

# 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).

#### (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.

#### (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 within the region, the conversion of housing to barrier-free housing is supported by measures such as reducing the interest on Japan Housing Finance Agency’s (Independent Administrative Institution) Flat 35 S Loans for obtaining

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 2015) | Target value (percentage) as of the end of 2020 |
|--|------------------|---------------------------------|--|---|
| Railway stations                                     | 3,542            | 3,045                           | 86.0%  | 100%  |
| Bus terminals  | 48               | 43                              | 89.6%  | 100%  |
| Passenger ship terminals                             | 14               | 14                              | 100.0%   | 100%  |
| Airport passenger terminals                          | 35               | 30                              | 85.7% (100%)   | 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.

2 The installation of elevators, escalators, and slopes that can be used by the disabled in airport passenger terminals had already reached the 100 percent level by March 2001.

○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 2020 |
|---|--------------------------------|---|--|---|
|   | As of the end of 2015          | As of the end of 2015   | As of the end of 2015                  |   |
| Railway carriages   | 52,346                         | 34,140  | 65.2%                                  | About 70%                                       |
| Low-floor buses (excluding exemption-certified vehicles)        | 45,228                         | 22,665  | 50.1%                                  | About 70%                                       |
| Lift-equipped buses (excluding exemption-certified vehicles)    | 15,124                         | 895   | 5.9%                                   | About 25%                                       |
| Welfare taxis   | —                              | 15,026  | —                                      | About 28,000 cars                               |
| Passenger ships   | 650                            | 238   | 36.6%                                  | About 50%                                       |
| Airplanes   | 593                            | 571   | 96.3%                                  | 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

housing that fulfills a certain barrier-free level; 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  |
|---|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 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   |
| 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 |

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.

### (3) Promoting Universal Design for the 2020 Tokyo Olympic and Paralympic Games

Taking the upcoming 2020 Tokyo Olympic and Paralympic Games as an opportunity to promote the precepts of universal design and Mental barrier-free and Universal design town building and implement measures to leave behind a concrete legacy after the Games come to an end, a liaison council of ministries and agencies with ties to Universal Design 2020 was set up in February 2016 under the purview of the Headquarters for the Promotion of the Tokyo Olympic Games and Tokyo Paralympic Games. In August 2016, an interim summary was compiled for discussions in the “Mental barrier-free and Universal design town building” and “Town-building Subcommittees of the network of ministries,” which were set up under the liaison council. Then, in February 2017, the liaison council was upgraded to a council of relevant ministers, which decided on a Universal Design 2020 Action Plan that sets out an agenda of concrete measures.

## 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," decided by the Cabinet on May 20, 2016, as well as the "Plan for Dynamic Engagement of All Citizens," the "Japan Revitalization Strategy 2016," and the "Basic Policy on Economic and Fiscal Management and Reform 2016," decided by the Cabinet on June 2, 2016, all promote teleworking. In ways such as this, the momentum to promote teleworking has increased greatly.

Relevant ministries and agencies set up a liaison council of government ministries and agencies concerned with teleworking. The council, whose members include vice ministers from each ministry, works cooperatively to promote the further adoption of teleworking, including by sharing each ministry and agency's initiatives to promote teleworking and considering collaborative measures.

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)" and "Pool Safety Standards Guidelines" and programs such as the Social Capital Development Integrated Grant 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 2015 is implemented at 952 housing projects (24,836 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

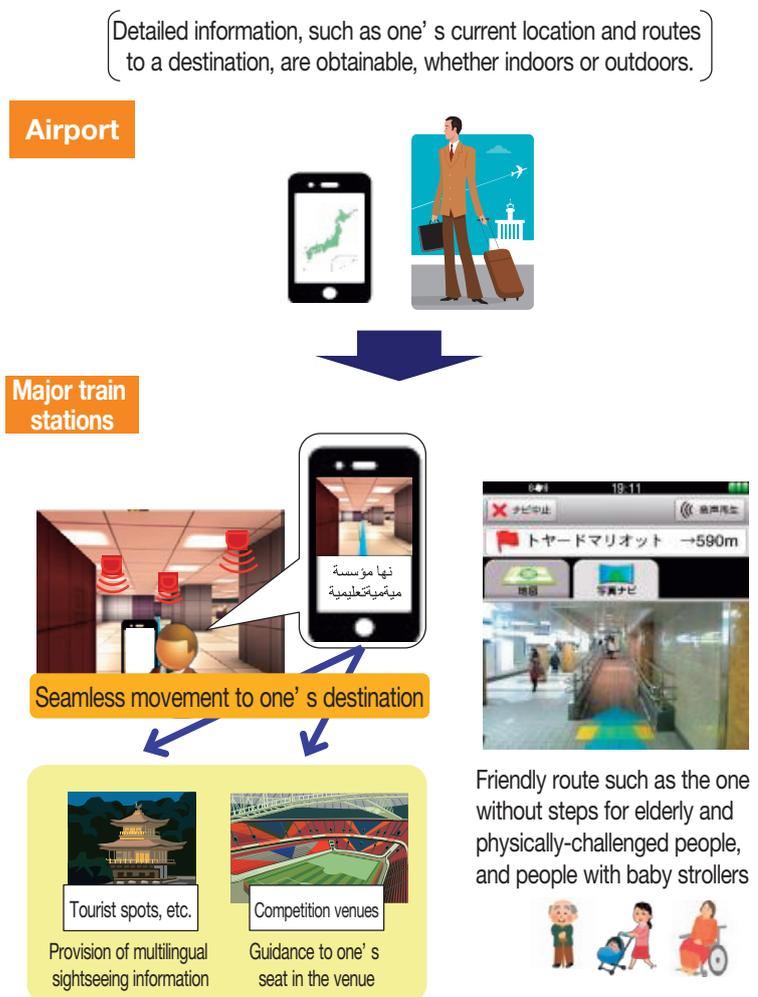
In order to respond to the demand for the transportation of disadvantaged such as the elderly and disabled to hospitals and other care facilities, the implementation of welfare taxis<sup>Note</sup> is being promoted, and as of the end of FY2015, 17,062 vehicles were in operation. In addition, the Investment 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 FY2015, 3,107 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 are carrying out environmental improvements such as the promotion of “open data” aimed at the creation of services by diverse entities, and in March 2017, we revised the specification for data needed to build the services. In addition, using the area around Tokyo Station, the area around Shinjuku Station, Narita Airport, and International Stadium Yokohama (Nissan Stadium) as model cases, we have developed indoor digital maps and a positioning environment and have conducted demonstration tests of mobility support services for people such as wheelchair users.

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



**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.

## Column

## Toward the Realization of the Barrier-free, Stress-free Society

Information such as where you are, and which route would be best to reach your destination, is expected to become even more accurate than it is at present, both indoors and outdoors, owing to the dissemination and technical innovation of the smartphone and other information communication tools, as well as to the four quasi-zenith Japanese satellites set to be operational in fiscal 2018, which will complement the GPS satellite of the United States.

By using these technologies and installing indoor electronic maps and transmission devices called beacons to accurately identify where you are, even in underground malls and inside buildings where satellite signals are hard to reach, a variety of private-sector services are emerging to provide even greater convenience. These services are also expected to help realize the Barrier-free, Stress-free society in which everyone, including elderly people, people with disabilities, and foreign visitors, can travel smoothly and take part in society.

With this image of future society in mind, the MLIT launched the Indoor high-precise positioning project as a new initiative pursued in concert with transport operators, facility managers, and various other private-sector companies, with an eye to the 2020 Tokyo Olympic and Paralympic Games. In fiscal 2016, a demonstration test was implemented using a navigation app to guide wheelchair users to avoid bumps and obstacles by installing indoor electronic maps and beacons on a trial basis with the cooperation of interested parties. The test was implemented in four locations: around Tokyo Station, which has the largest underground space in Japan; around Shinjuku Station, which is used by the largest number of passengers in Japan; in Narita Airport, which serves the largest number of international flight passengers; and in Nissan Stadium, which boasts the largest capacity of all stadiums in Japan.



## 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-related disasters occur almost yearly. The year 2016 saw meteorological phenomena and earthquakes which have not occurred recent years, including Kumamoto Earthquake in 2016, which recorded a maximum seismic intensity of 7 twice within a short period, three tropical cyclones making landfall in Hokkaido for the first time in recorded history, and a tropical cyclone making landfall on the Pacific coast of the Tohoku region for the first time in recorded history. Additionally, there were many other disasters, including torrential rain, with

the seasonal rain front falling on the areas afflicted by Kumamoto Earthquake in 2016 and an earthquake with an epicenter in central Tottori. The importance of natural disaster measures is more urgent than ever before because there is concern over water- and sediment-related 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, disaster mitigation, and dilapidation measures 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 in 2016, 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-related disasters.

Given the notion that major flooding exceeding the capacity of facilities engineering will inevitably occur, we set out a “Vision for the Restructuring of Society to Raise 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. We are carrying out initiatives based on that vision, starting with rivers under the ministerial jurisdiction. Further, in August 2016, we decided to expand the initiatives under the “Vision for the Restructuring of Society to Raise Flood Prevention Awareness” to rivers managed by prefectural governments and are trying to accelerate initiatives in rivers managed by prefectural governments, in light of the damage caused by the series of tropical cyclones that struck Hokkaido and Tohoku regions.

Given the concerns about the growing frequency and intensity of water disasters, sediment-related disasters, and droughts caused by global warming-induced 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 are studying projected damage and countermeasure plans, including for areas outside flood zones.

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 dyke in zero meter areas against earthquakes, according to the specific damage features anticipated.

Now, when there are less than four years until the 2020 Tokyo Olympic and Paralympic Games, is the time to ensure disaster-prevention measures in the capital region, for which we established the Roadmap of Measures Against the Tokyo Inland Earthquake Ahead of the Tokyo Olympic and Paralympic Games, which sets out a concrete action plan based on the Ministry of Land, Infrastructure, Transport and Tourism Tokyo Inland Earthquake Response Plan.

### (1) Rolling Out the Vision for the Restructuring of Society to Raise Flood Prevention Awareness

#### (i) Vision for the restructuring of society to raise flood prevention awareness

We established the Vision for the Restructuring of Society to Raise Flood Prevention Awareness in response to the heavy rains that fell in the Kanto and Tohoku regions in September 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.

In 2016, MLIT discussed concrete initiatives to take at rivers under ministerial jurisdiction and 129 areas alongside such rivers in light of regional features, with a view toward such things as smooth and rapid evacuation, appropriate flood fighting activities, and drainage of floodwater. We compiled initiatives for the next five years into Regional Action Policies and various initiatives are already underway.

In August 2016, we decided to expand these initiatives to rivers managed by prefectural governments. By the flood season of 2017, councils composed of prefectural and municipal governments, who are the river administrators, will be set up and, with the support of the national government, local governments will compile Regional Action Policies by March

2018 to reduce disasters in rivers managed by prefectural governments.

(ii) Responses based on disasters in Hokkaido and Tohoku regions in August 2016

The torrential rain brought by tropical cyclones that struck successively in August 2016 caused flood damage, including the dyke 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 light of these incidents, we are accelerating the expansion of initiatives under the Vision for the Restructuring of Society to Raise Flood Prevention Awareness to rivers managed by prefectural governments, which is an action that had already been decided. As one of the initiatives, we drew up the Guidelines for the Use of Hotlines for Small and Medium-sized Rivers, in order to widely entrench in the prefectural governments the use of “hotline” to support the decision to issue evacuation orders by river administrators communicating information during a flood through means such as direct telephone calls to the mayor.

In January 2017, the Infrastructure Development Council reported on its recommendations for restructuring society to raise flood prevention awareness regarding small and medium-sized rivers. The report recommended that relevant parties such as river administrators, local governments, and local communities cooperate and support each other, responding with all-out, unified efforts toward the goals of “eliminating human suffering resulting from the inability to escape” and “ensuring the continuity of local community functions” according to the current situation facing small and medium-sized rivers, such as climate change and a declining population.

In light of this report, in February 2017, we submitted to the Diet a bill to partially amend the Flood Control Act with the aim of achieving “zero failures to escape” and “minimization of social and economic damage” from floods by creating evacuation plans at nursing-care facilities located in areas with a high water-disaster risk, mandating evacuation drills, and disseminating water-disaster risk information, including for small and medium-sized rivers, to community residents.

Figure II-7-2-1 Vision for the Restructuring of Society to Raise Flood Prevention Awareness

In response to torrential rains that fell in the Kanto and Tohoku regions, the restructuring of society to raise flood prevention awareness 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 a [Vision for the Restructuring of Society to Raise Flood Prevention Awareness](#).

- <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.

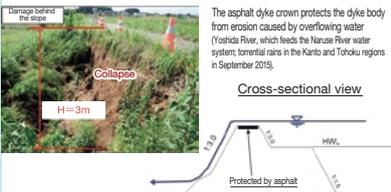
**Key measures**

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.

<Structural measures for flood damage mitigation>

- Promote measures to devise ways of constructing dykes that can extend the time to collapse even in the event of an overflow.

<Ideas for constructing dykes to mitigate damage (example of measure)>

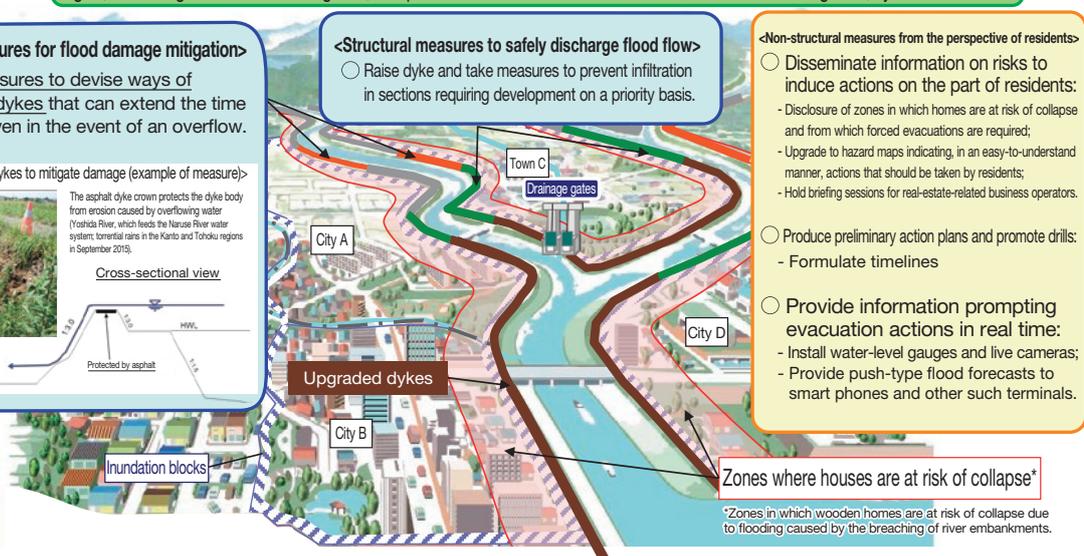


<Structural measures to safely discharge flood flow>

- Raise dyke and take measures to prevent infiltration in sections requiring development on a priority basis.

<Non-structural measures from the perspective of residents>

- Disseminate information on risks to induce actions on the part of residents:
  - Disclosure of zones in which homes are at risk of collapse and from which forced evacuations are required;
  - Upgrade to hazard maps indicating, in an easy-to-understand manner, actions that should be taken by residents;
  - Hold briefing sessions for real-estate-related business operators.
- Produce preliminary action plans and promote drills:
  - Formulate timelines
- Provide information prompting evacuation actions in real time:
  - Install water-level gauges and live cameras;
  - Provide push-type flood forecasts to smart phones and other such terminals.



Source) MLIT

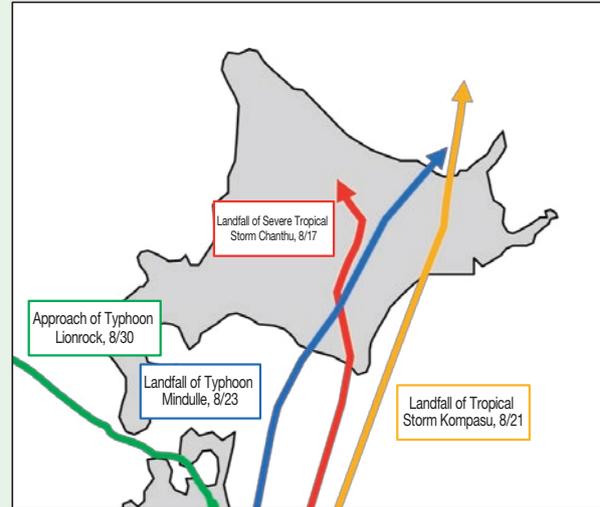
## Column

### Promoting Emergency Flood Control Measures in Response to the Series of Tropical Cyclones That Occurred in August 2016

#### ■ Damage from the series of tropical cyclones in August 2016

The series of tropical cyclones that struck Hokkaido in August 2016 brought record-breaking heavy rain, which breached dykes and caused flooding along the banks of the Tokachi River water system. As a result, homes and farmland were swamped, roads were flooded, bridges were damaged, and other such serious damage was sustained throughout the area.

Another impact from Typhoon Lionrock was the record-breaking downpour on the coastal regions of Iwate prefecture, causing serious flood damage along the Omoto River (Iwaizumi Town).



Two tropical cyclones made landfall on Hokkaido in a single year (three, when including re-landfall), for the first time since statistics began to be compiled by the Japan Meteorological Agency (1951). More damages due to approach of Typhoon Lionrock.  
Source) MLIT

#### (1) Damage from Typhoon Mindulle and Tropical Storm Kompas

The overflow of Ishikari River, a river under the ministerial jurisdiction, inundated homes in Fukagawa City and Asahikawa City, flooding approximately 120 ha of farmland. Similarly, the overflow of the Tokoro River wrought its own severe flood damage, inundating some 470 ha of farmland in Kitami City. Flood damage was also seen along the Bebetsu River, a river of the Ishikari River water system that is managed by Hokkaido, and where dykes were breached.

#### (2) Damage from Typhoon Lionrock

Along the Sorachi River, belonging to the Ishikari River water system and under the ministerial jurisdiction, the dyke breached and inundated approximately 130 ha of Minami-Furano Town.

Along the Omoto River, a part of the Omoto River water system that is managed by Iwate Prefecture, inundating much of the narrow, low-lying area and hitting a record-breaking rise in water level that resulted in injuries at a facility vulnerable for people.

#### ■ Emergency flood control measures

##### (1) Hokkaido emergency flood control project

In fiscal 2016, the Hokkaido Emergency Flood Control Project was launched in cooperation among relevant institutions, to implement both structural

Damage along the Tokoro River



Photo taken on Aug. 21, 2016

Source) MLIT

Damage along the Omoto River



Photo taken on Aug. 31, 2016

Source) MLIT

and non-structural emergency initiatives in regions along rivers that suffered severe damage in the August 2016 series of tropical cyclones that struck Hokkaido.

In addition to disaster recovery efforts, urgent and concentrated structural measures are being taken to develop dykes and river channels by fiscal 2019, with the aim of preventing a recurrence of this disaster, or anything similar. The soil that was excavated to create a river channel is being used to restore the farmland, promoting a quick restoration and reconstruction of the affected region.

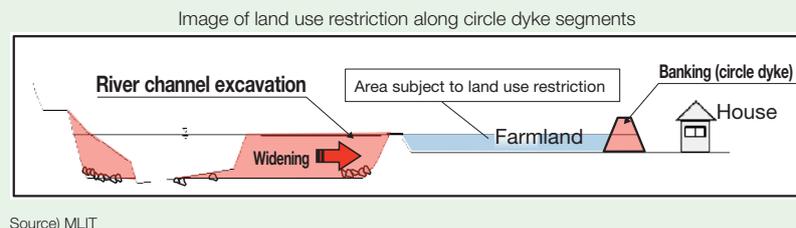
Non-structural measures are also being taken in cooperation among relevant institutions, to ensure quick evacuation by residents as necessary, such as by promoting push-type systems for transmissions of flood information along rivers under the ministerial jurisdiction. At present, the initiatives are restricted to segments of Class A rivers that are managed by Hokkaido, but in the future, a council composed of prefectures and municipalities will be established for Class B rivers as well, to examine and implement disaster mitigation measures that also include small and medium rivers.

## (2) Emergency flood control measures along rivers managed by Iwate prefecture

In Iwate prefecture, emergency measures against extensive flood damage will be implemented roughly over the next five years through a special emergency project against catastrophic river disasters, a project against river disasters, and an emergency project related to restoration following river disasters.

Structural measures will focus on preventing a recurrence of identical or similar disasters by constructing circle dykes and continuous dykes, and building river channels. In addition to the construction of a circle dykes, a restriction will be placed on land use along the Omoto River in consideration of the current land use situation, and to ensure effective flood control.

Non-structural measures will include the designation of water level alert rivers and the dissemination of information about flood risks in cooperation with relevant institutions, to ensure residents evacuate as necessary.



## (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 twenty organizations and thirty-seven departments and agencies, 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 to commence 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.

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 studies measures 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. The Kanto, Chubu, and Kinki Regional Development Bureaus have set up councils in different areas and have been conducting hearings attended by companies and studies of the projected impact of disasters in terms of damage.

In August 2016, we convened the Fourth MLIT Water Disaster Prevention and Mitigation Headquarters and expanded initiatives based on the Vision for the Restructuring of Society to Raise Flood Prevention Awareness to small and medium-sized rivers. At the same time, we promoted the establishment of systems of close coordination and cooperation among diverse stakeholders according to actual conditions in the communities, with the clear objective of supporting regional economies in addition to safeguarding lives, and decided on priority measures for FY2017. As specific examples of priority measures for FY2017, it was decided to: (i) promote urban flood countermeasures using real-time rainfall information, and (ii) improve disaster response capabilities that bring together Japan's disaster prevention technologies (ICT and robots).

### (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) and sediment-related disasters, droughts caused by natural hazards that exceed the capacity of facilities. In August 2015, a report was issued by the Infrastructure Development Council entitled “Approach to Climate Change Adaptations in the Field of Water-related Disasters.”

Regarding natural hazards that could occur relatively frequently, continue to steadily promote improvements that have been ongoing to date for the construction of dykes, 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 2016, under the purview of Nankai Trough Mega Earthquake and Tokyo Inland Earthquake Response Headquarters, we formulated the Roadmap for Tokyo Inland Earthquake Responses in Preparation for Hosting the Tokyo Olympic and Paralympic Games. The roadmap lays out a concrete action plan for shifting to a society with higher disaster prevention awareness, which extends the concept of a society with higher flood prevention awareness to other disasters such as earthquakes and sediment-related disasters. The roadmap especially reflects the Ministry of Land, Infrastructure, Transport and Tourism Tokyo Inland Earthquake Response Plan. 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 FY2017, it was determined (i) enhancement of the road re-opening plan in preparation for a large-scale earthquake, (ii) promotion of earthquake resistance improvement of houses and other buildings in preparation for the Tokyo Inland Earthquake, and (iii) establishment of a cooperative system, including public-private partnership for a wide-area disaster waste disposal system utilizing the mass transportation characteristic of ships.

We also decided the TEC-FORCE Action Plan for Nankai Trough Mega Earthquake, which plans for the prompt dispatch of TEC-FORCE and other response teams after an earthquake.

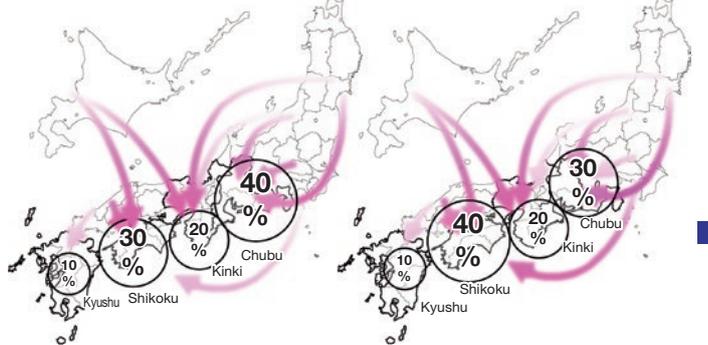
Figure II-7-2-2 Overview of the TEC-FORCE Action Plan for Nankai Trough Mega Earthquake

- An action plan formulated with the aim of conducting disaster emergency response activities (e.g., securing emergency transportation routes and emergency water drainage) smoothly and swiftly in immediate response to the enormous damage by Nankai Trough Mega Earthquake.
  - The action plan prescribes a mobilization plan, timeline for wide area deployment, wide area staging bases, and more.
- \* Formulated based on the Basic Plan for the Promotion of Nankai Trough Earthquake Disaster Risk Reduction Countermeasures (March 2014, Central Disaster Prevention Council) and Nankai Trough Mega Earthquake Response Plan (April 2014, MLIT).

### Mobilization plan of TEC-FORCE

◆ Scale of mobilization of TEC-FORCE members and machinery based on the projected impact\*

① Scenario in which the greatest projected impact is in the Chubu region      ② Scenario in which the greatest projected impact is in Shikoku



(\* Area where flooding by tsunami would be at least two meters deep, number of buildings completely destroyed)

- TEC-FORCE: Approx. 7,700 people
- Helicopters for disaster measures: 8
- Machinery for disaster measures: Approx. 565
- Ships for disaster measures: 43

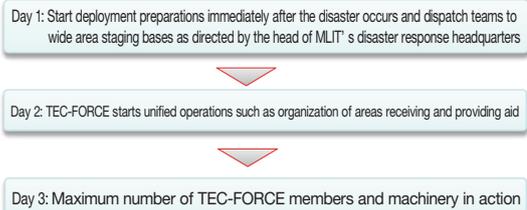


TEC-FORCE



Drainage pump vehicle

### Conception of wide area deployment timeline



### Wide area staging bases

| Areas receiving aid                 | Wide area staging bases                                     | Location  |
|-------------------------------------|---|---|
| Chubu Regional development bureau   | Ashigara SA (down)<br>Enakyo SA (down)<br>Kawashima PA (up) | Oyama Town, Sunto County, Shizuoka<br>Ena City, Gifu<br>Kakamigahara City, Gifu |
| Kinki Regional development bureau   | Kusatsu PA (down)   | Kusatsu City, Shiga   |
| Shikoku Regional development bureau | Toyohama SA (down)<br>Ishizuchisan SA (up)                  | Kanonji City, Kagawa<br>Saijo City, Ehime                                       |
| Kyushu Regional development bureau  | Mito SA (down)  | Mine City, Yamaguchi  |

Source) MLIT

## Column

### National Government Agency Projects for Restoration of National Auxiliary Roads, Prefectural Roads, and Village Roads

The national government has been implementing disaster recovery efforts from Kumamoto Earthquake, which inflicted damage that requires advanced technologies to restore, and other such severe damages, through projects under its direct control or by taking over the local recovery efforts.

Despite the fact that National Route 325 in the Aso-Ohashi Bridge area is categorized as a national highway controlled by Kumamoto Prefecture, its restoration was decided to be undertaken as an agency project of the national government, based on the Road Act as it lies adjacent to an active fault and bridges a deep valley, requiring advanced restoration technologies on May 9, 2016.

On May 10, 2016, a government ordinance was approved by the Cabinet to designate the Kumamoto Earthquake as an Extraordinary Disaster under the Act on Large-scale Disaster Restoration. The designation of Extraordinary Disaster ranks second to Specified Large-scale Disaster, and warrants the establishment of a reconstruction headquarters by the national government. Thus, the designation enables the national government to act as an agent in implementing disaster restoration projects in Kumamoto, such as for the restoration of roads, at the request of the prefectural and municipal governments. On May 13, upon requests from Kumamoto prefecture and Minami-Aso Village, it was decided that the national government would act as an agent in the restoration of Kumamoto-Takamori Prefectural Road, including the Tawarayama Tunnel, and the Tochinoki-Tateno Village Road in Minami-Aso Village, including the Aso-Choyo Ohashi Bridge. The Act on Large-scale Disaster Restoration was established in the aftermath of the Great East Japan Earthquake, and was applied for the first time since coming into force in June 2013.

In the government agency project for disaster recovery of the Aso-Ohashi Bridge area, the design of the new National Route 325 Aso-Ohashi Bridge has been decided and a construction contract has been signed (as of March 31, 2017). In regard to the Kumamoto-Takamori Prefectural Road project, the restoration of the Tawarayama Tunnel was completed on December 24, 2016, which successfully secured an east-west passage. The Tochinoki-Tateno Village road is planned to be opened to traffic in the summer of 2017 after emergency repairs.

Damage to roads being restored as a national government agency project

Aso Ohashi Bridge (National Route 325)



Source) MLIT

Tawarayama Tunnel (prefectural road)



Aso-Choyo Ohashi Bridge (village road)



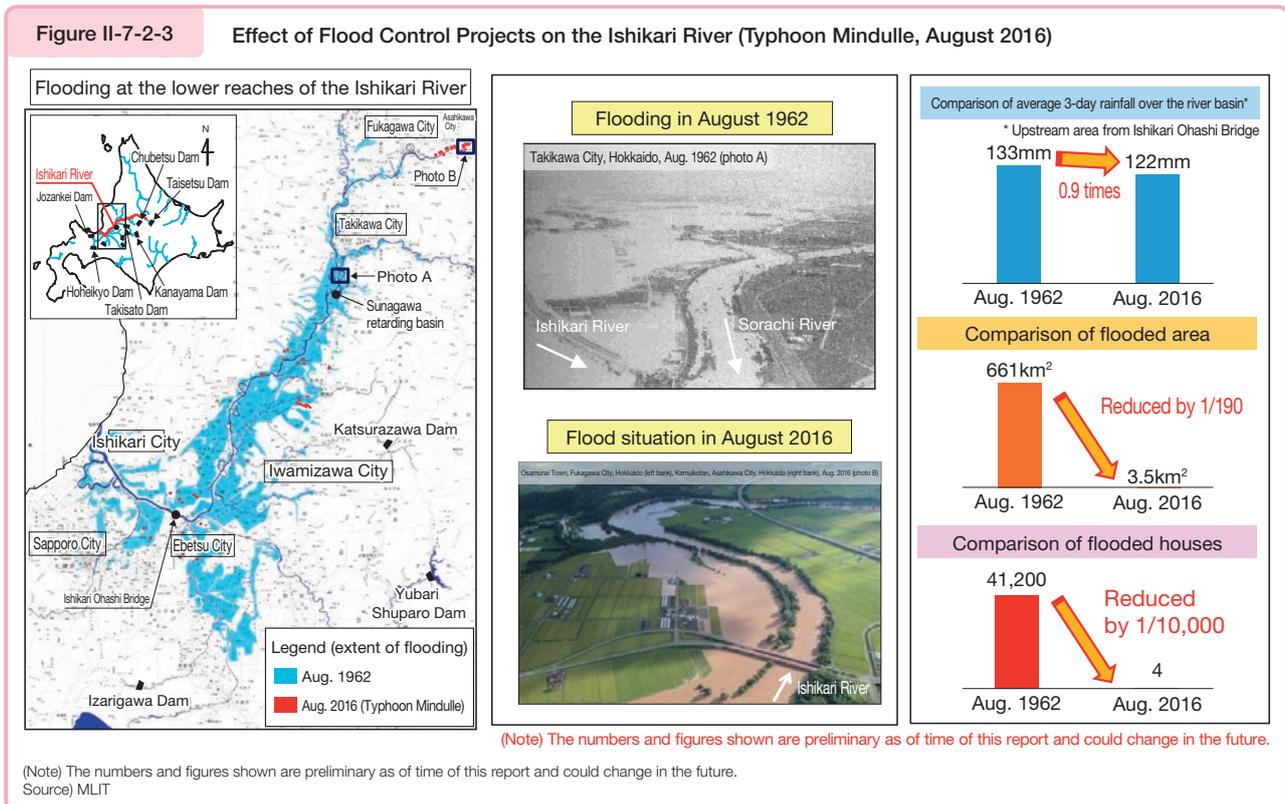
## 2 Shaping National Land that is Safe and Resilient to Disasters and Enhancing and Strengthening the Framework of Preparedness for Crisis Management

### (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 2016, which is caused by tropical cyclones that hit Hokkaido and Tohoku regions and other factors. 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 2016, the value of flood control projects implemented previously was demonstrated. For example, during Typhoon Mindulle, the average rainfall over the Ishikari River basin was nearly the same (about 0.9 times) as that during the August 1962 floods that brought large-scale flood damage to the area. However, damage from Typhoon Mindulle was greatly reduced (flooded area 1/190, flooded houses 1/10,000) by the effect of flood control projects, such as constructing dykes, excavating river channels, and building retarding basins and dams.



#### (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 water control facilities, such as dykes and excavating river channels, dams, and discharge channels. In addition, in order to use the existing facilities effectively, we are working on dam improvement, including dam redevelopment, 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, for areas with a high likelihood of grave human casualties due to dyke breaches in densely populated areas, in coordination with town planning projects, a safe and pleasant living environment that protects the human lives of local residents will be created, and to increase the safety of areas away from rivers, the development of super levees that do not collapse in the face of flooding that exceeds the planned capacity of facilities is being carried out.

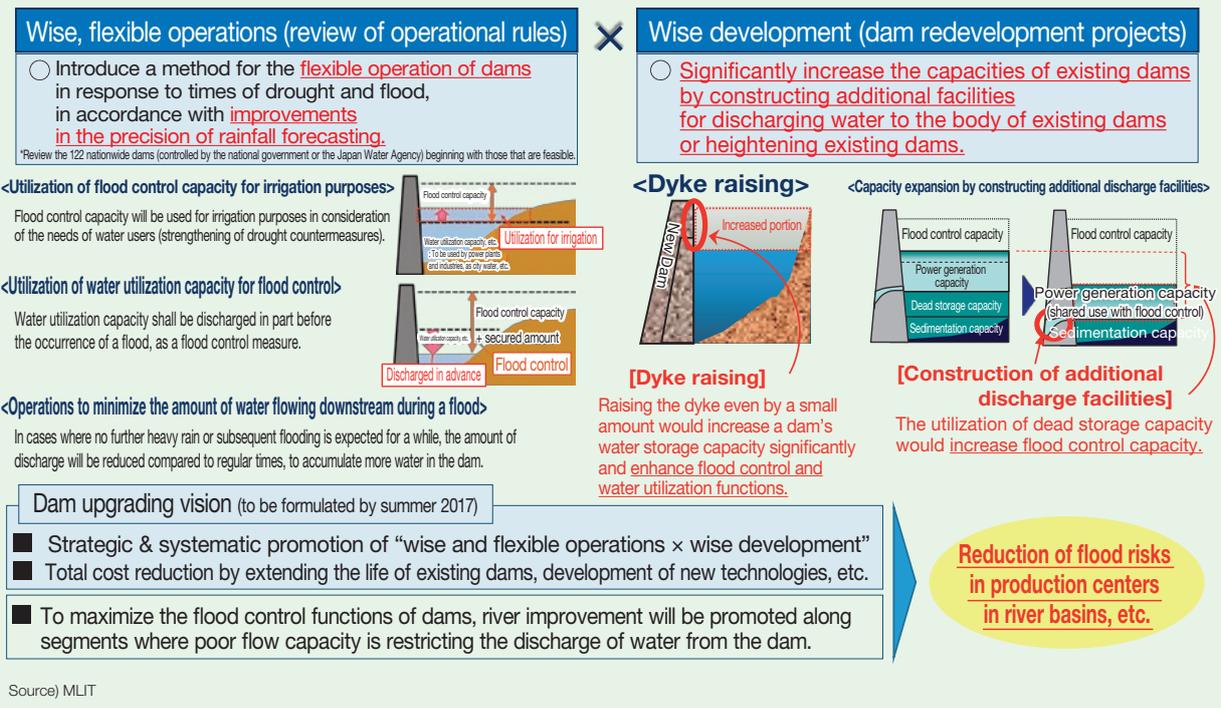
## Column

### Dam Upgrading

– Early Upgrading of Water Utilization and Flood Control Capacities to Support Local Economies –

In recent years, frequent droughts and floods are posing increasing risks on corporate production activities. To mitigate this risk at an early stage, it is effective to maximize the capacity of existing dams by

heightening the dams using new construction technologies, and reviewing operational rules. From this perspective, dam upgrading was selected as one of the Productivity Innovation Projects of the MLIT by the MLIT Productivity Innovation Headquarters in November 2016. Hereafter, a dam upgrading vision will be formulated, and water utilization and flood control effects will be drawn out as early as possible, by strategically and systematically implementing structural and non-structural measures that maximize the capacities of existing dams (wise and flexible operations × wise development).



## (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 dyke 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 rainwater storage infiltration facilities, as well as measures to reduce civilian damage.

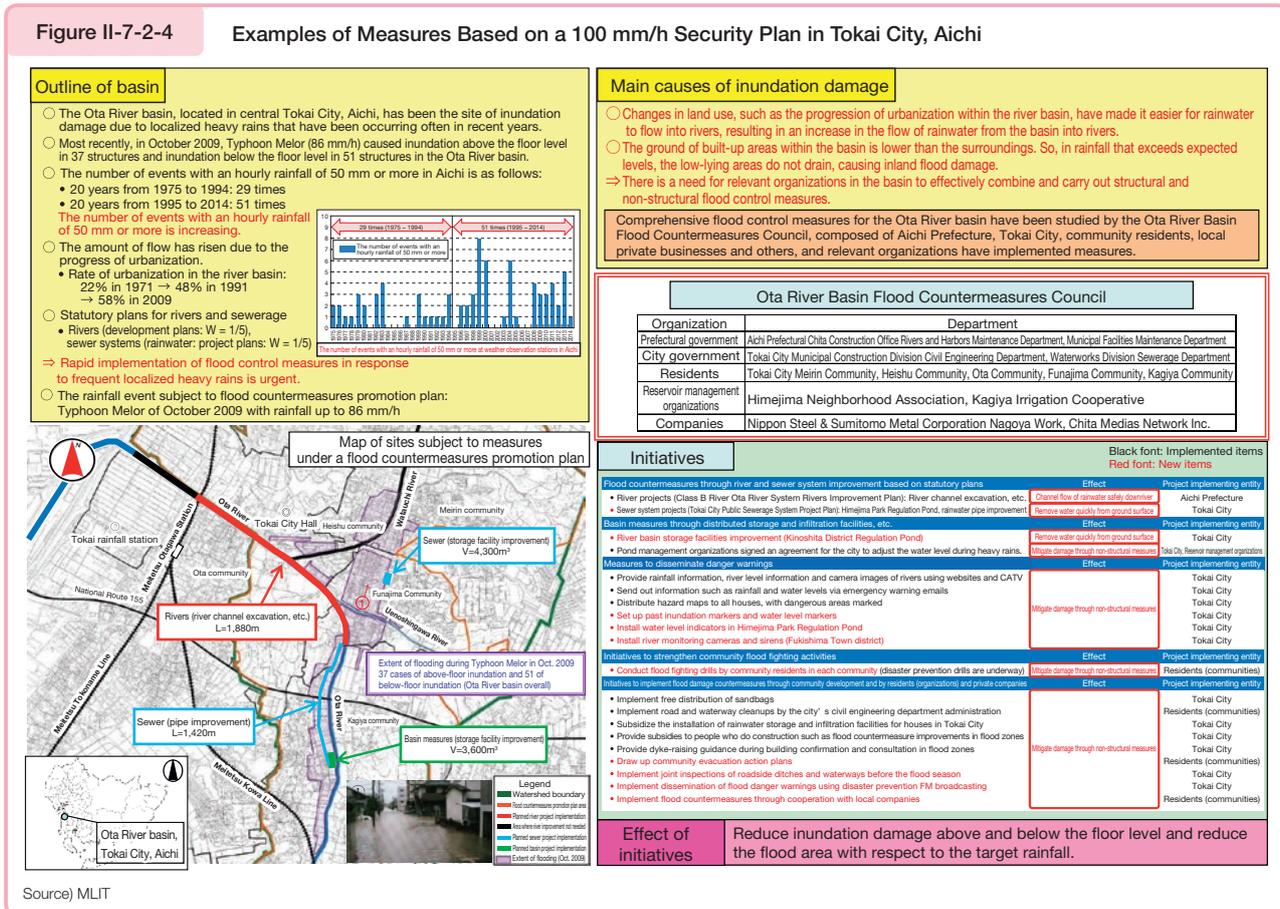
In addition, to prevent the disruption of urban functions due to flooding as well as the flooding of underground malls

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-7-2-4 Examples of Measures Based on a 100 mm/h Security Plan in Tokai City, Aichi



c. Integrating flood control measures with land use

Land use combined with a circle dyke<sup>Note</sup> 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 dykes 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, and the increased complexity of the urban landscape including the concentration of population and wealth as

**Note** A dyke that surrounds districts with housing and other structures

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 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.

## Column Launch of Anti-inundation Measures Through Public-private Partnership

Given the frequent occurrence of localized heavy rains, a system for designating inundation damage control zones was established under the revised Sewerage Act that came into force in July 2015, to enable prompt and efficient anti-inundation measures through the cooperation of public sewerage system administrators and private businesses, in conjunction with urban redevelopment efforts and other city planning initiatives.

### <Overview of the inundation damage control zone system>

#### ○ Designation of inundation damage control zones

In areas where urban functions are concentrated and inundation damage cannot be prevented by simply developing the public sewerage system, it is necessary to promote anti-inundation measures through public-private partnership. These areas may be designated as inundation damage control zones by public sewerage system administrators.

#### ○ Enforcement by ordinance

To prevent inundation damage in designated zones, an ordinance may be established that sets forth technical criteria for temporary retention or underground seepage of rainwater, and requires private businesses to install rainwater storage facilities, in place of the criteria for drainage facilities in Article 10 of the Sewerage Act.

#### ○ Agreement for management of rainwater storage facilities

Public sewerage system administrators may manage rainwater storage facilities with a storage capacity of 100 m<sup>3</sup> or more located within inundation damage control zones based on a management agreement. Even if there is a change in facility owner, the agreement remains effective against the next owner (a continuing effect), so the public sewerage system administrator may manage the rainwater storage facility on a continuous basis.

#### Effects in inundation damage control zones

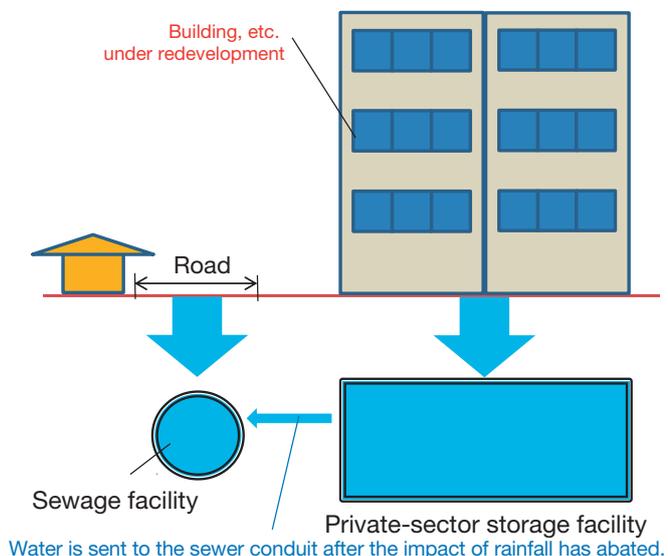
Frequent occurrences of localized heavy rains (torrential rains) are strengthening needs to promptly increase safety against inundation.

There is not enough space under public-use land such as roads and parks for public sewerage system administrators to construct rainwater storage facilities.

Inundation damage control zones are designated, accompanying private sector redevelopment initiatives.

The public and private sectors cooperate in implementing anti-inundation measures, and promptly increase community safety against inundation.

#### Image of anti-inundation measures through public-private partnership



Source) MLIT

### <Support measures for private businesses in inundation damage control zones>

#### ○Urban inundation damage prevention projects in designated regions (subsidy for sewerage disaster prevention works)

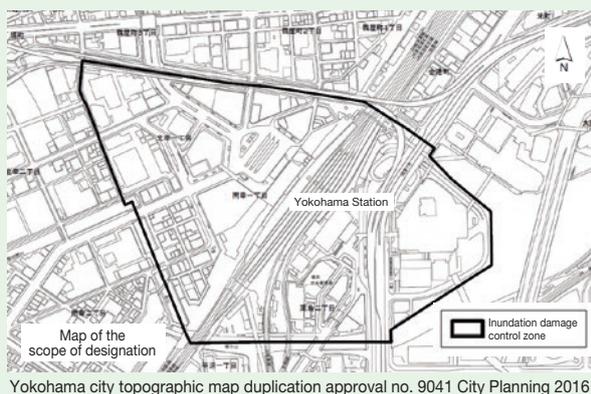
In inundation damage control zones, the government will directly subsidize the cost of developing sewerage facilities incurred by sewerage system administrators and the cost of developing rainwater storage facilities incurred by private businesses, also supporting anti-inundation measures through public-private partnership.

#### ○System of additional depreciation deductions for rainwater storage and utilization facilities (income tax, corporate tax)

In cases where a private business builds a rainwater storage and utilization facility with a capacity of 300 m<sup>3</sup> or more in an inundation damage control zone, a tax measure is applied that provides a 10% additional depreciation deduction on the allowed depreciation limit for five years (expiration date: March 31, 2019), provided that sterilization equipment and filtering facilities installed along with the structure for storing rainwater are not included in the scope of rainwater utilization facilities.

### <First-ever designation of an inundation damage control zone in Japan>

In Yokohama City, the area around Yokohama Station (Excite Yokohama 22 Center Zone), which is one of the largest commercial centers within the Tokyo metropolitan region and serves as a gateway to Yokohama, was designated an inundation damage control zone on January 25, 2017, to increase the area's safety level against inundation, and became the first area to receive the designation in Japan. Hereafter, discussions are planned to be held with relevant businesses, to promote anti-inundation measures through public-private partnership.



Source) Developed from materials on Yokohama city



Source) City of Yokohama Environmental Planning Bureau

#### (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. In addition, in light of the damage to a facility for the elderly caused by Typhoon Lionrock in 2016, we have been holding briefings to raise awareness of the danger of flood damage and sediment-related disasters at facilities around the country for people requiring assistance.

#### (v) Publicizing 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 issue 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 water level reaches flood-warning levels (special caution water levels of flood), this information is also released. As of the end of March 2016, there are 419 flood forecast rivers and 1,572 water level alert rivers.

The water level, rainfall information, 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 "MLIT Disaster Management Information of River"<sup>Note 1</sup> to be utilized in issuing warnings and evacuation during floods.

The personal delivery of flood information, 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 May 2017 to 373 municipalities in 63 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 rainfall information.

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 probable inundation zones

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 (probable inundation zones) 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, probable inundation zones because of conceivable maximum-scale rainfall will be sequentially designated and publicly disclosed.

In order to produce hazard maps that are directly tied to more effective evacuation actions in municipalities located in probable inundation zones, 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 minimum information required as well as technical support for their dissemination and utilization.

Probable inundation zones have been designated and publicly disclosed for approximately ninety-seven percent<sup>Note 2</sup> of flood-forecasted rivers and rivers for which water levels are publicly disclosed. Flood hazard maps have been produced for approximately ninety-nine percent<sup>Note 2</sup> of municipalities included in areas that are expected to become inundated.

The MLIT not only allows for tax subsidies for inundation prevention facilities obtained by the underground malls, etc. in probable inundation zones in accordance with inundation prevention plans and 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 and others 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 dykes, weirs, floodgates, and drainage pump stations, under management greatly increased, and the age degradation of these facilities is advancing. Also, for river infrastructure, migration to condition-based maintenance is being implemented where degradation conditions are monitored through inspections so that measures are taken at appropriate moments to as move to extending facility life cycles and renewal in a planned manner. In addition, the Priority Plan for Social Infrastructure Development states that

**Note 1** <http://www.river.go.jp> [PC version], <http://www.river.go.jp/s> [smartphone], <http://i.river.go.jp> [mobile]

**Note 2** As of the end of March 2016.

major river infrastructure administered by the nation will have lifetime extension plans by FY2016. In addition, necessary technological development for extending lifetime will be furthered and technical standards for middle to small rivers will be studied 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 dykes and other river management facilities and river channels for the promotion of appropriate maintenance.

#### (viii) Measures against illegally moored vessels in rivers

Since illegally moored vessels in rivers can impede flood control measures (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), river administrators are providing guidance on the lawful mooring of unlawfully moored vessels and on the relocation of unlawfully moored vessels to proper storage facilities and otherwise working to remove unlawfully moored vessels.

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 rainfall 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<sup>Note</sup>, are promoted.

#### (x) Developing hills using construction-generated soil

The Koto Delta, an expansive low-lying zone with a maximum subsidence of 4.5 meters that was created by pumping out the subterranean water that had previously existed here, is presently home to approximately 2.5 million people. As this zone sits below sea level, there is considerable concern that a stretch of this zone will become submerged in a large-scale flood, thereby forcing large numbers of residents to travel long distances for evacuation purposes. At the same time, there is a lack of locations for processing construction-generated soil in urban centers, such that the effective utilization of this soil is also a pressing matter. For this reason, a project to get businesses that produce construction-generated soil to create hills for parks and other land features at their own costs as one approach to processing this soil has been launched.

### (2) Countermeasures Against Sediment-related Disasters

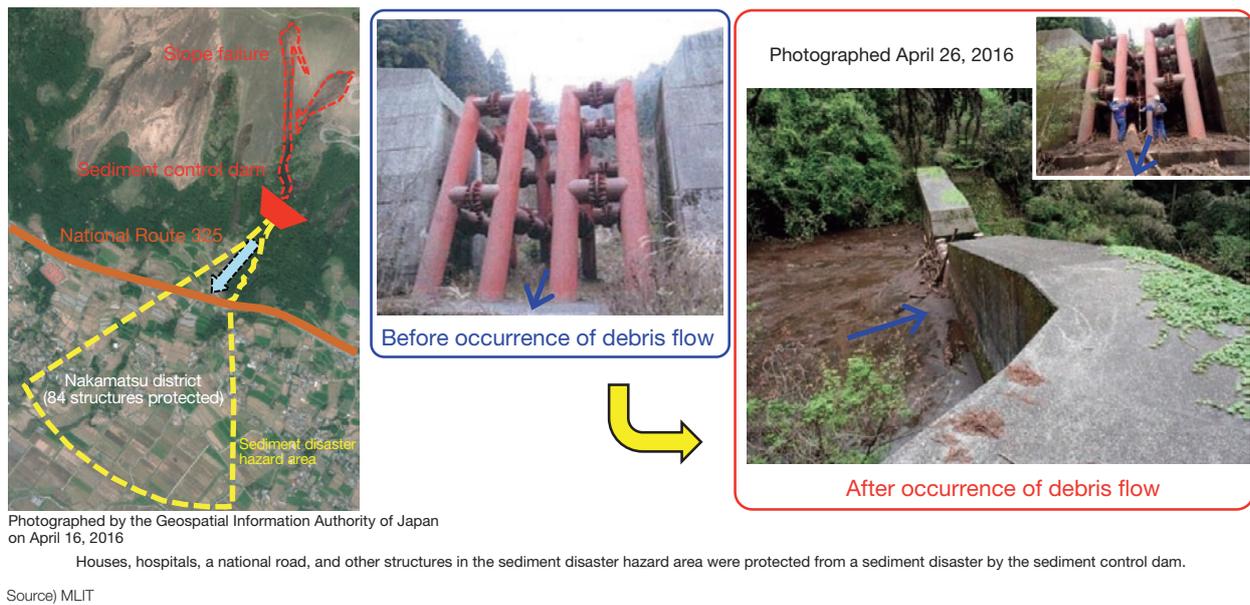
Japan has a steep geography and vulnerable geology over a wide area. In addition, Japan has a low number of plains and development of residential land has extended to hills and piedmont slopes along with the development of economy as well as the increase in population. As a result, there are about 520,000 areas vulnerable to sediment-related 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-related disasters. There have been 1,000 cases of sediment-related disaster caused by heavy rain and earthquake annually on average in the past 10 years (from 2007 to 2016). In 2016, there were 1,492 cases, causing great damage and leaving 18 people dead or missing.

**Note** "Road Disaster Information Web Map" web site: [http://www.mlit.go.jp/road/bosai/doro\\_bosaijoho\\_webmap/index.html](http://www.mlit.go.jp/road/bosai/doro_bosaijoho_webmap/index.html)

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

The Kumamoto Earthquake and subsequent torrential rain with the seasonal rain front of 2016 caused sediment-related disasters in Kumamoto and elsewhere that resulted in significant damage, including 15 deaths. In Minamiaso Village, Kumamoto Prefecture, sediment that was produced on slopes by the earthquakes flowed downstream, but existing sediment control dams blocked the sediment flow, demonstrating their effectiveness in mitigating damage. Additionally, sediment-related disaster prevention facilities already constructed in each area also demonstrated their effectiveness.

Figure II-7-2-5 Effect of Sediment Control Dams in the 2016 Kumamoto Earthquake

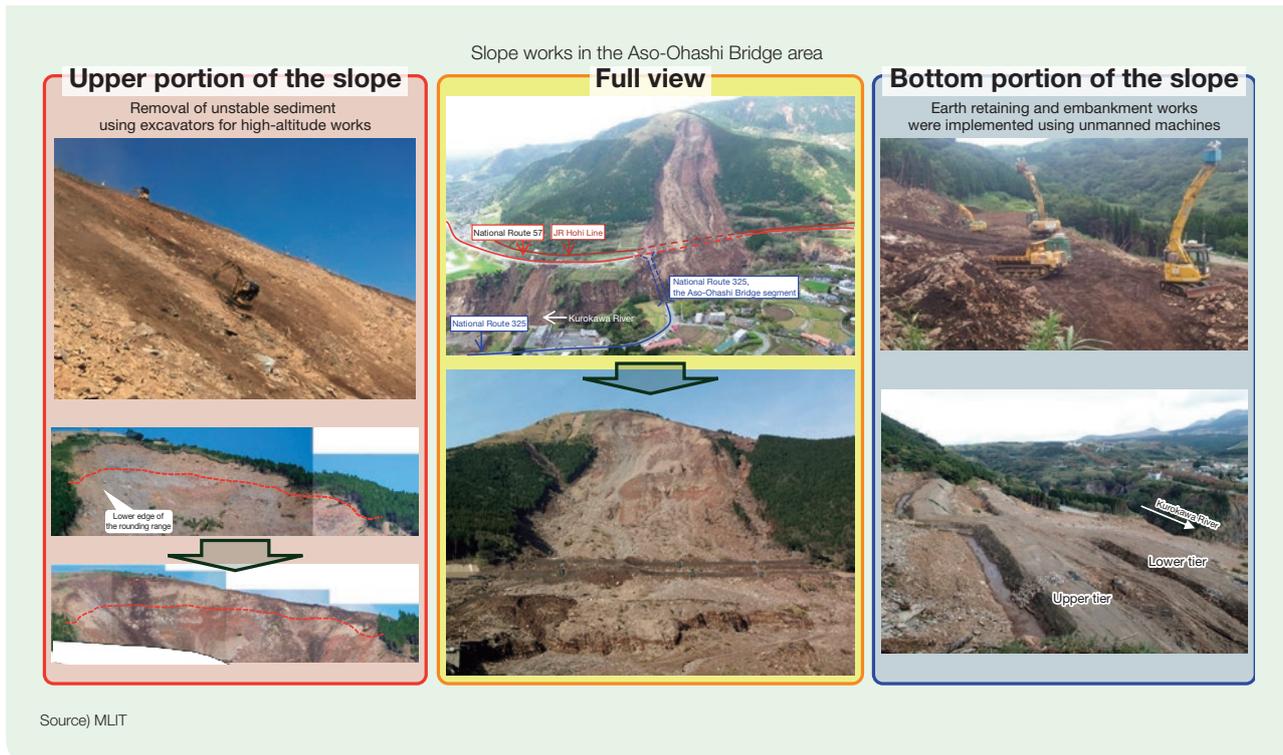


## Column Measures Against Large-scale Slope Failures in the Aso-Ohashi Bridge Area

The 2016 Kumamoto Earthquake caused large-scale slope failures in the Aso-Ohashi Bridge area, closed off National Routes 57 and 325, in addition to suspending operations on the JR Hohi Line.

To prevent any secondary disasters due to the large volume of unstable sediment on the upper regions of the slope falls, new slope measures have been launched as part of a sediment control project directly managed by the national government. The Aso-Ohashi Recovery Technology Committee was organized to implement measures toward the stabilization of the collapsed slope and early recovery of transportation facilities that have been damaged, based on discussions and advice from a professional, academic perspective.

The slope control work was performed by simultaneously operating fourteen unmanned machines, the largest number ever used. After conducting earth retaining and embankment works eliminating unstable sediment, the removal of sediment that posed a high risk of collapse was completed by December. From January, manned operations were accelerated for the recovery initiative.



(i) Fundamental countermeasures against sediment-related 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-related 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.

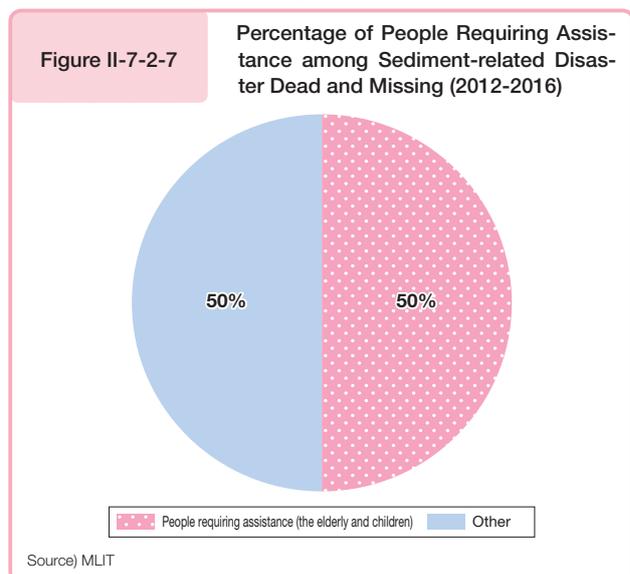
(ii) Emergency countermeasures against sediment-related disasters in sediment disaster-affected areas

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

(iii) Countermeasures against sediment-related disasters to protect those requiring assistance during disasters

People requiring assistance during disaster such as the elderly and children who cannot evacuate by themselves are liable to suffer the damages by sediment-related disasters. Among the dead and missing of sediment-related disasters, the percentage of people requiring assistance is high. So, in order to protect social welfare facilities, medical facilities, etc., for people with special needs, construction of sediment-related disaster prevention facilities such as sediment control dams is promoted in a focused manner.

In accordance with the Act for Promotion of Measures to Prevent Sediment Disasters in Sediment Disaster Alert Areas, etc., (Sediment Disaster Prevention Act), measures combining structural and non-structural elements are being promoted, such as by restricting development pertaining to facilities used by persons with special needs and stipulating the names and addresses of facilities used by persons with



special needs in sediment-related disaster hazard areas and matters relating to the transmission of information on sediment-related disasters in municipal plans for the prevention of local disasters.

(iv) Countermeasures against sediment-related 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-related disaster safety and maintain and create urban environments and landscapes with abundant greenery.

(v) Countermeasures against sediment-related 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-related disasters to promote regional disaster prevention

In hilly and mountainous areas at high risk of sediment-related disasters which has a large impact on community people, construction of sediment-related 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-related disaster alert areas.

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

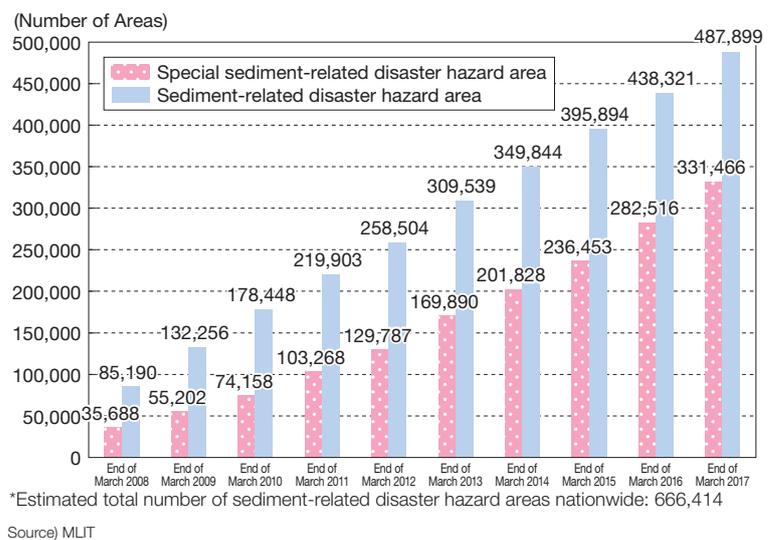
a. Promoting sediment disaster prevention measures through designation of sediment-related disaster hazard areas

In accordance with the Sediment Disasters Prevention Act, areas vulnerable to sediment-related disasters that cause harm to residents are designated as sediment-related disaster hazard areas, warning and evacuation systems will be developed. Also, areas vulnerable to sediment-related disasters that cause damage to architectural structures and serious harm to residents are designated as special sediment-related disaster hazard areas, and non-structure measures are taken to restrict certain development activities and restrict on building structures. Also, guidelines and case studies are released for the development of warning and evacuation systems as well as the creation of hazard maps, further the development of warning and evacuation

systems as well as the creation of hazard maps against sediment-related disasters are being promoted in the municipalities.

The Sediment Disaster Prevention Act, which was amended in response to sediment-related disasters that occurred in the city of Hiroshima from torrential rains in August 2014, was enacted in January 2015 and mandated the public disclosure by prefectural governments of the results of basic surveys, imposed an obligation on prefectural governors to provide notifications of sediment-related disaster warning information to municipal mayors and disseminate such information to the general public, and called for matters stated in municipal local disaster prevention plans for areas designated as sediment disaster alert areas to be put into effect and for other such measures to be taken.

Figure II-7-2-8 Designated Sediment-related Disaster Hazard Areas Nationwide (End of the March, 2017)



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 FY2015, this program decreased risky houses by 40 and 18 new houses were built to replace risky houses.

(viii) Countermeasures for large scale sediment-related disasters

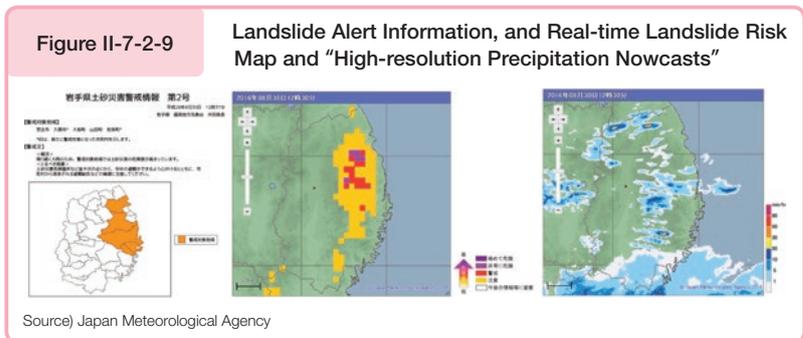
In order to reduce the damages caused by deep-seated catastrophic landslide, combination of structural and nonstructural measures are taken by, for example, development of sediment-related disaster prevention facilities as well as strengthening of the warning and evacuation system by use of deep-seated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

If there is a risk of a natural damming of a river (landslide dams) or debris flows following volcanic eruptions, urgent survey are conducted in accordance with the “Sediment Disaster Prevention Act” to provide municipalities with information on the land areas vulnerable to sediment-related disasters as well as the timing of occurrence. In recent years, sediment-related 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 urgent survey and strengthening cooperation with relative organizations are promoted.

(ix) Issuing a Landslide Alert Information

In case that the risk of sediment-related disasters (or landslides\*) increases due to heavy rainfall, Landslide Alert Information is jointly issued by prefectures and the Japan Meteorological Agency over the respective-municipalities. Issuance of the Landslide Alert Information 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.

\* “Landslides” refer to debris flows and concentrated slope failures.

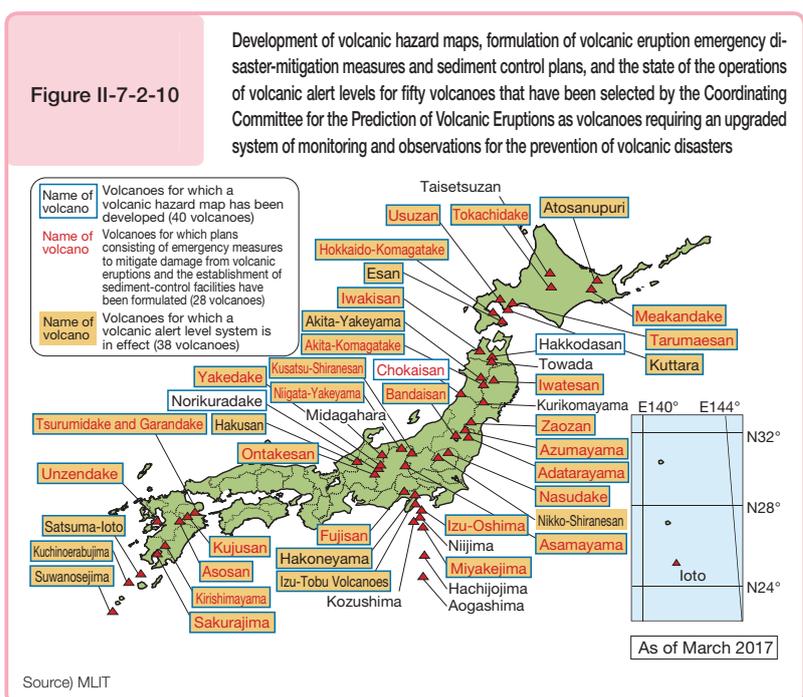


(3) Volcanic Disaster Countermeasures

(i) Countermeasures for sediment-related disasters following volcanic activity

In preparation for the volcanic mudflow caused by volcanic eruptions and the debris flow caused by rainfall, sediment control 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-related 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 sediment-control 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-related 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 sediment-control departments, as members of the Volcanic Disaster-Prevention Council, decided that they would study volcanic hazard maps from the standpoint of sediment-related disasters caused by eruptions. Thus, by developing volcanic sediment-control hazard maps (volcanic hazard maps that relate to sediment-related disasters), support was provided for a series of studies on alerts and evacuation systems by the Volcanic Disaster-Prevention Council.

In response to the eruption of Mt. Aso in October 2016, a survey of ash fall was conducted by helicopter and on land, 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 March 2017).

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 been strengthening volcanic activity observation, evaluation systems, and information provision. For instance, JMA has reinforced observation facilities around the crater as well as started volcanic gas observation. The agency has upgraded systems to monitor and evaluate volcanic activity and release disaster prevention information. From the perspective, it has established the Volcanic Observation and Warning Centers accompanying the increase of the number of personnel working on volcanoes, and also commissioned spatial advisors to JMA. In addition, it has instituted “Eruption Notice” designed to promptly report an eruption in progress. A close study and publication of volcanic alert level criteria are ongoing.

#### (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 Volcano, three years after it began erupting in November 2013, the 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. The area of the island had increased to approximately 2.7 km<sup>2</sup> as of September 2016 (inclusive of the former Nishinoshima). Monitoring of volcanic activity and status of the island using aircraft will be continued in the future.

## Column

### Field Surveys for Creating Maps and Charts of Nishinoshima Island

The eruption on Nishinoshima Island that began in November 2013 spewed lava and formed new land, almost fully covering the old island that existed prior to the eruption and expanding it further. After the eruption, the Japan Coast Guard conducted the aerial observation monthly, and confirmed that a state of quietude has continued since the last eruption in November 2015, two years after the first eruption. In August 2016, the coverage of the eruption warning was reduced to the area around the crater, so the Japan Coast Guard and the Geospatial Information Authority of Japan conducted a joint survey from October to November 2016, to create new maps and charts.

Members of the survey team landed on Nishinoshima Island with a rubber boat deployed from the Japan Coast Guard's survey vessel (Shoyo), and installed triangulation points and hydrographic survey markers for referencing positions and heights. The position information (latitudes, longitudes, altitudes) for creating maps and charts was thereafter acquired by performing satellite surveys, tidal observations, and leveling for determining heights.

After the field survey, the Geospatial Information Authority of Japan took aerial photographs around the island using its survey aircraft (Kunikaze III), planning to publish and provide a new map based on the results of the field survey.

Furthermore, the Japan Coast Guard deployed a boat from (Shoyo) and an aircraft (Mizunagi) to survey the land and shallow waters around the island and collect data on water depths and coastlines. A new chart of Nishinoshima Island is being planned to be published based on the collected data.

As press members were also aboard the survey vessel (Shoyo), the details and significance of the survey of Nishinoshima Island were widely reported with coverage of the island's flora, fauna, and nature, which suggests the high interest levels among the people in Japan.

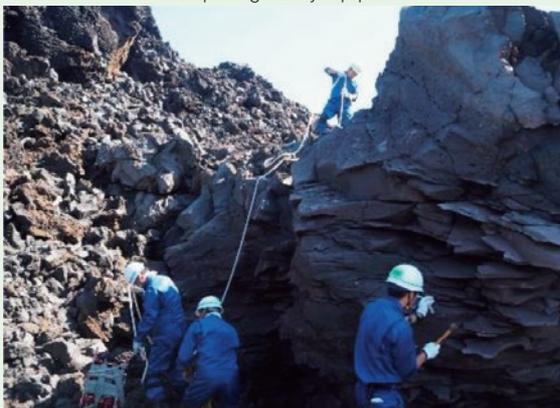
Survey vessel (Shoyo)



Landing on the island via a rubber boat



Transporting survey equipment



Leveling to determine heights (the pyroclastic cone is seen in the background)



Source) MLIT

## (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 <sup>Note 1</sup> 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 of volcanoes in more detail. Ground surface deformation of volcanoes are being monitored with SAR interferometry <sup>Note 2</sup>, 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.

## 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

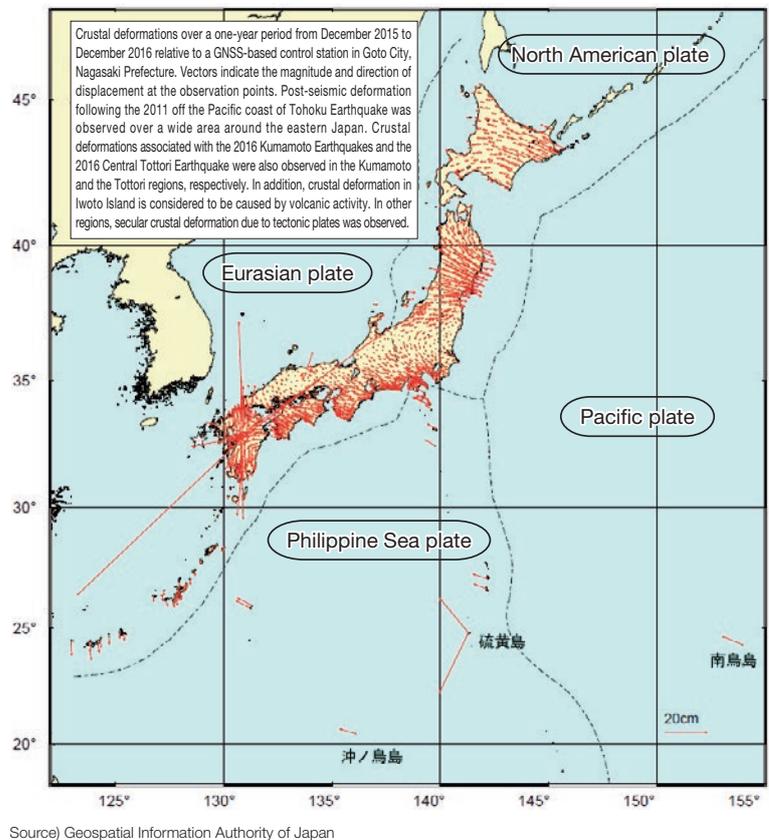
To protect human lives and assets from storm surges and high waves caused by frequently occurring storm surges, a combination of structural and non-structural measures are being promoted, such as the development of coastal levees and the issuing of flood prevention warnings. In May 2015, the Flood Prevention Act was partially amended. In order to further reinforce measures in terms of both structural and non-structural elements, a system for the designation of coastal areas for which water levels pertaining to storm surges are publicly disclosed and areas vulnerable to inundation was established.

## (ii) Promoting coastal erosion measures

Since a variety of factors contribute to coastal erosion across the nation, the administrators of rivers, coasts, shipping ports, and fishing ports are coordinating to implement measures such as sand bypasses <sup>Note 3</sup> and sand recycling <sup>Note 4</sup>.

Figure II-7-2-11

Movements of Japan Archipelago Captured by Continuous Observation with GNSS



**Note 1** Global Navigation Satellite System

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

**Note 3** 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 4** 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.

### (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.

For the tsunami measures for coasts, structural measures are taken to develop coastal levees and so on necessary for resisting tsunami with relatively high frequency of occurrence, take earthquake and liquefaction measures, enable automatic/remote operation of floodgates, and develop coastal levees and seawalls with a tenacious structure that includes various structures, such as green coastal levees, in addition to non-structural measures taken to assist creation of tsunami and storm surges hazard maps and manage and operate floodgates and others effectively. In light of the fact that many operators of floodgates lost their lives during the Great East Japan Earthquake, the formulation of operating rules related to floodgates has been mandated. Additionally, a study was conducted for instilling operation and retreat rules into onsite operators, and the Management System Guidelines for Floodgates and Land Locks in Tsunami and Storm Surge Measures were revised and broadened in April 2016.

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. In July 2016, sea routes to be secured in case of emergency were designated in the Seto Inland Sea in addition to the three major bays in Japan. 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 (86 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 rivers, the bulking up of river embankments, quakeproofing, and liquefaction measures 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.

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.

For the tsunami measures of railways, the conditions of evacuation guidance when tsunamis occurred after the Great East Japan Earthquake are being inspected and fundamental thinking for evacuation (speedy evacuation is the most effective and important measure, etc.) for the largest scale tsunamis following something like Nankai Trough Mega Earthquake is being reflected in the response guidelines and case studies compiled for passenger railways to secure safety when tsunamis occur to promote initiatives by railway companies.

**(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 2017, JMA monitors tsunamis with 191 Ocean-bottom tsunami meters, 18 GPS wave gauges, and 174 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 78 tsunami information maps, as of the end of March 2017, depicting the behavior of a maximum level tsunami caused by the 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 Private Urban Organization is assisting private enterprises develop distribution facilities that can be used for evacuation from tsunamis and other disasters. On August 30, 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 densely built-up areas

Development activity to rapidly improve densely built-up 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 densely built-up areas that are highly vulnerable in the event of an earthquake (4,450 hectares) by FY2020 (densely built-up areas that are highly vulnerable in the event of an earthquake as of the end of FY2016: 4,039 hectares).

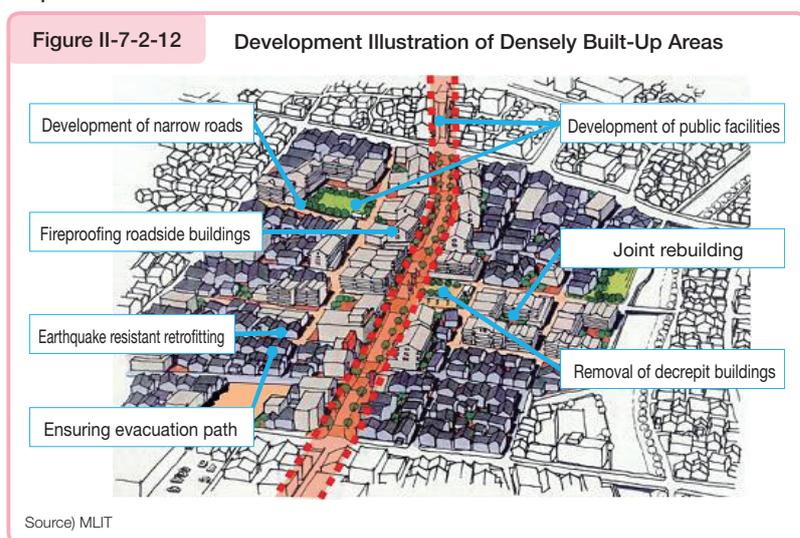
To realize this, fireproofing architectural structures along trunk roads to cut off fire paths and serve as evacuation paths in combination to form a skeletal disaster prevention axis (disaster prevention axis) and the development of disaster prevention parks to serve as evacuation areas, disaster prevention block improvement projects, and integrated housing and urban development 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 from 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.

#### (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.



**(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, transport emergency supplies, and deploy emergency transport essential to recovery efforts when earthquake disasters occur, seismic strengthening of bridges and undergrounding of cables are implemented to important roads, such as emergency transport roads.

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 Nankai Trough Mega Earthquake and Tokyo Inland Earthquake, earthquake measures for major stations, elevated bridges, and other railway facilities are being promoted. Also, the fortification of the Honshu-Shikoku Bridge's (Hon-Shi Bisan Line) earthquake resistance will be steadily implemented to avoid and reduce damage due to Nankai Trough Mega Earthquake and other events and secure the railway network that connects Honshu and Shikoku.

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-related disasters to large-scale earthquakes**

In preparation for large-scale earthquakes such as Nankai Trough Mega Earthquake, implementation of effective sediment-related disaster countermeasures with combination of structural and non-structural measures are being promoted for the areas at risk of sediment-related 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 December 2016, JMA put into place new technique to estimate the epicenters of earthquakes more precisely, when multiple earthquakes occur at the same time. JMA also prepares for introducing techniques to estimate seismic intensity correctly, even for a large earthquake in which strong tremors covers an extremely wide area.

With regard to long-period ground motion, information on observation of long-period ground motion is being issued on a trial basis from March 2013 to provide useful information that will contribute to the initial response immediately after

the earthquake, such as the early detection of human and fixture damage. In addition, a report summarizing issues such as how to provide information on forecasts of long-period ground motion was released in March 2017. Going forward, preparations will be made to provide new earthquake early warnings based on this report.

(x) Japan Coast Guard initiatives

To elucidate the physical mechanism of huge earthquakes, observations of seafloor crustal movements are conducted on the landward slope of the major trenches along the Pacific side of Japan such as the Japan Trench and Nankai Trough where the large earthquakes have repeatedly occurred. To monitor crustal movements GNSS observations are also conducted in coastal areas and the Izu Islands.

In May 2016, the distribution of the strength and weakness of interplate coupling in the presumed source region of the Nankai Trough Megathrust Earthquake was clarified for the first time, based on survey data of seafloor crustal movements over the past 10 years in the area of the Nankai Trough, and published as a research paper.

(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), GNSS surveying, and leveling.

Also, monitoring of ground surface deformation crustal movements started using the interferometric SAR of the Advanced Land Observing Satellite “DAICHI-2.”

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 engaging in research and development work and trial operations 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 deliberations 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 there were in the wake of the Great East Japan Earthquake. Thus, in order to ensure the safety of people in areas where there is a concentration of people and urban functions, a system based on plans for promoting urban regeneration and ensuring safety was established in 2012. In areas subject to urban regeneration and emergency development measures (fifty-nine areas nationwide as of the end of March 2017), efforts are being undertaken to improve urban disaster preparedness through public-private partnerships by way of the production of plans for promoting urban regeneration and ensuring safety, the conclusion of agreements concerning facilities for promoting urban regeneration and ensuring safety, and the easing of various regulatory constraints. Comprehensive support for the production of plans for promoting urban regeneration 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 operational-continuity functions in the event of a disaster

If the supply of energy during a disaster is suspended in areas where urban functions are concentrated, there is a risk that economic activities will become paralyzed and disaster measures will be impeded, thereby causing a huge socioeconomic impact on this country.

In order to address these vulnerabilities in our cities, we are using a project for the urgent promotion of the development of operational-continuity zones in case of disaster, and are accordingly promoting the development of area-wide energy networks to ensure operational 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

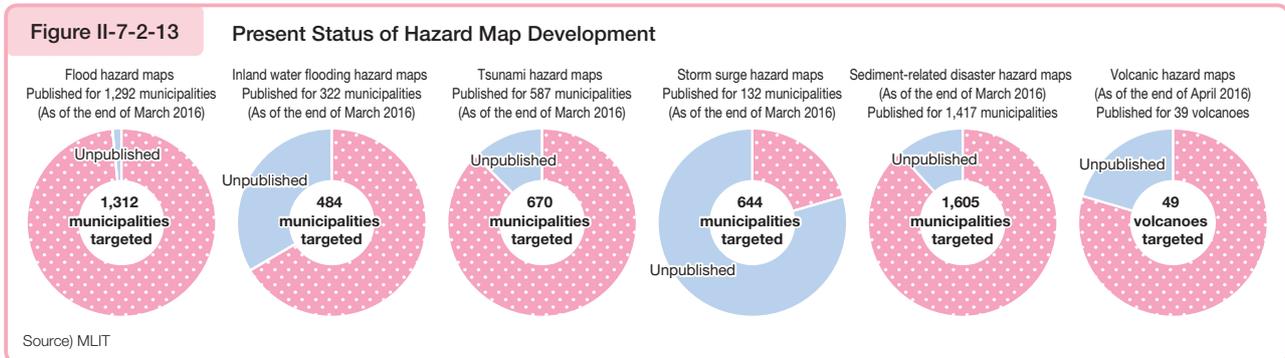
(i) Aggregation of disaster prevention information

The “MLIT Disaster Prevent Information Center<sup>Note</sup>” 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.

**Note** “MLIT Disaster Prevention Information Center” web site: <http://www.mlit.go.jp/saigai/bosaijoho/>

## (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<sup>Note</sup>.



## (iii) Improvement of disaster prevention weather information

In order to take precautionary measures against many kinds of weather disasters, the Japan Meteorological Agency issues information such as Emergency Warnings, Warnings, Advisories, and Bulletins related to weather conditions. The Agency also provides detailed real-time risk maps indicating the risk of landslides. With the help of these data, Landslide Alert Information and flood forecasts for designated rivers are jointly issued by the MLIT, prefectural governments and the Agency.

In July 2015, the Meteorological Subcommittee of the Council of Transport Policy received recommendations to proactively announce the possibility that a large-impact weather event, however unlikely, may occur and to convey the level of risk and the level of imminence involved in an easy-to-understand manner. Initiatives are accordingly being advanced with a view to the implementation of these recommendations.

## (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 2008 and is available for deployment to smoothly and rapidly implement technical support for the local government of the affected area to carry out various emergency disaster measures such as rapidly assessing the extent of the disaster, prevent expansion of damage, and rapid recovery of affected areas. In 2016, TEC-FORCE dispatched approximately 3,500 members, who rendered around 15,300 man-days of service to 96 municipalities and 11 prefectures that sustained damage as a result of numerous natural disasters, including the Kumamoto Earthquake in April, torrential rain with the seasonal rain front that fell on Western Japan from June to July (including the areas affected by the Kumamoto Earthquake), a series of tropical cyclones that hit Hokkaido and the Tohoku region, and earthquake with an epicenter in central Tottori prefecture that occurred in October. Furthermore, TEC-FORCE gave technical advice to police, fire department, and the SDF to ensure the safety of life-saving and rescue activities in place where the risk of secondary disaster exists. TEC-FORCE responded with total efforts to minimize the damage caused by disasters

**Note** "MLIT Hazard Map Portal Site": <http://disaportal.gsi.go.jp/>

**(ii) Initial response in the Kumamoto Earthquake**

In response to the earthquake (M6.5, maximum seismic intensity 7) that struck in Kumamoto at 21:26 on April 14, 2016, MLIT immediately established an emergency system and held the first meeting of the headquarters for major disaster countermeasures. In the affected area, immediately after the earthquake struck, we inspected rivers, dams, erosion and sediment control facilities, roads, and other facilities. At the same time, we dispatched liaisons from the Kyushu Regional Development Bureau to the affected local governments to coordinate the dispatch of TEC-FORCE and other personnel and ascertain the status of damage at the site and assistance needs. Furthermore, the following morning, we surveyed of the general damage situation from the air using helicopters, and TEC-FORCE members started surveying the status of damage caused to facilities under the jurisdiction of local governments. Also, efforts were made to prevent secondary disasters, including emergency inspections of sites at risk of suffering sediment-related disasters, and obstacles were eliminated from roads. Regional Development Bureaus, from Hokkaido to Okinawa, dispatched TEC-FORCE, for the first time since it was created in 2008. On April 22, 2016, a maximum of 440 members and 83 pieces of machinery were dispatched in a single day and contributed to the subsequent quick disaster recovery.

**(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 Operational 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 2016, we established a TEC-FORCE Action Plan for Nankai Trough Mega Earthquake, and took other steps to strengthen the support system for local governments, in order to quickly and smoothly dispatch TEC-FORCE members and machinery.

**(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.

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

In comprehensive flood fighting practices at Regional Development Bureaus, we conducted information-transmission drills, life-saving and rescue drills, and flood-fighting drills by flood fighting teams with the participation of fire departments, the Self Defense Forces, and other relevant organizations in an effort to strengthen the ability to respond to a flood disaster. We also conducted operational drills of the emergency disaster measures headquarters based on the scenario of Nankai Trough Mega 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 drill 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. Based on spirit of the fact that a plenary session of the United Nations General Assembly designated Japan's Tsunami Preparedness Day (November 5) as World Tsunami Awareness Day in December 2015, we obtained the participation of international students and other foreigners in these drills, as well as visits by embassy, 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 maintains patrol vessels and aircraft around the clock to allow for rapid responses and rescue operations in the event of a disaster. In FY2016, during the Kumamoto Earthquake in April, the Coast Guard conducted

coastal damage assessment surveys using patrol vessels and aircraft 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.

### (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.

In addition, to speed up and consolidate the control of floodgates and other facilities, the development of tsunami and storm surge disaster prevention stations to prevent tsunami and storm surge damages is being supported through disaster prevention and safety grants and other means.

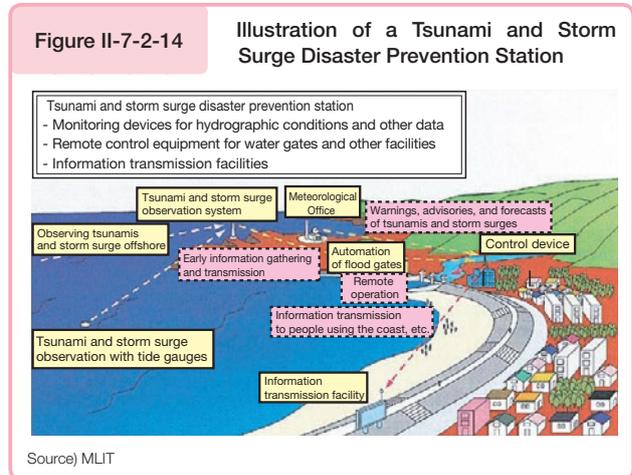
### (11) Disaster Recovery of Public Works Facilities

Damage caused to public civil-engineering facilities under the jurisdiction of the MLIT (including rivers, sediment control structures, roads, coastal areas, sewage systems, parks, and ports) in 2016 is reported to have totaled approximately 587.8 billion yen (at 15,400 sites) due to the frequent occurrence of disasters nationwide, including the Kumamoto Earthquake in April, torrential rain with the seasonal rain front in June, record rainfall in Hokkaido and Iwate due to the effect of Typhoon Mindulle and Lionrock in August, Typhoon Malakas in September, and the Central Tottori Earthquake 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 (Technical Emergency Control Force) to local areas immediately after each area was hit by a disaster 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.

However, we have now established the Assessment Policy for Public Works Facilities Recovery Construction Projects in Large-scale Disasters, and put it into operation in 2017, to prepare regions to achieve quicker recovery and reconstruction following the large-scale disasters that are anticipated to occur. Specifically, the policy, which is the first institution of such a system in 60 years since the establishment of the Assessment Policy for Public Works Facilities Recovery Construction Projects in 1957, predetermines how to improve the efficiency of disaster assessments, which are to be started immediately after the government states that a serious disaster is anticipated, and significantly shortens the time until completion of disaster assessments. The administrative procedures up to the point at which a project is adopted have been significantly reduced through the optimization (simplification) of the assessment process. For example, the maximum amount of money a project that can perform a paper-based assessment, carried out in a conference room just with documents, can be allotted has been increased from less than JPY three million in ordinary cases to less than JPY hun-



dred million, depending on the status of damage of the local government, and design documents have been simplified to shorten the time for surveying and designing by making use of aerial photographs and standard cross-sectional drawings.

Furthermore, emergency funds for disaster countermeasures were allocated to 24 areas that were damaged by natural disasters, including torrential rains and strong winds associated with Severe Tropical Storm Chanthu, Typhoon Lionrock, and Tropical Storm Kompasu, and other such weather events in 2016, in order to carry out disaster prevention measures to ensure the safety and security of residents.

### (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.

Considering that road networks are essential to overcome weakness of regions that are likely to be isolated once a disaster occurs, we will continually develop them in a systematical manner.

### (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 concluded, 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, 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.

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. As of April 2016, 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 December 2016, the Act on Promotion of Utility Pole Removal was enacted and came into force.

#### (4) Disaster Prevention Measures for Various Transportation Modes

For railways, subsidies are provided to partially cover the costs of improvement projects such as disaster prevention projects carried out by passenger rail companies including rockfall and avalanche measures as well as coastal protection and improvement projects carried out by Japan Railway Construction, Transport and Technology Agency (Incorporated Administrative Agency) to maintain the function of the Seikan Tunnel such as the improvement of substations and train control facilities.

For ports, in order to secure port functions and maintain regional economic activities during disasters as well as to achieve early restoration of facilities affected by disasters, a Port BCP has been created, and the Wide Area Port Disaster Councils and others have been working to promote the establishment of a cooperative framework for the national government, port authority, port users, and others.

For airports, initiatives have been taken based on the Evacuation and Rapid Recovery Plans in the Event of an Earthquake or Tsunami Striking the Given Airport (draft). This plan studies disaster countermeasures that take into account disaster prevention-related plans for the area in which an airport is located, as well as links to 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 promoting the establishment of cooperative frameworks for coordination between the public and private sectors across the nation. This includes 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 goods (1,400 locations listed as of March 31, 2017) and encouraging the signing of cooperation agreements between distributor associations and local governments.

### Column

#### Support for the Recovery of Railways That Sustained Damage in the Kumamoto Earthquake and Tropical Cyclones of 2016

##### (1) Minami-Aso Railway

Minami-Aso Railway sustained damage to many of its facilities from the Kumamoto Earthquake that occurred in April 2016, including Saikakuyama Tunnel and the Daiichi Shirakawa Bridge, designated a recommended civil engineering heritage by the Japan Society of Civil Engineers.

In July 2016, the MLIT conducted surveys with a view to examining recovery methods for railway facilities that were damaged, and concluded in its report compiled in April 2017 that recovery of the facilities would take some five years from the design stage, at the longest, and would cost roughly 6.5 to 7 billion yen.

Based on this result, Minami-Aso Railway and the local government are presently putting their heads together to examine what types of support could be offered for the early recovery of the facilities.

##### (2) JR Hokkaido

The tropical cyclones that struck Hokkaido in August 2016 brought severe damage to JR Hokkaido's Nemuro Line and Sekisho Line. Among the bridges that were washed away were the Shimoshintokugawa Bridge, which was constructed in 1907 and served for more than 100 years, and the Shimizugawa Bridge.

In November 2016, the MLIT announced its intention to provide support through a subsidy for disaster recovery works, in consideration of JR Hokkaido's financial condition and the aging of its facilities.

The Nemuro Line recommenced operations by the end of December 2016, with the exclusion of the segment between Higashishikagoe Station and Shintoku Station.

Minami-Aso Railway, cracks in Saikakuyama Tunnel



Source) MLIT, "Results of the survey on the disaster recovery of Minami-Aso Railway" (announced April 16)

JR Hokkaido Nemuro Line, loss of Shimizugawa Bridge



Source) JR Hokkaido

## 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 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 architects, initiatives to optimize operations to design and construction administration 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 FY2016, 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 Play Facilities

While surveys to elucidate the causes of accidents involving elevators, escalators, and play facilities and the training of staff members at regional development bureaus in terms of safety and accident measures continue to be carried out, initiatives for ensuring safety have been advanced by partially revising the system of periodic inspections under the Building Standards Act and relevant ordinances, as well as making active use of guidelines for the appropriate maintenance and management of elevators and escalators and spreading awareness of the need to install open-door 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 Public Transportation**

In October 2006, Transport Safety Management System was introduced in the wake of frequently occurring troubles and accidents, which was seen to be caused by human error in each transportation mode. This is to build and strengthen the safety management system, which will be united with the organization, including the fields, which are under the proactive involvement of the top management, in the transportation business, coupled with election system of safety managers and creation of safety management regulations. The country has to check the system through advice and evaluation, which is intended to continuously improve the safety management system using the PDCA cycle.

In FY2016, 932 parties (59 railway parties, 640 automobile parties, 223 shipping parties, and 10 airline parties) were subject to a transport safety management evaluation.

October 2016 was designated as the “10 Years of Strengthening Transport Safety Management Month” to mark the 10 years that had passed since the system was introduced. We carried out initiatives to further spread and instill the system, including holding discussions about how the system should be in the future, such as the “2016 Symposium on Safety in the Transport Business: Review of the 10 Years since the Introduction of the Transport Safety Management System and Directions for the Next 10 Years,” and the “Transport Safety Management 10th Anniversary Seminar.” Furthermore, the system’s effects and issues were reviewed and discussions were started in the Transport Council’s Task Force on Ensuring Transport Safety, in order to study the evolution of the system in the future.

In FY2016, a transportation safety management seminar hosted for transportation operators by the national government in order to deepen understanding of this system was attended by 3,789 persons. In FY2015, 7,043 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).

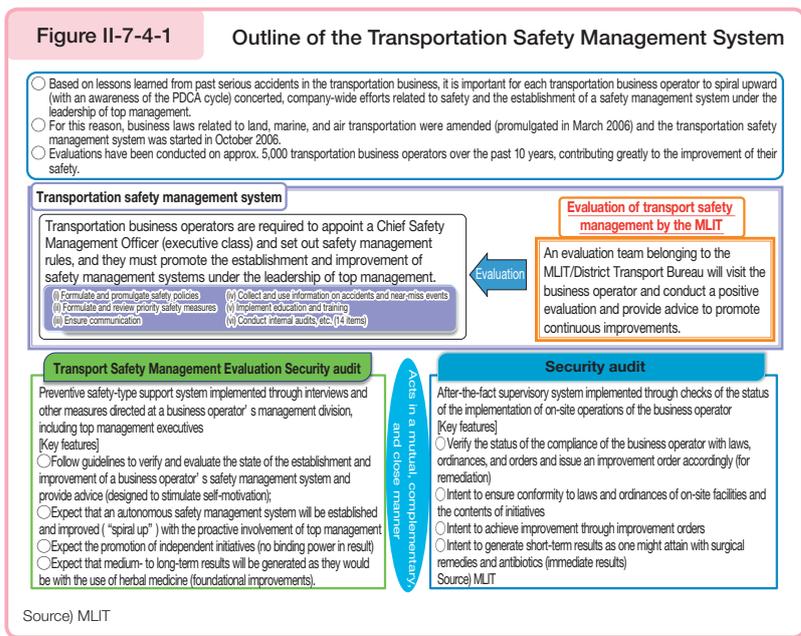
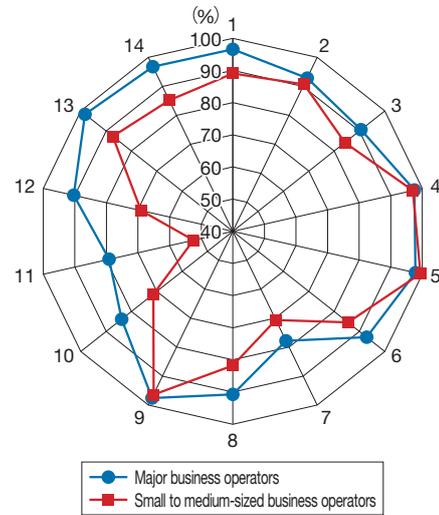


Figure II-7-4-2

Differences in Terms of the Status of Initiatives between Major Business Operators and Other Business Operators (FY2015)



(Note) Numbers (1) through (14) in the radar chart correspond to item numbers in the "Guidelines for Promoting Safety Management by Transport Operators: Further Improving Transportation Safety," which were formulated and publicly released in March 2010, and indicate the extent to which initiatives for each item have been fulfilled.  
Source) MLIT

## 2 Railway Transportation Safety Measures

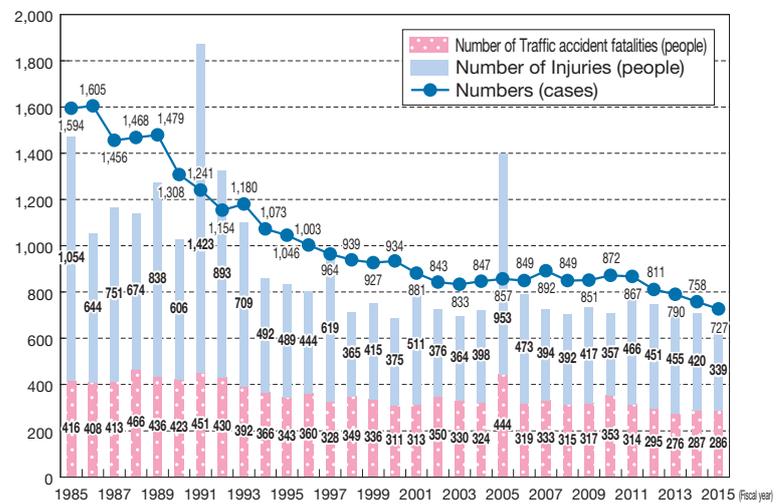
Driving accident numbers for railway traffic show a declining trend over the long term<sup>Note</sup> due to factors such as the promotion of driving assistance facilities including automatic train stop systems (ATS) and rail crossing measures, but since many people may be killed or injured if a train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

### (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.

Figure II-7-4-3

Transition in Number of Casualties and Number of Driving Accidents in Railways



(Note) In 2005, the JR West Fukuchiyama Line derailment accident occurred, after which for years the number of casualties and human losses have increased due to operation accidents.  
Source) MLIT

**Note** In 2005, JR Fukuchiyama line derailment accident occurred, after which, for years the number of casualties and human losses have increased due to operation accident.

**(i) Measures that were triggered by the JR West Fukuchiyama line derailing accident**

In July 2006, the “Ministerial ordinance to define the technical standard related to the Railways” was revised to make the installation of Automatic Train Stop (ATS) devices, with functions to limit speed on the curves, driver anomaly detection, and train stopping devices; and driving condition recording devices mandatory. Improvements for which a time limit was stipulated by the ordinance were completed by the end of June 2016.

**(ii) Measures taken in the wake of the derailment of a Japan Freight Railway on the Hakodate Line**

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 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 security audits conducted in FY2014, railway operators are subject to modulated, more effective security audits, including planned security audits and provisional security audits conducted whenever similar types of problems occur.

**(2) Promotion of Railway Crossing Measures**

Unopened grade crossings<sup>Note</sup> 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 FY2016, 587 problematic crossings were designated, greatly exceeding the usual number of designations, as the amended Act on the Promotion of Railway Crossings allowed the Minister of Land, Infrastructure, Transport and Tourism to make such designations even in the absence of an agreement between railway operators and road administrators as to the methods by which improvements will be carried out.

Also, road administrators and railway operators collaborated to identify 1,479 crossings in need of urgent consideration of countermeasures, based on objective data including crossing elements, progress of countermeasures, the conditions behind the occurrence of accidents, and other examples of objective data. These findings were produced and published as safe grade crossing passage records.

Moving forward, we will continually promote further improvements in any possible ways in addition to conventional countermeasures after consideration at the Regional Railroad Crossing Improvement Council in collaboration with local interested groups. These include conventional grade separation, structural improvements, flyovers for pedestrians, construction of railroad crossing safety equipment, colored pavement and other infrastructure-based and non-infrastructure-based measures.

**(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 665 stations as of the end of FY2015). 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.

In response to the fatal accident caused by a visually impaired person falling at Aoyama-itcho Station on the Tokyo Metro Ginza Line on August 15, 2016, we set up an investigative commission for improving the safety of station platforms on August 26, and studied comprehensive safety measures related to the prevention of falls, in terms of structural and non-structural measures. In the interim summary released 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

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

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.

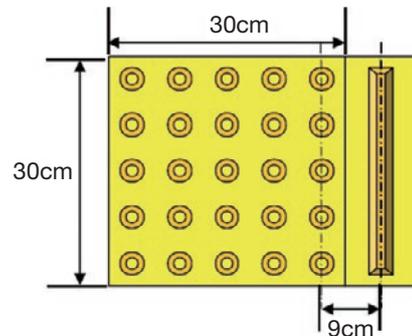
Also, in the interim summary, it was decided to construct tactile paving with boundary lines by FY2018 at stations that serve 10,000 people or more. In addition, the main non-structural measures indicated in the summary include station employees offering to guide visually impaired riders at stations 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.

Figure II-7-4-4 Platform Door



Source) MLIT

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



- 25 truncated domes (5 x 5)
- Line shaped protrusion indicating the inside of the platform (boundary line)

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 MLIT has been participating actively in discussions at IMO.

At an IMO meeting held in November 2016, IMO has started reviewing standards related to fire safety on passenger ferries in light of situations that many fire accidents have occurred on passenger ferries in recent years. Japan is willing to contribute discussions in this matter by introducing Japan's efforts based on fire accidents in Japan.

Also, in January 2017, we developed domestic legislation in association with the revision of international standards, such as a mandatory Polar Code that takes into account the unique dangers of polar seas, and IGF Code for ships that use low-flash-point fuels such as liquid natural gas (LNG).

Port State Control (PSC)<sup>Note 1</sup> has been implemented to ensure that foreign ships entering ports in Japan comply with

such international regulations and standards, and to eliminate substandard ships<sup>Note 2</sup>.

As an initiative focused on ship safety measures in Japan, a manual including effective firefighting procedures, the features of firefighting equipment, and training methods to enhance preparations for ferry operators to engage in firefighting was compiled and publicly released in response to a fire on board a ferry off the coast of Tomakomai, Hokkaido, in July 2015. In FY2016, briefings were held for ferry operators nationwide and the manual was used to provide guidance to them.

As a safety measure for small craft, we revised the Ordinance for Enforcement of the Act on Ships' Officers and Boats' Operators, making the wearing of lifejackets mandatory for all passengers as a general rule from February 1, 2018, and formulating a guideline about safety requirements for smartphone apps to prevent ship accidents.

#### (ii) Ensuring ship navigation safety

In accordance with the Seaman and Small Craft Operator Act, which complies with the STCW Convention<sup>Note 3</sup>, 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 July 2016, we partially amended ordinances, expanding the items subject to compliance penalty points, and publicized the amendments in order to reduce the number of small boat accidents. In accordance with the Pilotage Act, qualifications for people who can perform pilotage are defined for the safety of vessel traffic. Based on the report of the Basic Policy commission established at the Council of Traffic Policy Maritime Subcommittee, to secure a stable supply of pilots who will be needed in the future, initiatives to facilitate the acquisition of licenses required for the provision of mutual assistance among neighboring small to medium-sized pilotage districts are being carried out.

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 2016 there were 372 cases of determinations and a total of 477 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 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 ministries, agencies, and organizations, is making efforts to raise the safety awareness of boat operators, including by directly visiting ships to provide guidance and by holding marine accident prevention workshops.

Also, we provide information, such as "Maritime Information and Communication System (MICS)<sup>Note 4</sup>," to the broader public in order to prevent marine accidents due to insufficient understanding of available information. In August 2016, we enhanced the function of "Marine Safety Information" by adding information to encourage alertness toward waterspouts.

**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.

**Note 4** 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

Figure II-7-4-6 Establishing a Centralized Maritime Traffic Control System in Bays

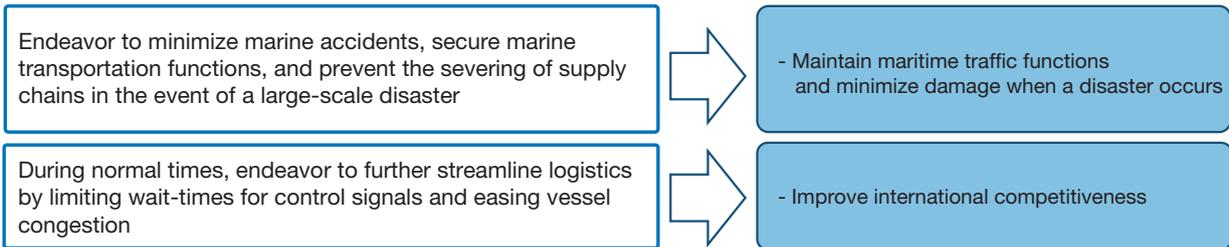
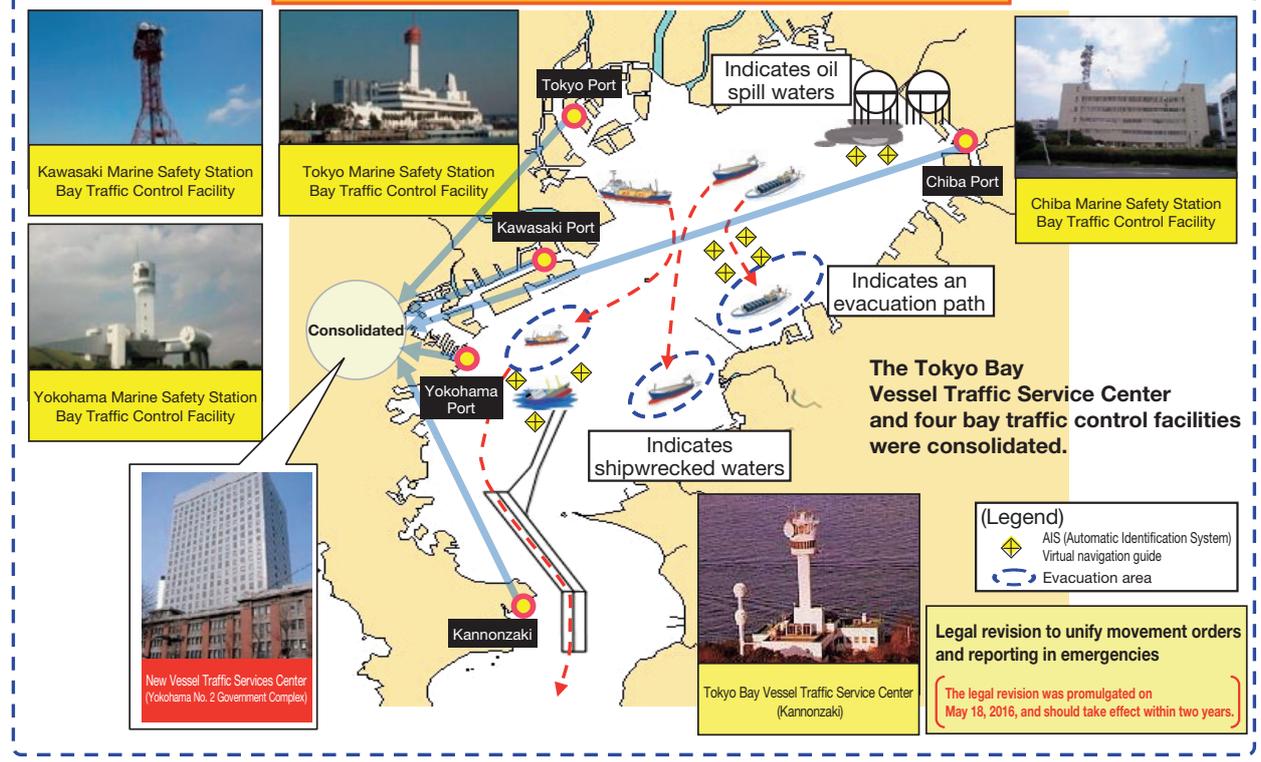


Illustration of the centralization of maritime traffic control



Source) MLIT

The Japan Coast Guard works to quickly and smoothly escort vessels to safe sea areas when a tsunami or other emergency disaster occurs. During non-emergency periods, it coordinates the Vessel Traffic Service Center in Tokyo Bay with port traffic controls offices and is building a system to carry out these operations in an integrated fashion in order to ease congestion and ensure the safe and efficient operations of vessels. In May 2016, legislation was enacted to partially amend such laws as the Maritime Traffic Safety Act, which creates systems to maintain maritime traffic functions when an emergency occurs.

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

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). Moreover, the nautical charts in just English was published for the foreign seafarers as part of provision for prevention of the marine accident. Nautical charts for regional ports and fishing harbors affected by the Great East Japan Earthquake were revised by February 2017, following those for major ports, which were revised by FY2015.

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

For Aids to Navigation, development is performed effectively and efficiently in accordance with the vessel traffic envi-

ronment as well as needs and in FY2016, improvements and renovation was carried out in 286 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<sup>Note 1</sup> is being provided under the cooperative mechanism<sup>Note 2</sup> 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 in July 2016 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 44% 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. For this, the Japanese Coast Guard is working to disseminate and enlighten self-rescue measures based on the three principles: wear a life jacket at all times, ensure appropriate contact means such as a portable telephone packed in a waterproof package, and effectively use the emergency call number “Dial 118.” In addition, the passenger mortality due to fall in the sea from small boats (fishing boats or pleasure boats), is five times higher in the passengers who do not wear a life jacket, than those who do, therefore, life jackets contributes greatly in saving the passengers from the fall. The Japan Coast Guard is therefore, through various occasions, endeavoring to raise awareness of the need to wear a life jacket.

## (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.

# 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.

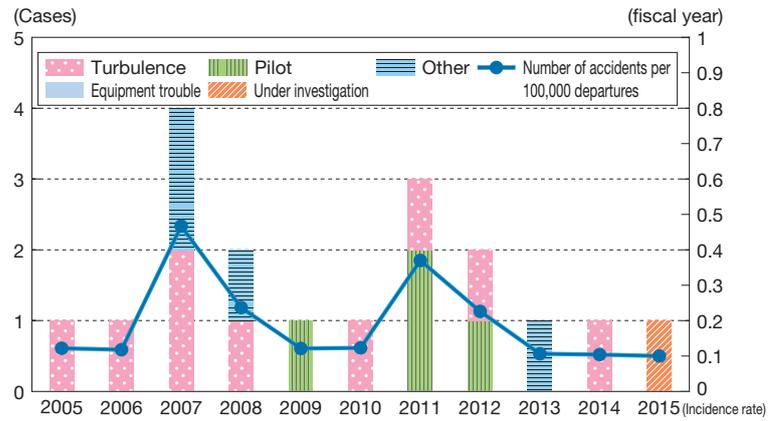
The Voluntary Information Contributory to Enhancement of the Safety (VOICES) program has been operated since

**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.

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. Recommendations such as improving airport operations have been obtained through this program. While dissemination activities have been yielding results and more reports were issued in FY2016 than in 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.

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



Source) MLIT

(ii) Air transport safety measures

While passenger deaths aboard specific Japanese air carriers<sup>Note</sup> 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.

(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. The MLIT carried out safety evaluation for the results of test flights conducted after the first flight by designers, as well as operation and maintenance system. Special flight permit required to conduct test flights in the United States was issued in August 2016. Since then, test flights based in North America have been taking place, and the MLIT has been monitoring and supervising the development activities, including test flights, by dispatching personnel to the United States. Going forward, we will continue conducting appropriate and smooth reviews in conjunction with the development progress.

**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.

**(iv) Safety measures applicable to unmanned aircraft**

On December 10, 2015, an amendment to the Aeronautical Act was issued to enforce basic rules for unmanned aircraft, such as flying airspace and flying methods. During the year after it took effect (December 10, 2015 to December 9, 2016), 10,120 permits/approval were granted, including flights above densely inhabited districts and flights for the purpose of aerial photography. Also, in July 2018, the Public-Private Council for Improving the Environment Related to Small Unmanned Aircraft, which consists 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 will study and improve systems in light of trends such as technical development and will continue to ensure safety through the appropriate application of the amended Aeronautical Act and by publicizing guidelines.

**(v) Safety measures for small aircraft**

Human factors such as inappropriate flying control and judgment, inappropriate understanding and judgment of weather conditions, and insufficient checks before takeoff have been the common causes of aviation accidents involving small aircraft in recent years. In order to prevent these kinds of small aircraft accidents, we will provide thorough instruction on accident prevention, including compliance with laws, ordinances, and safety regulations, operation based on reasonable flight plans, accurate understanding of weather information, and enhancement of company education and training of pilots. We will also meticulously promote small aircraft measures from various perspectives in light of examples of accidents in recent years. Since FY2014, an examination system has been enforced for specified aircraft flying skills that requires an examination to determine whether, during the two years before the day of a flight, pilots have maintained aircraft flying skills and knowledge, such as maneuvers during takeoff and landing and handling during emergencies. We encourage appropriate application of that system. Also, we call on private pilots, who usually fly small aircraft, to attend safety workshops held by pilots' organizations. We actively support workshops for small aircraft pilots by dispatching instructors and through other methods. Furthermore, in December 2016, we launched the Small Aircraft Safety Improvement Committee, which is composed of experts, to continually study greater safety measures for small aircraft. 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 FY2016, we conducted system development and traffic control training with a view toward beginning to use the air traffic control data system at the Hakodate and Sendai Airports.

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

During FY2016, accidents subject to investigations by the Japan Transport Safety Board consisted of 25 aircraft accidents and serious incidents, 32 railway accidents and serious incidents, and 763 marine accidents and incidents, and those investigations looked into finding causes and preventing recurrence.

Investigation reports for 30 aircraft accidents and serious incidents whose investigations were finished in FY2016 were released. These included the release in November 2016 of the results of an investigation into an accident in April 2015 in which an aircraft collided with an aeronautical safety facility during its landing approach at Hiroshima Airport, injuring 26 passengers and two crewmembers.

Likewise, investigation reports for 21 railway accidents and serious incidents were released. These included the release in July 2016 of the results of an investigation into a serious incident in April 2015 in which a utility pole fell onto the track of the JR Tohoku Line (Yamanote Line).

Investigation reports for 893 marine accidents and incidents were also released. These included the release in July 2016 of the results of an investigation into an accident in December 2014 in which the fishing vessel Daiichi Genpuku Maru capsized and sank off the west-northwest coast of Hamada Port, resulting in the deaths of four crewmembers, with another

crewmember missing.

Since 2013, 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. Also, in 2014, it started operating a global edition of J-MARISIS, to which information for 11 countries has been added to contribute to safe international ship navigation. Then, in 2015, it began operating a mobile version of J-MARISIS that can be used on a smartphone or a tablet.

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

## 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.

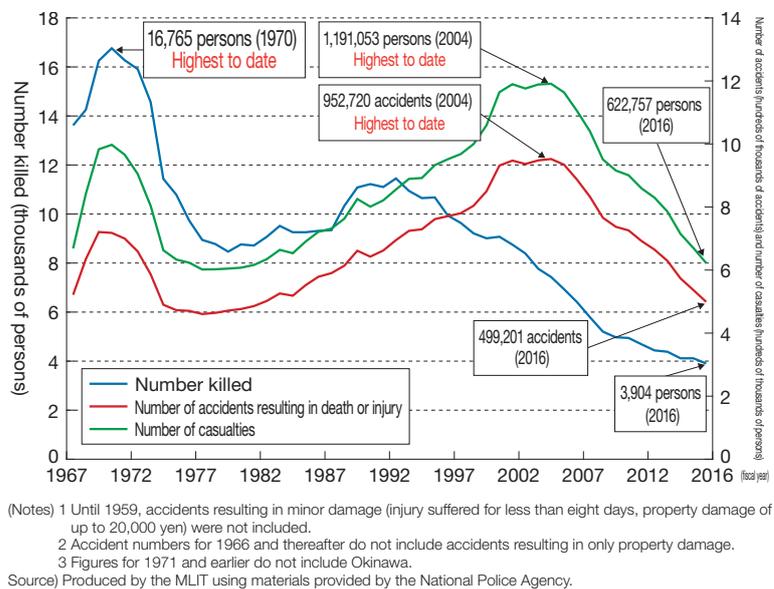
In FY2016, when a public transport accident occurred, the Assistance Office made the consultation service well known to victims, as well as responded to consultation from victims. When no public transport accidents needed to be dealt with, the Assistance Office was involved in numerous other activities, 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 addition, in response to the ski bus accident in Karuizawa that occurred in January 2016, MLIT opened its Assistance Office around the clock and set up regional consultation services in the Kanto District Transport Bureau and the Hokuriku-Shinetsu District Transport Bureau to handle inquiries from victims and their families. We also held meetings to explain measures for preventing a recurrence and to listen to opinions and other responses.

## 7 Safety Measures for Road Traffic

In 1970, the number of traffic accident fatalities peaked at 16,000. This figure declined to a quarter of this level, or 3,904 fatalities (a decrease of 213 from the preceding year) in 2016, coming in under 4,000 for the first time in the 67 years since 1949. However, many traffic accidents were caused by elderly drivers, and approximately half of them, or 1,870 fatalities, were killed 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



### (1) Promoting Efficient and Effective Traffic Accident Measures

By promoting the functional differentiation of roads, we will divert automobile traffic to highly safe expressways. 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 locations prone to speeding and sudden braking, in order to secure safe walking spaces by restricting the flow of vehicular 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 road narrowing 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.

Given that the number of fatal traffic accidents involving bicycles and pedestrians has decreased only by 20% 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.

With respect to temporary two-lane expressways, which have a high rate of fatal accidents caused by sudden crossing into oncoming traffic, in addition to expediting the change to four lanes and the establishment of additional lanes, we will verify the installation of wire rope as a measure to prevent head-on collisions, along 100 km of expressway nationwide.

### (2) Promoting Safety Measures for School Commute Routes

For school-commuting roads, following 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.

### (3) Safety Driving Support on Expressways Using IT

Japan is the first country in the world that commenced the ETC2.0 service, which utilizes roadside units installed across the country and onboard units. Safe driving support is promoted by providing alerts on locations where accidents occur frequently and on objects that have fallen onto the road as well as information on snow accumulations, overtopping waves, and other such circumstances to the vehicle's car-navigation system. 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, and are carrying out initiatives aimed at practical use of technologies to automatically detect, warn, and guide vehicles driving in the wrong way, based on the Roadmap to Future Measures against Wrong-way Driving on Expressways, with the aim of achieving zero wrong-way accidents on expressways by 2020.

### (4) 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. Old bridges and tunnels, which were intensively developed during Japan's period of high economic growth, will face rapid aging in the future.

To achieve appropriate management of roads in light of this situation, the amended Road Act, which includes clarification of the need for inspections, was promulgated in 2013. In government ordinances, technical standards were established for the maintenance and management of roads, and on March 31, 2014, a ministerial ordinance was enacted that clarified the obligations of road administrators, 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 of roads, as summarized by the Infrastructure Development Council's Road Subcommittee on April 14, 2014, 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 provision of training for the staff members of local governments, 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.

Additionally, in order to deal with the aging of 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.

### (5) 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 promptly implementing all possible recurrence prevention measures contained in the "Thorough Measures to Achieve Safe and Secure Chartered Bus Operations," which were compiled on June 3, in order to prevent such a tragic accident from ever occurring again.

## Column Measures Implemented in the Light of the Karuizawa Ski Bus Accident

The Karuizawa ski bus accident that occurred on January 15, 2016 suddenly took the lives of thirteen young people with promising futures. With a strong resolve to never allow such a tragic accident to happen again, "Comprehensive countermeasures for realizing safe and secure operations of chartered buses" were compiled in June.

Among the comprehensive countermeasures, those that require prompt legal attention, such as the introduction of a system for the renewal of business licenses for chartered buses, the establishment of an expense contribution system for having designated private institutions make rounds of visits to chartered bus operators to provide guidance, and the strengthening of penalties, were brought to an extraordinary Diet session in the form of a proposal to revise the Road Transportation Act. The revision was unanimously

approved, implemented, and came into force, in part, on December 20, 2016.

**○Status of implementation of the comprehensive countermeasures**

So far, eighty of the eighty-five items that were set forth as comprehensive countermeasures have been implemented. These include the tightening of standards for disciplinary action against auditors, and the establishment of a hotline for reporting on fares that fall below the lower limit.



**Overview of the revised Road Transportation Act**

**(1) Introduction of a business license renewal system**

- Chartered bus operators shall be inspected **every five years** to determine whether they possess **the ability to execute their business safely**.

**(2) Prevention of easy re-entry and evasion of disciplinary action by unqualified operators**

With respect to passenger vehicle transportation businesses:

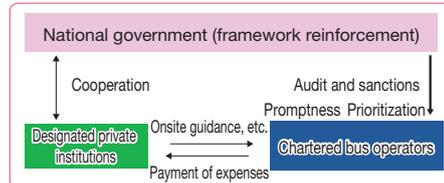
- Business license
    - **Extension of the disqualification period** (current stipulation: two years ⇒ after revision: **five years**)
    - Restrictions on re-entry by subsidiaries of companies whose license has been revoked, and who exit the market after an audit as a measure to evade disciplinary action
  - Issuance of a qualification certificate to operation managers\*
    - **Extension of the disqualification period** (current stipulation: two years ⇒ after revision: **five years**)
- \*Personnel in charge of labor management of drivers or vehicle operation management, including daily inspection
- Thirty days prior notification of business closure (current stipulation: ex-post notification system)

**(3) Reinforcement of audits and promotion of voluntary improvement**

- A system shall be established in which designated private institutions provide onsite guidance to chartered bus operators by collecting the necessary fee from them.

**(4) Strengthening penalties**

- Statutory penalties will be strengthened, and a heavy corporate penalty will be established against business operators who fail to comply with transportation safety orders.  
(current stipulation: a fine of up to one million yen (violators, corporations) ⇒ after revision: one year in prison and a fine of up to one and a half million yen (violators), or a fine of up to one hundred million yen (corporations))



| Comprehensive countermeasures   | Major items for implementation | Overall: 80 / 85 items have been implemented  |
|---|--------------------------------|---|
| (1) Strengthening compliance requirements for chartered bus operators, operation managers, etc. | 26 / 27 items implemented      | <ul style="list-style-type: none"> <li>• Enhance instructions and supervision of new drivers, etc.</li> <li>• Require images to be recorded and stored using a drive recorder</li> <li>• Strengthen the qualification requirements for operation managers</li> <li>• Increase the required number of operation managers</li> <li>• Require a roll call during nighttime and long-distance services</li> <li>• Require the use of the seatbelt in auxiliary seats</li> </ul>   |
| (2) Early correction of legal violations, elimination of disqualified operators, etc.           | 21 / 21 items implemented      | <ul style="list-style-type: none"> <li>• Conduct a verification audit within thirty days of a correction order against a legal violation</li> <li>• Shut down or revoke the license of operators who fail, multiple times, to correct a legal violation</li> <li>• Impose stricter sanctions for violations of transportation safety</li> <li>• Increase the ratio of suspended vehicles</li> <li>• Introduce a system for revocation of business licenses (one-shot revocation) in consideration of the maliciousness or severity of the accident</li> <li>• Strengthen the criteria for administrative sanctions against operation managers</li> <li>• Require the introduction of a business license renewal system, the formulation of safety investment plans, and an estimate of business income and expenditure</li> <li>• Strengthen penalties against those who violate transportation safety orders</li> <li>• Expand the disqualification reasons for business licenses, operation manager qualification, and maintenance manager qualification</li> </ul> |
| (3) Increasing the effectiveness of audits, etc.  | 8 / 10 items implemented       | <ul style="list-style-type: none"> <li>• Place greater weight on audits by using accredited institutions</li> </ul>   |
| (4) Strengthening relationships with travel agencies, customers, etc.                           | 19 / 20 items implemented      | <ul style="list-style-type: none"> <li>• Establish a hotline for reporting on fares that fall below the lower limit</li> <li>• Establish a third-party committee on commissions by the joint effort of the travel agency industry and chartered bus industry</li> <li>• Require safety information to be reported to the national government</li> </ul>   |
| (5) Promotion of accident prevention through structural safety measures                         | 14 / 15 items implemented      | <ul style="list-style-type: none"> <li>• Promote R&amp;D of systems for responding to driver emergencies</li> <li>• Display an ASV mark on vehicles equipped with an ASV system</li> <li>• Strengthen vehicle body constructions</li> <li>• Support the introduction of a digital driving recorder, etc.</li> </ul>   |

The MLIT believes that the steady implementation of the items in the comprehensive countermeasures by the government, chartered business operators, and all other stakeholders is of utmost importance in ensuring safe and secure operations of chartered buses, and is committed to steadily following up on their status of implementation and thoroughly disseminating initiatives for preventing a recurrence of identical or similar accidents.

#### (6) 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 transition 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 FY2013 and 2014, and the status of implementation has been followed up and its effects have been reviewed. 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.

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

In November 2014, an interim review of a 2009 comprehensive safety plan for commercial vehicles that was formulated with the aim of halving the number of deceased persons and the number of accidents resulting in injury or death relating to the use of commercial vehicles in the decade between 2009 and 2018 was conducted. Various initiatives to further reduce accidents have been advanced to go along with new measures that have been implemented; these measures include the implementation of accident-prevention measures based on accident trends by industrial sector and key factors, the dissemination of measures to prevent accidents caused by physical changes affecting drivers, and the implementation of accident-prevention measures based on the use of survey data, accident data, and other types of pertinent information.

##### (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 accordance with a transportation safety management program introduced in October 2006, business operators have been establishing and improving safety management systems internally on a company-wide basis. In 2016, 537 operators were subject to evaluations of transportation safety management whereby the state verifies the status of the implementation of these systems.

##### (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 response to the ski bus accident that occurred in Karuizawa in January 2016, thorough countermeasures were compiled in June and December, and we have implemented such measures as a system to correct legal violations promptly and to tighten administrative penalties to force business operators who are repeat violators to withdraw from the market.

In order to reinforce audit functions for the prevention of accidents through efforts to merge audit information with accident information, reinforce analytical functions, and identify business operators deemed to be at high risk of causing an accident, a comprehensive safety information system for commercial vehicles to construct.

## (iv) Eliminating drunk driving

We promoted thorough checks for inebriation using alcohol analyzer during roll calls and made efforts to raise the effectiveness of the use of alcohol analyzer by expanding locations subject to IT roll calls to business offices, besides G Mark offices, that have met certain conditions as well as to remote locations. In addition, to eliminate driving by business drivers while under the influence of stimulants or dangerous drugs, 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.

## (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.

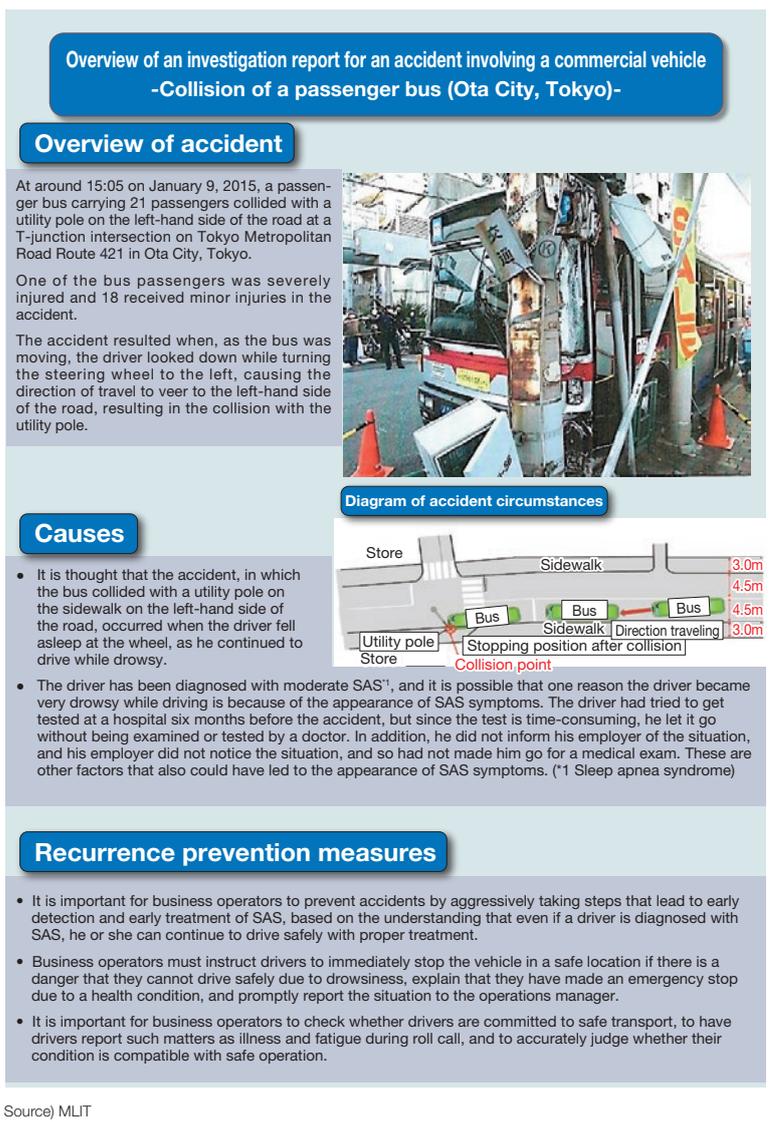
## (vi) Measures based on the recommendations of the Committee Investigating Accidents Involving Commercial Vehicles

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. It has publically released 19 reports on cases concerning incidents subject to special important investigations, such as an accident in which a passenger bus crashed into a traffic light pole in Ota City, Tokyo, on January 9, 2015.

## (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, brain 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. The Council

Figure II-7-4-10 Accident Investigation Reports



conducted a survey of businesses in order to organize the issues for spreading the use of such screenings.

(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.

**(8) 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, which are occurring more and more frequently, a Vice Ministers' Council was established in January 2017 among relevant ministries and agencies to take a wide look at ways to promote public awareness and encourage the adoption of automobiles equipped with advanced safety technology, such as advanced emergency braking systems. An interim report was compiled in March.

(ii) Expanding, enhancing, and strengthening safety standards

Eleven international regulations have been adopted in Japan to improve the safety of automobiles. Due to this adoption, new safety standards were developed, including vehicle proximity warning systems installed in hybrid cars and automatic headlights.

(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, in FY2016, we began the sixth-term ASV promotion plan and began 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 braking systems to mitigate collisions with pedestrians began in FY2016.

(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 WP.29 in March 2017.

Figure II-7-4-11 Braking Systems to Mitigate Collision with Pedestrians



Source) MLIT

## (vi) 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/](http://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.

Also, in FY2016 the number of recall notifications was 364 and the number of recalled vehicles was 15,850,000.

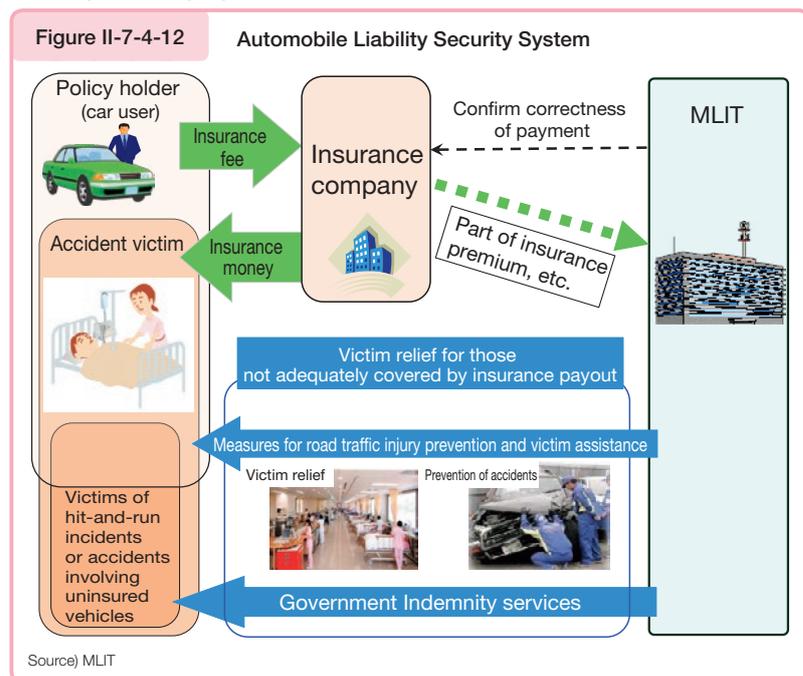
## (vii) Sophistication of vehicle inspections

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

## (9) 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.



## (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 capabilities 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.

**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.

### (10) Safety Measures for Mechanized Car Parking

In light of the occurrence of accidents involving deaths during mechanized car parking, we have developed guidelines on safety measures for mechanized car parking and have made requests to relevant organizations regarding safety measures and proper utilization. Also, we are proceeding with studies of JIS standardization of safety standards applicable to mechanical parking equipment in order to further improve the safety of mechanical parking equipment.

## 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. Japan, together with the United States and other countries, proposed draft guidelines on maritime cyber risk management at an IMO meeting held in June 2016. Interim guidelines were developed and approved based on that proposal. Japan is now considering specific security measures for maritime operators to implement based on the guidelines.

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.

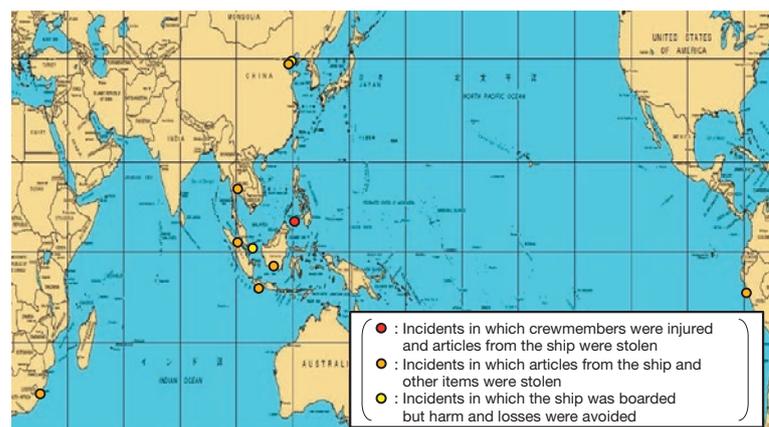
##### (ii) Anti-piracy measures

According to the International Maritime Bureau (IMB), there were 191 instances of piracy and armed robbery in 2016. Broken down by region, the sea area around Somalia and the Gulf of Aden accounted for 2 instances, Africa (the Gulf of Guinea) accounted for 55 instances, and the sea area around Southeast Asia accounted for 68 instances.

While the number of heinous cases of piracy increased rapidly in the sea area around Somalia and the Gulf of Aden 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)<sup>Note</sup> 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, cases in which vessels are pursued by suspicious boats continue to emerge and circumstances in terms of the navigation of merchant ships remain unpredictable.

Figure II-7-5-1

State of the Occurrence of Piracy and Armed Robbery Against Japanese-related Ships as Reported to the MLIT (2016)



Source) MLIT

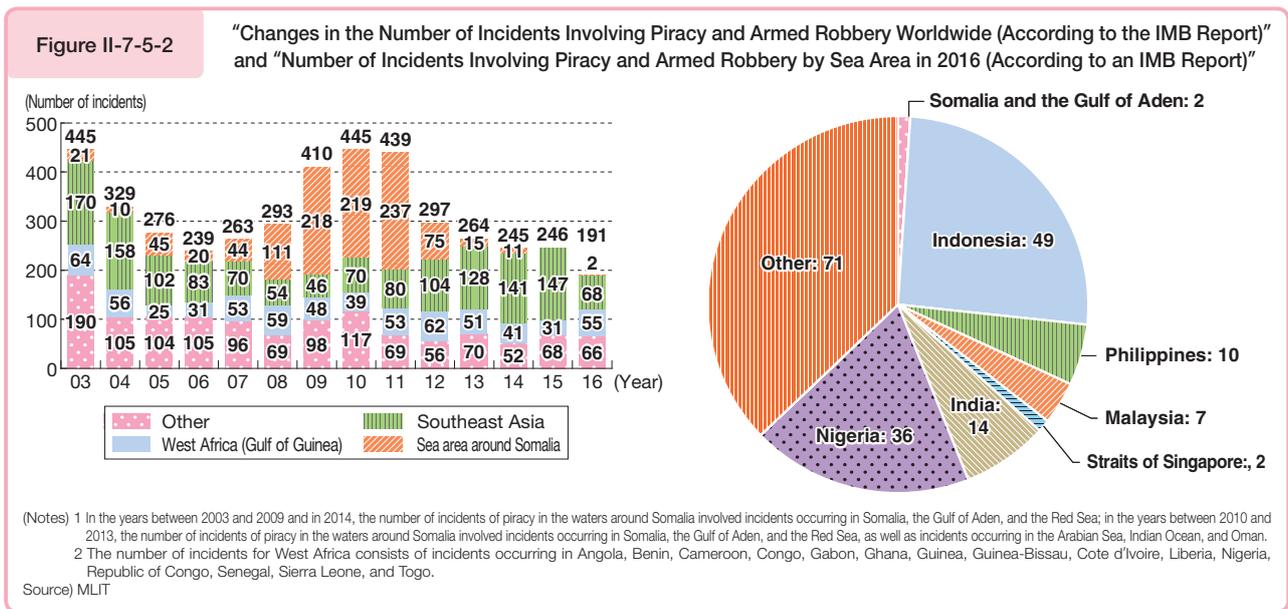
**Note** Stipulations of self-defense measures (such as measures to avoid piracy and the development of escape compartments onboard a ship) to prevent or minimize the harm caused by Somali piracy as produced by the International Chamber of Shipping and other international shipping organizations.

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 two 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, which allows security guards employed by commercial security companies to guard Japanese-flagged vessels with which certain requirements are satisfied and 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.

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 co-operation 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).



(iii) Security measures for ports

Human resource development for port security measures is being implemented for ASEAN countries through training, expert conferences, and other measures. Also, information is being shared with other countries as a part of the initiative to further raise the level of security in international ports.

(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. During the Ise-Shima Summit held in May 2016, the MLIT conducted joint drills with public transportation operators, requested operators under its jurisdiction to perform voluntary inspections, and implemented other anti-terrorism measures in partnership with the private sector. Looking ahead to the Rugby World Cup in 2019 and the Tokyo Olympics and Paralympics in 2020, 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<sup>Note</sup>” as the axis of promoting counter-terrorism measures. Also, the sharing of information regarding railway counter-terrorism measures with major nations is being actively pursued.

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

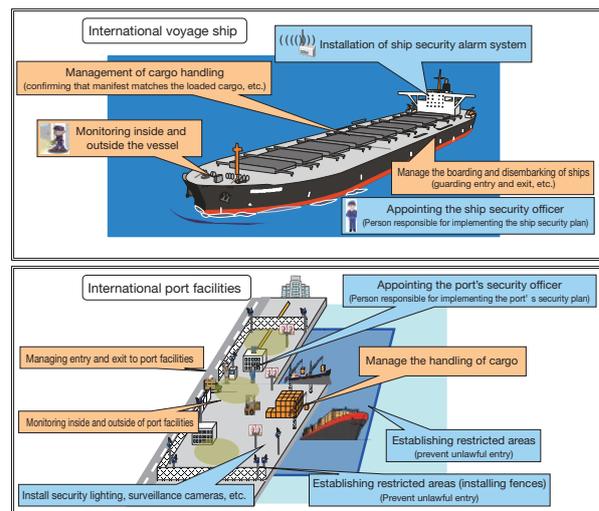


Source) MLIT

(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, in the light of the results of inspections for the Japanese international port facilities and the security levels of foreign countries, MLIT has increasingly enhanced its port security measures, for example, the three-item check (checks on the ID, organization and purpose of entrance) at all the Japanese international port facilities after July 2014.

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 enhance security checks at airports, body scanners and other equipment will be installed at major airports in Japan by the 2020 Tokyo Olympic and Paralympic Games. In FY2016, body scanners were installed at eight airports, including Haneda, Narita, Kansai, Chubu, New Chitose, and Fukuoka as part of efforts to strengthen aviation security measures. 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<sup>Note 1</sup> 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<sup>Note 2</sup> 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.

**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.

#### (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, the MLIT is taking information security measures, including at incorporated administrative agencies and critical infrastructure operators under its jurisdiction (aviation, railway, and logistics), in accordance with a policy formulated by the government's Cybersecurity Strategy Headquarters. These measures include strengthening information security functions and carrying out initiatives to enhance and strengthen preparedness for dealing with cyber attacks, in collaboration with the National Center of Incident Readiness and Strategy for Cybersecurity.

## 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, increased awareness of the risks of terrorism committed against passengers, calls for the early detection of suspicious incidents, and the implementation of joint drills on counter-terrorism measures.

In FY2016, we focused on the promotion of counter-terrorism measures in accordance with the hosting of the Ise-Shima Summit, and are striving to reinforce counter-terrorism 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.

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. These offenses are becoming more aggravated and increasingly sophisticated. Cases in which foreign fishing vessels are found to be illegally operating continue to arise. Some vessels operate unlawfully under cover of darkness to evade control. Such cases are also becoming more aggravated and increasingly sophisticated. International criminal organizations are also getting involved in the smuggling and the stowaway. 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

### The Yearly Seizure of Stimulant Drugs Hits a Record at 1,314 kg

The Japan Coast Guard has been detecting a succession of crimes related to the smuggling of large amounts of stimulant drugs into Japan, and has seized a total of approximately 1,314 kg in 2016 (corresponding to an end trafficking price of approx. 91.9 billion yen and a usage of roughly 43.8 million times). This figure immensely surpasses the 785 kg that was seized in 1999 as the largest, yearly amount at the time.

In terms of amount seized per incident, approximately 597 kg of stimulant drugs were seized in a large-scale smuggling incident by Taiwanese captain of a Malaysian yacht exposed in Naha City, Okinawa Prefecture in May 2016. This surpassed the record seizure of approximately 564 kg in Minami-Satsuma City (former Kasasa Town), Kagoshima Prefecture in October 1999.

The Japan Coast Guard, while keeping their eyes peeled for maritime smuggling of stimulant drugs, and has more attempts to smuggle in large amounts of drugs at once, such as in deliveries of drugs at sea using small boats, and drugs hidden in sea cargo containers. They have also detected foreign cruise passengers attempting to smuggle drugs into Japan.

Drugs, etc. that have been seized



Source) MLIT

A ship that was involved in smuggling



## 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.

## (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 on 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.