

## 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, off-street 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

## a. Accessibility of Housing and Architecture

In order for those such as the elderly and disabled to lead a secure, safe, and comfortable housing life within the region,

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

(as of March 31, 2014)

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

	Total Facilities	Passenger Facilities Compliant with Accessibility Standards for Public Transportation (No Grade Barriers) <sup>(Note 1)</sup>	Share of Total
Railway stations	3,491	2,909	83.3%
Bus terminals	50	41	82.0%
Passenger ship terminals	16	14	87.5%
Airport passenger terminals	33	28	84.8% (100%) <sup>(Note 2)</sup>

(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 Installation of elevators, escalators, and slopes that can be used by people such as those with disabilities (removing steps de facto).

○ Vehicles

	Total Number of Vehicles, etc.	Vehicles Compliant with Accessibility Standards for Public Transportation <sup>(Note)</sup>	Share of Total
Railway carriages	52,601	31,308	59.5%
Low-floor busses	45,329	19,883	43.9%
Lift-equipped busses	14,488	559	3.9%
Welfare taxis	-	13,978	-
Passenger ships	688	197	28.6%
Airplanes	566	525	92.8%

(Note) “Compliance with smoothness of transport vehicles” is calculated based on each vehicle’s compliance with the Accessibility Standards for Public Transportation.

Source) MLIT

the conversion of housing to be barrier-free is supported by measures, for example, the financing interest of the Japan Housing Finance Agency's (Independent Administrative Institution) "Flat 35 S Loan" is reduced for obtaining housing that fulfills a certain barrier-free level;; subsidies are provided for barrier-free renovations; public housing and Urban Renaissance Agency rental housing which are newly supplied on the basis of the housing rehabilitation project are rendered barrier-free by standard specification; and assistance and other options are available for the development of serviced housing for the elderly by private sector businesses and others.

Also for architectural structures used by the general public, including those such as the elderly and disabled, architected to be over a certain scale are required to be accessible in accordance with the "Barrier-free Law" and approved specific buildings that meet certain requirements are eligible for support measures such as subsidy programs. For government facilities that are used by unspecified but many 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 Approvals of Architecture for Specified Designated Building in Accordance with the "Barrier-Free Law"

Fiscal year	FY1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
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
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

Source) MLIT

#### b. Universal Design of Pedestrian Spaces

In accordance with the "Barrier-Free Law", areas such as roads and station squares, which connect to facilities such as stations, government facilities, and hospitals, must ensure that everyone, including the elderly and disabled, should be able to pass through comfortably. This is achieved by promoting the universal design of pedestrian spaces through measures including: creating wide sidewalks; reducing unevenness, slopes, and grades; eliminating utility poles; and making guiding blocks for the visually impaired.

#### c. 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, like eliminating grade disparities at entrances, exits, and passages as well as ensuring facilities such as restrooms are usable by those such as the elderly and disabled. Also, 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 promoted as an integral part of town planning.

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

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

#### a. 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.

## b. Promotion of Teleworking

Teleworking, a flexible work style that uses information communication technology for the freedom to work anywhere, contributes to vitalization of local cities, etc. through promotion of workforce participation by women, etc. and creation of new workplaces and is required of promotion. In addition, teleworking promises to reduce the burden of commutes by combining work and living arrangements, realize harmony of work and life (work-life balance), and ensure business continuity during disasters and other events among other benefits.

The “Declaration to be the World’s Most Advanced IT Nation” decided by Cabinet on June 14, 2013 (Revised on June 24, 2014), states, “To these ends, government will collaborate with industry to support employment models for teleworking from home that allow workers to spend at least one full workday per week at home targeting women engaged in child raising, who find it particularly difficult to continue working, as well as men participating in childcare, and caregivers. The target is full development and widespread adoption of such models by 2016 to encourage greater social participation by women, secure labor during a time of low birth rates and an aging population, support greater participation by men in childcare, and achieve balance between work and care giving” and teleworking will be promoted even more through initiatives.

Relevant ministries and agencies are coordinating to promote the further adoption of teleworking through initiatives such as creating a facilitating environment and raising awareness in the belief that teleworking will create employment opportunities for people seeking alternative working arrangements and also vitalize regions among other effects.

The Ministry of Land, Infrastructure, Transport and Tourism conducted the assessment of the current situation of teleworking, quantitative assessment of the current teleworking population, and assessment of the teleworking development base demands, etc.

## (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 Regarding Safety Requirements for 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 2013 is implemented at 986 housing projects (24,904 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 Ageing Society

In order to respond to the demand for the transportation disadvantaged such as the elderly and disabled to use hospitals and other care facilities, the implementation of welfare taxis <sup>Note</sup> is being promoted and as of the end of FY2013, 16,059 vehicles are being operated. Also, 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 from FY2012, universal design taxis that are easy for the elderly and various people are granted preferential measures regarding motor vehicle tonnage tax and vehicle excise tax if the vehicle meets standard specifications and is certified by government. Also, as of the end of FY2013, 3036 organizations are providing fee-based passenger transport services to allow municipal governments and NPOs to provide fee-based transport services using private vehicles in the case where the parties of the regional residents agree that services by bus or taxi companies are deemed difficult to provide and the

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

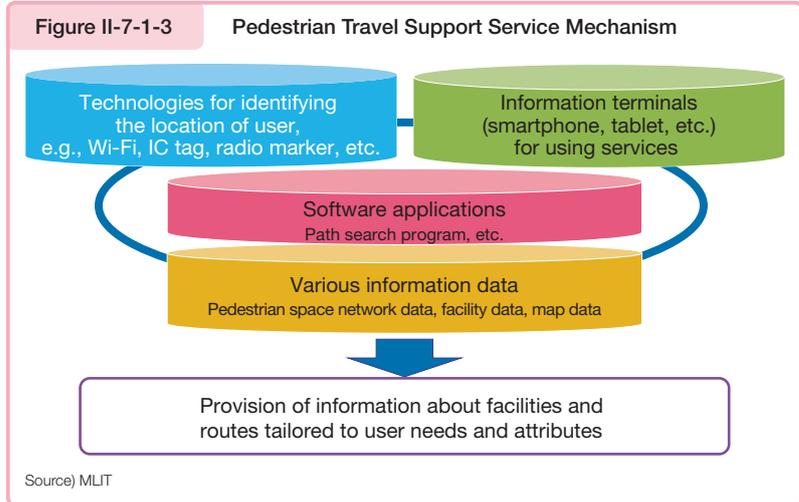
private fee-based passenger transport services are required to ensure the passenger transport which is necessary for the living of the local residents.

## 4 Promoting the Support of Pedestrian Travel

To build a universal society where everyone including the elderly, disabled, and foreign travelers can get information about travel as required and readily take part in activities, efforts are being made to support pedestrian travel through use of Information Communication Technology (ICT).

A guideline easily implementable by local governments (March issue in 2014) has been prepared based on the knowledge gained from the local projects carried out from 2011 to 2013 in 14 locations nationwide. Furthermore, since June, 2014, matters necessary for promotion of support

of pedestrian travel have been studied by the “Pedestrian Travel Support (Using ICT) Promotion Review Committee” (presided by Vice-Minister for Engineering Affairs, Ministry of Land, Infrastructure, Transport and Tourism, and the chairman is Ken Sakamura, Professor in Information Science at the University of Tokyo).



## Section 2 Natural Disaster Measures

Japan's national land is subject to severe conditions including climate, geography, and geology; almost every year natural disasters such as earthquakes, tsunamis, floods, and sediment-related disasters occur. Even in 2014, heavy disasters occurred due to sediment-related disaster in Hiroshima Prefecture, eruption of Ontakesan (Mt. Ontake) and others, leading to massive damages in several locations. Also, the importance of natural disaster measures is more urgent because there is concern over occurrence of more frequent and serious water disasters due to climate change as well as occurrence of giant earthquakes such as the Nankai Trough Mega Earthquake and Tokyo Inland Earthquake. To this end, disaster prevention, disaster mitigation, and dilapidation measures must be fundamentally bolstered and non-structural and structural measures are being taken to protect the lives and living.

## 1 Responding to Weather Disasters Getting More Serious and Imminent Giant Earthquakes

### (1) Ideal Way of Disaster Prevention and Mitigation for Coping with New Stage

Recently, more than 50 mm of rainfall per hour has occurred frequently, showing the increasing tendency of localized, concentrated, and heavy rain. In September, 2014, Ontakesan (Mt. Ontake) erupted, presenting a situation waiting powerful volcanic eruption to occur. These situations were considered as “a new stage” and the direction of future study thereof was summarized in January, 2015.

As for earthquakes and tsunamis, the damage to be caused by the Nankai Trough Mega Earthquake and Tokyo Inland Earthquake was anticipated in accordance with the damage caused by the Great East Japan Earthquake and other earthquakes, and structural and non-structural measures are being taken to cope with the largest earthquake ground motion and tsunami.

On the other hand, as for flood and so on, facilities have been installed to cope with rainfall, etc. that does not occur too frequently, the hazard maps showing the damage to be caused by such rainfall, etc. have been created, and non-structural measures such as improvement of weather information has been taken. However, no measures have been formulated against the largest class rainfall. Therefore, flood measures in non-structural and structural perspectives need to be taken with a view to the “worst”.

The “ideal way of disaster prevention and reduction for coping with new stage (hereinafter referred to as the “ideal way”) basically aims to protect human lives using facilities against the rainfall, etc. that occurs relatively frequently. Against the extraordinarily heavy rainfall and so on that occur rarely, the policy aims to “protect human lives at least and avoid catastrophic damage to the socioeconomy” and respond to it by taking mainly non-structural measures. The basic concept is to “protect human lives” and avoid catastrophic damage to the socioeconomy”.

Specifically, in order to “protect human lives”, it is necessary for the residents not only to escape when warned to evacuate their area (“instruction awaiting” type evacuation) but also to escape themselves according to the “condition information” about the amount of rainfall, etc. (“independent action” type evacuation). Also, in order to “avoid catastrophic damage to the socioeconomy”, all interested parties of national and local public entities, enterprises, etc. must share the sense of crisis to take social measures on the assumption of the worst case. In order to take specific actions in accordance with the “ideal way” summarized in January, 2015, the Regional Development Bureau started at the end of March, 2015, estimation of the damage to be caused by large-scale flooding, etc. that could occur in Tokyo, Nagoya, and Osaka in cooperation with the relating local governments, local enterprises, economic organizations, etc.

## (2) Responding to Climate Change

It is feared that water disaster (flood, inland water, or storm surge), sediment-related disasters, and drought damage occur more frequently and seriously due to the climate change caused by global warming. In order to address this fear, the “Panel on Infrastructure Development River Subcommittee’s Subcommission to Evaluate Flood Control Measures for Climate Change” conducted study and revealed the “About the Ideal Way of Climate Change Measures in the Water Disaster Field – Toward the Society that Shares Disaster Risk Information to Mitigate Disasters – Midterm Summary” in February, 2015. In order to cope with the water disasters which are getting more serious, it is important to steadily carry out construction and improvement of facilities as adaptive measures. In addition, the whole society needs to share disaster risk information and take measures to mitigate disasters on the assumption of the cases where the facilities cannot avoid disasters.

As for the measures to be taken against the disasters in coast areas, the “Committee for Study Influence of Climate Change in Coast Areas (Seaport and Seashore) and Direction of Coping” will study the direction of measures and summarize it in April, 2015.

Based on the abovementioned summaries, the relevant authorities will cooperate to implement the measures to cope with the disasters in coast areas.

## (3) 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 getting more frequent and serious. With this situation in mind, the “Underground Mall, Subway, Etc. Working Group” and “Disaster Action Plan 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 Mall, Subway, Etc. Working Group” sorts out underground space problems in cooperation with the relevant bureaus, determines the measures to take, and provides information to the administrators of underground malls, subways, and connected buildings.

The “Disaster Action Plan Working Group” created timelines focused on the evacuation order and others for the

directly controlled rivers in Japan before the flood season of 2014, and tried it. In addition, in the Metropolitan area and Chubu area, this group is promoting the leading project in order to create integrated timelines for all parties concerned, and will create the timelines before the flood season of 2015.

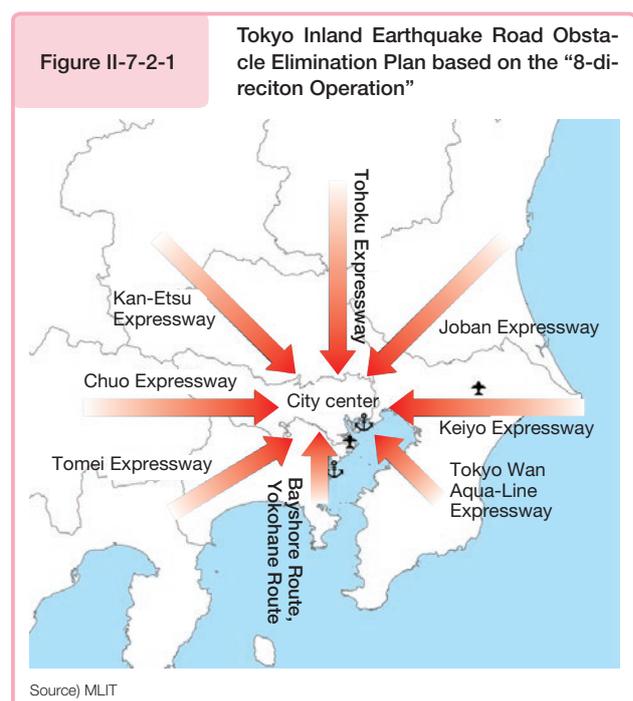
#### (4) Responding to the Nankai Trough Mega Earthquake and Tokyo Inland Earthquake

If the 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 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 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 development and management of a lot of infrastructures and protection of human lives and properties on the sea and 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 “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, to determine the reality-based responses to be taken with might and main. Also, regarding the Nankai Trough Mega Earthquake, more specific and practical “Regional Response Plans” were developed for each regional block along with the abovementioned plans. In July, 2014, the MLIT determined the priority responses to be taken after 2015 after following up the implementation states of the abovementioned plans.

Specifically, in order to accelerate emergency operations in a disaster, the MLIT is promoting the introduction of a method for collecting and analyzing the disaster information using big data, including: probe information from the electronic disaster information system; increase of other organization’s offshore tsunami observation data utilized to provide tsunami observation information approximately 10 minutes at the most before arrival of tsunami to the land area when the Nankai Trough Mega Earthquake occurs; strengthening of emergency transportation roads used to support emergency life-saving operations and restoration of support operations after occurrence of the Tokyo Inland Earthquake; and buildup of the system for swift elimination of road obstacles. The Kanto Regional Development Bureau established the “Tokyo Inland Earthquake Road Obstacle Elimination Plan Study Committee” in July 2014, create a plan to eliminate road obstacles swiftly and appropriately while carrying out rescue operations. They also formulated and revealed, on February 20, 2015, the “Tokyo Inland Earthquake Road Obstacle Elimination Plan (First Edition)” intended to eliminate obstacles on highways, national roads, and other selected roads by executing the “8-direction Operation”, an operation for moving forward toward the city center from eight directions at the time of a disaster. (See Figure II-7-2-1)



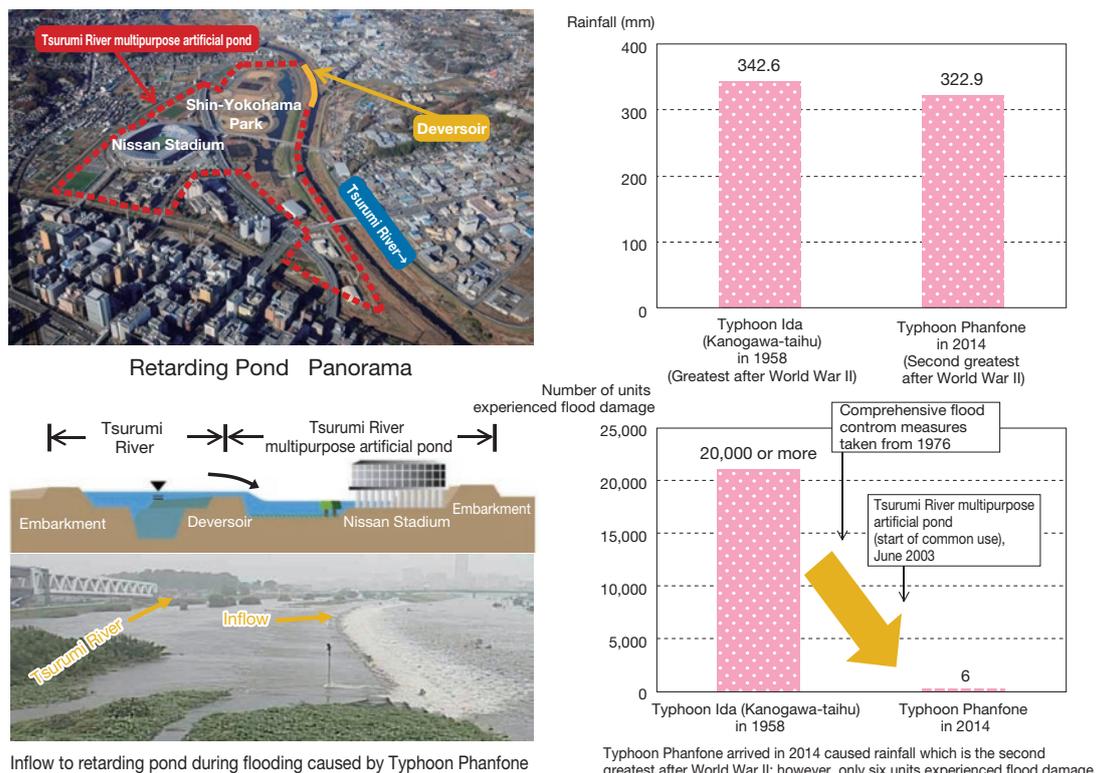
## 2 Shaping National Land that is Safe and Resilient to Disasters, Enhancing and Strengthening the Framework of Preparedness for Crisis Management

### (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 expanding the river channel to safely flush away floods, embankments, development of discharge channels, dams to temporarily hold back floods, and artificial ponds have steadily improved the degree of water control safety. However, in 2014, flooding in various locations has occurred such as the heavy rainfall disaster occurred in the Shikoku region due to Severe Tropical Storm Nakri and Typhoon Halong that approached Japan in succession and the heavy rainfall disaster occurred in the northern area of Kyoto Prefecture (it also occurred in 2013). In order to mitigate and reduce damage caused by torrential rains and other factors, 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 recent disaster forms and the influence of climate change.

In addition, preventive flood control measures which had been taken so far exerted an effect for the floods, etc. occurred in various locations in 2014. For example, the flood control measures which had been taken so far, such as storage of 1,540,000 m<sup>3</sup> (largest amount in history) of water in the Tsurumi River multipurpose artificial pond, exerted an effect and reduced the inundation damages drastically when there was postwar Japan's second heaviest rainfall in the Tsurumi River basin due to Typhoon Phanfone.

Figure II-7-2-2 Tsurumi River multipurpose artificial pond



Source) MLIT

### a. Preventative Water Control Measures

The occurrence of large scale floods leads to human and economic losses, greatly affecting socioeconomic activities and because the recovery and reconstruction requires a great amount of time and resources, preventative water control measures are important to keep disaster from occurring. For this reason, water control facilities such as levees, excavating river channels, dams, and discharge channels are developed systematically. Also, in order to use the existing facilities effectively, the redevelopment of existing dams is carried out to enhance the water control function through increase in height and restructuring of the capacity of the existing dams. In addition, existing levees that are not sufficiently safe from permeative destruction or erosion due to floods are being strengthened.

Additionally, for “areas with a high likelihood of grave human casualties due to levee collapses 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 formed and to increase the safety of areas away from rivers, the development of high-standard levees that do not collapse in the face of flooding that exceeds the planned capacity of facilities is being carried out.

### b. Preventing the Reoccurrence of Flood Disasters

In recent years, within regions that experienced flooding, river channels are excavated and levees are being built to improve the flow capacity of rivers, drainage pump stations are developed to prevent inside water flooding among other measures are being implemented intensively in a short time span to prevent or mitigate flooding.

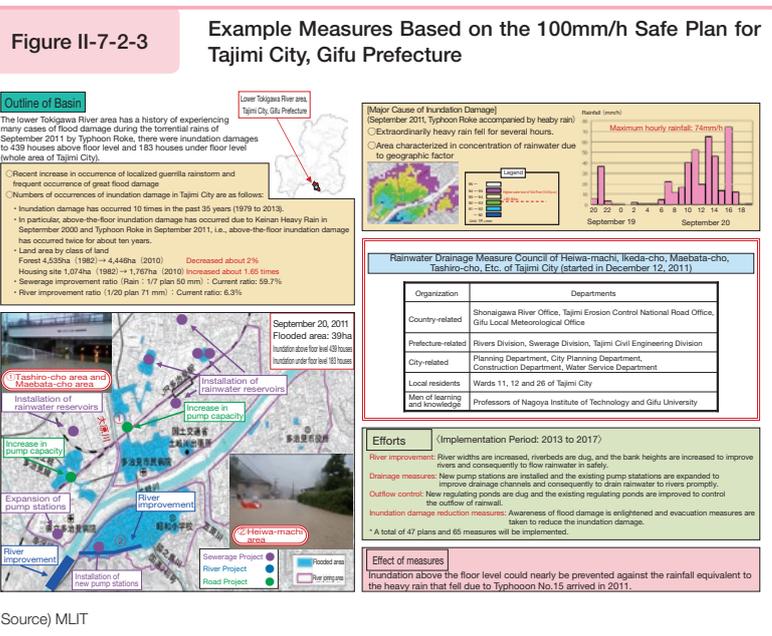
### c. Flood Control Measures Tailored to River Basin Characteristics

For rivers that experience a significant decline in flood control safety due to river basin development or existing urban areas regularly subject to flood damages, 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 increase in the impermeable land area following the development of urban areas and peripheral areas as well as 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, the development of rainwater harvesting facilities is being promoted through measures such as river basin storage and infiltration projects and tax breaks so that the relevant local authorities can cooperate to further suppress rainwater drainage and measures to reduce civil damages.

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 flood 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 “100mm/h safe plan” is registered and initiatives to promote mitigation measures against flood damages are being implemented in addition to the development of rivers and sewerage.

### (c) Integrating Flood Control Measures with Land Use

In accordance with land use conditions, if it is an area prone to inundation disasters and more efficient and effective than developing a consecutive levee, integrated land use that combines the development of a circle levee <sup>Note</sup> and the regulation of land use through measures such as designation of disaster risk areas is combined in cooperation with local authorities to promote flood control measures.

### (d) Inner Water Measures

To prevent flooding through inner water inundation and strive for the healthy 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 increased rainwater drainage due to the advancement of urbanization, the increased complexity of the urban landscape including the concentration of population and wealth as well as the increased use of underground spaces make the risk of damage due to inner water inundation even greater. For this reason, measures such as integrated projects for the reduction of sewer flooding damages and integrated projects for inner 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 inner 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 flood measures.

### d. Strengthening the Flood Prevention Framework

In coordination with prefectures and flood prevention administration bodies, joint inspections of levees before flooding season, training exercises for communicating information, seminars for flood prevention technology, and flood prevention drills are carried out to ensure that areas requiring special attention are widely known and flood prevention technology is mastered from the perspective of flood prevention to assist the strengthening of a flood prevention framework that minimizes damages due to flooding.

In addition, in order to strengthen regional flood fighting capabilities through the participation of various entities, initiatives are supported to voluntarily secure evacuation and create inundation prevention plans in facilities such as underground malls in areas vulnerable to inundation, facilities for people with special needs, and large-scale factories. Specifically, underground malls are expected to be inundated through the connecting buildings, and therefore initiatives are carried out to promote creation of evacuation securement and inundation prevention plans.

### e. Publicizing Forecasts and Warnings of Flooding and Providing River Information

The Minister of Land, Infrastructure, Transport and Tourism or Prefectural Governor designate rivers with large river basins that are at risk of causing great damages 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 middle to small rivers are designated as water level alert rivers and during floods, when the water level reaches flood warning levels (special caution water levels), this information is also released. As of the end of March 2015, there are 419 flood forecast rivers and 1,568 water level alert rivers.

The water level, rainfall volume, 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

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

website “River Disaster Prevention Information (Kawa Boh) <sup>Note 1</sup>” to be utilized in issuing warnings and evacuation during floods.

Also, the data broadcast function of digital terrestrial television is being used in cooperation with broadcasters for efforts to provide river water levels and rainfall volume information and by March 2015, 51 broadcast stations nationwide are providing such services. For the observation of rainfall volume, to deal with floods and sediment-related disasters due to the increased frequency of heavy storm (so called sudden showers) in recent years, XRAIN (MLIT X-band MP radar network) <sup>Note 2</sup> is being developed, which makes more detailed and real-time rainfall volume observation possible, for more appropriate river administration and disaster prevention activities in addition to the conventional radar (C-band radar) and rain-gauge network. Rainfall information is also available on the Internet and an observation system consisting of 38 radars was established as of the end of March 2015.

#### f. Designation of Areas Vulnerable to Inundation

To raise awareness of the dangers from flooding, work to ensure the effective evacuation of residents, and guide appropriate land use, districts that are likely to be inundated when the river floods (inundation forecast districts) are designated and information such as the depth of inundation is publicized in accordance with the “Flood Control Act”.

Also, so that residents can smoothly and rapidly initiate evacuation measures even when flood inundations occur, the method of distributing flood forecasts and the technical support for the creation and communication of hazard maps indicating evacuation areas are offered to municipalities. In addition, a portal site <sup>Note 3</sup> is opened on the MLIT homepage where all domestic hazard maps can be viewed.

Inundation forecast areas are already designated and publicized for roughly 97% of the rivers concerned and 98% of municipalities within inundation forecast areas already created flooding hazard maps (as of the end of March 2015).

The MLIT not only allows for tax subsidies for inundation prevention facilities obtained by the underground malls, etc. in inundation forecast areas 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, etc. 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.

#### g. 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 developed function as intended during floods and other situations.

In the course of river development carried out, the number of facilities such as levees, weirs, floodgates, and drainage pump stations under management greatly increased and the age degradation of these facilities is also advancing. Also, for river infrastructure, migration to condition-based maintenance is being implemented where degradation conditions and its progress is 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 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” revised partially 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, stipulates the absolute minimum technical standards that must be adhered to by all administrators regarding the maintenance and repair of river management facilities and others by decree, and also revise the “Technical Criteria for River Works: Maintenance (River)” for promotion of appropriate maintenance.

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

**Note 2** Compared to existing radars, observation at higher frequency (every minute), and higher resolution (250m mesh) is possible. Also, time needed for information transmission was reduced from 5-10 minutes to 1-2 minutes.

**Note 3** “MLIT Hazard Map Portal Site” web site: <http://disaportal.gsi.go.jp>

#### h. Measures Against Illegally Moored Vessels in Rivers

Vessels illegally moored in rivers hampers flood control measures (interfere with the implementation of river works, obstruction of the downward flow during floods, damage to river administration facilities, etc.) and other aspects of river administration (water contamination by fuel leakage, obstruction of river usage, etc.). Such illegally moored vessels are directed to move to legal mooring facilities or removed.

In May 2013, the “Promotion Plan for Comprehensive Measures for the Appropriate Management and Improvement of the Operation Environment of Pleasure Boats” was created to resolve the issue of abandoned vessels (illegally moored vessels). In December 2013 the River Law enforcement ordinance was amended and the act of abandoning ships and other vessels was made illegal.

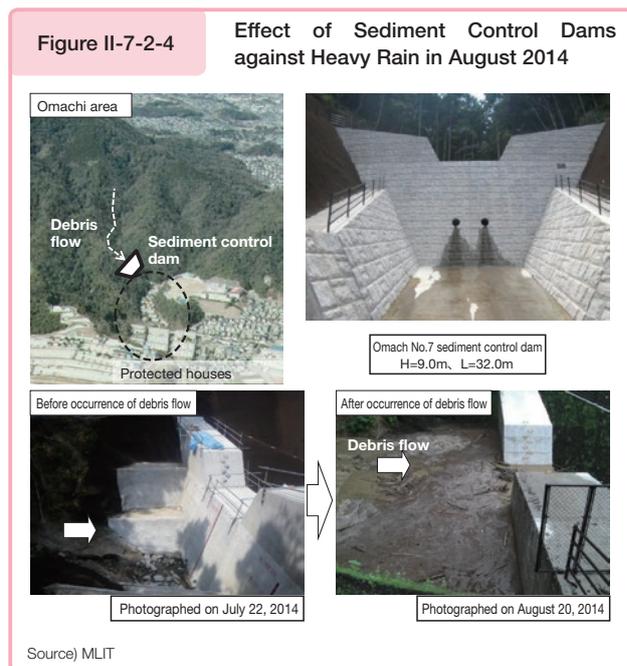
#### i. Road Submergence Measures

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.

### (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 2005 to 2014). In 2014, there were 1,184 cases, causing great damages such as 81 deaths.

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 heavy rainfall in August 2014 caused a lot of sediment-related disasters in Hiroshima City, Hiroshima Prefecture, accompany significant damages such as 74 deaths. In Omachi area, Asaminami-ward, the existing sediment control dams blocked debris flows, succeeding in protection of 32 houses and 80 families living in apartments from sediment-related disasters. In addition, existing constructed sediment-related disaster prevention facilities exerted effects in various parts of all over the country.



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

#### a. 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.

#### b. 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.

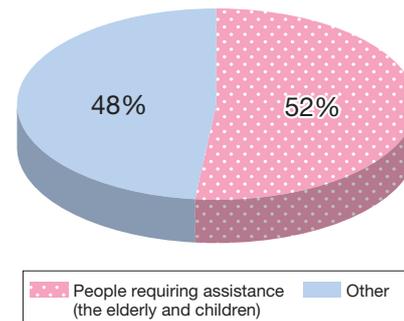
#### c. Countermeasures against Sediment-related Disasters to Protect Those Requiring Assistance during Disasters

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.

Also, based on the "Act on Promotion of Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (Sediment Disasters Prevention Act)", the construction of facilities where people require special assistance is restricted in special sediment-related disaster hazard areas, and also matters concerning facility names, locations and information about sediment-related disasters are defined when making municipal disaster prevention plans. Considering the above, combination of structural and non-structural measures are being promoted.

Figure II-7-2-5

Percentage of People Requiring Assistance among Sediment-related Disaster Dead and Missing (2010-2014)



Source) MLIT

#### d. 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.

#### e. Sediment Disaster Measures for Slopes Near Roads

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

#### f. Countermeasures against Sediment-related Disasters to promote Regional Disaster Prevention

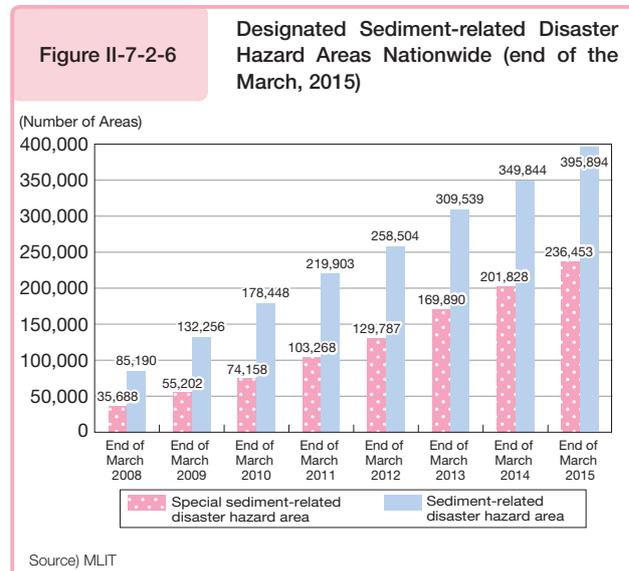
In hilly and mountainous areas at high risk of sediment-related disasters which has a large impact on community people, construction of sediment disaster prevention facilities for protecting people's lives as well as maintaining the important facilities such as evacuation shelters, evacuation routes,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

### g. Promoting the Countermeasures against Sediment-related Disasters Based on the Sediment Disaster Prevention Act

#### (a) Promoting the 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.

Houses near cliffs vulnerable to slope failures are prompted to relocate using the program for relocating at risk housing located near cliffs. In FY2014, this program decreased risky houses by 17 and new 7 houses were built to replace risky houses.



#### (b) Amendment of the Sediment Disasters Prevention Act

Sediment-related disasters occurred in Hiroshima City in August 2014 due to heavy rain clarified the problem with the evacuation systems related to sediment-related disasters, that is, there were many areas which had not been designated as sediment-related disaster hazard areas or finished with baseline survey and the residents were not well-informed of the risk of sediment-related disasters.

To cope with such problems, the “Sediment Disasters Prevention Act” was partially amended and came into effect in January, 2015.

The amended Act forces prefectures to disclose baseline survey results, forces the governors of prefectures to deliver Sediment Disaster Alert to the mayors of municipalities and disseminate the information to ordinary people, and forces the municipal governments with sediment-related disaster hazard areas to take actual actions according to the description items in the regional disaster prevention plan.

## Column

### Amendment of “Sediment Disaster Prevention Act”

Early on August 20, 2014 morning, Hiroshima City suffered concentrated localized rainfall, and debris flows and slope failures occurred in Asakita-ward and Asaminami-ward resulting in tremendous damages (74 deaths) due to sediment-related disasters.

This sediment-related disasters revealed the problems such as insufficient systems for evacuating from dangerous areas, for example, (1) the residents are not properly informed of the risk of sediment-related disaster, (2) evacuation warnings and orders were not given in advance, and (3) evacuation shelters and routes are in dangerous areas. To cope with these problems, the bill to revise the “Sediment Disaster Prevention Act” was submitted at the 187th Diet session (extraordinary Diet session) and the bill was enacted in November 2014, coming into effect in January 2015.

[Outline of Revision]

#### a. Clearly indicating the areas at risk of sediment-related disasters

In order to inform residents of the risk of sediment-related disasters and promote designation of sediment-related disaster hazard areas, prefectural governments must publicize the results of baseline survey. The baseline survey is scheduled to be completed within about 5 years.

#### b. Delivering the information contributing to the smooth issuance of evacuation warnings and orders

In order to contribute to the appropriate issuance of evacuation orders by municipal governments, Sediment Disaster Alert is stipulated in laws, the prefectural government must deliver the relevant information to the municipal government and ordinary people. Upon receipt of the information concerned, the municipal government basically need to issue an evacuation order immediately. When a municipal government asks for an advice on cancellation of an evacuation order, the national or prefectural government must give a necessary advice.

#### c. Improving and strengthening the evacuation systems

In order to improve and strengthen the evacuation systems such as securing the places for evacuation, municipal disaster prevention plans will be created to define evacuation shelters, routes and disaster drills for individual sediment-related disaster hazard areas. In addition, transmission way of Sediment Disaster Alert to the social welfare facilities, schools, and medical facilities will be determined.

Also, in order to promote creation of hazard maps by municipalities, prefectural governments will support the creation by providing municipalities with electronic maps, prepare a report summarizing the progress of the creation, and submit the report to the national government.

#### d. Assistance from National Government

The national government will have to help prefectural and municipal governments take sediment-related disaster measures by giving the advice necessary for them.

The recent revision of the law allows the residents to know the risk of sediment-related disasters as early as possible and made the relation among national, prefectural, and municipal governments more concrete. With the abovementioned points in mind, sediment-related disaster prevention measures will be promoted further by promoting close collaboration between administrative organs and by strengthening the warning and evacuation system.

Disaster situation of Yagi area



Source) MLIT



#### h. Countermeasures for Large Scale Sediment-related Disasters

In order to reduce the damages caused by deep-seated catastrophic landslide, combination of structural and non-structural 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.

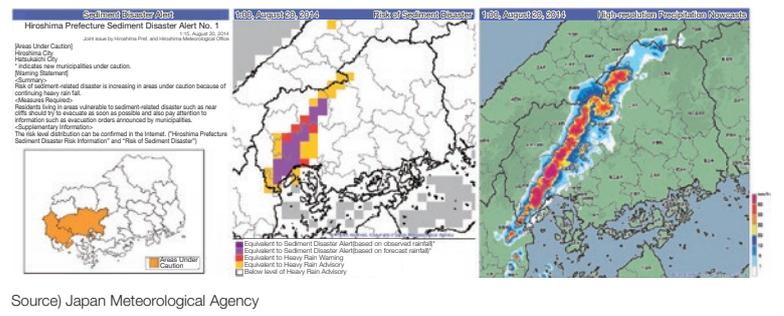
In FY2014, urgent survey was conducted at Ontakesan (Mt. Ontake) erupted in September and provided information obtained in urgent survey.

i. Issuing Sediment Disaster Alert

When the risk of sediment-related disasters increases due to heavy rainfall, Sediment Disaster Alert is jointly issued by prefectures and the Japan Meteorological Agency in each municipality. Sediment Disaster Alert is used as reference for evacuation orders announced by municipalities and voluntary evacuation of residents. In addition, the grid data indicating the risk of sediment-related disasters as well as precipitation data are provided in detail.

Figure II-7-2-7

Sediment Disaster Alert, and Risk of Sediment Disaster and “High-resolution Precipitation Nowcasts”



(3) Volcanic Disaster Countermeasures

a. Countermeasures for Sediment-related Disasters Following Volcanic Activity

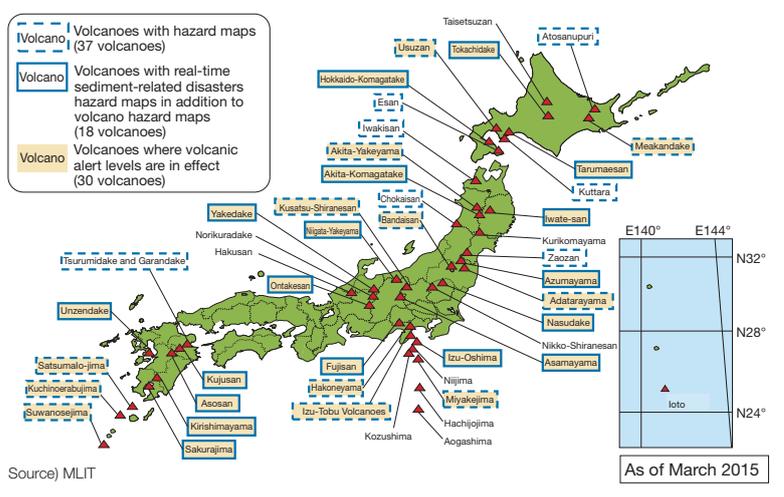
In preparation for the volcanic mudflow caused by volcanic eruptions and the debris flow caused by rainfall, sediment control dams, training dike and so on for preventing or reducing damages are being constructed. In addition, for facilities which are unable to properly maintain their functions due to 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 the eruption with good accuracy beforehand, causing serious damage. For these reasons, “Volcano Eruption Emergency Mitigation SABO Plans” are being prepared to develop facilities in advance and reduce damage by immediate measures in accordance with the volcanic activities changing from moment to moment. The plans are being prepared for 29 volcanoes which are active and have a large social impact in case of eruption. Also, to ensure that residents and others can smoothly evacuate from volcanic eruption, MLIT supports municipalities to prepare the “Volcano Hazard Maps”.

When the Ontakesan (Mt. Ontake) erupted in September, 2014, the situation of volcanic ash fall was assessed using helicopters and through field investigation as the urgent survey based on the “Sediment Disaster Prevention Act”, and provided the results of simulation related to the debris flow. In addition, monitoring cameras and sensors were installed and temporary sediment control dams with a block masonry structure were constructed.

Figure II-7-2-8

Development level of volcanic hazard maps, real-time sediment-related disaster prevention hazard maps and volcanic alert levels of volcanoes specified as “Volcanoes in need of more intensive monitoring and observation for volcanic disaster mitigation” by the Coordinating Committee for Prediction of Volcanic Eruptions



### b. 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.

### c. 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 47 volcanoes in need of more intensive monitoring/observation for volcanic disaster mitigation selected by the Coordinating Committee for Prediction of Volcanic Eruptions, observation facilities have been deployed and volcanic activity is being monitored around the clock.

Also, volcanic alert levels are being applied and improved through coordination of evacuation planning at local Volcanic Disaster Mitigation Councils (applied to 30 volcanoes as of the end of March 2015).

## Column

### Eruption of Ontakesan (Mt. Ontake) on September 27, 2014 and Response by Japan Meteorological Agency

Ontakesan (Mt. Ontake) erupted at about 11:52, September 27, 2014. The smoke emitted from this volcano flowed eastward and rose to an estimated height of about 7,000 m above the crater rim. In addition, the survey conducted by a relevant organization showed that large cinders were scattered about 1 km from the crater row and pyroclastic flows reached about 2.5 km to the southwest and about 1.5 km to the northwest. This eruption of the Ontakesan is the first one after the very small eruption occurred in March, 2007.

In consideration of the eruption, the Japan Meteorological Agency (JMA) issued Near-crater Warning at 12:36 on the same day, and raised the volcanic alert level from 1 (Normal <sup>Note</sup>) to 3 (Do not approach the volcano). After that, on January 19, 2015, in consideration of the Coordinating Committee for Prediction of Volcanic Eruption's opinion that the volcanic activity had reduced, JMA reduced the area in which caution is required against eruption to the 3 km area around the crater.

Since the eruption occurred around noon during the tourist period, a lot of climbers visited the area near the mountaintop. The Fire and Disaster Management Agency reported that the total number of missing and dead was 63 persons (as of October 23, 2014) and it was the greatest among the numbers of missing and dead due to volcanic disasters after World War II.

JMA took special notice of loss of many lives due to this eruption, and therefore conducted study about the observation framework for grasping the symptoms of phreatic eruptions and changes in volcanic activity as well as provision of easy-to-understand information to climbers and sightseers in the "Conference for Reviewing Volcano Observation Framework, Etc." and "Conference Concerning Provision of Volcano Information" under the Coordinating Committee for Prediction of Volcanic Eruptions. The committee summarized an urgent proposal in November 2014 and a final report in March 2015. In response to this, JMA is making efforts to strengthen the volcano observation framework by installing volcano observation facilities for the volcanos requiring constant observation throughout the country as well as provide easy-to-understand information.

**Note** This keyword has been changed to "Be mindful that the volcano is potentially active".



#### d. Japan Coast Guard Initiatives

As a precursor to the eruption of oceanic volcanoes, phenomenon such as discolored water in the surrounding sea area is observed and the information is relayed to sailing vessels. Also, to serve as basic data to predict the eruption of oceanic volcanoes, comprehensive studies will be implemented to gather basic information on seabed terrain, geological structure, and other information as well as implement GNSS continuous observation of the Izu Islands sea area to monitor crustal movements.

For Nishinoshima Volcano started to erupt in November 2013 for the first time in 39 years, its area has increased to 2.5 km<sup>2</sup> (including former Nishinoshima) as of March 2015. The status of volcanic activity and change in the island form are continuously monitored using aircrafts.

#### e. Geospatial Information Authority of Japan Initiatives

##### (a) Improved Observation and Monitoring of Volcanic Activities

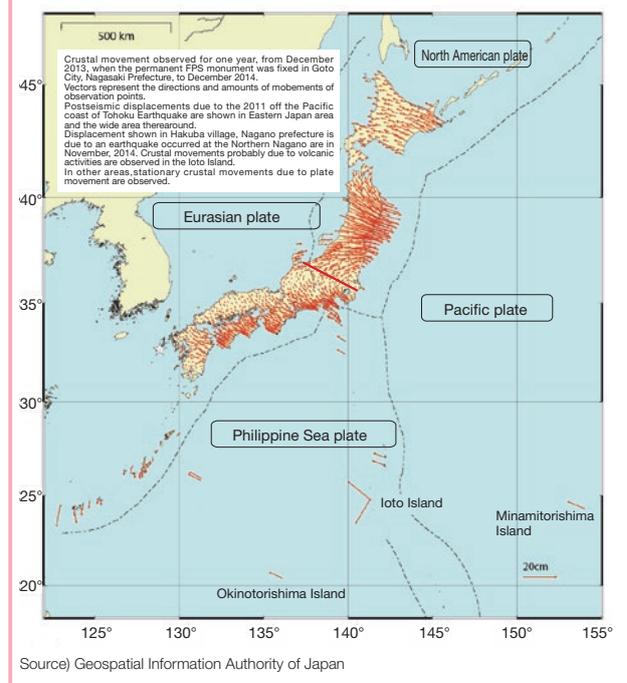
At active domestic volcanoes, continuous observation by GNSS-based control stations (GNSS <sup>Note 1</sup> successive observation facilities called GEONET), volcanic deformation survey by automatic distance and angle measurement devices, and continuous observation by Remote GNSS Monitoring System (REGMOS) are implemented to continuously monitor the three dimensional deformation of the earth's crust. Also, the GNSS observation data conducted by other institutions are integrated into the analysis to monitor the crustal deformation in the surrounding area of volcanoes in more detail. In addition, the Advanced Land Observing Satellite-2 (DAICHI 2) started to observe the change in shape of surface of volcanos through use of SAR <sup>Note 2</sup> interferometry. Observation such as aerial photography was conducted when Ontakesan (Mt. Ontake) erupted.

##### (b) 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

Figure II-7-2-9

#### Movements of Japan Archipelago Captured by Continuous Observation with GNSS



**Note 1** Global Navigation Satellite Systems

**Note 2** Technology that monitors changes in the earth's surface from artificial satellites in space.

by analysis of the abovementioned observation data.

#### (4) Storm Surge and Denudation Measures

##### a. 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.

##### b. 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 1</sup> and sand recycling <sup>Note 2</sup>.

##### c. 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

##### a. Promoting Tsunami Measures

In preparation for the large scale tsunami disasters created by earthquakes such as the massive earthquake which occurs along the Nankai Trough, 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 flooding 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 including 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 June 2014, the “Seacoast Law” was amended to improve the coastal disaster prevention and mitigation measures by locating disaster-mitigating forests at the coastal protection facilities which are developed integrally with coastal levees and forcing stipulation of operating rules of floodgates and so on. For the three major harbors where population and functions are concentrated, a study is conducted to ensure a sufficiently high protection level considering the height of tsunami which exceeds the tsunami with a relatively high frequency of occurrence.

For the tsunami measures for harbors, in order to maintain the harbor functions when a large-scale tsunami occurs, development of seawalls 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.

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.

For fluvial tsunami measures, in consideration of the liquefaction of levees and tsunami river reversal damages by the Great East Japan Earthquake as well as floodgate operators stricken by disaster, measures such as raising river levees, earthquake resistance and liquefaction measures for levees, automation and remote operation of floodgates are being promoted.

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

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

For the four river systems in the Tohoku Region, the lessons learned from the Great East Japan Earthquake will be applied to the formulation of earthquake and tsunami measures, geographic changes to the surrounding river mouth area such as land subsidence following earthquakes will be reflected in changes to the “Basic Policy for River Improvement” and the “River Improvement Plan” that follows the basic policy will be formulated and changed, and initiatives for regional reconstruction and town planning such as the development of river levees in the river mouth area are being promoted in coordination with the region.

Regarding tsunami measures for airports, in preparation for large-scale tsunami disasters caused by events such as the Nankai Trough Mega Earthquake, 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 continue to 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 the 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.

## Column

### The “Seacoast Law” was amended for the first time in 15 years.

In preparation for large-scale tsunamis and other disasters following the Nankai Trough Mega Earthquake with an occurrence probability within the coming 30 years is 70% which, the “Seacoast Law” was amended in June 2014 for the first time in 15 years to improve coastal disaster prevention and mitigation measures, cope with dilapidation of coastal protection facilities such as a lot of coastal levees and so on developed during the period of high economic growth, and promote appropriate maintenance of coasts.

#### Main Points of the Amendment

##### 1. Locating the Coastal Levees, Etc. with a Disaster Mitigation Function at Coastal Protection Facilities

When the Great East Japan Earthquake occurred, coastal levees were destroyed by overtopping waves resulting in tremendous damage to the areas behind the coastal levees. After the Great East Japan Earthquake, coastal protection facilities have been developed basically for protection against tsunamis with relatively high frequency of occurrence. On the other hand, for tsunamis higher than the designed height, it has been determined to provide coastal protection facilities with a disaster mitigation function so that the effect of the coastal protection facilities are exerted tenaciously. The act amended this time expressly defines coastal levees with a “tenacious structure” such as foot protection works or forest (“green coastal levees”) provided integrally with coastal protection facilities in order to further promote disaster mitigation measures against tsunamis and storm surges.

Also, parties concerned have been allowed to form a council to discuss the adjustment between enterprises and so forth in terms of coastal disaster prevention and mitigation measures.

##### 2. Developing the Rules for Operating Floodgates and Land Locks

When the Great East Japan Earthquake occurred, in keeping with the fact that a lot of people in charge of operation of floodgates and so on died, the managers of facilities have been obliged to develop the rules for operating floodgates and land locks and conducting trainings. In addition, provisions concerning emergency measures have been developed so that coast administrators can remove obstacles in the case where they prevent land locks from being closed at the time of disaster.

##### 3. Developing the Standards for Maintenance and Repair of Coastal Protection Facilities

In order to keep the coastal protection facilities likely to deteriorate rapidly in satisfactory condition, the responsibility of coast managers for maintenance and repair of coastal protection facilities has been jurally

clarified, and set up the maintenance and repair standards on the premise that coastal protection facilities are inspected in a planned manner and repair is appropriately carried out according to the inspection results.

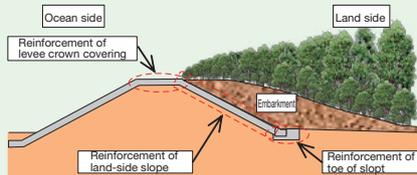
#### 4. Stranded Vessel Removal Order

Coastal managers could not order to remove the vessels, etc. stranded in the sea areas within the coastal protection areas. However, coastal managers have been legally allowed to order to remove stranded vessels, etc. that can damage coastal protection facilities.

#### 5. Establishing the Coastal Cooperation Organization Framework

Recently, private corporations and organizations have implemented a variety of activities at coasts. In order to improve coastal management according to the region-specific circumstances, the coastal administrators have been legally allowed to assign corporations and organizations that voluntarily carry out various activities such as cleaning, planting, protection of endangered animals and plants and perform coastal management appropriately and securely as coastal cooperation organizations.

Locating the Levees, Etc. with a Disaster Mitigation Function at Coastal Protection Facilities



Developing the Standards for Maintenance and Repair of Coastal Protection Facilities



Developing the Rules for Operating Floodgates and Land Locks



Stranded Vessel Removal Order



Source) MLIT

Establishing the Coastal Cooperation Organization Framework



Coast cleaning with community

#### b. Providing Disaster Prevention Information Regarding Tsunamis

In order to strive for the prevention and mitigation of disasters caused by tsunamis, the Japan Meteorological Agency (JMA) is monitoring seismic activities across the nation around the clock in order to make quick 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 such as use of the word “huge” for Major Tsunami Warnings in the case of large earthquakes with magnitude 8 or more to emphasize that it is an emergency situation from March 2013.

As of March 2015, JMA monitors tsunamis with 38 Ocean-bottom tsunami meters, 18 GPS wave gauges, and 172 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 a tsunami disaster prevention information map for the expected behavior of tsunamis in port areas based on new assessments of the massive earthquake which occurs along the Nankai Trough (Cabinet Office, August 2012).

#### c. Tsunami Evacuation Measures

Because there are concerns for tsunami disasters caused by large earthquakes such as the massive earthquake which occurs along the Nankai Trough in the future, a technical guidance was created to compile methods for ensuring the appropriate placement of evacuation and other facilities utilizing the basic data of urban plans which was released in June 2013.

Efforts are being made to make a tsunami evacuation plan taking into account the special characteristics of ports so that workers and others active on waterside land can safely evacuate and retreat during disasters such as tsunamis. Also, for tsunami evacuation facilities developed by local governments, grants for disaster prevention and safety as well as other instruments are utilized to promote development. In addition, the Organization for Promoting Urban Development (general incorporated foundation) is assisting private enterprises in developing distribution facilities with a function of evacuating from tsunami and other disasters.

#### d. Development of Parks and Greenery that Effectively Function to Reduce Tsunami Damages

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.

#### e. 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

#### a. Improving the Earthquake Resistance and Safety of Housing and Architecture

Based on the amended “Act on Promotion of Seismic Retrofitting of Buildings” which went into effect in November 2013, established goals of making at least 95 percent of housing and architecture used by many people earthquake-resistant by 2020 as well as make the reporting of earthquake-resistance diagnosis results for large-scale architectural structures and others used by an unspecified number of people mandatory along with the creation of display requirements for the earthquake-resistance of architectural structures 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 diagnosis, intensive and emergency assistance is being implemented in addition to usual subsidies.

#### b. Promoting the Earthquake Resistance of Housing Land

To prevent or reduce damages due to rock falls and slides during large earthquakes, the technical standards for creation of new earth fill is being strengthened as per the amended “Act on Regulation of Residential Land Development” and other regulations. Also, to prevent damages to the existing residential land due to rock falls and slides as well as liquefaction, the residential land earthquake resistance promotion project is supporting the local government in implementing studies to survey changes and preventative measures.

#### c. Implementing Danger Assessments for Housing Land in Disaster Stricken Areas

To prevent secondary disasters and ensure the safety of residents for housing land, 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 swiftly and accurately after disaster strikes.

#### d. Development to Improve Densely Built-Up Areas

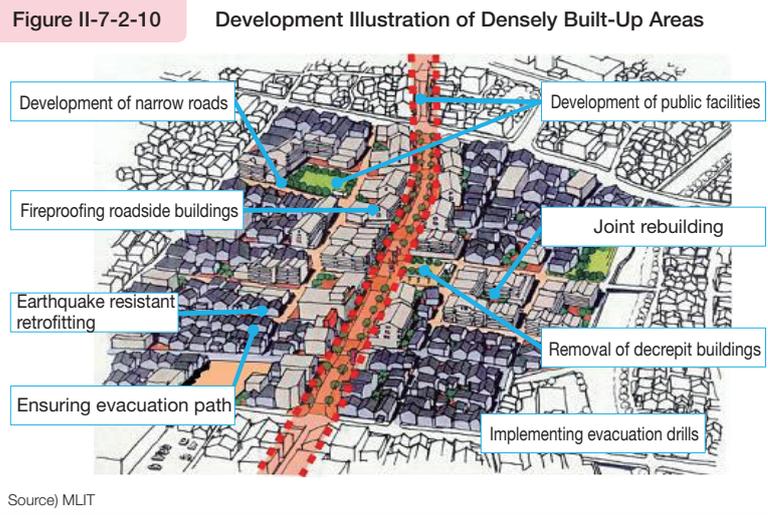
Densely built-up areas with issues regarding disaster prevention and living environment are an urgent issue that requires immediate improvements through development, and the minimum safety is planned to be secured by 2020 for the “land

area of densely built-up areas that are conspicuously dangerous when earthquakes occur” (approximately 6,000 ha).

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.

#### e. Securing Open Space

To improve disaster prevention functions and strive for more safer and comfortable town building, 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 living supplies, and as an evacuation area to protect the lives of evacuees from urban fires. Also, a disaster prevention block improvement project that integrates the implementation of developing a disaster prevention park and the surrounding urban area is being implemented in eight regions including Shinkawa Disaster Prevention Park (Mitaka City, Tokyo Metropolis).



#### f. Promoting Construction and Improvement of Government Buildings as Disaster Prevention Centers

Government buildings need to secure comprehensive seismic performance to ensure the safety for visitors and to be able to function fully as centers for disaster emergency activities in the occurrence of large-scale earthquakes. Therefore, MLIT is setting a target to improve their seismic resistance and promoting construction and improvement of government buildings in a systematic and prioritized way, and in FY2014, Central Government Building No.4 (Chiyoda-ku, Tokyo) was renovated for earthquake resistance.

#### g. 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 damages 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 the earthquakes along Nankai Trough 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 with priority given to important roads, such as emergency transport roads.

For port works, for the Nankai Trough Mega Earthquake and Tokyo Inland Earthquake where extensive damages are expected, to secure an economic and social system that does not succumb to functional failure, increase Japan's competitiveness, and gain international trust, the earthquake resistance of port facilities, that serve as the base of wide area networks both domestically and internationally as well as port complexes are being strengthened.

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. In addition, studies are being conducted as to how structural and non-structural measures should be taken for airport facilities when widespread large-scale disasters such as the Nankai Trough Mega Earthquake occur.

For railway works, in preparation for the 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 is being steadily implemented to avoid and reduce damages due to the 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" which aims to minimize damages in anticipation of disasters striking are being combined for the promotion of integrated earthquake measures.

#### h. Sediment-related Disaster Countermeasures against Large-Scale Earthquakes

In preparation for large-scale earthquakes such as the Nankai Trough Mega Earthquake, implementation of effective sediment-related disaster countermeasures with combination of non-structural and 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.

Also, after a large-scale earthquake, rainfall and aftershocks increase the risk of secondary disasters such as slope failures over a wide area. It is essential to swiftly assess a risk of slope failures according to various factors such as seismic intensity and terrain. It is also important to conduct emergency inspections at high-risk areas, and carry out emergency measures appropriately on the basis of the inspection results for preventing damage of secondary disasters. For this purpose, efforts are being made to strengthen the system for improving the accuracy of risk assessment and conducting inspections in wide area.

#### i. Japan Meteorological Agency Initiatives

To prevent and mitigate disasters caused by earthquakes, seismic activities in and around Japan as well as crustal deformation in the Areas under Intensified Measures against Earthquake Disaster (Tokai Region) are being monitored 24/7 basis to provide Earthquake Early Warnings (EEWs), earthquake information, and information on the Tokai Earthquake as swiftly and accurately as possible.

For Earthquake Early Warning (EEWs), the software of the calculation systems is being improved and effective use of the data obtained by the seismometers installed offshore and deep in the ground by the relevant organizations is being promoted. These improvements lead to more accurate and more prompt issuance of the Earthquake Early Warning, even when multiple earthquakes occur at the same time as well as when a large earthquake occurs.

In addition, 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 caused by long-period ground motion, from March 2013, information on observation of long-period ground motion is being issued on a trial basis. Also, studies are being conducted to provide a forecast of long-period ground motion.

#### j. Japan Coast Guard Initiatives

To contribute to research on the fundamental causes of earthquakes, crustal movements of the seafloor are being observed in the Pacific Ocean waters such as the Japan Trench and Nankai Trough where the occurrence of massive trench-type earthquakes is predicted. Also, in coastal areas and the Izu Islands, GNSS observations are being used to monitor crustal movements.

#### k. 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, GNSS surveying, and leveling through about 1,300 GNSS-based control stations (GEONET). Also, monitoring of crustal movements started using the interferometric SAR of the land observing satellite “DAICHI-2”.

##### (b) Research on Natural Disasters Associated Following Earthquakes

From the results of geodetic observation 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. Also, national fundamental geospatial information and past disaster record as well as seismic intensity is combined and analyzed to research and develop method to promptly obtain and provide disaster information soon after disasters. Additionally, for the purpose of exchanging information on surveys, observations and research outcomes regarding earthquake prediction between relevant government organizations and universities as well as 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.

#### l. Stranded Commuter Measures

If a large-scale earthquake occurs in a major city, urban functions will be paralyzed and more commuters will be stranded compared with the Great East Japan Earthquake, therefore to secure the safety of evacuees and stranded commuters in regions where population and urban functions are concentrated; the “Urban Reconstruction Safety Protection Plan System” was newly established in 2012. Across the nation, 62 regions are designated as urban reconstruction emergency development regions to create a urban reconstruction safety protection plan, conclude agreements on urban reconstruction safety protection facilities, and loosen various regulations in order to improve the disaster prevention capabilities of urban areas in cooperation between the public and private sectors. In the same year, the “Urban Safety Protection Promotion Project” was set to comprehensively assist creation of the urban reconstruction safety protection plan and implementation of non-structural and structural measures based on this plan. In 2013, the system for providing subsidies was expanded to cover the areas around major stations, and special taxation measures were created for storage warehouses listed in the urban reconstruction safety protection plan.

#### m. Safety and Security Measures of 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

#### a. Securing Winter Road Traffic (Snow and Winter 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. In case of unusual snowfall, traffic will be stopped at an early stage and concentrated snow removal will be carried out. where large vehicles are stalled, they will be moved swiftly in accordance with the “Disaster Countermeasure Basic Act”, amended in November 2014, to ensure quick restoration of traffic. When large snowfall occurred mainly in Chugoku and Shikoku regions on December 5, 2014, the “Disaster Countermeasure Basic Act” was

applied for the first time to move vehicles stalled on Route 192 on the border between Ehime and Tokushima Prefectures. Furthermore, unifying the sharing and dissemination of snow removal conditions and other information, as well as improving the efficiency of snow removal, is being promoted, along with the establishment of measures for relaying headquarters information to the relevant organizations of road administrators.

#### b. 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.

#### c. Implementing Snow Clearing Waterways Projects

In heavy snowfall regions, in addition to securing flood control functions, water conveyance channels are being developed for rivers with abundant water volume to supply small and medium-sized rivers flowing through the city with water for snow clearing waterways.

## Column

### MLIT's Response to Heavy Snowfall

Vehicles stalled in various locations due to the record snowfall that occurred in the Kanto and Koshin Regions in February, 2014. These stalled vehicles disturbed the snow clearing work. While clearing snow off the roads was delayed, vehicles in other locations stalled, causing the large-scale closing of roads for several days.

The large-scale closing of roads often occurs due to the stalling of a large-sized vehicle which can be caused by the use of summer tires or not installing chains.

The MLIT is reinforcing the snow cleaning system for such an unusual amount of snowfall, as well as improving the provision of information for road users, to secure winter road traffic.

#### Establishment of Unusual Snowfall Countermeasures Headquarters of MLIT

To minimize the damage due to unusual snowfall, the "Unusual Snowfall Countermeasures Headquarters of MLIT" (General manager: Ohta, Minister of MLIT) was established as a permanent organization in December 9, 2014. The Headquarters created for the first time the disaster prevention action plan (timeline) indicting the disaster prevention action to be taken against snow damage on a time series basis, and the Ministry proper, the Regional Development Bureau, and transportation service providers will act in cooperation with each other on the basis of the information, such as the weather information provided by the Japan Meteorological Agency, to minimize the damage.

#### Intensive Implementation of Snow Clearing Work Along with Early Closing of Roads

Once the stalling of vehicles occurs, the stalled vehicles block the passage of snow clearing vehicles and it takes time to remove stalled vehicles, resulting in prolonged traffic closing.

To cope with the problem, in the road sections where vehicle stalling can occur, the standby locations of road cleaning vehicles and a personnel distribution plan are determined in advance to make preparations for quick initial response.

Since 2014, efforts have been made to reduce the total time of traffic closure by closing off the traffic at an early stage and clearing snow effectively before the occurrence of a vehicle stalling rather than after its' occurrence, particularly in the cases of unusual snowfall when a vehicle will likely stall.

### Movement of Vehicles by Road Administrators Based on the Disaster Countermeasure Basic Act

Based on the experience obtained from the heavy snowfall that occurred in Kanto and Koshin Regions in February, 2014, the “Disaster Countermeasure Basic Act” (hereinafter referred to as the “amended disaster countermeasure act”), amended in November 2014, allowed road administrators to specify road sections and order drivers of vehicles to move their vehicles out of roads when it is necessary to secure passage for emergency vehicles. In addition, the “amended disaster countermeasure act” allows road administrators to move vehicles and other obstructions by themselves when the drivers do not follow orders to move their vehicles or if they are absent.

When heavy snowfall occurred in 2014, the “amended disaster countermeasure act” was positively applied to quickly remove stalled vehicles for effective snow clearing work, as well as to reduce traffic closing times. In 2014, only 48 sections of highways and national roads were specified and eight vehicles were forcibly removed by road administrators (as of March 31, 2015).

Occurrence status of stalled vehicles (February 15, 2014)



Source) MLIT

Forced removal of left vehicles (January 2, 2015)



Source) MLIT

### Appealing to Drivers

To secure winter road traffic, cooperation of drivers in attaching winter equipment is essential. For this reason, drivers are asked to pay attention to weather and traffic information provided at *Michi-no-Eki*, service areas and parking areas, as well as to attach appropriate equipment such as winter tires and chains.

Regional development bureaus and expressway companies announce in advance the road sections that could be closed early when unusual snowfall occurs and they appeal to the vehicles without appropriate winter equipment to avoid passing through these sections.

\* Road sections scheduled to be closed ([http://www.mlit.go.jp/road/bosai/road\\_closed/](http://www.mlit.go.jp/road/bosai/road_closed/))

Where unusual snowfall can occur, the “Unusual Snowfall Countermeasures Headquarters of MLIT” will make an urgent announcement. On December 31, 2014, during the New Year period when heavy snow was expected, the “Unusual Snowfall Countermeasures Headquarters of MLIT” showed drivers the damages and impacts that occurred in the past under similar weather conditions in order to call for caution, such as refraining from going out unless necessary. As a result, this was reported on the evening TV news, Web news, and so on.

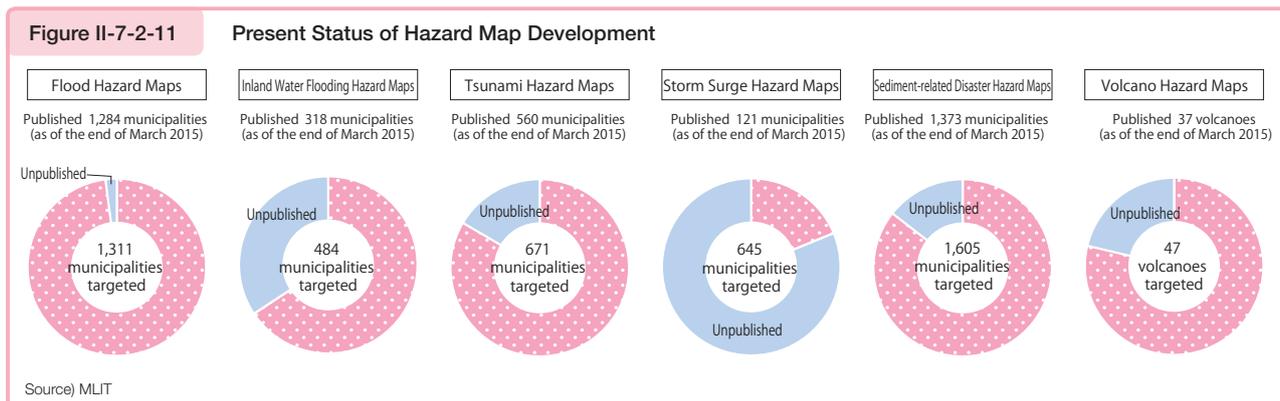
## (8) Sophistication of Disaster Prevention Information

### a. Aggregation of Disaster Prevention Information

The “MLIT Disaster Prevention Information Center <sup>Note 1</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.

### b. Development of Hazard Maps

For residents to take appropriate evacuation actions when disasters occur, the creation and distribution of hazard maps by municipalities is being promoted in addition to creating an Internet portal site <sup>Note 2</sup> where various hazard maps from all over the country can be searched and browsed.



### c. Improvement of Disaster Prevention Weather Information

The Japan Meteorological Agency issues warnings and advisories by municipality as well as provides distribution maps, which are named “nowcasts”, indicating up to an hour forecast for extreme meteorological phenomena affecting a small area such as tornadoes, thunder, and heavy rains. In August 2014, provision of “High-resolution Precipitation Nowcasts” started to allow the half-hour forecast of precipitation distribution to be seen at 250-mesh resolution (four times higher than before). The “High-resolution Precipitation Nowcasts” is compatible with smartphones. For Hazardous Wind Watch, since September 2014, improvements have been made to provide the information indicating that there is an increasing possibility of occurrences of strong gusts such as tornadoes in the vicinity of the area where a tornado was witnessed in the case where a report of sighting of the tornado was obtained.

## (9) Strengthening the Crisis Management System

In response to natural disasters, forecasting natural phenomena that could lead to disaster (Japan Meteorological Agency), in addition to conducting inspections and emergency rehabilitation of facilities during disasters (departments in charge of facility management), and rescue operations at sea (Japan Coast Guard), there are many places with established initial response systems such as the emergency assembly of staff and the establishment of disaster measure headquarters but in light of the disaster response during the Great East Japan Earthquake, the crisis management system needs to be strengthened further. Additionally, using the equipment, manpower, expertise and other resources of MLIT and relevant organizations to support local governments stricken by disaster will be promoted more actively.

**Note 1** “MLIT Disaster Prevention Information Center” web site: <http://www.mlit.go.jp/saigai/bosaijoho/>

**Note 2** “MLIT Hazard Map Portal Site”: <http://disaportal.gsi.go.jp/>

### a. 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 (Technical Emergency Control Force) was established in FY2008 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 or contain damages, and rapid recovery of affected areas. In FY2014, approximately 1,600 members were dispatched to 32 prefectures and 129 municipalities for a total of 4,400 man-days in response to Typhoon Neoguri and rainy front in July, Severe Tropical Storm Nakri and Typhoon Halong in August, heavy rainfall started on August 16, Hiroshima sediment-related disasters caused by heavy rainfall started on August 19, eruption of Ontakesan (Mt. Ontake) in September, earthquake centered in the north of Nagano Prefecture in November, and other disasters to carry out technical assistance such as assessment of damages and minimization of further damages immediately after occurrence of the disaster.

Emergency inspections on sediment-related disaster danger sections (Hiroshima City, Hiroshima Prefecture)



Source) MLIT

### b. Improving Business Continuity Systems

Following the ratification of the government-wide operational continuity plan (government operation continuity plan), previous undertakings of the Ministry of Land, Infrastructure, Transport and Tourism Operational Continuity Plan (Second Edition) were followed up to create the Ministry of Land, Infrastructure, Transport and Tourism Operational Continuity Plan (Third Edition) on April 1, 2014. Also, the operational continuity framework is being strengthened through such measures as the stockpiling of supplies and securing support systems from other regions without awaiting orders from ministry headquarters (immediate dispatch of TEC-FORCE).

### c. Deployment of Information Communication Systems and Equipment in Preparation for Disasters

To secure information communication systems in the event of a disaster, MLIT headquarters, local branch offices, 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, to rapidly respond to disasters, the deployment of disaster response helicopters, satellite communication vehicles, drainage pump vehicles, illumination vehicles, and other disaster response machinery is being developed at regional development bureaus and local offices across the nation, so that in the event of a large-scale disaster, the framework will be able to execute rapid deployment.

### d. Implementing Practical and Wide-Area Disaster Prevention Training

Assuming the worst-case scenario that can occur, realistic and wide-area training was actively carried out including coordination with relevant organizations and wide-area dispatching of the TEC-FORCE from Regional Development Bureaus. Also, mainly in flood fighting months (particularly in May), in addition to realistic trainings in flood fighting activity conducted by flood prevention teams, integrated and realistic evacuation trainings combining together the evacuation training, information communication training, and other trainings were conducted by various organizations such as self-defense flood control organizations.

Additionally, the Great East Japan Earthquake reaffirmed the importance of coordination between relevant organizations during large-scale disasters, therefore efforts to improve and strengthen a wide-area disaster prevention framework in preparation of massive earthquakes and other large-scale disasters through the implementation of various joint exercises between multiple organizations centered around regional offices and bureaus including designated local government agencies, fire fighting organizations, and the Japan Self-Defense Force is being promoted to promote initiatives to enhance and strengthen wide-area disaster prevention readiness in preparation for large-scale disasters such as great earthquakes.

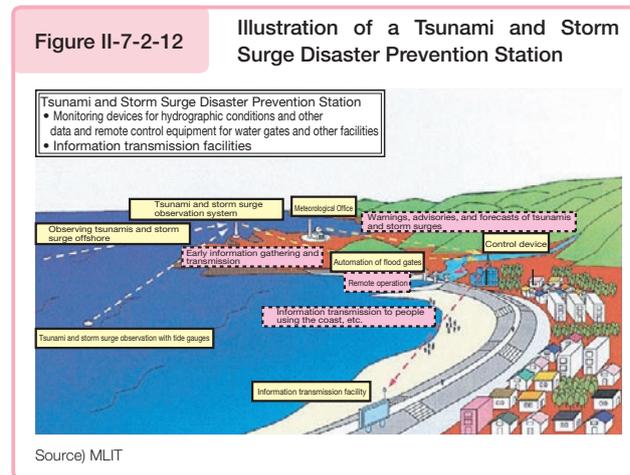
### e. Preparing for Initial Response at Sea

The Japan Coast Guard deploys patrol vessels and aircraft around the clock to allow for rapid responses in the event of a disaster. Also, in accordance with the scale of the disaster a countermeasure headquarters is established to implement damage assessment surveys and rescue operations through patrol vessels and aircraft for an immediate and appropriate response.

### (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

In 2014, damages to public works facilities under the authority of MLIT (rivers, roads, coast, sewage, etc.) came to roughly 181.9 billion yen (9,085 cases) of reported damages due to many domestic large-scale disasters such as the sediment-related disasters caused by the short-duration downpour in Hiroshima City in August and the earthquake occurred in northern Nagano Prefecture in November.

Regarding these natural disaster damages, TEC-FORCE was deployed immediately after the disaster. In addition, since FY2014, the disaster restoration technical experts dispatch system has been used to give technical advices and other assistance on the request of the affected local government such as dispatching the experts enrolled in the National Association of Disaster Prevention to pursue swift restoration and reconstruction as well as prevention of secondary disasters.

Also, for municipalities where damages were concentrated in particular, the general price unit of spending limits for disaster assessments was removed and for assessments involving only desk work, the monetary limit for assessments was raised from the usual less than 3 million yen to less than 10 million yen to simplify assessments and greatly reduce the administrative paperwork leading to project adoption in the interest of facilitating rapid disaster recovery to support early recovery.

Furthermore, the districts (40 cases) affected by natural disasters such as heavy rainfall caused by Severe Tropical Storm Nakri and Typhoon Halong and rainy season; strong winds, heavy snow, avalanches and waves from low pressure were granted emergency project promotion grants for disaster measures to ensure the safety and comfort of residents and urgently implemented measures to prevent recurrences of disasters.

### (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.

## Column Efforts to Improve Functions of Disaster Prevention Application Software

Since the Great East Japan Earthquake occurred in 2011, public awareness on disaster prevention has been improved. In recent years, local governments and private enterprises have created and supplied a lot of disaster prevention application software that provide various kinds of disaster prevention map information through smartphones and cell phones. To promote development of versatile and practicable disaster prevention application software that allow highly reliable disaster prevention map information to be used anywhere at any time, it is essential to provide people with much more various kinds of disaster prevention map information. For this purpose, in 2014, the Geospatial Information Authority of Japan and the MLIT Water and Disaster Management Bureau advertised for disaster prevention application software in cooperation of the Cabinet Office.

As part of these efforts, various kinds of disaster prevention map information were created and provided to the public for the model district Kainan City in cooperation of Wakayama Prefecture and Kainan City, and a lot of useful applications for disaster prevention application software were developed using the information. In addition a review committee consisting of academic experts was held to select disaster prevention application software with superb functions with comprehensive consideration given to availability, user-friendliness, and so on. Further validation test for evacuation guidance with the cooperation of citizens, using some of the selected disaster prevention application software which are useful in the case of evacuation (especially, for searching and mapping the information of evacuation routes and evacuation area), was carried out with a disaster drill in Kainan city, Wakayama Prefecture.

Regarding the efforts stated above, the developers (applicants) of the applications expressed the opinion that the efforts are ambitious, forward-looking and stimulating and that they want to develop more practicable applications on the basis of the result of the validation test. The participants in the validation test expressed the opinion that they want to use disaster prevention map information easily on a routine basis through such efforts and that the disaster prevention map information should be utilized for disaster prevention learning.

The disaster prevention application software were developed using lots of information such as evacuation areas and hazard maps; however, the information needs to be highly utilized to contribute more to evacuation guidance and so on. Also, the users have many opinions about improvements in user-friendliness and functions, and it is necessary to provide more disaster prevention map information and develop and spread disaster prevention application software. Based on the above-mentioned results, further efforts will be made to improve provision of disaster prevention map information to the people.

Validation Test for Evacuation Guidance Conducted in Kainan City, Wakayama Prefecture



Source) Geospatial Information Authority of Japan



### 3 Secure Transportation Systems Resistant to Disasters

#### (1) Ensuring Redundancy and Substitutability

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

The road network functions as emergency transport during disasters to facilitate early relief, fulfilling its function as a “lifeline”.

#### (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. In June, 2013 the Road Law, was amended to promote the conclusion of disaster alliances with private sector businesses to implement swift road openings and the establishment of a council for road administrators to create a framework that keeps roads open. 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 ETC2.0 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 sign posts to promote the provision of sea level information to road users.

#### (3) Accelerating the elimination of utility poles

Utility-pole-free town development is being promoted to prevent utility poles from falling down in the event of disasters, such as earthquakes, and thus blocking the passage of emergency vehicles, etc. In addition, development concurrent with new construction or widening of roads is being promoted and studies are being conducted with the related organizations to introduce low-cost methods, such as direct burying and use of small-sized boxes.

#### (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 the port functions and maintain regional economic activities during disasters as well as 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 established for the national government, port authority, port users, and others to work together to promote the establishment of a cooperative framework.

For airports, in addition to serving as the base of emergency life-saving activities and emergency transport when earthquakes and other disasters occur, airports are considered important from the perspective of maintaining air transport to maintain the aviation network and ensure the continuity of hinterland economic activity. For such important airports, seismic strengthening is being carried out for government facilities critical to ensure necessary control functions as well as basic facilities that are absolutely essential. For such important airports, seismic strengthening is being carried out for government facilities critical to ensure necessary control functions as well as basic facilities that are absolutely essential.

Also, in preparation for tsunami disasters, tsunami evacuation plans were created to stipulate evacuation procedures for saving lives of airport users in the event of a tsunami. 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. In addition, studies are being conducted as to how structural and non-structural measures should be taken for airport facilities when widespread large-scale disasters such as the Nankai Trough Mega Earthquake occur.

#### (5) Building a Logistics System Resistant to Disaster

The Great East Japan 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. In light of this lesson, the establishment of a logistics system that is resistant to disasters through the coordination of central government, local government, and logistics companies was evaluated and private logistics facilities that could be used as a base for supplies in the event of an earthquake were listed up (1,203 locations nationwide, as of February 28, 2015) and for applicable facilities, support was given to implement emergency power supply, communication, and other facilities to promote the establishment of a cooperative framework for coordination between the public and private sectors across the nation.

### 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 2014. In accordance with this, the “Law for a Partial Revision to the Building Standards Law” was enacted in May 2014.

For measures concerning the architect, efforts have been made to optimize the design and construction supervision, based on the “Act for Partial Revision of the Architect Law”, which was enacted in June of the same year.

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.

The year 2014 marks the 5<sup>th</sup> year of enforcement of this system, and the “Review Committee Regarding the Future of Secure Execution of Defect Warranty Liability Legislative System” was newly launched by the experts to discuss about smooth operation, dissemination and enlightenment of this system.

#### (2) Ensuring the Safety of Elevators and Play Facilities

Investigation to study accident causes of conveyors (elevators and escalators) and play facilities and safety and accident measures training for local government and regional development bureau officials will continue to be done. Also, continuing initiatives to ensure safety, such as partial amendment of periodic inspection system and additions of quake-

resistance standards for conveyors and safety device installation standards for luggage elevators for luggage will be taken as well.

## 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 damages 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 FY2014, transportation safety management assessment was carried out on a total of 465 companies (75 railway companies, 107 automobile companies, 262 shipping companies, and 21 aviation companies).

Moreover, in the “policy vision for transportation safety”, which was compiled in December, 2011, through the deliberation of transportation safety committee, under the transportation council, 1) strengthening of widespread awareness activities for small and medium- sized companies; 2) ensuring the effectiveness of safety management, with the focus on large and medium sized business; 3) promote the efforts of the three points shown to enhance the training and security of human resource, which performs the management evaluation; is the direction of the policies to ensure safety in future.

Figure II-7-4-1

Illustration of the transportation safety management system

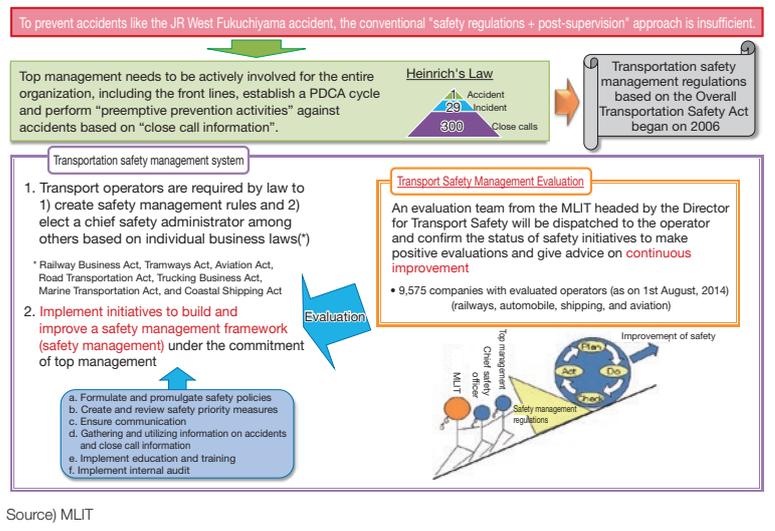
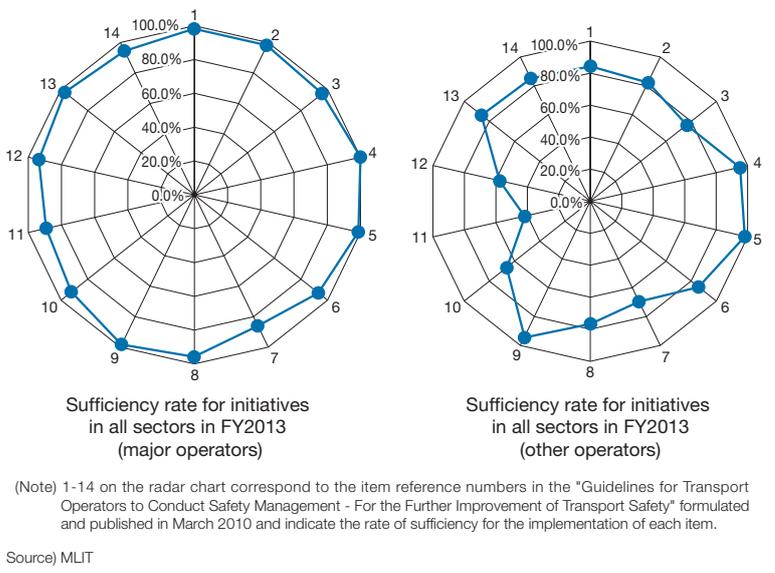


Figure II-7-4-2

Differences in Implementation by Large-Scale Operators and Other Operators (FY2013)



Implementation of effective evaluation in the wake of expansion of all chartered bus operators (about 4,200 people), specifically for the mandatory implementation of transportation safety management system, and spread awareness to small to medium- sized business, through utilization of certification seminar systems (private institutions that are certified by MLIT to carry out the seminars), founded in July, 2013. About 14,000 people had participated by the end of December, 2014 in these certification seminars.

For the transportation safety management system, the MLIT will improve the effectiveness of the system and disseminate it's concept to all the operators for enhancement and strengthening in the future.

## 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 like the promotion of driving assistance facilities including automatic train stop systems (ATS) and rail crossing measures, but the trend is plateauing in recent years, requiring the promotion of further safety measures.

### (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.

#### a. Measures that were triggered by the JR West Fukuchiyama line derailling accident

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.

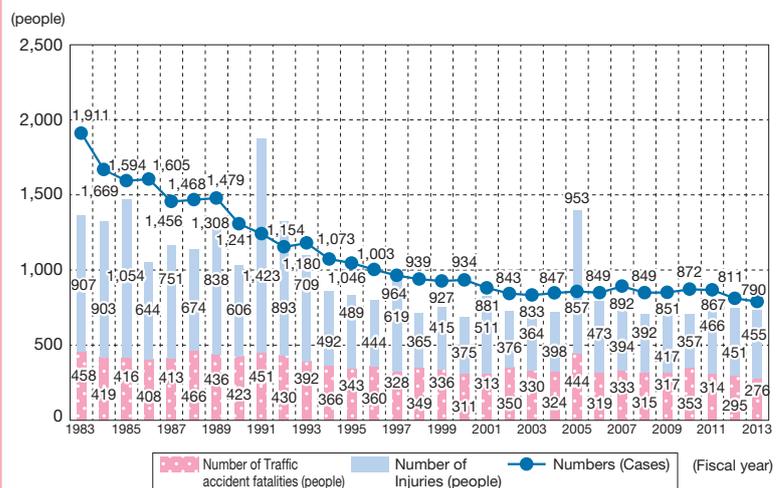
#### b. Measures from the JR East Uetsu line derailment

A “Railway Wind Measures Council” was convened to consider both non-structural and structural measures for strong winds and in addition to installing additional wind gauges, the wind observation system for railways was strengthened, along with other measures.

#### c. Measures taken to ensure the safety of JR Hokkaido, from the JR Freight Hakodate Line Train Derailment

JR Hokkaido has 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 to reliably execute the same.

Figure II-7-4-3 Transition in number of casualties and number of driving accidents in railways



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.

## (2) Promotion of Railway Crossing Measures

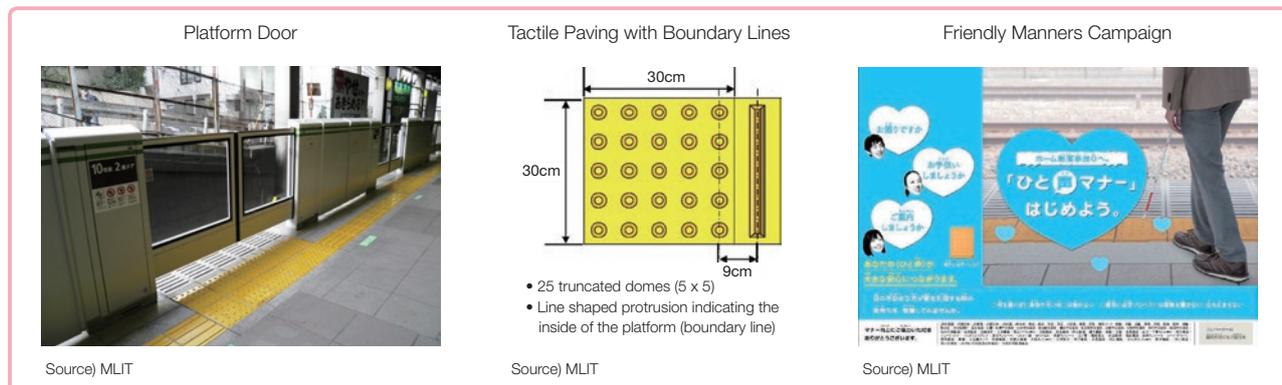
“Gridlocked rail crossings <sup>Note</sup>”, mainly seen in urban areas, cause crossing accidents and chronic traffic congestion, requiring immediate measures. For this reason, the road administrators and railway operators work together to prevent railroad crossing accidents, by developing crossing facilities 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 “9<sup>th</sup> traffic basic traffic safety plan”.

In 2014, immediate measures were implemented for the development of safety equipment and expansion of sidewalks and drastic measures for railroad crossing disposals, through continuous steric intersection measures. This was pursued along with developing safety equipment, which was specified in all 6 railroad crossings, and structural improvements, such as widening the railroad crossing in all 36 places, as well as the creation of railroad crossings in 43 places, based on the “Railroad crossing improvement and promotion act”.

In addition, the “Railroad crossing and traffic safety records” were created and published in 2015, with the aim of intensively continuing the promotion of safety measures for pedestrians crossing railroads.

## (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 615 stations as of the end of FY2014). Based on the “Basic policy to promote smoothness of transport etc.” (March 2011), the “Priority plan for social infrastructure development” (August 2012) and the “Basic Plan on Transport Policy” (February 2015), structural measures, such as promoting the development of platform doors and tactile paving with boundary lines, as well as, technology development for platform doors with better carriage door alignment; and non-structural measures, such as “friendly manners campaign” calling on rail users to offer assistance to those with visual impairment, are being promoted.



## 3 Safety Measures for Maritime Traffic

In the sea areas surrounding Japan, around 2,500 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.

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

### (1) Improving ship safety and ensuring ship navigation safety

#### a. Improving Ship Safety

The International Maritime Organization (IMO) is central in stipulating international standards for safety of the ships, and in July, 2014, in accordance with the SOLAS convention <sup>Note 1</sup>, development of the national laws were carried out, along with the changes to fire protection requirements for the deck and bulkhead in passenger ships carrying not more than 36 people, and additional protection requirements for noise was implemented, while actively participating in IMO discussions.

A committee on large container ship safety is held to consider the safety measures of large container ships, in the wake of large container MOL COMFORT Pat. Breakage accident of Bahama flagged, which occurred in the Indian Ocean in June, 2013, and in March, 2015, a report on the safety measures of large container ships that are currently in service was compiled and published.

Also, Port State Control (PSC) <sup>Note 2</sup> is being implemented, in order to eliminate substandard ships <sup>Note 3</sup>.

#### b. Ensuring Ship Navigation Safety

In accordance with the “Law for Ships’ Officers and Boats’ Operators” which complies with the STCW Convention <sup>Note 4</sup>, the qualifications for seafarers are defined to ensure ship navigation safety from human factors. In June 2010, the revised STCW Convention (Manila Amendments) with amendments stipulating additional competencies required for seafarers was adopted and the partial amendments to domestic Ministerial Ordinances came into force in April 2014. Also, for the pilotage system, qualifications for people who can perform pilotage are defined for the safety of vessel traffic but finding successors is turning out to be challenging, therefore, securing a stable supply of human resources and the provision of necessary incubation training are being promoted.

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 2014 there were 339 cases of determinations and a total of 424 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.

As marine casualty prevention measures, Maritime Information and Communication System (MICS), provides information through weather information providing system that has lighted buoy platform, and a marine casualty prevention and liaison meeting with the relevant ministries was held with the aim to achieve effective cooperation of maritime casualty prevention measures, and the relevant organizations have cooperated and deployed “National Campaign for Preventing Marine Casualties”. In addition, a marine casualty prevention workshop, in cooperation with relevant ministries and organization was held, and has implemented a variety of marine casualty prevention campaign in the region, for marine casualty prevention for small boats.

Based on the report of Council of Traffic Policy, “Initiatives for Maritime Traffic Safety” (October, 2013), when a large-scale disaster occurs, safe and smooth evacuation, and damage to ship has been minimized, and the construction of centralized maritime traffic control in Tokyo Bay has been promoted, in order to alleviate congestion and control the signal wait for the ships, during peacetime.

In addition, to improve efficiency of safety and navigation of the ship transit in the narrow water ways, Kurushima Strait was subjected to detailed and accurate tidal observation, and it provides a tidal information on the Internet through entire region simulation.

Regarding the nautical charts, efforts are being made to further enhance the electronic charts, with increased importance, along with popularizing the electronic chart information display device (ECDIS). Moreover, in 2014, for the navigation in complex water, publication for the English version of the routing guide began to promote the understanding of the navigation, along with, printing the nautical charts in just English for the foreign seafarers as part of marine casualty

**Note 1** International Convention for the Safety of Life at Sea, 1974

**Note 2** The oversight of foreign ships by the port of call.

**Note 3** Vessels that do not conform to the standards of international treaties

**Note 4** The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978. The 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 promote the protection of the marine environment.

prevention measures. Furthermore, there is a promotion to revise the nautical charts for the major 15 ports that were affected in the Great East Japan Earthquake.

Regarding the navigation warnings and notices to mariners, visual information that is a beneficial information displayed on a map is provided over the Internet from June 2014.

For Aids to Navigation, development is performed effectively and efficiently in accordance with the vessel traffic environment as well as needs and in FY2014, improvements and renovation was carried out in 354 locations.

Also, of the 158 Aids to Navigation that were affected by the Great East Japan Earthquake, the remaining 28 Aids to Navigation (as of March 2015) awaiting restoration, these will be restored in time as the ports and breakwaters are restored.

The “Marine Accident Analysis Center” established under the National Maritime Research Institute (Incorporated Administrative Agency) 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.

The Straits of Malacca and Singapore (SOMS) is a vital and extremely important sea lane where Japan imports 80% of crude oil. In order to secure safety of navigation in the SOMS, the Government of Japan has been contributing to the Navigation Aids Facilities Fund <sup>Note 1</sup> under the “Cooperation Mechanism <sup>Note 2</sup>”. In the 7th Cooperation Forum in September 2014, the Government of Japan proposed to conduct a hydro-graphic survey of the SOMS again to revise the charts of the SOMS, because 16 years past from the first survey, the seabed topography may have been changed under the influence of tides. In response to this, the literal states consists of Indonesia, Malaysia and Singapore decided to conduct the survey of the SOMS again in collaboration with Japan in the Three Literal States Technical Experts Conference. Japan will continue the cooperation for navigation safety and environment protection through public-private partnership, along with the good relationship with the coastal countries.

## (2) Promotion of safety measures for the passengers

About 55% of cases reported about the dead or missing passengers is 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 water-proof package, and effectively use the emergency call number “118”. In addition, the passenger mortality due to fall in the sea from small boats (fishing boats or pleasure boats), is 3 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. For this reason, in cooperation with relevant ministries and local government, along with specifying promotion model Marina <sup>Note 3</sup> for life jacket wearers, and support towards LGL <sup>Note 4</sup>, there has been a promotion to wear life jackets through out the year.

## (3) Strengthening the Rescue System

In order for the Japan Coast Guard to carry out swift and appropriate rescue, distress frequencies are monitored around the clock and an emergency telephone hotline, “Dial 118” is made available to quickly catch accident occurrence information. Also, along with improving the rescue technology and capabilities of those such as special search and rescue units, mobile rescue workers, and divers, enhancements and fortifications of the medical control framework to ensure the quality of emergency life-saving treatment that emergency response personnel perform as well as advancing the functionality of patrol vessels and aircraft is being carried out as part of efforts to enhance and fortify the rescue and emergency system. Also, the enhancement and fortification of coordination between ministries, agencies, local governments, and private rescue organizations is also being carried out.

**Note 1** A fund established to cover the costs of replacement and repair of lighthouses and other navigational aid facilities used by the Straits of Malacca and Singapore.

**Note 2** An instrument which realizes the spirit of Article 43 of the United Nations Convention on the Law of the Sea that describes the cooperation between User States and States bordering State of a strait for the first time in the world. The Cooperative Mechanism consists of the three bodies; Co-operation Forum, Project Co-ordination Committee, and the Aids to Navigation Fund.

**Note 3** Marinas and fishermen’s cooperatives that are actively taking the initiative to promote the wearing of life jackets at all times. Designated as centers for raising safety awareness and promoting life jacket wearing in the region.

**Note 4** Local activities to promote the wearing of life jackets by the family of fishermen and others. Stands for Life Guard Ladies (female promoting life jacket wearing)

## 4 Air Traffic Safety Measures

### (1) Strengthening Aviation Safety Measures

#### a. State Safety Program (SSP)

The Aviation Bureau, in accordance with Chapter 19 Annex of convention on International Civil Aviation, developed the State Safety Program (SSP) in October, 2013, which stipulated the measures that must be taken for civil aviation safety, as an aviation safety authority, and was enforced from April, 2014. The Aviation Bureau in SSP sets state's safety indicators and target values, develops standards related to aviation safety, conducts audit and inspection, and implement necessary disposition. In addition, the Aviation Bureau requests aviation service providers to formulate safety policies, set safety indicators and target values, report safety information, conduct safety education and training, and implement the risk management regarding safety.

Moreover, the Aviation Bureau started the aviation safety information spontaneous reporting system (VOICES) from July 2014 to further collect aviation safety information and improve safety. In the VOICES, the Aviation Bureau requests voluntary reports on "close call experience", which are hard to capture by duty reports, extensively from the aviation officials, and experts analyze the reports with information source concealed. The analysis results will be shared among aviation officials and used for the preventive measures for aviation accidents.

#### b. Air Transport Safety Measures

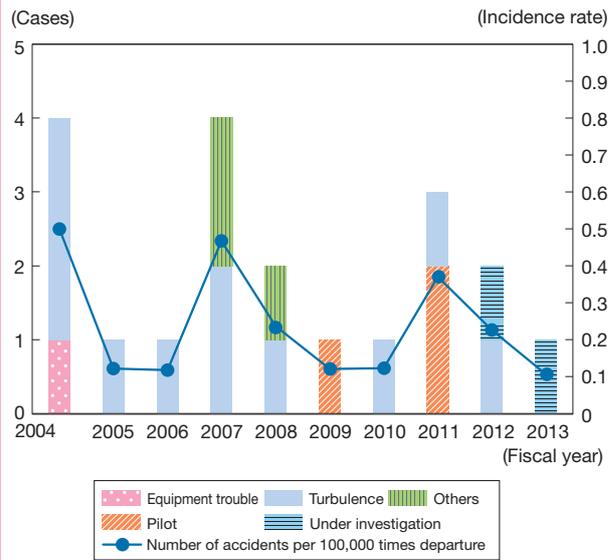
Although there are no fatal accidents since 1986 among specified domestic air carriers <sup>Note</sup>, to appropriately respond to safety troubles, the safety management system of airlines and others will be improved, preventative safety measures will be promoted, and preliminary audits and strict site inspections, including unannounced visits, for domestic airlines newly entering the market or expanding business along with other measures to appropriately improve systematic monitoring. 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.

#### c. Certification of Domestic Jetliners

In October 2014, the first flight test aircraft of the first domestic jetliner left the assembly line and was unveiled to stakeholders on a rollout ceremony. The MLIT, as the national government of design and manufacturing, certification is under way concerning compliance with safety and environmental standards. To implement certification more appropriately and smoothly, the establishment and expansion of the certification organization, along with close coordination with the aviation authorities of the United States and Europe, are being carried out.

Figure II-7-4-4

Incidence and Frequency of Accidents on Domestic Airlines



Source) MLIT

**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.

#### d. Action taken for Boeing 787 Battery Trouble Measures

Battery trouble occurred on Boeing 787 in January 2013, causing a suspension of flights lasting several months. For this case, the airlines were requested to make a proper disclosure of safety information to users in addition to battery improvements. Afterwards, a similar trouble occurred with a Boeing 787 on the ground in January 2014. MLIT concluded in the assessment report on that trouble released in December 2014, it was confirmed that corrective measures taken in light of the trouble cases occurred in the previous year were effectively functioned and, from the view point of ensuring safety and security of users, it was necessary that close cooperation continue to be kept with aviation stakeholders involved including those of the United States and other relevant countries.

### (2) Developing Air Traffic Systems for Aviation Safety

Since the majority of serious incidents concerning air traffic services originates from human error, measures to prevent human error such as miscommunication between controllers and pilots and installation of visual display and transmission systems for controllers and pilots are being promoted.

Since the demand for operation of small aircraft such as helicopters is increasing for such missions as disaster response, development of low altitude routes considering its operational characteristics is being evaluated as well.

## 5 Determining the Causes of Aircraft, Railway, and Marine Accidents/Serious Incidents and Preventing Recurrence

The Japan Transport Safety Board launched the operation of “Japan-Marine Accident Risk and Safety Information System (J-MARISIS) Global Version” from April 2014. Using this system, regarding marine accidents occurred all over the world, the accident investigation reports (English Version) that the Japan Transport Safety Board has investigated as well as the accident investigation reports released by foreign Marine Accident Investigation Authorities (Australia, the United States, France, New Zealand, the Netherlands, Canada, and the United Kingdom) can be searched from the world map.

With respect to the accidents/serious incidents investigation, 25 cases of aircraft accident investigation reports were released, and five recommendations and two safety recommendations were issued. In January 2013, a Boeing 787-8 made an emergency landing at the Takamatsu Airport because the main battery of Boeing 787-8 caused a thermal runaway during the airplane’s takeoff climb, and executed emergency evacuation on taxiway. For this serious incident, a safety recommendation was issued to the Federal Aviation Administration of the United States to review the technical standards for lithium ion battery.

In addition, 18 cases of railway accidents/serious incidents investigation reports were released. Amongst these, the MLIT held a review committee to study the effective measures to prevent uneven loading in the containers, based on the investigation report of the derailment accident that occurred in Hokkaido in April 2012. Moreover, in the investigation report of the derailment that occurred in Hokkaido in September 2013, the Japan Transport Safety Board stated measures to prevent the recurrence of accidents such as ensured implementation of inspection and maintenance of the track.

Furthermore, 1,079 cases of marine accidents/incidents investigation reports were released, and six safety recommendations were issued. Amongst these, for the fire accident happened on a vessel in Hokkaido in May 2013 which

### Japan-Marine Accident Risk and Safety Information System (J-MARISIS) Global Version

Web page [http://jtsb.mlit.go.jp/hazardmap/index\\_en.html](http://jtsb.mlit.go.jp/hazardmap/index_en.html)

Display example of accident investigation report

Source) MLIT

caused six fatalities, the Japan Transport Safety Board issued safety recommendation to the owner of the vessel to try to secure the emergency escape routes regardless where a fire breaks out. The Japan Transport Safety Board also issued safety recommendation to the Cambodian authority to provide adequate instructions to the management companies and owners that are operating similar ships to the vessel.

## 6 Support for Victims and Families of Public Transport Accidents

In order to support the victims and others of public transport accidents, the Public Transport Accident Victims Support Office was established in April 2012. The Support Office exercises such initiatives as transferring requests from victims to public transport operators and introducing appropriate authorities in accordance with the consultation content of victims.

In FY2014, when a public transport accident occurred, the Support Office made the consultation service well known to victims, as well as responded to consultation from victims. Also, during ordinary times, education and training was implemented for support staff, networks with external organizations were established and the promotion for the creation of victim support plans by public transport operators among other activities were carried out.

In the future, based on feedback from stakeholders, the Support Office's functions will continue to be improved and measures to support the victims and others of public transport accidents will be steadily moved forward.

## 7 Safety measures for road traffic

In 2014, deaths caused by traffic accidents had decreased from a peak of 16,000 people in 1970 to one-fourth 4,113 (down 5.9% compared to the previous year), but half of traffic accident fatalities (2,038 people) occurred while riding a bike or walking. Of these, half of the traffic accident fatalities occurred within 500 meters of the homes of victims, making it a very difficult situation. 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.

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

In recent years, in response to progress in road development, we have entered an era that needs to be able to reproduce community roads with pedestrian and bicycle-only space, by moving automobile traffic to highly safe expressways and dividing road functions in two: roads for pedestrians and bicycles, and expressways for automobiles.

For arterial roads that account for roughly 60% of traffic accident fatalities, effective and efficient accident measures are being promoted through public participation and collaboration under the “accident zero plan (strategy for concentrated relief of accident prone sections)” in order to implement concentrated measures in areas with a high degree of danger for accidents.

Meanwhile, for community roads where the proportion of accident casualties involving pedestrians and bicycle riders is high, measures are taken for the purpose of ensuring safe pedestrian spaces by suppressing the vehicle traffic and reducing speeds, as well as by converting traffic to arterial roads. Wide-ranging and comprehensive traffic accident suppression measures are being promoted in collaboration with the prefecture public safety commission. These measures include: broad speed regulations combined with narrowing the road, widening the road shoulder, developing the sidewalk, and placing humps to suppress vehicle speed.

### (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 the IT

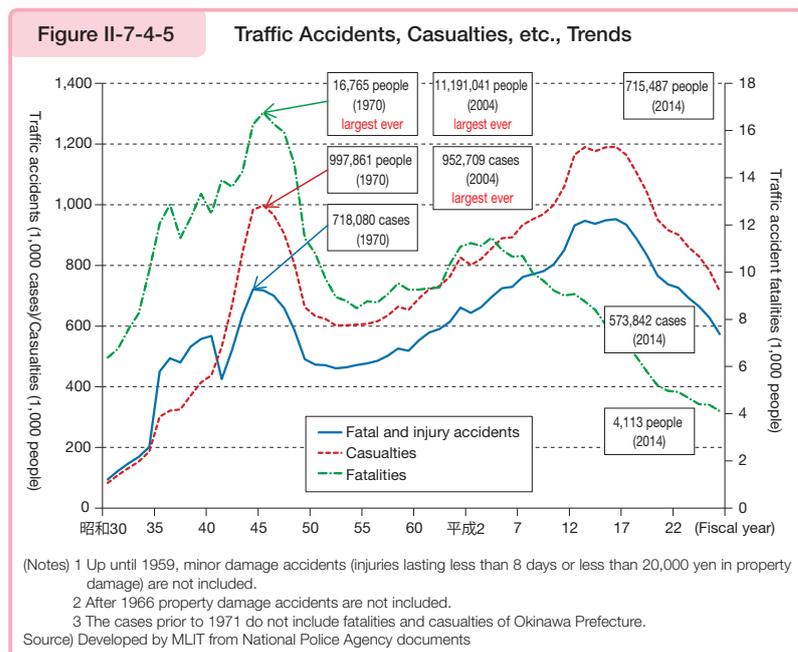
The ITS Spot Service and ETC 2.0 service, which uses a vehicle-equipped device has been available on expressways across the country since August 2011. The services support safety driving by calling attention to accident prone areas or falling objects as well as forewarning of snow and overtopping wave conditions, through the car navigation system.

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

There are about 700,000 bridges nationwide and they are rapidly aging. Therefore, the stakeholders, including municipalities which manage about 500,000 bridges, must maintain, repair, and renew them to ensure their safety.

Additionally, to achieve the appropriate management of the roads, clarifying the need for inspections, creating regulations to designate roads to attract the traffic of large vehicles that impact road structures the most, and persecution of vehicles that violate limits were some of the things included in the amended Road Law that was promulgated for government ordinances. The facilities subject to renovation and repairs by the agency were defined as tunnels and bridges, and technical standards were established for the maintenance and management of roads.

A ministerial ordinance was enacted on March 31, 2014 that clarified the obligations of road administrators, such as



visual inspections in close proximity of bridges and tunnels once every five years.

In addition, on April 14, 2014, the “Recommendations for the Full-Scale Implementation of Road Aging Countermeasures” was published by the Panel on Infrastructure Development Road Subcommittee for the establishment of maintenance cycles (clarifying the obligations of road administrators) and to create a framework to govern maintenance cycles.

The MLIT is working even more actively on support for measures taken against aging roads that are implemented by local governments, such as the steady promotion of routine inspections using the “Road Maintenance Conference”, which was established in all prefectures by July 2014. The support includes Implementation of the bulk order placement of inspection works on a regional basis, enhancement of the training of local government staff, and technical support for direct control diagnoses.

#### (5) Steady implementation of the “Expressway and Chartered Bus Safety and Security Recovery Plan”

In response to the Kan-Etsu 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.

#### (6) Accident Prevention Measures Associated with Bus Driver’s Physical Condition Sudden Change

In response to the Hokuriku highway express bus accident occurred on March 3, 2014, conventional measures related to health care of drivers were reviewed, and the “Measures to Prevent Bus Accident Associated with Bus Driver’s Physical Condition Sudden Change” was formulated on April 18, including the revision of “Health Care Manual for the Fleet Vehicle Drivers.” We are working to disseminate these measures across road transport operators and to prevent accidents caused by bus driver’s physical condition sudden change.

#### (7) Strengthening Research Function on Accidents Caused by Fleet Vehicles

For serious accidents caused by fleet vehicles that have a great social impact, it is required to obtain the recommendations for objective and high-quality preventive measures along with carrying out research and analysis for causes of advanced and complex accidents while achieving further clarification of structural and organizational problems behind the accident.

For this reason, we are working to strengthen the accident investigation capabilities by establishing the “Fleet Vehicle Accident Investigation Committee” in cooperation with the National Police Agency.

#### (8) 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.

#### (9) Comprehensive Safety Measures for Automobiles

##### a. Safety Measures for Commercial Motor Vehicles

An intermediate review was carried out in November 2014 for the “Commercial Motor Vehicles Comprehensive Safety Plan 2009” formulated in March 2009. To achieve the goal of reducing the accident fatalities and personal injury accidents by half in 30 years, the MLIT and stakeholders will work together to steadily implement measures of the plan after the intermediary review, and work towards ensuring safety and security of commercial motor vehicles.

In addition, 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. Moreover, we started a study on the establishment of system modalities that will bear the next

generation traffic management by integrating the evolution of various functions, such as utilization of bio sensor and cloud, and the results of progress in technologies.

#### b. Considering Vehicle Safety Measures for the Future

In the Ninth Fundamental Traffic Safety Program (established March 2011), the goal of reducing traffic accident fatalities to less than 3,000 by 2015 was established. For the achievement of this traffic accident reduction goal, the three measures of “expanding, enhancing, and strengthening safety standards, etc.”, the “Advanced Safety Vehicle (ASV) Promotion Plan”, and “vehicle assessment” will be coordinated in a synergistic manner to promote vehicular safety measures.

#### c. Expanding and Strengthening Safety Standards

In order to improve automobile safety, four international standards related to steering and emergency spare tire, etc, have been introduced in Japan. The requirement for traveling performance at curve and required handling operation power upper limit, and braking performance with the emergency spare tires mounted, have been newly developed. In addition, mounting of advanced brake system (Anti-lock brake system (ABS)/ combined brake system (CBS) for motorcycles is required. Mounting of lane deviation warning system (LDWS) for bus and truck is required as well. These standards will be reinforced.

#### d. Development, Commercialization, and Promotion of Advanced Safety Vehicle (ASV) (ASV)

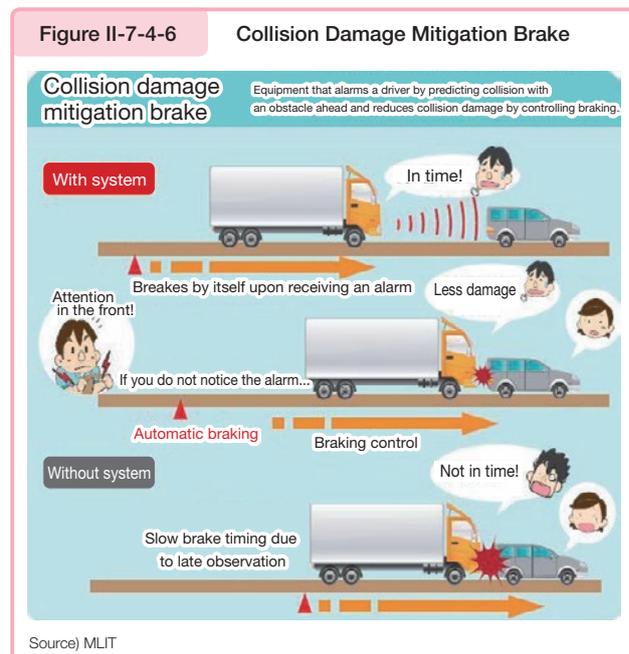
We are proceeding with a study on development and practicalization of new technologies such as driver error response system as well as promoting full-scale popularization of practicalized ASV technologies such as collision damage mitigation brake under the cooperation of industry, academia and government.

#### e. Providing Safety Information Through Automobile Assessment

In order to promote the selection of safe automobiles and child seats by users and the development of safer automobiles, the evaluation results of the safety of cars is published. From 2014, we started new assessment of preventive safety technology such as collision damage mitigation brakes.

#### f. Efforts Towards Realization of Automatic Driving

The Automatic Driving Sub-committee started under the World Forum for Harmonization of Vehicle Regulations (WP29) and Japan and United Kingdom were appointed co-chairs. In addition, Japan is leading international standardization of emerging technologies such as proposing the standard for lane maintaining support devices. Even in Japan, initiatives such as verification tests for the practical use of telecommunication usage type driving support system are being taken based on the Strategic Innovation Creation Program (SIP) which is the government offices and ministries collaboration program.



### g. Swift and Steady Implementation of Automobile Recalls and Informing Users and Others

For the swift and steady implementation of automobile recalls, efforts are made to gather information from automobile manufacturers and users and during the audit of recall operations by automobile manufacturers confirmation and guidance is carried out and for automobiles with concerns for safety and environmental performance, the National Traffic Safety and Environment Laboratory (Incorporated Administrative Agency) is conducting technical verifications. Also, to strengthen the gathering of defect information, public awareness campaigns for the “automobile defect information hotline” ([www.mlit.go.jp/RJ/](http://www.mlit.go.jp/RJ/)) were actively carried out.

In addition, the information collected by MLIT including malfunctions, accidents, and fires are made public and information is provided to users regarding matters that require the attention of users or details necessary for the appropriate usage or maintenance and management or to take appropriate measures when malfunctions occur. In particular, press releases and other measures were used to especially raise user and public awareness for “Be careful for engine stall of automatic transmission car!!” and “Must attach stud-less tires to all four wheels!!”.

Also, in FY2014 the number of recalls submitted was 355 and the number of cars affected was 9,557,888.

### h. Sophistication of Vehicle Inspections

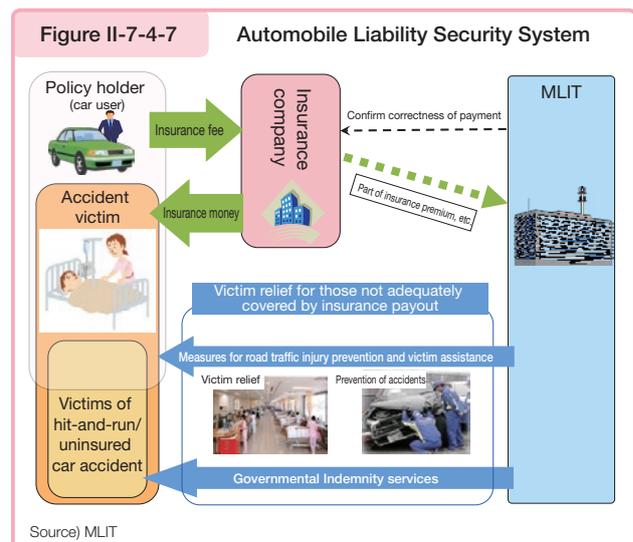
In order to prevent illegal secondary modifications <sup>Note</sup> and the early detection of vehicular malfunctions, information technology is being utilized to make vehicle inspections more sophisticated.

## (10) 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.

## (11) Safety Measures for Mechanical Multistory Parking Garage

In light of the occurrence of fatalities and other accidents involving mechanical multistory parking garages, we have formulated the safety guidelines and requested the relevant organizations to ensure safety and use the guidelines properly. Moreover, in response to the revision of “Parking Law Enforcement Regulations”, a new minister’s certification system has been introduced to conduct the examination of safety features of mechanical multistory parking garages.



**Note** Obtaining a new inspection with various parts removed and then reinstalling the parts in question after the inspection for usage.

## Section 5 Crisis Management and Security Measures

### 1 Promoting Crime and Terrorism Countermeasures

#### (1) Coordinating with Other Countries for Crime and Terrorism Countermeasures

##### a. International Initiatives for Security

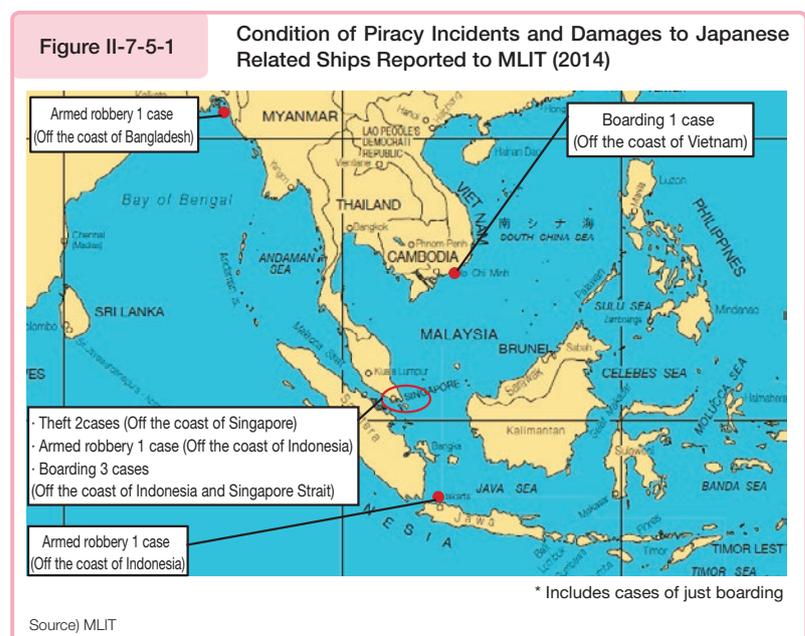
In addition to participating in meetings and projects in the field of transport security at international organizations such as Group of Eight (G8), International Maritime Organization (IMO), International Civil Aviation Organization (ICAO), and Asia-Pacific Economic Cooperation (APEC), this knowledge is applied to domestic security measures while promoting initiatives for international cooperation and harmony.

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.

##### b. Anti-Piracy Measures

According to the International Maritime Bureau (IMB), the number of pirate incidents occurred off the coast of Somalia in 2014 was 11 cases. That is, pirate incidents had been increasing until 2011 but changed to low level in recent years due to the effect of anti-piracy measures by international society such as the continued anti-piracy activities by the navy of each country, implementation of self-defense measures through Best Management Practices (BMP) <sup>Note</sup> implemented by merchant ships, and embarkation of Privately Contracted Armed Security Personnel on merchant ships. However, incidents of chasing by a suspicious ship is continuously occurring to merchant ships navigating through Somalia peripheral sea area and unpredictable situation continues for the navigation of the merchant ships.

Under this situation, the Japan Maritime Self-Defense Force destroyers are 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 (Pirate Measures Law)”. The MLIT provides a single contact point for escort requests from shipping companies and others and selects vessels to be escorted. The MLIT also appropriately applies the “Act on Special Measures Concerning the Guarding of Japanese Ships in Pirate-infested Waters” (enforced on November 30, 2013) 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.



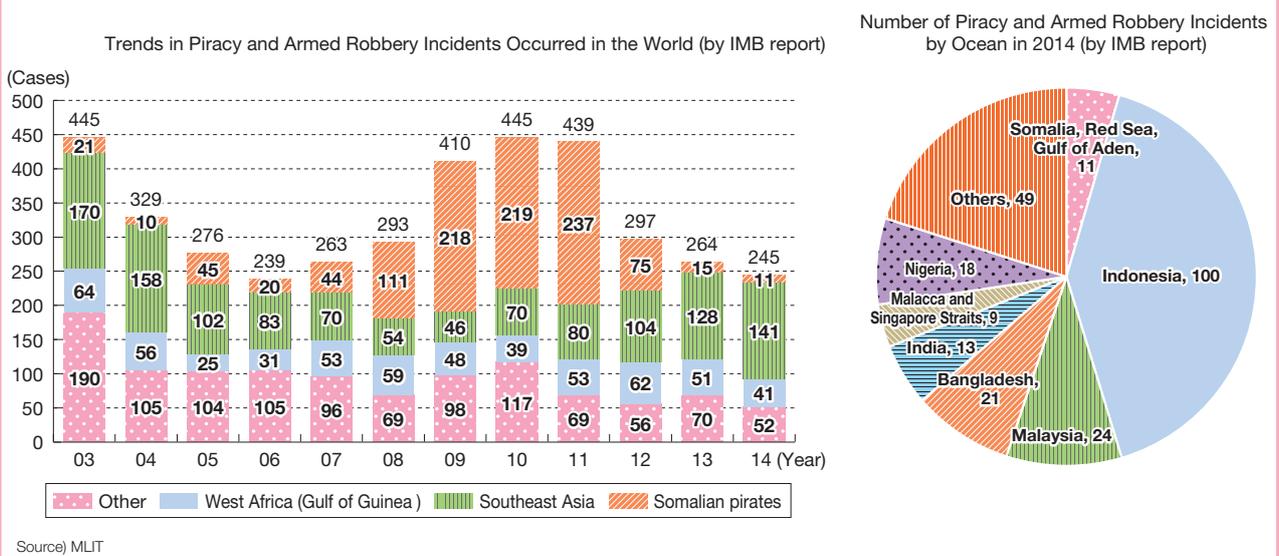
**Note** A compilation of self-defense measures (avoidance measures for pirate activities, establishing evacuation areas [citadels] within vessels, etc.) created by various organizations deeply involved with shipping such as the International Chambers of Shipping to prevent or minimize damages due to Somalian pirates.

Japan Coast Guard, for anti-piracy measures in the water off the coast of Somalia and Gulf of Aden, dispatches its eight officers, onboard Japan Maritime Self Defense Force destroyers to conduct judicial police activities in case of piracy incident.

In addition, the Japan Coast Guard provides capacity building assistance towards maritime security agency officials of coastal states, such as off the coast of Somalia and in the Gulf of Aden and Southeast Asian waters, and is working on the promotion of collaboration and cooperation with relevant countries and agencies. Specifically, the Japan Coast Guard dispatched an aircraft to Djibouti to exercise pirate convoy training with country’s coast guards and dispatched patrol vessels and aircraft to the coastal states of Southeast Asian water to practice joint training of anti-piracy measures with coast guard agencies of each country, and provided training and lecture, etc. In addition, the Japan Coast Guard invited coast guard agency staff of each country and dispatched experts in each country for short-term training on anti-piracy cooperation. Further, the Japan Coast Guard dispatched it’s staff to international organizations such as Regional Cooperation on Combating Piracy and Armed Robbery against Ships in Asia and Information Sharing Center (ReCAAP-ISC).

Although the number of Somali piracy incidents has transitioned at a low level, yet the threat by Somali pirates still exists, so the situation might reverse if initiatives for anti-piracy measures taken so far are weaken. On the other hand, in 2014, the cases of petroleum products steeling from small tankers are increasing in Southeast Asia waters, and in recent years the armed robbery incidents in Indonesia territorial waters and its surroundings are increasing, so there is a need for continued precise measures to match with their needs such as capacity improvement assistance for the coastal countries.

Figure II-7-5-2 “Trends in Piracy and Armed Robbery Incidents Occurred in the World (by IMB report)” and “Number of Piracy and Armed Robbery Incidents by Ocean in 2014 (by IMB report)”



c. 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

In recent years, a variety of major incidents targeting public transport are occurring around the world such as the September 11 terrorist attacks in the United States of America (September 2001), the London Bombings (July 2005), and the Mumbai attacks (November 2008). Further after January this year, terrorist attack in France, killing incidents of Japanese nationals in Syria and Tunisia, are evident of a growing threat of international terrorism. In light of these circumstances, counter-terrorism measures are being developed in each respective field and counter-terrorism measures are implemented during busy seasons, through supervision and inspections.

Figure II-7-5-3

Implementing “Displaying Security and User Participation” as the Axis of Railway Counter-Terrorism Measures



(Source) MLIT

### a. Promoting Counter-Terrorism Measures for Railways

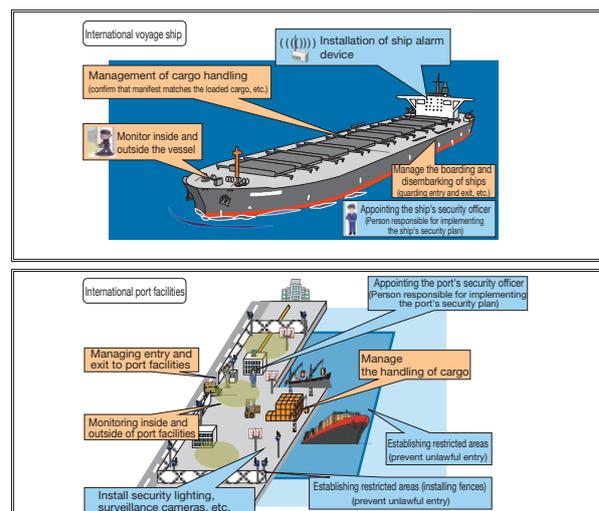
In addition to increasing security cameras within stations and strengthening patrols, “crisis management levels” are set and operated as well as “displaying security and user participation” <sup>Note</sup> as the axis of promoting counter-terrorism measures. Also, the sharing of information regarding railway counter-terrorism measures with major nations is being actively pursued.

### b. Promoting Counter-Terrorism Measures for Ships and Ports

Security is ensured through the approval of security rules and ship inspections of international voyage ships, approval of security rules for international port facilities, regulation of arriving ships, and site inspections of international voyage ships and international port facilities as well as Port State Control (PSC) in accordance with the “Act on Assurance of Security of International Ships and Port Facility”. In addition, based on the inspection results for the international port facilities as well as the security standard in foreign countries, we are even more thorough in the security measures by implementation of three points of confirmation (personal identification, affiliation check, purpose confirmation) in and out of all international port facilities from 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.

### c. Promoting Counter-Terrorism Measures for Aviation

In order to do every possible thing to prevent a terrorist attack involving 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 trespassing inside and outside our country, in addition to strengthening the fences for invasion preventive measures against vehicles and people, prompt measures are being taken such as installing sensors on every airport which are able to cope with invasion. Moreover, prevention of carrying explosives which can not be detected by metal detectors, is enhanced by implementing a random manual search for international passengers. 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.

### d. 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.

### e. 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 license is permitted before bonded area loading.

For the security system of airfreight with the purpose of protecting airfreight 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 management information system is being implemented to accurately confirm the identity and association of truck drivers and full-scale system operation started from January 2015.

## (4) Information Security Measures

As the dependence on IT for socio-economic activities in general continues to grow, various cyber attacks are becoming more prevalent such as email attacks targeted toward government institutions, increasing the importance of initiatives for information security measures.

Against this backdrop, based on the policy of "cyber security strategy headquarters" of the government, the MLIT is working on information security measures for improving, strengthening and readiness to cope with cyber attacks on

**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 airline companies.

information systems. In addition, as information security measures of the field of critical information infrastructures (aviation, railway and logistics), guidelines for protection from IT failure are being developed.

## 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 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 in addition to implementing joint training. Also, for pollution accidents involving oil or toxic liquid substances, response equipment is being improved to strengthen the system for a swift and effective response and environmental protection information on coastal waters needed to contain oil, etc., is being compiled and provided.

## 3 Strengthening the Coast Guard System

### (1) Improving and Strengthening the Operational System

In order to fully respond to Chinese large government vessels which are persistently wandering around territorial waters surrounding the Senkaku Islands, the Japan Coast Guard is developing 1,000 ton patrol vessels equipped with surveillance ability to establish a full-time patrol system by large patrol vessels for the security of Senkaku territorial waters. The Japan Coast Guard will also develop mooring facilities to strengthen the base functions in Ishigaki Port and deploy boat crew for a newly commissioned patrol vessels. In addition, we promote switching of patrol vessels to alternative high-performance patrol boats to ensure the system which can precisely respond to changes in the situation. In addition, we will promote the development of new jet aircraft and regulatory capacity advanced patrol vessels, and ensure the operating costs of them from FY2015 to establish a maritime security system around the Senkaku territorial waters and all over the oceans of Japan without security holes.

### (2) Promoting Counter-Terrorism Measures

To prevent terrorism, the Japan Coast Guard patrols around facilities that are at risk, such as coastal nuclear power plants and petrochemical complexes as well as U.S. Armed Forces facilities by patrol vessels and aircrafts. Also, during Golden Week, summer vacation, and the Year-end and New Year holidays and other periods when passenger travel is at the peak, security is especially tightened in passenger ship terminals where many people are concentrated.

In addition, we also encourage the strengthening of self-security to maritime persons and businesses and others, request to make notification reports of the suspicious information or activities to cooperate with the local community.

### (3) 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 activity, suspicious boats needs to be stopped for site 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.

#### (4) Promoting Measures against Maritime Crimes

Some major characteristics of recent maritime crime indicate that illegal fishing by foreign fishing vessels have been increasing and particularly arrests of Chinese coral fishing vessels have increased. Regarding the poaching crimes in Japan, poachers and buyers tied in organized manner are engaged in maritime poaching crimes as well as organized criminals seeking sources of funding by poaching. Environmental crimes such as illegal dumping of waste into the ocean to save processing costs are still occurring, and its characteristics are becoming more malicious and sophisticated. Also, for domestic crimes involving firearms and drugs, some are closely related to smuggling crimes facilitated by Japanese criminal organizations and international crime syndicates along with illegal transit facilitated by international crime syndicates. Regarding various maritime crimes, there is still a need for vigilance and Japan Coast Guard is strengthening monitoring and prosecution, gathering and analyzing crime information, and strengthening site inspections by effectively utilizing patrol vessels and aircraft as well as sharing information with relevant domestic and international organizations as part of the efforts to pursue effective measures and take strict yet appropriate measures against maritime crimes.

## 4 National Security and Protection of Citizen's Lives and Assets

### (1) Responding to North Korea Issues

In response to the North Korea launching ballistic missiles and conducting nuclear tests, in accordance with the “Act on Special Measures concerning Prohibition of Entry of Specified Ships into Ports”, all ships registered to North Korea are prohibited from entering Japan’s ports and in light of the international situation this measure was extended to April 13, 2015. To ensure the implementation of these measures, the Japan Coast Guard is conducting the confirmation of information regarding the arrivals of North Korean-flagged ships. Also, to ensure the effectiveness of the measures banning exports to North Korea such as the United Nations Security Council Resolution 1874, in accordance with the “Special Measures Law Regarding Cargo Inspections, etc., of Japan in Accordance with the United Nations Security Council Resolution 1874, etc.”, the MLIT and the Japan Coast Guard is coordinating closely with relevant administrative agencies to ensure the effectiveness of measures stipulated by the law.

Also, in light of leadership changes at North Korea, the MLIT is strengthening its readiness including information gathering and communication to thoroughly implement measures in preparation of worst case scenarios and will continue to maintain the monitoring and warning systems. Also, for the cases of missile launches referred as rocket launches for “artificial satellites” conducted by North Korea on April, 13 and December 12, 2012, and nuclear tests conducted by North Korea on February 12, 2013, information was collected and shared as part of the efforts to ensure the safety and security of citizens.

### (2) Responding to Armed Attacks and Other Situations Under the National Citizen Protection Plan

In accordance with the “Act concerning the Measures for Protection of the People in Armed Attack Situations, etc” and “Basic Policy Regarding the Protection of National Citizens” which stipulates measures regarding the evacuation, rescue and minimization of losses due to armed attacks, etc., MLIT, the Geospatial Information Authority of Japan, the Japan Meteorological Agency, and Japan Coast Guard stipulate “Plan Regarding the Protection of National Citizens”. The MLIT will implement support such as communication and coordination with designated public agencies that serve as transporters for the transport of evacuating residents in accordance with requests from local government; the Japan Coast Guard is designated to carry out the transport of evacuating residents and emergency supplies when the transport capacity of designated public agencies is insufficient and to carry out search, rescue, and emergency activities.

## 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, in May 2012 “the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response (hereinafter Act on Special Measures)” was established 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) businesses registered as requiring special inoculation 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 sector agencies are required by regulation to implement measures against breakouts of new type influenzas, etc., and designated public sector agencies 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 (hereinafter National Action Plan) 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 to ensure the segregation goes smoothly 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.