urgently and intensively enhance flood control functions over the next five years or so while coordinating river projects with Sabo projects. At the same time, support will be provided for the installation of risk management-type water level gauges (water level gauges specialized for floods) and the examination of town planning using the past record of flood and topographical information.

Additionally, emergency funds for disaster countermeasures were allocated to 44 areas that were damaged by natural disasters, including torrential rain associated with the seasonal rain front and Typhoon Talim, and other such weather events, in order to carry out disaster prevention measures to ensure the safety and security of residents.

With respect to roads damaged in the 2016 Kumamoto Earthquake, restoration of National Route 57 is advancing with the north side restoration route and, through national government agency in accordance with the Road Act and the Act on Large-scale Disaster Restoration, restoration work is continuing on Aso Ohashi Bridge on National Route 325, Kumamoto-Takamori Prefectural Road, and Tochinoki-Tateno Village Road.

In addition, regarding damaged expressways, with the restoration in April 2017 of the approximately 17 km between Mashiki-Kumamoto Airport Interchange and Matsubase Interchange on the Kyushu Expressway, which had all-day lane closures imposed, transit has been restored to all lanes.

(12) Promoting non-structural Measures Including Information and Public Relations for Safety and Comfort

To ensure safety and comfort, non-structural measures were promoted in addition to structural measures for natural disasters and the status of progress was subject to annual inspections in accordance with the "MLIT General Framework of Non-structural Measures Promotion for Safety and Comfort", however, the Great East Japan Earthquake brought to light the need for congruent and integrated evaluations of structural and non-structural aspects and currently deliberations are in progress following the re-evaluation of the Social Capital Improvement Priority Plan/MLIT Disaster Prevention Operation Plan.

3 Secure Transportation Systems Resistant to Disasters

(1) Ensuring Redundancy and Substitutability

Rails, ports, airports, and other facilities are being made disaster resistant and an emergency transport framework for rescue, restoration activities, business continuity is being established to ensure redundancy and substitutability efforts are being made to secure the safety of users.

The road network is necessary to overcome weakness in terms of disasters, such as a community's susceptibility to becoming isolated by a disaster, and we will carry out improvements systematically.

(2) Road Disaster Prevention Measures

To support the emergency lifesaving and restoration assistance activities in the event of large-scale disasters, development of missing links for securing substitutability, disaster measures (measures for slopes, embankments, etc.), earthquake disaster measures (seismic reinforcement, etc.), and snow/cold region measures (development of anti-snow facilities) are being promoted. Additionally, supplementing traffic facilities with disaster prevention functions (turning Michi-no-Eki, service and parking areas into disaster prevention bases, as well as developing emergency lines of communication and fire escapes) were promoted. Disaster alliances with private sector businesses to implement swift road openings are conclud-

ed, and a council for road administrators to create a framework that keeps roads open was established. In addition, based on the Disaster Countermeasure Basic Act amended in November 2014, development of the system and equipment that allow road administrators to smoothly move vehicles for swift removal of road obstacles is being promoted.

Also, in addition to motorcycle squads, cameras, and UAV (unmanned aerial vehicles), big data such as ETC 2.0 probe information and private probe information are used effectively to grasp early damage situations, thus enhancing initial responses.

Additionally, in order to support rapid emergency lifesaving activities and transportation of emergency relief goods during disasters, the Act to Partially Amend the Road Act, etc., was enacted on March 30, 2018. The Act requires the National Government to hold wider responsibilities for reopening damaged Logistically-Important Roads and their alternative routes and performing disaster recovery activities on behalf of the original road administrators in the event of disaster.

Meanwhile, for regions that sustained devastating damage from the tsunami caused by the Great East Japan Earthquake, road development is being carried out as part of urban area development prioritized in the recovery plan and the development of access roads to expressway interchanges is being promoted. Additionally, as one measure to reduce tsunami damage, sea level indicator sheets are being added to road signposts to promote the provision of sea level information to road users.

(3) Accelerating Removal of Utility Poles

We are committed to removing utility poles to prevent them from falling down and blocking the traffic of emergency vehicles in the event of earthquake. Also, we have implemented measures to prohibit the installment of new utility poles on emergency transport roads and special measures for the property tax.

Furthermore, in accordance with the Act on Promotion of Utility Pole Removal, we moved forward with the formulation of a plan for accelerating removal of utility poles, in order to promote measures related to the removal of utility poles comprehensively, systematically, and quickly.

(4) Disaster Prevention Measures for Various Transportation Modes

For railways, in an effort to ensure safe and stable railway transport that is resilient to disasters, subsidies are provided to partially cover the costs of disaster prevention projects carried out by passenger rail companies, including rockfall and avalanche measures as well as countermeasures conducted by the Japan Railway Construction, Transport and Technology Agency (Incorporated Administrative Agency) against deformation that has occurred in pilot and service tunnels of the Seikan Tunnel, which has been open for 30 years.

For ports, in light of the lessons of the Kumamoto Earthquake, a system was established in June 2017 for the national government to administer port facilities based on a request from the port authority during an extraordinary disaster. Efforts are being made to strengthen disaster preparedness by conducting disaster prevention drills based on this system and ports' BCPs in cooperation with parties concerned.

For airports, we are promoting the formulation of evacuation and rapid recovery plans in the event of an earthquake or tsunami striking an airport, taking into consideration disaster prevention-related plans for the area in which an airport is located as well as coordination with other airports.

(5) Building a Logistics System Resistant to Disaster

The Great East Japan Earthquake and Kumamoto Earthquake highlighted the importance of utilizing the expertise and facilities of private sector logistics companies from the perspective of ensuring the smooth transport of relief supplies. That is why we are pushing initiatives aimed at the establishment of a logistics system that is resistant to disasters through the coordination of central government, local government, and logistics companies, including promoting the use of private logistics facilities as bases for the distribution of relief supplies (1,458 facilities listed as of March 31, 2018) and encouraging the signing of cooperation agreements between distributor associations and local governments. Going forward, we will continue promoting the establishment of cooperative frameworks for coordination between the public and private sectors across the nation and will conduct operation drills to achieve smooth distribution of relief supplies.

Column

Initiatives Related to Railway Restoration in Response to More Frequent and Serious Disasters

Natural disasters occurring one after another across the country in recent years have caused immense damage to railways.

As of April 2018, service is suspended on nine lines of four railway operators.

When quick restoration has been difficult with just the operators' own resources, the MLIT has promoted swift restoration by subsidizing restoration expenses based on the Act on Improvement of Railroads and Rail Tracks. Also, while we have provided individual support in the past according to the scope of damage and business conditions, such as with Sanriku Railway, which suffered damaged during the Great East Japan Earthquake, we established a new support system under a supplementary budget in FY2017, in order to provide strong support in the future for the restoration of railways that sustain tremendous damage, like in the Great East Japan Earthquake and Kumamoto Earthquake.

Under the new system, when a railway operator in a tough operating situation is hit by a remarkably abnormal and severe disaster, the national and local governments will split the cost burden half and half (current system: national government ¼, local governments ¼, railway operator ½) for lines that meet certain conditions such as the scale of the disaster and changes being made in the business structure to ensure sustainable business operation after restoration. The system is applicable to future disasters as well, since there is a need to quickly secure funds for disaster recovery.

Also, in light of the fact that damage to railway facilities caused by natural disasters is occurring frequently and more seriously, we have increased the budget for disaster recovery from 68 million yen to 910 million yen from the FY2018 budget, with a view toward stable and agile disaster recovery projects.

Groundbreaking ceremony for disaster recovery work on the Minami Aso Railway

Damage on the Minami Aso Railway (between Tateno Station and Choyo Station)

Column

Practice Transporting Disaster Relief Supplies to Shelters in Cooperation with Saitama City: Establishing Smooth Transportation of Relief Supplies, Including Over the 'Last Mile'

During the Kumamoto Earthquake of April 2016, facilities managed by distribution companies were used as transportation hubs for relief supplies, reminding us of the utility of using private sector distribution facilities and the importance of cooperation from private businesses during a disaster.

At the same time, there is the challenge of the 'last mile', where supplies do not reach shelters even though they have made it to the municipal supply points that come before the shelters.

In light of the Kumamoto Earthquake, Saitama City is working actively on partnering with distribution companies, including signing a cooperation agreement to use a distribution facility belonging to Sagawa Express Co., Ltd. as the city's hub for transportation of supplies.

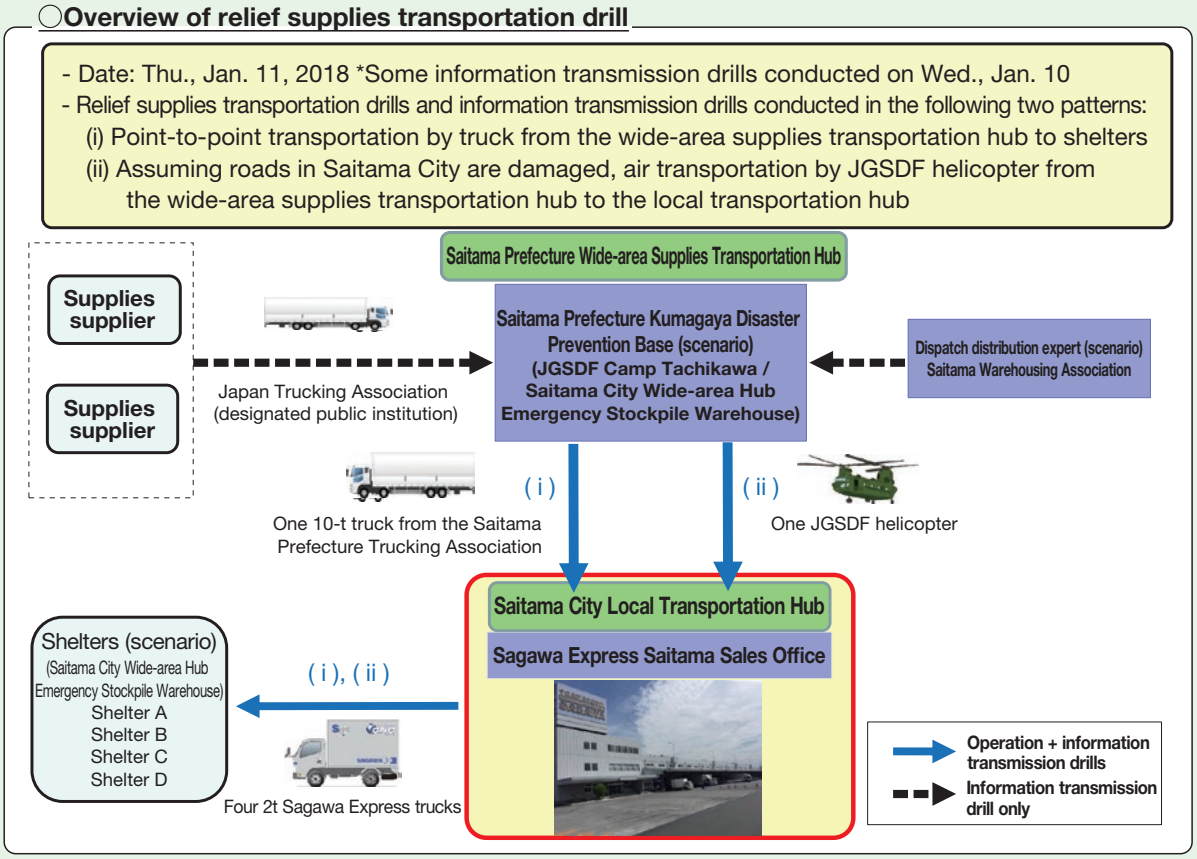
Then, it was decided to strengthen the collaboration among parties concerned and increase their readiness by conducting drills, with cooperation from Saitama City and distribution companies, aimed at ensuring a smooth system for transporting supplies to shelters.

During the drills, point-to-point truck transportation from Saitama Prefecture's wide-area supplies transportation hub to shelters was conducted with cooperation from the Saitama Trucking Association and Sagawa Express. Additionally, assuming a scenario in which the road traffic network is not working in Saitama City, transportation was also conducted via helicopter from a wide-area supplies transportation hub to the local transportation hub in the Saitama City with the support of the Japan Ground Self-Defense Force (JGSDF).

At Sagawa Express' large delivery center, which is the local transportation hub in the Saitama City, relief supplies brought in by large truck and helicopter were sorted and loaded onto trucks going to shelters.

○Overview of relief supplies transportation drill

- Date: Thu., Jan. 11, 2018 *Some information transmission drills conducted on Wed., Jan. 10
- Relief supplies transportation drills and information transmission drills conducted in the following two patterns:
  (i) Point-to-point transportation by truck from the wide-area supplies transportation hub to shelters
  (ii) Assuming roads in Saitama City are damaged, air transportation by JGSDF helicopter from the wide-area supplies transportation hub to the local transportation hub



Source) MLIT

During this drill, cooperation among the parties concerned was strengthen in addition to confirming that relief supplies could be transported smoothly with the cooperation of Sagawa Express, which has extensive distribution knowhow, and by using its facility as Saitama City's supplies hub. Saitama City has positioned the company's facility as the "Relief Supplies Transportation Hub During a Disaster" in its regional disaster prevention plan.

In order to achieve a smooth and reliable relief supplies transportation system by leveraging the knowledge of transportation companies and through cooperation among the national and local governments and private businesses, we will strive to establish a distribution system that is resilient to disasters, so as to spread such initiatives throughout the country in the future.

Source) MLIT

Section 3 Ensuring the Safety of Architecture

(1) Securing Trust for the Production and Supply System for Housing and Buildings

After the amended Building Standards Law went into effect in 2007, the building confirmation process became backlogged, leading to a large decrease in the number of building confirmations; therefore, in light of this, the operation of building confirmation procedures was improved on two occasions in 2010 and 2011 to speed up the building confirmation review and simplify the application documentation among other improvements.

The Minister of Land, Infrastructure, Transport and Tourism inquired the Panel on Infrastructure Development about the ideal for future standards policies in August 2012, and review was proceeded on the items that were requested most for review by priority at the Building Standards Sub commission established at the Building Subcommittee of the same Panel in September of the same year. Of this, regarding the scheme for promoting the seismic resistance of housing and buildings, the first findings were compiled in February 2013 and based on this the revised Law for Partial Amendments to the Act for Promotion of Renovation for Earthquake-Resistant Structures of Buildings was enacted in November 2013.

Also, regarding the ideal standards regarding wood structures and ideal efficient and practically implementable confirmation and inspection regulations the second report was compiled in February 2013. Accordingly, the Act to Partially Amend the Building Standards Act came into force in June 2015.

As measures pertaining to Kenchikushi (architects and building engineers), initiatives to make operations to design and construction administration appropriately in accordance with the Act to Partially Amend the Kenchikushi Law, which came into force in June of the same year, have been undertaken.

Additionally, when defects are discovered in new houses the defect warranty will be reliably fulfilled so that consumers can purchase housing with peace of mind and in accordance with the Act on Assurance of Performance of Specified Housing Defect Warranty (Housing Defect Warranty Performance Act), requiring construction companies and real estate transaction agents to secure funds (house defect warranty security deposit or a valid housing defect warranty liability insurance contract), the insurance underwriting system of housing defect warranty liability insurance entities will continue to be improved and initiatives to raise awareness among consumers and other measures to publicize the system are being carried out.

In FY2017, at the Research Committee for Newly Developing a Housing Defect Warranty Performance System, backed by key personnel (a fresh opportunity to engage in ongoing studies for future reviews of this system), issues to date have

been subject to follow-up action and opinions have been exchanged for future reviews.

(2) Ensuring the Safety of Elevators and Amusement Facilities

While surveys to elucidate the causes of accidents involving elevators, escalators, and amusement facilities and the training of staff members at local governments and regional development bureaus in terms of safety and accident measures continue to be carried out, initiatives for ensuring safety have been advanced by making active use of guidelines for the appropriate maintenance and management of elevators and escalators and spreading awareness of the need to install Unintended Car Movement Protection devices in existing elevators.

Section 4 Strengthening Safety Measures in the Transport Sector

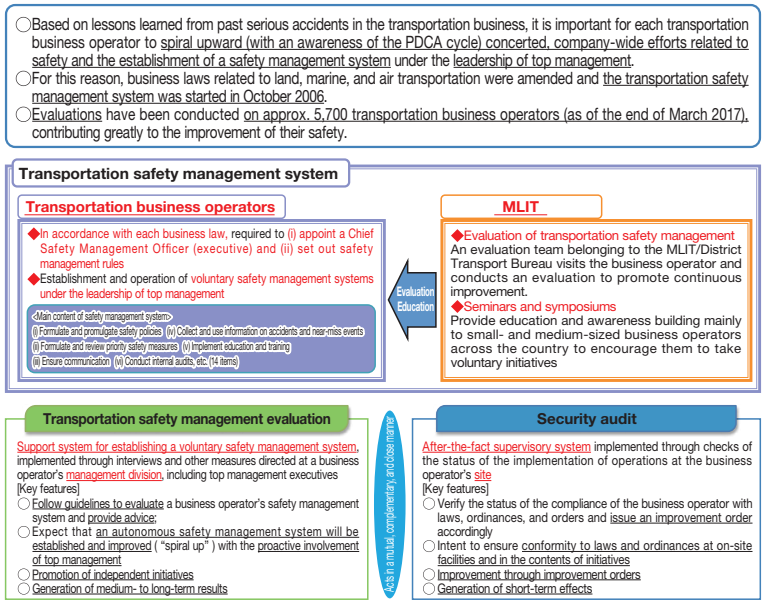
Ensuring safety is a central and fundamental issue in the transport sector and once an accident occurs, not only can it cause significant damage, but also has an enormous impact on society so various measures are being undertaken to prevent accidents from occurring.

1 Building and Improving the Safety Management System in the Transportation Business

The Transportation Safety Management System was introduced in October 2006 based on the lessons of JR Fukuchiyama line derailment accident and other accidents. The system requires transportation business operators to a Chief Safety Management Officer and to establish safety management rules. It encourages the establishment of a safety management system encompassing the whole company under the leadership of top management and is used by MLIT to conduct transportation safety management evaluations (verification of the status of a transportation operator's initiatives and provision of needed advice).

In FY2017, 1,094 parties (63 railway parties, 818 automobile parties, 196 shipping parties, and 17 airline parties) were subject to a transport safety management evaluation.

Figure II-7-4-1 Outline of the Transportation Safety Management System



Source) MLIT

In FY2017, a transportation safety management seminar hosted for transportation operators by the national government in order to deepen understanding of this system was attended by 3,183 persons. In FY2017, 13,493 persons attended seminars as part of an accredited seminar program established in July 2013 for the purpose of further disseminating and shedding light on this system for small to medium-sized business operators (a program through which transportation safety management seminars organized by private-sector organizations are accredited by the MLIT).

October 2016 marked 10 years since the Transport Safety Management System began. While certain results have appeared, there are still a number of issues, including the need to deploy further initiatives in the automobile transportation sector, the need to respond to operators that are still on the way to implementing initiatives and to encourage the deepening of initiatives, and the need to strengthen the national government's system for conducting effective evaluations. Accordingly, the Transport Council deliberated these issues and we obtained its report in July 2017. In light of the report,

we will strive to strengthen and expand the Transportation Safety Management System by carrying out initiatives such as the following:

- Verify the safety management system of all chartered bus operators by FY2021;
- Deepen top management's awareness for dealing with issues such as aging personnel due to a shortage of labor—which is a contemporary problem—aging transportation facilities, natural disasters, terrorism, and infectious diseases, and encourage organization-wide initiatives;
- Establish a Chief Safety Management Officer Council (safety managers forum) with the aim of creating a place for "horizontal collaboration" to deepen interaction among transportation operators' chief safety management officers and safety management personnel; and
- Create a Minister of Land, Infrastructure and Transportation Award to support establishment/entrenchment of a safety culture in transportation operators and initiatives toward continuous revision/improvement.

Figure II-7-4-2 How the Transportation Safety Management System Should be in the Future(Transport Council Report (July 2017))

Deliberation contents

- Need to deploy further initiatives in the automobile transportation sector
- Need to respond to operators that are still on the way to implementing initiatives and to encourage the deepening of initiatives
- Need to strengthen the national government's system for conducting effective evaluations

Report contents

I Measures in the automobile transportation sector

1. Priority measures to improve the safety of chartered bus operators
   - (i) Verify the safety management system of all chartered bus operators over the next five years
   - (ii) Make transportation safety management evaluation a requirement for business license renewal in cases where a chartered bus operator has received administrative penalties
2. Measures to encourage initiatives in the automobile transportation sector
   - (i) Expand scope of application for truck operators and taxi operators (fleet of 300+ vehicles → fleet of 200+ vehicles)
   - (ii) Give various incentives to operators who are mandated to make efforts

II Measures common to all sectors

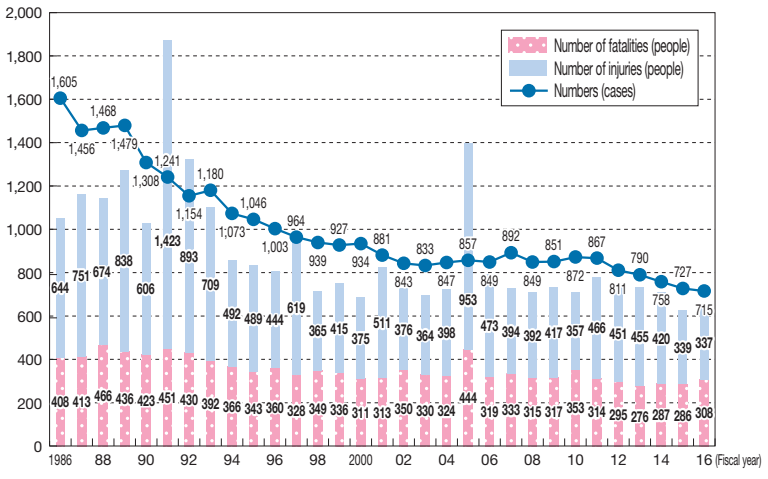
3. Measures to encourage the deepening of initiatives by transportation operators
   - (i) Encourage top management's awareness and organization-wide initiatives for dealing with a changing business environment and social environment (aging personnel and new risks such as terrorism and infectious diseases, etc.)
   - (ii) Establish a Chief Safety Management Officer Council
   - (iii) Create a Minister of Land, Infrastructure and Transportation Award
   - (iv) Promote measure to facilitate initiatives by small to medium-sized business operators
4. Strengthen the national government's system
   - Strengthen the training of national government personnel who conduct evaluations
5. Utilize ICT in the transportation safety management sector
   - Examine the utilization of ICT, including big data analysis and technical progress in IoT and AI

Source) MLIT

2 Railway Transportation Safety Measures

Driving accident numbers for railway traffic show a declining trend over the long term[Note] due to factors such as the promotion of driving assistance facilities including automatic train stop systems (ATS) and rail crossing measures, but since many people may be killed or injured if a train collides or derails, the promotion of further safety measures must continue.

Figure II-7-4-3 Transition in Number of Casualties and Number of Driving Accidents in Railways



Source) MLIT

(1) Improving Railway Safety

In the light of past accidents, measures, like creation of necessary standards, will be implemented, and direction will be given to railway operators to ensure implementation, as well as, confirm the status of implementation for safety audits, and give feedback on audit results for further implementation of measures to improve the safety of railways.

JR Hokkaido has been instructed to implement the Measures to be taken by JR Hokkaido as business improvement order and supervision order, in January 2014, and carryout supervision and guidance through periodic reports, permanent

Note The number of casualties increased in the years which driving accident caused severe human damage, such as 2005 in which JR-West Fukuchiyama line derailment accident occurred.

audit systems (for five years) to reliably execute the same.

In accordance with the results of an investigation pertaining to reviews of the approach taken for safety audits conducted in FY2014, railway operators are subject to modulated, more effective safety audits, including planned safety audits and provisional safety audits conducted whenever similar types of problems occur.

(2) Promotion of Railway Crossing Measures

Unopened grade crossings[Note] primarily in urban areas are a factor behind crossing accidents and chronic traffic congestion and measures to promptly address this problem are needed. For this reason, the road administrators and railway operators work together to prevent railroad crossing accidents, by developing crossing facilities, such as flyovers, structure improvement, and pedestrian bridges, and through the maintenance of railroad crossing safety equipment, such as railway crossing barriers, based on the Improving the Railway Crossings Act and the 10th traffic basic traffic safety plan.

In FY2017, in accordance with the Act on the Promotion of Railway Crossings, 237 new locations were designated as crossings to be improved, which with the 587 crossings designated in FY2016 brought the total up to 824 crossings. Regional Railroad Crossing Improvement Councils were gradually held regarding the designated crossings, and road administrators and railway operators made efforts to advance crossing measures based on the local circumstances.

In the future, in addition to countermeasures, such as the construction of crossing facilities including flyovers and structural improvements, as well as the construction of railroad crossing safety equipment, crossing countermeasures will be further promoted based on studies by the Regional Railroad Crossing Improvement Council, which cooperates with community stakeholders. This will include a general mobilization of measures in both structural and non-structural terms, including immediate measures involving the use of colored pavement and measures affecting areas surrounding crossings, such as the development of parking spaces.

(3) Promoting the Development of Platform Doors

To improve the safety of the visually impaired and other rail station users, the installation of platform doors to prevent falling from the platform is being promoted (installed at 686 stations as of the end of FY2016). In accordance with the Basic Policy on Promoting the Facilitation of Mobility (March 2011), Basic Plan on Transport Policy (February 2015), and Priority Plan for Social Infrastructure Development (September 2015), we have been implementing structural measures, such as by promoting the development of platform doors and tactile paving with boundary lines and the development of technologies for new types of platform doors to address the problem that arises when train doors do not line up properly with the platform, as well as non-structural measures, such as encouraging users to reach out to and help guide visually-impaired riders to where they are supposed to go.

An investigative commission for improving the safety of station platforms met on August 26, 2016, and studied comprehensive safety measures related to the prevention of falls, in terms of structural and non-structural measures. It released an interim summary in December 2016. It was decided that, as a structural measure, platform doors are to be installed by 2020 as a general rule at stations serving 100,000 people or more, and where construction conditions are met, such as fixed locations for train doors and adequate space on the platform. Where the development conditions are not met, we have studied ways to meet them, such as installing new types of platform doors and making fixed door locations by updating train cars. Where new types of platform doors are to be installed, we have decided to construct them or start construction within about five years. Regarding stations that serve fewer than 100,000 people, we have decided to carry out priority development at the same level as stations serving 100,000 people or more, if such development is deemed necessary after taking the station's condition into consideration. Through such initiatives, we will work to achieve the development goals of approximately 800 stations by FY2020, set out in the Basic Plan on Transport Policy, as far in advance as possible.

Also, in the interim summary, it was decided to construct tactile paving with boundary lines by FY2018 at stations that serve 10,000 people or more. In addition, the main non-structural measures indicated in the summary include station employees offering to guide visually impaired riders at stations without platform doors, enhancing the service provided by station employees, including calling out clearly to visually impaired riders, encouraging other riders to reach out to and help guide visually impaired riders, promoting understanding of the "barrier-free heart" mindset, and cooperating with the training of guide dogs in stations, among other measures.

Note Railway crossings that are closed for more than 40 minutes/hour, during the hours when the train frequency is high.

Furthermore, at the seventh meeting of the investigative commission, held in July 2017, the status of railway operators' initiatives to improve platform safety were summarized and shared in an effort to encourage further initiatives by relevant parties, including railway operators, through horizontal spread of best practices.

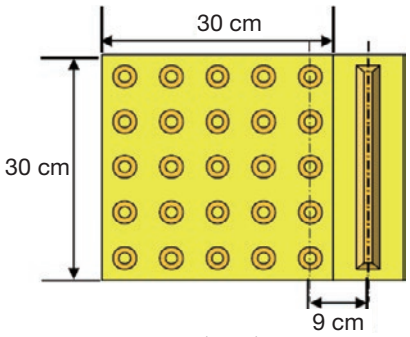
(4) Studying Measures Related to Railway Transportation Trouble

We established an investigative commission to examine measures related to railway transportation trouble. The commission, which held its first meeting in February 2018, is to review how railway car inspections ought to be. It will examine measures to prevent the recurrence of transportation disturbances and mitigate their effects, in light of railway transportation trouble that has occurred in recent years, such as a crack in Shinkansen bogie, a transportation disturbances caused by overhead wire damage, and a standstill for a long time due to snow damage. It will also examine and study the structural causes that are thought to be behind the trouble, such as the declining birthrate and aging personnel. The commission aims to compile the necessary measures by the summer of 2018.

Figure II-7-4-4 Platform doors

Source) MLIT

Figure II-7-4-5 Tactile Paving with Boundary Lines



- 25 tactile bumps (5 x 5)
- Line bump (boundary line) indicating the side of the platform close to the track

Source) MLIT

3 Safety Measures for Maritime Traffic

In the sea areas surrounding Japan, around 2,200 vessels are involved in marine accidents every year. Once a marine accident occurs, not only are precious lives and property lost, but Japan's economic activities and marine environment may be adversely affected in a major way, requiring the promotion of further safety measures.

(1) Improving Ship Safety and Ensuring Ship Navigation Safety

(i) Improving ship safety

In order to ensure ship safety globally, the international regulations and standards have been developed at the International Maritime Organization (IMO), and Japan has been participating actively in discussions at IMO.

Based on proposals from Japan and other countries, the IMO started to consider international rules related to maritime autonomous surface ships that use the latest ICT technology, in order to increase maritime safety through the prevention of human error, etc.

Also, it has been pointed out that fire accidents on passenger ferries have been occurring frequently in recent years. The IMO is therefore studying fire safety measures for passenger ferries. Japan has contributed to the discussion by suggesting to the IMO measures based on cases of fires in Japan.

Port State Control (PSC)[Note 1] has been implemented to ensure that foreign ships entering ports in Japan comply with such international regulations and standards, and to eliminate substandard ships[Note 2].

As an initiative focused on ship safety measures in Japan, a the guidelines including effective firefighting strategies, the features of fire-fighting equipment, and training methods to enhance preparations for ro-ro passenger ship operators to engage in firefighting was compiled and publicly released in response to a fire of a ferry occured off the coast of Tomakomai, Hokkaido, in July 2015. We continued to provide guidance to ro-ro passenger ship operators nationwide in FY2017.

Also, in light of the fact that a revision to a relevant ordinance made the wearing of lifejackets mandatory for all passengers as a general rule from February 1, 2018, as a safety measure for small craft, we produced posters, leaflets, and an awareness-raising video in an effort to spread awareness of the rule in cooperation with relevant ministries, agencies, and organizations. Additionally, in order to use smartphones to prevent maritime accidents, we studied a system to share location information among different smartphone apps.

(ii) Ensuring ship navigation safety

In accordance with the Seaman and Small Craft Operator Act, which complies with the STCW Convention[Note 3], the qualifications for seafarers are defined, as are the qualifications and compliance matters for small craft operators, to ensure ship navigation safety from human factors.

Also, in order to reduce the number of small boat accidents, which account for around 80 percent of all maritime accidents, we publicized compliance matters and conducted re-education courses for violators. In accordance with the Pilotage Act, qualifications for people who can perform pilotage are defined for the safety of vessel traffic. In light of the second report by an investigative commission related to the securing and training pilots, which was established to secure a stable supply of pilots, we partially revised an ordinance in January 2018, establishing a new system of partial passing of exam requirements as part of efforts to encourage people to apply to be pilots.

Investigation and inquiry, in accordance with the Act on Marine Accident Inquiry, are conducted for a marine technician, a small craft operator, or a pilot who causes a marine accident intentionally or negligently in the course of duties and in 2017 there were 316 cases of determinations and a total of 423 marine technicians, small craft operators, or pilots were performed disciplinary actions of suspension of business operation (one to two months) or admonition to prevent the occurrence of marine accidents.

Since 2003, the Japan Coast Guard has organized the direction and specific measures for vessel traffic safety measures to work on over a period of roughly five years into a Traffic Vision. In April 2018, it formulated its Fourth Traffic Vision and is carrying out various measures to ensure maritime safety over a wider area.

Since human factors such as inadequate vigilance and inappropriate maneuvering account for approximately 80% of ship accidents, in order to prevent accidents caused by such carelessness, the Japan Coast Guard, in cooperation with relevant organizations and private associations carries out accident prevention measures according to the type of vessel and operation season, in light of the results of its daily analysis of maritime accidents that have occurred.

Note 1 Supervising of foreign vessels by port state

Note 2 Vessels not conforming to standards of international convention

Note 3 The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978. This international convention stipulates the training and certification of mariners for the purpose of improving the safety of human lives and assets at sea, and also promotes the protection of the marine environment.

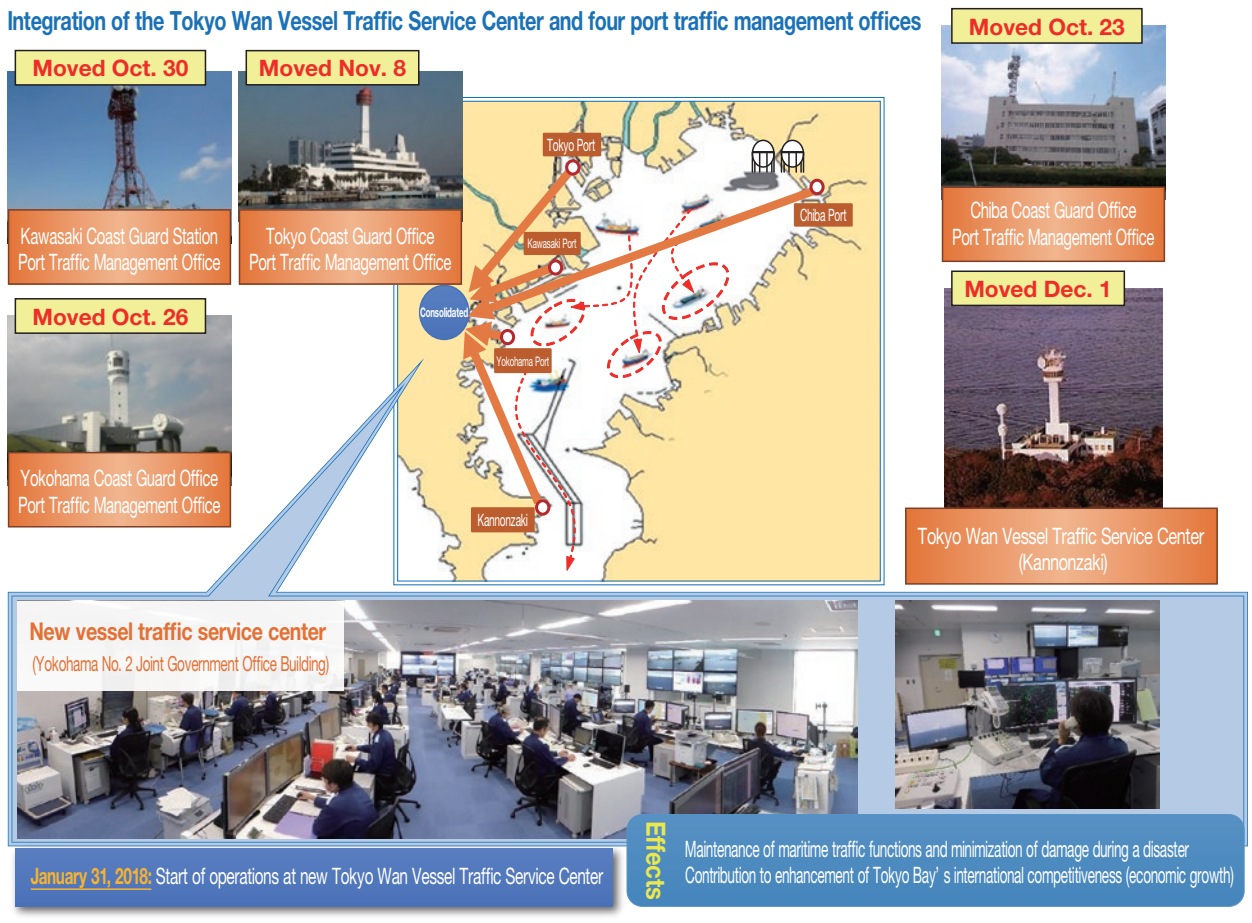
Also, the Coast Guard provides information, such as "Maritime Information and Communication System (MICS)[Note]," to the broader public in order to prevent marine accidents due to insufficient information.

In order to quickly and smoothly get vessels to safe sea areas when a tsunami or other emergency disaster occurs and, during non-emergency periods, in order to ease congestion and ensure the safe and efficient operations of vessels, the Coast Guard coordinated the Tokyo Wan Vessel Traffic Service Center with port traffic control offices in the ports of Chiba, Yokohama, Kawasaki, and Tokyo and established a new Vessel Traffic Service Center in Yokohama to carry out these operations in an integrated fashion. The new center began operations in January 2018.

With respect to nautical charts, we are endeavoring to upgrade electronic navigational charts, which have gained in importance thanks to the dissemination of the Electronic Chart Display and Information System (ECDIS). Additionally, we have published English-only nautical charts for foreign seafarers as part of measures to prevent marine accidents. In FY2017, with the enforcement of a law to partially amend such laws as the Maritime Traffic Safety Act in relation to centralization of maritime traffic control in Tokyo Bay, the amendments are reflected in the relevant charts of Tokyo Bay.

Regarding the navigational warnings and notices to mariners, visual information that constitutes valid information displayed on a map is provided over the Internet.

Figure II-7-4-6 Establishment of Integrated Maritime Traffic Management in Tokyo Bay



Source) MLIT

Note A service that provides information such as local weather and hydrographic conditions, including wind direction, wind speed, and wave heights, as observed at lighthouses and other stations nationwide, as well as the status of offshore construction, and live images from cameras giving a picture of sea conditions via the Internet and through distribution via email of emergency information released by the Japan Coast Guard

In addition, to improve the safety and navigation efficiency of ships in narrow waterways, tidal current information for Kurushima Strait is provided on the Internet through entire region simulation.

For Aids to Navigation, development is performed effectively and efficiently in accordance with the vessel traffic environment as well as needs and in FY2017, improvements and renovation was carried out in 257 locations.

The Marine Accident Analysis Center established under the National Maritime Research Institute (National Research and Development Corporation) conducts highly specialized analysis of accidents as well as rapid analysis and transmission of information when major marine accidents occur, and contributes to consider measures to prevent its recurrence.

Ensuring the safety of ship navigation in the Straits of Malacca and Singapore, highly important maritime transportation routes through which eighty percent of crude oil imported to Japan passes, is important. Cooperation for the financing of the Aids to Navigation Fund[Note 1] is being provided under the cooperative mechanism[Note 2] with the involvement of littoral states and users. In addition, Japan is providing technical cooperation through the dispatch of experts, by maritime stakeholders, in order to conduct hydrographic surveys on the straits, a move that was approved as a Japan-ASEAN Integration Fund (JAIF) project, by Japan and three littoral states (Indonesia, Malaysia, and Singapore). Japan will continue this cooperation for the safety of navigation and the protection of the environment in the straits through public-private partnerships, together with our good relationships with the littoral states.

(2) Promotion of Safety Measures for the Passengers

About 43% of cases reported about the dead or missing passengers are due to fall accidents into sea. In order to survive after the fall, first thing to do is to float, and then promptly request a rescue. In addition, the passenger mortality due to falls into the sea from small boats (fishing boats or pleasure boats), is eight times higher in the passengers who do not wear a life jacket than those who do. Life jackets therefore contribute greatly to saving passengers from falls into the sea. That is why the Japanese Coast Guard takes various opportunities to spread and raise awareness about ensuring self-rescue means based on three principles: wear a life jacket at all times, ensure appropriate contact means such as a portable telephone packed in a waterproof package, and effective use of the 1-1-8 emergency telephone hotline to the Japan Coast Guard.

(3) Strengthening the Rescue System

In order to engage in prompt and precise rescue activities, the Japan Coast Guard operates the 1-1-8 emergency telephone hotline and endeavors to rapidly ascertain information on the occurrence of accidents, such as by receiving information on marine accidents at any time, day or night, through the Global Maritime Distress and Safety System (GMDSS). Also, along with improving the rescue technology and capabilities of those such as special rescue team, mobile rescue technicians, and divers, enhancements and fortifications of the medical control framework to ensure, from a medical perspective, the quality of emergency life-saving treatment that emergency response personnel perform as well as advancing the functionality of patrol vessels and aircraft is being carried out as part of efforts to enhance and fortify the rescue and emergency system. Also, the enhancement and fortification of coordination between ministries, agencies, local governments, and private rescue organizations is also being carried out.

Note 1 A fund established to cover costs incurred to replace or repair lighthouses and other facilities used for aiding navigation installed in the Straits of Malacca and Singapore.

Note 2 A mechanism that substantiates, for the first time in international history, the cooperation of littoral states and states using these straits in accordance with Article 43 of the United Nations Convention on the Law of the Sea. This mechanism comprises three elements: the Cooperation Forum, the Project Coordination Committee, and the Navigation Aids Facilities Fund.

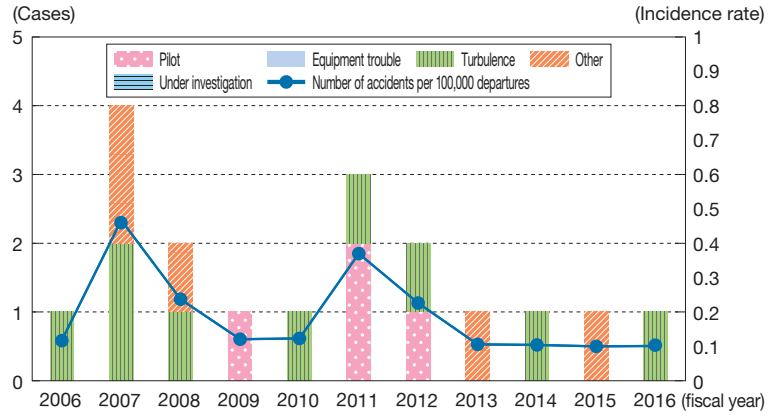
4 Air Traffic Safety Measures

(1) Strengthening Aviation Safety Measures

(i) State Safety Program (SSP)

Since April 2014, the Civil Aviation Bureau has been implementing the State Safety Program (SSP), which sets forth targets for civil aviation safety and measures to be taken for their attainment, in accordance with Annex 19 of the Convention on International Civil Aviation. In FY2015, the Civil Aviation Bureau, formulated a "Medium-term orientation for the administration of aviation safety," which outlines the orientation of safety targets for the next five years. In FY2016, a direction for further safety measures related to small aircraft was added in light of the frequent occurrence of accidents involving private small aircraft in recent years.

Figure II-7-4-7 Number and Frequency of Accidents on Domestic Airlines



Source) MLIT

The Voluntary Information Contributory to Enhancement of the Safety (VOICES) program has been operated since July 2014 in order to collect more information relating to aviation safety that is not subject to mandatory reporting and harness such information for the improvement of safety.

While dissemination activities have been yielding results and the number of reports issued in FY2017 increased by about 20 percent over the preceding year, attempts will be made to further use the system through continued work to highlight the importance of safety information. Efforts will also be made to improve safety by making use of obtained recommendations.

(ii) Air transport safety measures

While passenger deaths aboard specific Japanese air carriers[Note] have not occurred since 1986, efforts are being made to reinforce the safety management system adopted by airlines and preventive safety measures are being promoted to appropriately deal with safety-related issues. As well, preliminary reviews upon the launch or expansion of a domestic airline and strict (including unannounced) and systematic on-site audits are properly conducted. Also, in accordance with the increased entrance of foreign airlines following the promotion of the open sky policy, monitoring of foreign airlines entering Japan were strengthened with site inspections and other measures.

In September 2017, there was a case of an object falling from an aircraft. In order to promote measures to prevent falling objects and to quickly investigate and respond to the case after the fact, in November 2017 we set up a commission, composed of experts and working-level personnel, to promote comprehensive countermeasures related to the prevention of falling objects. In March 2018, the commission compiled a set of proposals for falling object prevention standards for airlines to follow. Since November 2017, in cases where parts are missing from aircraft taking off or landing at airports with lots of international routes, we have been demanding a report from all airlines, etc., including foreign airlines.

(iii) Certification of domestic jetliners

With the development of Japan's first domestic jetliner, the MLIT, as the national government of design and manufacturing, established and expanded a certification organization to implement certification of compliance with safety and environmental standards more appropriately and smoothly and is carrying out reviews with close coordination with the aviation authorities of the United States and Europe. At present, four test aircraft have been transported to the United

Note Domestic air carriers that operate air transport businesses that use aircraft with 100 or more passenger seats or with a maximum takeoff weight of more than 50,000 kilograms.

States, where test flights and on-ground tests have been implemented. MLIT has stationed personnel in the United States to monitor and supervise the development activities, including test flights. We will continue appropriate and smooth safety reviews, anticipating delivery of the first aircraft, scheduled for mid-2020.

(iv) Safety measures applicable to unmanned aircraft

In December 2015, an amendment to the Aeronautical Act was issued to enforce basic rules for unmanned aircraft, such as flying airspace and flying methods. In FY2017, 14,065 permits/approval were granted as of the end of December. Also, in July 2016, a public-private council composed of relevant government ministries and agencies, manufacturers, and user organizations put together the Direction for System Development to Ensure Further Safety of Small Unmanned Aircraft. Based on these recommendations, we established a commission to study how to ensure the mutual safety and harmony of aircraft and unmanned aircraft in March 2017. Based on the commission's discussions, we compiled an interim report about matters such as measures to avoid collisions between aircraft and unmanned aircraft and between one unmanned aircraft and other. Furthermore, in September 2017, a commission to study the flying of unmanned aircraft outside the field of vision and above third parties was established in MLIT and the Ministry of Economy, Trade and Industry. In March 2018, it compiled requirements for flying unmanned aircraft outside the field of vision.

(v) Safety measures for small aircraft

We have conventionally implemented various measures regarding small aircraft, including establishment of a system of periodic skills reviews for pilots. Nevertheless, there have been numerous accidents in recent years, including one in which a plane crashed into a house in Chofu City, Tokyo in July 2015. In response, MLIT's Civil Aviation Bureau held safety courses at major airports nationwide, developed new courses for small aircraft mechanics, and took additional measures such as encouraging enrollment in aviation insurance for private aircraft. Additionally, the accident investigation report on the Chofu crash was released in July 2017, and recommendations were issued to MLIT. In response, we produced and distributed safety awareness leaflets based on the content of the recommendations and implemented other initiatives such as checking the understanding of pilots through periodic skills reviews. Going forward, we will continue to further promote comprehensive safety measures for small aircraft while taking into account the opinions of experts and relevant organizations through the Small Aircraft Safety Improvement Committee, which has been meeting regularly since December 2016. For sky leisure enthusiasts who enjoy pursuits such as ultralights, paragliding, skydiving, gliders, and hot air balloons, we carry out sky leisure safety measures, such as enhancing safety training and providing information on aviation safety through such organizations as the Japan Aeronautic Association and relevant sports associations.

(2) Developing Air Traffic Systems for Aviation Safety

In order to ensure safe operation and on-time performance of aircraft, and to support the smooth implementation of traffic control functions, we are continuing to develop a new air traffic control data system that merges the existing systems.

In FY2017, we introduced a trajectorized airport traffic data processing system at Kagoshima Airport and Miyazaki Airport.

5 Finding the Causes of Aircraft, Railway, and Marine Accidents/Incidents, and Preventing Recurrence

During FY2017, accidents subject to investigations by the Japan Transport Safety Board consisted of 31 aircraft accidents and serious incidents, 14 railway accidents and serious incidents, and 873 marine accidents and incidents, and those investigations looked into finding causes and preventing recurrence.

Investigation reports for 31 aircraft accidents and serious incidents whose investigations were finished in FY2017 were released. These included the release in July 2017 of the results of an investigation into an accident in July 2015 in which a small aircraft crashed into a house in Chofu City, killing two passengers and one resident and injuring three passengers and two residents.

Likewise, investigation reports for 28 railway accidents and serious incidents were released. These included the release in November 2017 of the results of an investigation into an accident in April 2016 in which a Kyushu Shinkansen train derailed with the Kumamoto Earthquake.

Figure II-7-4-8 J-MARISIS (mobile version)

Top page http://jtsb.mlit.go.jp/hazardmap/mobile/index.html

Example of display of accident information

Source) MLIT

Investigation reports for 966 marine accidents and incidents were also released. These included the release in November 2017 of the results of an investigation into an accident in December 2016 in which the fishing vessel Daifuku Maru capsized and sank off the north coast of Mihonoseki Lighthouse in Matsue City, Shimane Prefecture, resulting in the deaths of four crewmembers, with another five crewmembers missing.

The Japan Transport Safety Board has released the Japan-Marine Accident Risk and Safety Information System (J-MARISIS) that, by displaying digital maps on the Internet, can be used to search for marine waters where multiple marine accidents and incidents have occurred, and the results of those investigations. Additionally, it has released a global edition of J-MARISIS, to which information for 11 countries has been added to contribute to safe international ship navigation, as well as a mobile version of J-MARISIS that can be used on a smartphone or a tablet.

6 Support for Victims and Families of Public Transport Accidents

In order to support the victims and their families in public transport accidents, the Public Transportation Disaster Victims Assistance Office was established in April 2012. The Assistance Office relays requests from accident victims to public transportation business operators concerned and introduces appropriate organizations to accident victims depending on the content of the requests.

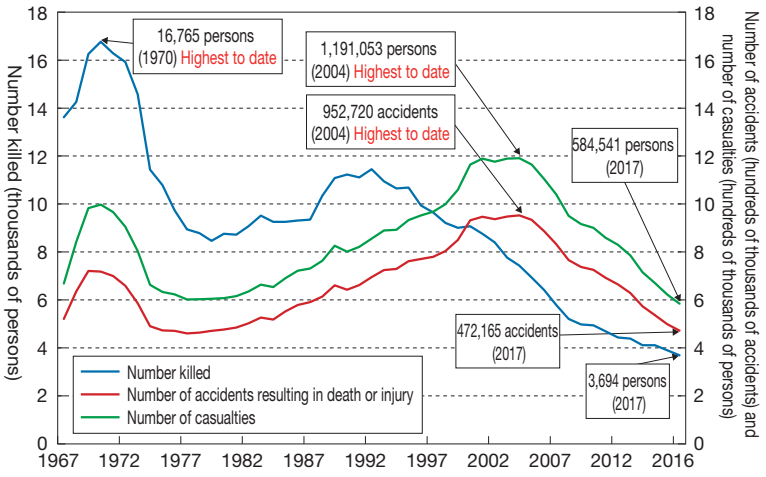
In FY2017, when a public transport accident occurred, the Assistance Office made the consultation service well known to victims, as well as responded to consultation from victims. When no public transport accidents needed to be dealt with, the Assistance Office was involved in numerous other activities, such as by providing education and training to staff members who provide support, building networks with relevant outside organizations, holding support forums for the victims of public transport accidents, and urging public transport operators to formulate plans for the provision of support to victims.

In response to the ski bus accident in Karuizawa that occurred in January 2016, MLIT held meetings to explain measures for preventing a recurrence and to listen to the opinions of victims and their families. We also continue to hold meetings to exchange opinions with an association for the bereaved.

7 Safety Measures for Road Traffic

In 1970, the number of traffic accident fatalities peaked at 16,000. This figure declined to less than a quarter of this level, or 3,694 fatalities (a decrease of 210 from the preceding year) in 2017, the lowest level since statistics started to be kept in 1948. However, elderly drivers caused many traffic accidents, and approximately half of them occurred while walking or riding a bicycle. With half of these incidents taking place within 500 meters of each victim's home, the situation remains grim. For this reason, efforts will be made to further reduce traffic accidents and various measures will be implemented in coordination with the National Police Agency and others.

Figure II-7-4-9 Changes in the Number of Traffic Accidents and Number of Casualties



* Figures for 1971 and earlier do not include Okinawa.
* Number of accidents resulting in death or injury and number of casualties: Based on materials provided by the National Police Agency
* Vehicle-km: Based on Economic Research, Traffic Survey and Census Data Collection [2016 Edition] (2010 and 2011 based on notes in the data)
* Number of automobiles: Based on Economic Research, Traffic Survey and Census Data Collection [FY2016 Edition]
* Population: "Population Estimates (October 1 of each year)," Ministry of Internal Affairs and Communications
* Death toll per 100,000 persons calculated based on the previous year's population (National Police Agency's calculation method)

Source) Prepared by the MLIT using materials provided by the National Police Agency

(1) Road Safety Measures

(i) Promoting road safety measures using big data for arterial roads and residential streets

By promoting the functional differentiation of roads, we are working to divert automobile traffic to expressways which are safer than other types of roads. Through measures applicable to accident-prone "black spots" and "zero-traffic accident plans" (tactics for the priority elimination of accidents at black spots) carried out in collaboration with prefectural public safety commissions, we are effectively and efficiently promoting accident measures in order to further improve the safety of arterial roads, which account for approximately sixty percent of traffic accident fatalities.

With respect to residential streets, where the number of fatal accidents is not on a stable downward trend compared to arterial roads, big data such as ETC 2.0 will be used to identify in advance key points such as places where people speed and brake suddenly, in order to secure safe walking spaces by restricting the through-traffic and forcing a reduction in vehicular speeds. Comprehensive measures to inhibit traffic accidents are being advanced in collaboration with prefectural public safety commissions, through such measures as decreasing the width of vehicular roads and widening roadside strips in combination with zonal speed limits, engaging in sidewalk development projects, and carrying out effective measures such as the installation of speed bumps and curb extensions.

The number of fatal traffic accidents involving bicycles and pedestrians has decreased by no more than 10% over the past 10 years, so we are promoting a configuration that separates pedestrians from bicyclists, who as a basic rule should travel on roadways.

(ii) Promoting Safety Measures for School Commute Routes

For school-commuting roads, in the wake of a series of accidents in April, 2012 involving groups of children commuting to schools, a "school route emergency joint inspection program" was implemented and included coordination among schools, boards of education, police, and other stakeholders. Intensive support was directed toward the measures based on the results above.

In addition, Japan has instituted a "school-commuting roads safety program" in each municipality to ensure the sustained safety of school-commuting roads, and has implemented regular joint inspections and improved and enhanced other measures as well.

(iii) Initiatives to improve the safety, reliability, and user friendliness of expressways

We will systematically carry out initiatives to improve the safety, reliability, and user friendliness of expressways, from the user's perspective, by using new technologies, with a view toward effective and efficient utilization of the expressway network. Specifically, in order to efficiently resolve such issues as driving performance and safety in provisional two-lane sections, we will use data to identify problematic areas and will move forward turning those sections into four lanes and creating additional lanes. Also, in order to ensure the safety of two-way traffic in provisional two-lane sections to be improved immediately, we are studying wire rope set up along approximately 100 km of 12 routes across Japan managed by expressway companies to see the effect on preventing head-on collisions and whether or not there are issues with driving performance and maintenance, etc. In addition, in response to the problem of cars driving in the wrong way on expressways, which is highly likely to lead to a major accident, we are implementing physical and visual measures at locations such as interchanges and junctions based on the Roadmap to Future Measures against Wrong-way Driving on Expressways. Also, with new technology for dealing with wrong-way driving, solicited from private companies and selected by expressway companies, going into practical use from FY2018, we are aiming to achieve zero wrong-way accidents on expressways by 2020.

These specific measures related to safety and security will be compiled into a medium-term improvement policy as the tentatively named Safety and Security Plan and will be promoted systematically and steadily.

Additionally, leveraging the current low-interest rate situation, we will use fiscal investment and loan programs to ensure the safety and security of expressways by accelerating the reinforcement of bridges against earthquakes.

(2) Systematic Road Facilities Management to Provide Safe and Secure Road Services

Nationwide, there are approximately 730,000 road bridges and approximately 10,000 road tunnels. But bridges and tunnels, which were intensively developed during Japan's period of high economic growth, face rapid aging in the future.

To achieve appropriate management of roads in light of this situation, the Road Act was amended in 2013, technical standards were established for the maintenance and management of roads, and the obligations of road administrators were clarified, such as visual inspections in close proximity of bridges and tunnels once every five years.

Having received recommendations on the full-scale implementation of measures to deal with the aging roads, as summarized by the Infrastructure Development Council's Road Subcommittee on April 14, 2013, we are working on building a framework for carrying out required actions as part of maintenance cycles. In particular, we are providing various kinds of support for local governments with many facilities to be managed. This support includes sharing technical information related to maintenance through the use of road maintenance councils that have been set up in all prefectures, the placement of lump sum ordering for inspection operations at the local level, the implementation of direct assessments and repairs by national government personnel on behalf of local governments, and support through subsidy systems for large-scale repair and upgrading jobs. Also, as a new financial support offered from FY2017, we expanded the eligible projects for the subsidy systems for large-scale repair and upgrading jobs to include consolidation and removal.

Additionally, in order to deal with the aging expressways, we are systematically carrying out large-scale upgrades and repair projects newly outlined in operational implementation plans according to amendments to the Road Act enacted in June 2014. Also, in October 2016, we issued a ministerial ordinance to set out the methods of maintenance and repair of bridges over railways in advance through discussions with railway operators, so as to encourage the systematic maintenance and repair of bridges over railways, and are working to prevent injury to third parties and ensure the safety of railways.

Additionally, in order to prevent impediment to road structures and traffic as a result of damage to property that occupies a road, an act to partially amend the Road Act was enacted on March 30, 2018, stipulating that persons with property that occupies a road have a duty to maintain that property and providing authority to order violators of that duty to take measures.

(3) Measures in Response to the Ski Bus Accident in Karuizawa

In light of the ski bus accident in Karuizawa that occurred in January 2016, we are implementing the "Thorough Measures to Achieve Safe and Secure Chartered Bus Operations," which consist of 85 items compiled in June 2016, in order to prevent such a tragic accident from ever occurring again.

(4) Steady Implementation of the "Expressway and Chartered Bus Safety and Security Recovery Plan"

In response to the Kan-Etsu-Do Expressway tour bus accident that occurred in April 2012, the "Expressway and Chartered Bus Safety and Security Recovery Plan" was formulated in April 2013 to shift and unify expressway tour buses into the new share-ride expressway bus and already established standards for driver replacement shifts and for the remaining measures, these have been definitely implemented in the two years between 2013 and 2014. The MLIT continues to ensure the effectiveness of each measure of this plan such as implementation of street audit and understanding of bus operators that must be continuously monitored, and promotes measures to improve the safety and regain trust of bus operations.

(5) Promoting Safety Measures According to a Safety Plan for Commercial Vehicles

In June 2017, we formulated the 2020 Comprehensive Safety Plan for Commercial Vehicles as a new plan to replace the 2009 Comprehensive Safety Plan for Commercial Vehicles that was established in 2009. The plan sets out new accident reduction targets of 235 or fewer deaths caused by commercial vehicle accidents and 23,100 or fewer accidents by 2020. We are advancing various measures toward achievement of those targets.

(i) Accident-prevention measures based on accident patterns by industrial sector and key factors

In order to promote transportation safety, we are evaluating accident-prevention initiatives based on characteristic accident patterns for each industrial sector—trucks, buses, and taxis—and are conducting follow-ups, including revisions of initiatives where necessary, so as to reduce accidents even further.

(ii) Establishing a framework for safety through the management of transportation safety

In order to promote initiatives for establishing and improving safety management systems in the automobile transportation sector through the transportation safety management program, the scope of application of the program for truck operators and taxi operators was expanded from operators with a fleet of 300 or more vehicles to operators with a fleet of 200 or more vehicles (a ministerial ordinance partially revising the relevant regulations went into effect on April 1, 2018). We have also decided to check the safety management systems of all chartered bus operators by FY2021. In 2017, evaluations of transportation safety management, where by the national government verifies the status of implementation of initiatives related to these systems, were conducted on 818 automobile transportation operators.

(iii) Ensuring compliance on the part of motor carrier businesses

In order to thoroughly ensure that motor carrier businesses comply with relevant laws and ordinances and practice appropriate operations management, business operators who flagrantly violate the law and those who have caused a major accident will be subject to thorough audits, while business operators who are suspected of violations will be subject to high-priority audits.

Also, in November 2016, we began operating a comprehensive safety information system for commercial vehicles with functions to identify and analyze business operators deemed to be at high risk of causing an accident.

Furthermore, in accordance with thorough measures for chartered buses compiled in response to the ski bus accident that occurred in Karuizawa, in December 2016 we introduced a system to correct legal violations promptly and have implemented measures to tighten administrative penalties to force business operators who are repeat violators to withdraw from the market. Since August 2017, we have also been conducting undercover investigations in which private sector investigators board actually operating chartered buses as a general user and investigate compliance with the law, such as the securing of rest time.

(iv) Eliminating drunk driving

In order to eliminate driving by business drivers while under the influence of alcohol, stimulants or dangerous drugs, thorough checks are conducted using alcohol analyzers during roll calls and guidance is being provided to business operators and operating managers whenever the opportunity arises through the use of workshops, nationwide transportation safety campaigns, general transportation safety checks conducted during the year-end and New Year's period, and other such initiatives in order to thoroughly ensure that drivers are guided and supervised on a daily basis regarding correct knowledge of drugs and the prohibition on their use.

(v) Promoting safety measures based on the use of IT and new technologies

We are providing support for the deployment of equipment that will contribute to the advancement of operation management such as digital operation recorder and for advanced initiatives such as preventing overwork driving, from the point of view to support the efforts made to prevent the traffic accidents caused by the automotive transportation operators. Also, to prevent accidents caused by health or driving while incapacitated by fatigue, we are accumulating such information as driving characteristics and physical condition management as big data, and have started using it to study accident prevention operation models, such as the possibility of establishing routes suited to the physical condition of the driver.

(vi) Measures based on the recommendations of the Committee Investigating Accidents Involving Commercial Vehicles

The Committee Investigating Accidents Involving Commercial Vehicles conducts more advanced, complex investigative analyses of accident factors for major accidents involving commercial vehicles that have a large impact on society. As of March 2018, it has publicly released 25 reports on cases concerning incidents subject to special important investigations, such as the accident in which a chartered bus fell off the road in Karuizawa Town, Kitasaku County, Nagano Prefecture on January 15, 2016.

Figure II-7-4-10 Accident Investigation Report

Overview of an investigation report for an accident involving a commercial vehicle
–Fall of a large chartered bus–
(National Route 18 (Usui Bypass) in Karuizawa Town, Kitasaku County, Nagano Prefecture)

Overview of accident

- At around 1:52 on January 15, 2016, a chartered bus carrying 39 passengers fell about 4 meters off a cliff on National Route 18 Usui Bypass in Karuizawa Town, Kitasaku County, Nagano Prefecture.
- A total of 15 people (13 chartered bus passengers, the driver, and the relief driver) were killed, 22 passengers were severely injured, and four passengers received minor injuries in the accident.
- The accident occurred approximately 1 km down a sudden succession of downhill stretches after the long uphill section of the Usui Bypass comes to an end at Iriyama Pass. The chartered bus strayed into the oncoming lanes while going around a left-hand curve on a single-lane downgrade, smashing through a guardrail on the right-hand side of the road and falling approximately 4 meter while rolling over.

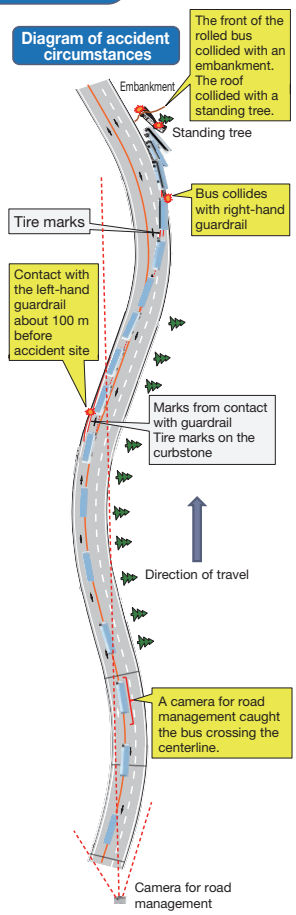
Aerial photograph of accident scene

(Provided by Nagano Police)

Causes

☆It is presumed that the accident occurred because the chartered bus could not make the curve as a result of traveling, at approximately 95 km/h, through a sharp downgrade left-hand curve in excess of the regulatory speed.
☆The road to the accident site is a series of downhill curves after crossing Iriyama Pass. It is thought that the driver of the chartered bus continued to drive while focusing on steering without braking sufficiently where engine braking, etc., should have been used to drive at a safe speed. It is thought that the direct cause of the accident was the loss of control of the vehicle as the vehicle's speed increased as a result of driving in such a way that would not be expected from a normal driver.
☆The driver had just been hired 16 days before the accident, and the business operator had not made the driver have a health checkup or aptitude test. Moreover, the driver had a blank period of at least five years when he did not drive large buses, and it is conceivable that he did not have sufficient experience or skill to drive a large bus on a mountain road. It is thought that the fact that the business operator allowed such a driver to drive the bus without providing adequate guidance and education and without checking his driving skills was a factor that led to the accident.
☆The operation manager produced and used inadequate operation instructions without investigating the route. A roll call was not conducted before starting work, and selection of the route and rest stops was left up to the driver.
☆The business operator entered the business at a time when demand for tour buses had grown greatly with the increase in inbound tourism. It is thought that a circumstance leading to the accident was the fact that the operator managed the business with little regard to safety, with the securing and training of drivers having not kept up with the rapid expansion in the scale of operations.

Diagram of accident circumstances



Recurrence prevention measures

(Chartered bus operators)
☆When selecting drivers, make sure that they have enough ability, after providing guidance and supervision according to the operational conditions
☆Make sure that drivers have health checkups and aptitude tests, as mandated by law, and provide labor management according to each driver's condition of health and appropriate guidance and supervision according to driving characteristics
☆Educate drivers on methods of safe driving according to the vehicle structure and route, and sufficiently check and evaluate drivers' driving skills through escort training
☆Operation managers are to always perform roll calls with drivers, give them written operation instructions that clearly state such matters as the route and departure/arrival times, and make sure to provide instructions needed for safe operation.
☆Drivers are to make sure to encourage passengers to wear a seatbelt, even when sleeping at night.

(MLIT)
☆Enhance and strengthen the audit system, and verify that business operators have made appropriate corrections regarding legal violations identified in audits
☆Introduce a business license renewal system for chartered buses and make sure operators maintain a safety management system
☆Establish a system of onsite guidance, using private-sector institutions, to complement audits, and check the status of safety management at all chartered bus operators at a frequency of about once a year-

Source) MLIT

(vii) Promoting measures to prevent accidents caused by rapid physical changes affecting drivers

The Council for Discussing Measures to Deal with Health-Attributable Accidents Involving Commercial Vehicles was established in September 2015 to promote screenings as a more effective tool contributing to the early detection of sleep-disorder breathing, cerebrovascular diseases, heart disease, and other key diseases, as recommended in the Manual on Health Management for Drivers of Commercial Vehicles, which was revised in April 2014. Also, in order to encourage operators to have their drivers have brain checkups, etc., we established guidelines on cerebrovascular disease counter-measures for automobile transportation operators in February 2018.

(viii) Safety measures for the land transportation of international maritime containers

In order to enhance the safety of the land transportation of international maritime containers, Guidelines for the Safe Land Transportation of International Maritime Containers were compiled on June 2013. We are working to disseminate these guidelines and ensure the effectiveness of them in collaboration with the stakeholders through stakeholders meetings and training sessions by related industries in rural areas.

(6) Comprehensive Safety Measures for Automobiles

(i) Considering vehicle safety measures for the future

In light of a report in June 2016 by the Automobile Task Force of the Road Transport Subcommittee under the Transport Policy Council, we are working to promote safety measures for children and seniors, safety measures for pedestrians and bicyclists, countermeasures against serious accidents involving large cars, and vehicle safety measures focused on handling new technologies such as automatic driving. Also, as a measure to prevent accidents involving elderly drivers, we carried out a study, in the UN, with the aim of establishing international standards regarding advanced emergency breaking systems based on an interim report compiled in a Vice Ministers' Council among relevant ministries and agencies in March 2017. Before the standards were established, we worked at promoting public awareness and encouraging the adoption of "Safety Support Cars (Support Car S)", such as by establishing a national government-run performance certification system.

(ii) Expanding, enhancing, and strengthening safety standards

Through the adoption in Japan of international standards established in the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29) to improve the safety of automobiles, we expanded and strengthened security standards, such as expanding the seats for which it is mandatory to have an unfastened seatbelt warning system. We also examined measures to ensure the safety of carts that drive on public roads, such as improving visibility by other traffic and installing seatbelts.

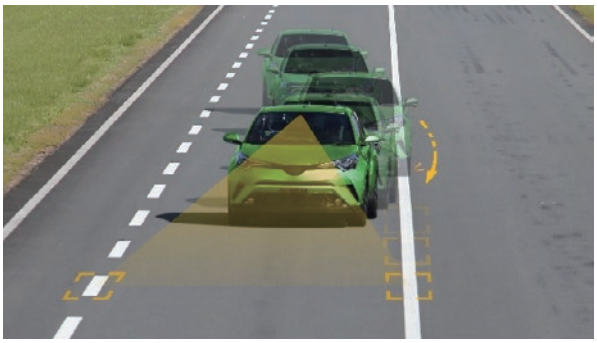
(iii) Promoting the development, commercialization, and popularization of advanced safety vehicles (ASV)

We promoted the full-scale spread of commercially viable ASV technology, such as advanced emergency braking systems, through cooperation among government, industry and academia. Also, under the sixth-term ASV promotion plan, which began in FY2016, we worked at studying technical requirements for successor models of handling systems in cases of driver abnormality, such as pulling over on the shoulder of the road.

(iv) Providing safety information through automobile assessment

In order to promote the development of safer automobiles, and enable consumers to choose safe automobiles and child restraint systems, the results of the assessment of automobile safety were published. Assessment of lane departure prevention systems began in FY2017.

Figure II-7-4-11 Lane departure prevention system



Source) MLIT

(v) Efforts toward realization of automatic driving

Established under the purview of the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29), the Automatically Commanded Steering Function Informal Working Group, co-chaired by Japan, has spearheaded the formulation of international standards on automatic driving, such as by proposing standards for automatic steering that could allow for automatic driving on expressways. Among the different types of self-steering, international standards on self-parking systems and lane keeping assist systems were established in March 2017 and, as a result, introduced in Japan. Also, in Japan, we have begun studying the safety requirements that vehicles with advanced automatic driving systems should have as well as measures to ensure safety.

(vi) The vehicle type designation system

In response to inappropriate handling, by several automakers, on completion inspection for the type designated vehicles, we established a task force in November 2017 and examined whether there were any points that ought to be revised regarding the reliable implementation of completion inspection by automakers, prevention of fraud, and the form of on-the-spot inspection by MLIT.

(vii) Swift and steady implementation of automobile recalls and informing users and others

In order to carry out vehicle recalls promptly and reliably, information is collected from vehicle manufacturers and users. In addition, checks are conducted and guidance is provided when audits are performed with respect to recall operations carried out by vehicle manufacturers. Technical verifications are conducted by the National Traffic Safety and Environment Laboratory of the National Agency for Automobile and Land Transport Technology on vehicles that are questionable in terms of conformity with safety or environmental regulations. To encourage recall repairs, we stepped up the dissemination of information to users through websites and social media. In order to reinforce the collection of information on defects, dissemination activities in connection with the hotline concerning information on automobile defects (www.mlit.go.jp/RJ/) are being proactively undertaken.

In addition, the information collected by the MLIT including malfunctions, accidents, and fires are made public and information is provided to users regarding matters that require the attention of users or details necessary for the appropriate usage or maintenance and management or to take appropriate measures when malfunctions occur. In particular, we used press releases and other means to call on users to "be wary of non-type approved child restraint systems that threaten the safety of children."

Also, in FY2017 the number of recall notifications was 377 and the number of recalled vehicles was 7,700,000.

(viii) Sophistication of vehicle inspections

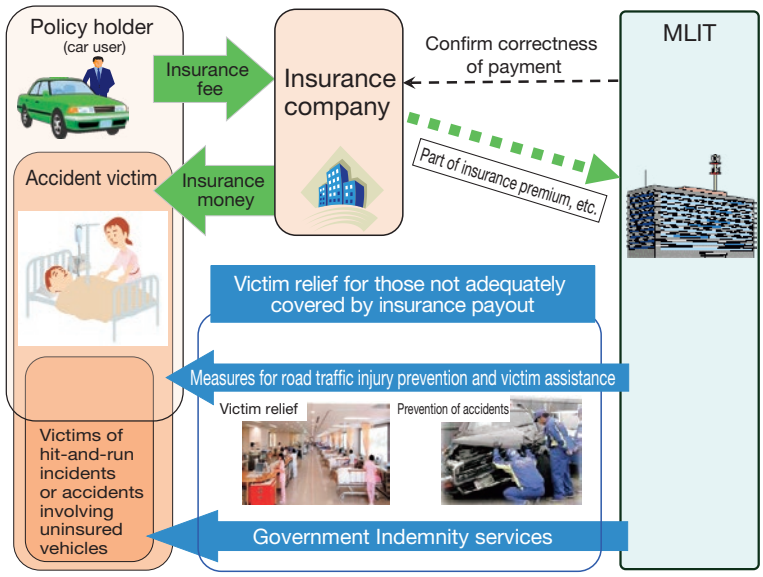
In order to prevent illegal secondary modifications[Note] and the early detection of vehicular malfunctions, information technology is being utilized to make vehicle inspections more sophisticated.

(7) Victim Support

(i) Protecting victims with the automobile liability security system

The automobile liability security system, implements various victim relief measures such as insurance payments of Compulsory Automobile Liability Insurance, governmental indemnity services (relief for victims of hit-and-run and uninsured car accidents), and payments for nursing care fees and administration of nursing care centers for those with severe residual disabilities based on the principle of the mutual support of the car society and is fulfilling a big role in protecting victims of traffic accidents.

Figure II-7-4-12 Automobile Liability Security System



Source) MLIT

(ii) Promoting traffic accident consultation activities

In order to promote the activities of traffic accident consultation offices set up by local governments, we are supporting consultation activities in communities, such as by increasing the handling capa-

Note Conduct whereby, after a vehicle undergoes a new inspection with components removed, the given components are re-attached to the vehicle and used accordingly.

bilities of counselors through training and the publication of practical manuals, and by holding meetings for liaison and coordination and the sharing of information, as well as by publicizing the availability of consultation activities through websites. In this way, we are helping to improve the welfare of traffic accident victims.

(8) Safety Measures for Mechanized Car Parking

In May 2017, JIS standards were established for standards related to the safety of mechanical parking equipment in order to improve quality based on international mechanical safety thinking and to create standards that are applicable to many kinds of mechanical parking equipment.

Also, in December 2017, the City Facilities Working Group of the Town Planning Fundamental Issues Subcommittee in the Infrastructure Development Council compiled a report on the specific direction for measures aimed at ensuring the safety of mechanical parking equipment in the future.

Section 5 Crisis Management and Security Measures

1 Promoting Crime and Terrorism Counter-measures

(1) Coordinating with Other Countries for Crisis Management and Security Measures

(i) International initiatives for security

In addition to participating in meetings and projects in the field of transport security at international conferences and organizations such as Group of Seven (G7), International Maritime Organization (IMO), International Civil Aviation Organization (ICAO), and Asia-Pacific Economic Cooperation (APEC), this knowledge is applied to domestic security measures while promoting initiatives for international cooperation and harmony. In the maritime affairs sector, Japan, together with the United States and other countries, proposed draft guidelines on maritime cyber security. Guidelines developed based on that proposal were approved at an IMO meeting held in June 2017.

The "International Working Group on Land Transport Security (IWGLTS)" established in 2006 currently has a participation of over 16 nations and is expected to further evolve as a framework for bilateral dialogue with the United States of America and European Union on land transport security and it will be utilized to improve domestic security and international contributions.

(ii) Anti-piracy measures

According to the International Maritime Bureau (IMB), there were 180 instances of piracy and armed robbery in 2017. Broken down by region, the sea area around Somalia accounted for 9 instances, Africa (the Gulf of Guinea) accounted for 45 instances, and the sea area around Southeast Asia accounted for 76 instances.

While the number of heinous cases of piracy increased rapidly in the sea area around Somalia beginning in 2008, such cases have declined to low levels in recent years thanks to anti-piracy efforts by the navies of different countries, the implementation of self-defense measures based on best-management practices (BMP)[Note] on the part of merchant ships, and the initiatives of the international community, such as in terms of the presence of armed security on board merchant ships. Nevertheless, in 2017 there was an instance of hijacking—the first in four years in 2013—and circumstances in terms of the navigation of merchant ships remain unpredictable.

Under this situation, a Japan Maritime Self-Defense Force destroyer is conducting escorts of merchant ships in the Gulf of Aden as well as surveillance patrols by the P-3C patrol aircraft based on the Law on Punishment of and Measures Against Acts of Piracy. The MLIT provides a contact point for escort requests from shipping companies and others and selects vessels to be escorted. The MLIT also steadily applies the Act on Special Measures Concerning the Guarding of Japanese Ships in Pirate-infested Waters (in force since November 30, 2013), which allows security guards employed by commercial security companies to guard Japanese-flagged vessels with which certain requirements are satisfied and

Note Stipulations of self-defense measures (such as measures to avoid piracy and the development of escape compartments onboard a ship) to prevent or minimize the harm caused by Somali piracy as produced by the International Chamber of Shipping and other international shipping organizations.

ensures the complete navigational safety of Japanese-flagged vessels.

In order to deal with pirates off the coast of Somalia and in the Gulf of Aden, the Japan Coast Guard dispatches eight of its officers to Japan Maritime Self Defense Force destroyers to conduct judicial police activities in cases of piracy incidents. These Coast Guard officers are engaged in vigilance against piracy and the collection of information together with Maritime Self-Defense Force officials. The Japan Coast Guard also dispatches airplanes to littoral states in those areas to conduct pirate escort and extradition drills with the coast guard agencies of the relevant countries.

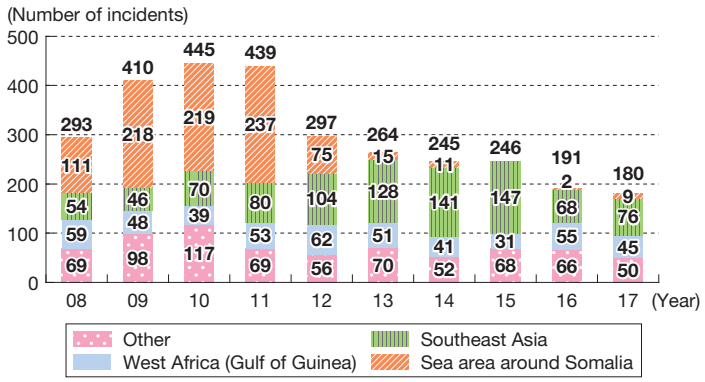
Figure II-7-5-1 State of the Occurrence of Piracy and Armed Robbery Against Japanese-related Ships as Reported to the MLIT (2017)

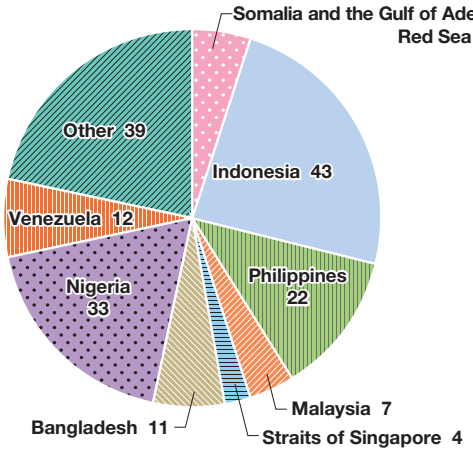
Source) MLIT

In the seas of Southeast Asia, the Japan Coast Guard dispatches patrol ships and airplanes to conduct cooperative anti-piracy drills and to exchange opinions and information with the coast guard agencies of countries where port calls are made. These are part of its efforts to promote links and cooperative relationships.

In addition, we are working actively to help increase law-enforcement capabilities, including conducting trainings for members of coast guard agencies of littoral states in these regions. We also contribute to international coordination and cooperation through international bodies, such as by dispatching personnel to the Information Sharing Center (ISC), which was established according to the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP).

Figure II-7-5-2 "Changes in the Number of Incidents Involving Piracy and Armed Robbery Worldwide (According to the IMB Report)" and "Number of Incidents Involving Piracy and Armed Robbery by Sea Area in 2017 (According to an IMB Report)"





(Notes) 1 In the years between 2003 and 2009 and in 2014, the number of incidents of piracy in the waters around Somalia involved incidents occurring in Somalia, the Gulf of Aden, and the Red Sea; in the years between 2010 and 2013, the number of incidents of piracy in the waters around Somalia involved incidents occurring in Somalia, the Gulf of Aden, and the Red Sea, as well as incidents occurring in the Arabian Sea, Indian Ocean, and Oman.
2 The number of incidents for West Africa consists of incidents occurring in Angola, Benin, Cameroon, Congo, Gabon, Ghana, Guinea, Guinea-Bissau, Cote d'Ivoire, Liberia, Nigeria, Republic of Congo, Senegal, Sierra Leone, and Togo.

Source) MLIT

(iii) Security measures for ports

Through the sharing of information with other countries and other international efforts related to port security, such as meetings with Japan-ASEAN port security experts, we are improving port security throughout the region.

(2) Comprehensive and Strengthened Counter-Terrorism Measures for Public Transport

The threat of global terrorism continues to be a serious one, and so it is important to carry out anti-terrorism measures for public transportation and key infrastructure. Preparing for the Tokyo Olympics and Paralympics in 2020, MLIT established the Antiterrorism Working Group, chaired by a Senior Vice-Minister of Land, Infrastructure, Transport and Tourism, to promote security measures. Under that working group, we established the Soft Target Antiterrorism Team and are proceeding with a cross-ministerial study. Going forward, we will strengthen both structural and non-structural anti-terrorism measures within our fields of jurisdiction and continue to carry out initiatives in coordination with relevant ministries and agencies.

(i) Promoting counter-terrorism measures for railways

In addition to increasing security cameras within stations and strengthening patrols, "crisis management levels" are set and operated as well as "displaying security and user participation[Note]" as the axis of promoting counter-terrorism measures.

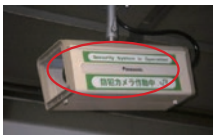
Figure II-7-5-3 Implementing "Displaying Security and User Participation" as the Axis of Railway Counter-Terrorism Measures

(Picture 1) "Crisis management poster" displayed inside the station

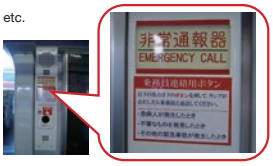
(Picture 2) "Anti-terrorism cooperator emblem" on sales staff, etc.

(Picture 3) Displaying request for cooperation relating to any suspicious objects, etc. discovered on the platform ticker

(Picture 4) Patrols by security guards and staff.



(Picture 5) Warning messages (such as "This area monitored by security cameras") are conspicuously displayed.



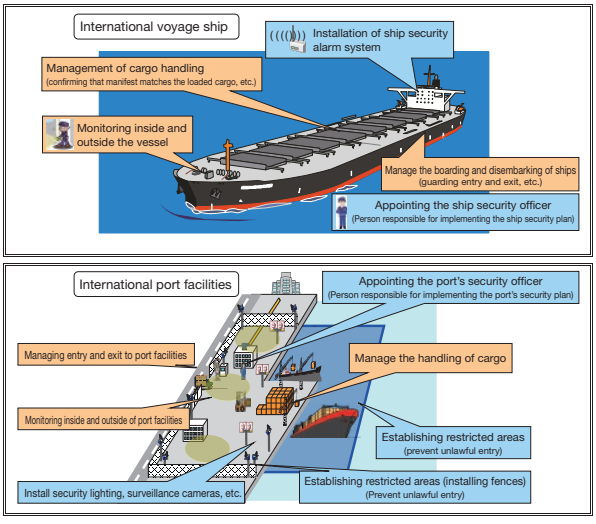
(Picture 6) Utilization of train intercom for the discovery of suspicious objects, etc. (State "For the discovery of suspicious activity" prominently on the explanation sticker as grounds for reporting

Source) MLIT

(ii) Promoting counter-terrorism measures for ships and ports

MLIT has been engaged in ensuring security, through approval of the Ship Security Plan of the Japanese ships engaged in international voyage and ship verification of them, approval of the Port Security Plan of the international port facilities in Japan, and control of all the ships entering into the ports, such control includes verification of them and Port State Control (PSC), in accordance with "Act on Assurance of Security of International Ships and Port Facilities." In addition, we will continue to implement joint inspections of security systems with the police, Japan Coast Guard and others in an effort to further strengthen security measures.

Figure II-7-5-4 Security Measures for International Voyage Ships and International Port Facilities



Source) MLIT

Note Displaying Security: Measures to proactively prevent terrorism by making security highly visible to people.
User Participation: Measures to promote each individual railway user to be aware of preventing terrorism and take appropriate actions to strengthen the network for monitoring terrorist activities.

(iii) Promoting counter-terrorism measures for aviation

In order to do every possible thing to prevent terrorist attacks toward aircraft in our country, the aviation security framework is being strengthened in accordance with the international standards defined by the Convention on International Civil Aviation. In such situation, corresponding to the cases of terrorism and the unlawful intrusion inside and outside our country, in addition to strengthening the fences for intrusion preventive measures against vehicles and people, prompt measures are being taken such as installing sensors on every airport, which are able to cope with intrusion. Furthermore, as part of efforts to strengthen aviation security measures, in FY2017, new body scanners were installed at eight airports, including Naha and Kagoshima, and high-performance automatic explosives detectors were newly installed in some major airports, including Tokyo International Airport. Also, information exchanges with major countries are carried out through active participation in international conferences and other opportunities to share Japan's experience with the latest security measures.

(iv) Promoting counter-terrorism measures for automobiles

Relevant businesses are instructed to carry out inspections inside vehicles, strengthen patrol of the inside and perimeters of business offices and garages, and dispatching security officers to major bus stops during seasons with increased travelers.

(v) Promoting counter-terrorism measures for major facilities

For various river facilities special attention is paid for suspicious objects during river inspections and sight patrols; the lockout of entries and exits of dam management offices and dam body inspection corridors is also being strengthened. For various road facilities, special attention is paid to suspicious objects when patrolling expressways and directly managed roads and the trash boxes of rest facilities is also being aggregated. For national parks, security patrols are strengthened and caution is called for with various bulletins. At construction sites signboards are installed along with other measures calling for greater caution.

(3) Balancing Security and Efficiency of Logistics

For international logistics, initiatives to balance security and efficiency are spreading to each country, even in our country, the dissemination of AEO system[Note 1] for logistics companies is being promoted. At present, the cargo for which the export declaration is done by AEO exporter, and AEO bonded transporter transports the cargo up to the bonded area, export declaration for the cargo is entrusted to AEO customs broker, also receiving the export permission before the cargo is stored in bonded area.

For the security system of air cargo with the purpose of protecting air cargo from the shipper to loading on aircraft, the KS/RA system[Note 2] based on international standards established by the ICAO is adopted. Then, based on the request of the United States for further security strengthening, the system was revised while maintaining the smooth performance of the logistics, applied from October 2012 for the United States for international passenger flights equipped with cargo, the same system was also expanded for application of all international passenger flights equipped with cargo from April 2014.

Also, in the container terminals of major ports, an access control system is being implemented to accurately confirm the identity and association of truck drivers and full-scale system operation started from January 2015.

(4) Information Security Measures

The sophistication of cyber attacks on government institutions and businesses has been growing in recent years. Amid the increasing importance of initiatives for information security measures, measures will need to be further fortified as we head toward the Tokyo Olympic and Paralympic Games in 2020.

For this reason, MLIT is taking information security measures, including at incorporated administrative agencies and critical infrastructure operators under its jurisdiction (aviation, railway, and logistics). These measures include carrying

Note 1 A system for the customs to certify international trade related business operators with well developed system of security management of cargos and compliance with laws and to grant the benefit of simplifying customs clearance.

Note 2 A system that confirms the safety of all air cargo before loading the aircraft for designated shippers (Known Shipper), designated air cargo shipping businesses or designated air shipping agents (Regulated Agent), or air carriers.

out initiatives to enhance and strengthen preparedness for dealing with cyber attacks. For especially important infrastructure, we plan to begin provisional operation from FY2018 of the tentatively named Transportation-ISAC, which is a system for business operators to share information and conduct analyses and countermeasures in coordination with each other.

2 Establishing a Response System for Accident Disasters

When accident disasters such as accidents involving multiple fatalities occur on rail, air, etc. or ships are involved in oil spill accidents, a disaster response headquarters is established within the MLIT to develop a system to collect and aggregate precise information quickly and be able to implement disaster emergency measures with relevant government agencies.

For accident disasters at sea, coordination with relevant organizations is being furthered such as ensuring a dispatch system for patrol vessels and aircraft and readying disaster mitigation equipment and rescue equipment, in addition to implementing joint training. Also, environmental protection information on coastal waters needed to contain oil, etc., is being compiled and provided.

3 Ensuring Public Safety at Sea

(1) Promoting Counter-Terrorism Measures

As measures to prevent terrorism, nuclear power plants, petroleum complexes, and other important facilities in coastal areas are subject to surveillance and detection functions carried out by patrol vessels and aircrafts. Passenger terminals, ferries, and other soft targets where large numbers of people can be found are also subject to surveillance and detection functions on a priority basis.

Counter-terrorism measures are also being carried out by public-private partnerships formed through close ties with relevant organizations and local governments. Such measures include the provision of thorough guidance to business operators on the matter of self-security, encouragement of counterterrorism drills, raising passengers' awareness of the risks of terrorism and calling on them to quickly report suspicious matters, the implementation of joint trainings on antiterrorism measures, and the holding of conferences on maritime and coastal antiterrorism measures. Also, we are now discussing how to strengthen antiterrorism measures in anticipation of the Tokyo Olympic and Paralympic Games in 2020.

(2) Promoting Measures Against Suspicious Vessels and Spy Ships

It is well known that suspicious vessels and spy ships are probably engaged in serious crime in our country's territorial waters and to shed light on their objectives and activities, suspicious boats needs to be stopped for boarding inspection and if crime is discovered, it needs to carry out a proper criminal investigation. For this reason, in response to suspicious vessels and spy ships, the Japan Coast Guard which is a police organization deals with them as the primary agency in cooperation with relevant government agencies.

The Japan Coast Guard conducts various training as well as closely works with relevant agencies, etc. to exchange information, and thereby strives to detect suspicious vessels and spy ships early as well as to maintain and improve capabilities to cope with them.

(3) Promoting Measures Against Maritime Crimes

Examples of recent trends that we are seeing in terms of maritime crimes include cases in which domestic poaching is carried out by poachers and buyers working in tandem and cases in which funding is provided by crime syndicates. Maritime environmental offences, such as cases in which waste products are illegally dumped into the ocean to avoid having to pay for treatment costs, continue to be perpetrated. Furthermore, in crimes in which foreign fishing vessels operate illegally, some vessels operate unlawfully under cover of darkness to evade control. International criminal organizations are also getting involved in the smuggling and the illegal migration. Regarding various maritime crimes, there is still a need for vigilance and Japan Coast Guard is strengthening surveillance and law enforcement, gathering and analyzing crime information, and strengthening boarding inspections by effectively utilizing patrol vessels and aircraft as well as sharing

information with relevant domestic and foreign organizations as part of the efforts to pursue effective measures and take strict yet appropriate measures against maritime crimes.

Column

First Detection of a Gold smuggling case-into Japan through transshipment

In May 2017, the Japan Coast Guard, in conjunction with relevant authorities, detected an incident of smuggling gold bullion into the country through delivery at sea (handing over cargo at sea).

In this incident, Chinese nationals who had come to Japan and Japanese nationals used a small boat to receive around 206 kg of gold from a vessel of unknown nationality on the East China Sea and tried to smuggle it into a fishing port in Karatsu City, Saga Prefecture. This was this first incident in Japan of smuggling gold into the country through transhipment and also the largest-ever amount seized in a single incident.

Also, in October 2017, an incident was detected in which Chinese crewmembers and Hong Kong passengers used a cruise ship to smuggle about 27 kg of gold into a port in Naha City, Okinawa Prefecture.

The gold seized in 2017 through the detection of these incidents amounted to a record-breaking 233 kg.

In addition, the Japan Coast Guard has also cracked down on the smuggling of drugs including methamphetamine via the sea and has detected incidents of transshipment-using small boats and smuggling of drugs hidden in sea cargo containers.

Situation during detection

Source) MLIT

Gold seized (approx. 206 kg)

Source) MLIT

Column

Dealing Strictly with North Korean Fishing Boats Increasing Rapidly in Japanese Waters Called Yamatotai: Ensuring the Safety of Japanese Fishing Boats

An area in the middle of the Japan Sea called Yamatotai is a good fishing ground for squid and crab. The area is named Yamatotai for the fact that the Yamato, a survey vessel in the then-navy's Hydrographic Department conducted a detailed survey of the area in 1926.

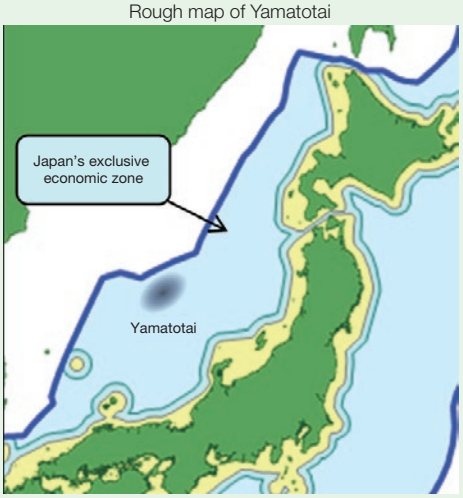
The average depth of the Japan Sea is about 1,700 meters, but the water is shallow (236 meters at the shallowest) in Yamatotai, which is the site of an oceanic ridge that developed when the Japan Sea spread apart in the past. Ocean currents hitting Yamatotai, which can be described as a mountain range in the sea, cause an upwelling of nutrient-rich deep-sea water. This results in growth of plankton, which are food for fish, turning Yamatotai into one of Japan's leading fishing grounds.

In recent years, North Korean fishing boats operating illegally in Japan's exclusive economic zone have been increasing rapidly near Yamatotai, creating a situation that threatens the safety of Japanese fishing boats.

In addition to patrol by aircraft, the Japan Coast Guard has been dispatching multiple patrol vessel, including large patrol boats, to the area since early July 2017, in order to ensure the safety of Japanese fishing boats and respond the illegal operations by North Korean fishing boats. These patrol vessel have made over 1,900 North Korean fishing boats leave Japan's exclusive economic zone near Yamatotai by giving warning to leave using steam whistles and loud sounds as well as water cannon at over 300 of those boats.

The Japan Coast Guard will continue to respond strictly, in close cooperation with authorities concerned, such as the Fisheries Agency.

Rough map of Yamatotai



Source) MLIT

Patrol vessel using water cannon at North Korean fishing boats

Source) MLIT

North Korean fishing boat leaving after being warned

Source) MLIT

4 National Security and Protecting Citizens' Lives and Assets

(1) Responding to North Korea Issues

In view of the international situation surrounding Japan, including North Korea's announcement in October 2006 that it had conducted a nuclear test, Japan prohibits certain ships connected with North Korea from entering its ports, in accordance with the Act on Special Measures Concerning the Prohibition of Entry of Specified Ships into Ports. In January 2016, North Korea conducted a nuclear test and in February it launched a ballistic missile referred to as a "satellite." In light of these developments, the government decided in a Cabinet meeting on February 19 to bar from entering Japanese ports any third-country ships verified through procedures set forth under Japanese law as having made a port call in North Korea, in addition to ships registered in North Korea, beginning on that day. Also, in a Cabinet meeting on April 1, it was decided to include those ships among the ships subject to sanctions based on a decision of the United Nations Security Council. Furthermore, in light of such facts as North Korea's nuclear test conducted in September, at a Cabinet meeting on December 9, it was decided to also include from that day forward ships registered in Japan that were verified through procedures set forth under Japanese law as having made a port call in North Korea. To ensure the implementation of these measures, the Japan Coast Guard is conducting the confirmation of information regarding the arrivals of North Korea-flagged ships. Also, to ensure the effectiveness of the measures banning exports to North Korea, such as United Nations Security Council Resolution 1874, in accordance with the Special Measures Law Regarding Cargo Inspections, etc., of Japan in Accordance with United Nations Security Council Resolution 1874, etc., close coordination with relevant administrative agencies is promoted to ensure the effectiveness of measures stipulated by the law.

Based on the repeated occurrences of North Korean transgressions, the MLIT has fortified immediate response systems in close coordination with relevant ministries and agencies, and a system for monitoring and keeping track of North Korea remains in effect. Even in cases of nuclear testing and ballistic missile launches, we collect information and provide necessary information to ensure the safety and security of the nation. In particular, in such cases as the possibility of a North Korean ballistic missile coming near Japan, we transmit information directly, or through business operators, to aircraft and ships near Japan, warning them to be alert. Moreover, the Japan Coast Guard is making system improvements with the aim of automating the transmission of information to ships near Japan.

(2) Responding to Armed Attacks and Other Situations Under the Civil Protection Plan

In accordance with the Act concerning the Measures for Protection of the People in Armed Attack Situations and Basic Guidelines for Protection of the People that stipulates measures regarding the evacuation, rescue and minimization of losses due to armed attacks, etc., the MLIT, the Geospatial Information Authority of Japan, the Japan Meteorological Agency, and Japan Coast Guard stipulate Plan for the Protection of the People. The MLIT has stipulated that support for engaging in communications and coordinating with designated public institutions as public carriers in connection with the transporting of refugees in response to local government requests shall be provided. The Japan Coast Guard has stipulated that the implementation of measures for alarms and evacuations shall be communicated and that required measures, such as those to be taken to help guide refugees, shall be implemented.

5 Infectious Disease Measures

We are coping with the infectious diseases, by close cooperation with the relevant ministries and agencies, including the Ministry of Health, Labor and Welfare and the Cabinet Secretariat for the measures.

For countermeasures against pandemic influenza and new infectious diseases, "the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response (hereinafter Act on Special Measures)" was established in May 2012 and put into effect in April 2013. The Act on Special Measures is designed to limit the spread of infections as much as possible, protect the life and health of national citizens, and minimize impact on citizen's lives and the national economy by:1) businesses in general must work to cooperate with prevention and countermeasures and consider impacts due to epidemics and work to implement appropriate measures in conducting business, 2) Registered business operations eligible for prior vaccination must continue to carry out business activities that contribute to the stability of citizen's lives and economy even during outbreaks, and 3) designated public institutions are required by regulation to

implement measures against breakouts of new type influenzas, etc., and designated public institutions that serve as transport operations must establish individual business plans in the event of new type influenzas, etc., emergency situations and carry out necessary measures to appropriately implement the transport of passengers or cargo.

In June 2013, the National Action Plan for Pandemic Influenza and New Infectious Diseases of JAPAN based on the Act on Special Measures was approved by the Cabinet and it includes countermeasures against pandemic influenza and new infectious diseases such as the basic policy, the implementation system, surveillance and intelligence gathering, prevention and stopping of outbreaks, medical treatment, and ensuring the stability of citizen's lives and the national economy for the various outbreak stages of pandemic influenza and new infectious diseases.

In accordance with this, MLIT amended the MLIT Action Plan or Pandemic Influenza and New Infectious Diseases in June 2013 and for the implementation of the newly incorporated various measures in the Act on Special Measures: 1) the role of designated (local) public institutions which are transport business operators, and 2) responses when a declaration of an emergency situation regarding Pandemic Influenza were defined. Additionally, during overseas outbreak phase, cooperate with preventative measures to delay domestic epidemics as much as possible and when quarantine airports and harbor are aggregated, call for cooperation between airport and port administrators, and after the early phase of domestic outbreak, make transport requests for emergency supplies such as medical and food supplies in case of urgent need.

Since 2013, we have conducted an annual information transmission drill based on the scenario of an outbreak of a new strain of pandemic influenza. Additionally, in 2016, we conducted an operations drill at the MLIT Headquarters for Promoting Measures Against New Strains of Pandemic Influenza and Other New Infectious Diseases to verify the responses that would be necessary during the spread of a new strain of pandemic influenza within Japan.